

**AN ANALYSIS FRAMEWORK APPROACH FOR
MANAGING CORPORATE E-LEARNING DEVELOPMENT**

PIETER DE VRIES
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AN ANALYSIS FRAMEWORK APPROACH FOR MANAGING CORPORATE E-LEARNING DEVELOPMENT

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Rethinking the past and future of technology supported learning convinced me that this field will continue to develop as an increasingly interesting innovation. In order to structure my knowledge acquisition and knowledge creation I decided to write a dissertation on the subject. In the selection process of the research issues there was a shift in focus from a general analysis of e-learning to a more specific subject orientation that is managing e-learning development in the corporate sector. Doing so, I was better able to interlink the research objectives with my daily work as a consultant, and apply the findings while working closely together with my colleagues at Cinop (Centre for the Innovation of Training and Learning) and later on at EduTec (Centre for Education and Technology at the Delft University of Technology). The management approach that was developed has helped us in practice to improve the consultancy process and achieve better results.

I could not have written this dissertation without the inspiring guidance of Jef Moonen, my first promoter. He helped me to go through the thinking and writing process inherent of the progression in the research activities. I am grateful for his dedication and support. Also I would like to thank Wim Veen, my second promoter, who gave me the opportunity to spend more time on the writing and was of great help in discussing and outlining the research issues. A special thanks goes to Betty Collis who played a key role in getting me started.

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In the production process of the dissertation it was Jan-Paul van Staalduinen who helped me to fight the disturbing peculiarities of the Office word processor.

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Table of Contents

List of Figures	i
List of Tables	iii
Introduction	v
1 E-learning: Understanding the Context	9
1.1 Socrates, the Book and E-learning	9
1.2 The Arrival of E-learning	12
1.2.1 What is e-learning?	13
1.2.2 Why e-learning?	19
1.3 E-learning Characteristics	24
1.3.1 Advantages or disadvantages?	24
1.3.2 The added value	26
1.3.3 Inhibiting factors: barriers for development	27
1.4 The Market	29
1.4.1 The supply side	30
1.4.2 The demand side	33
1.4.3 The e-learning hotspot	34
1.5 The 'Learning' Evolution	35
1.6 The Future of E-learning	38
1.6.1 The New Economy	38
1.6.2 E-business: Driver of the new economy	40
1.6.3 Consequences for e-learning	42
1.7 Separating the Hype from Reality	45
1.8 Future Trends	49
1.9 Conclusions	56
2 The Changing Paradigm of the Educational Business Column	59
2.1 Implementing change and innovation in education and training	60
2.1.1 An analysis framework for educational change	60
2.1.2 Factors for implementing change and innovation	62
2.1.3 Key change themes	63
2.1.4 The diffusion of innovations	66
2.1.5 Why are actors so important?	69
2.2 Technology in the Context of E-learning	70
2.2.1 Components of the technical e-learning infrastructure	71
2.2.2 Types of e-learning technology	72
2.2.3 Learning standards	75
2.2.4 The future of e-learning technology	76
2.3 Content in the Context of E-Learning	77

2.4	The Changing Paradigm: Lessons from the Past	80
2.4.1	<i>'Telematics' as a basic provision (De Vries, 1991)</i>	81
2.4.2	<i>The PTT – NIVO project (Kanselaar & Zwijgers, 1992)</i>	82
2.4.3	<i>Preliminary research: Telematics in Education (Collis & De Vries, 1991) & Analyzing European Projects in secondary education (Collis & De Vries, 1992)</i>	84
2.4.4	<i>The Emerging Trans-European Network for Education and Training: Guidelines for Decision Makers (Collis & De Vries, 1993).</i>	88
2.4.5	<i>Intermission: Moving from education to training in businesses</i>	92
2.4.6	<i>CISO-Project: Recommendations for an On-line Service for Dutch Education (Collis, Veen & De Vries, 1993; De Vries, Collis & Veen, 1993)</i>	92
2.4.7	<i>TeleCoach: A Conceptual Framework for the Development of a Flexible Learning and Teaching Environment (Project 1996-1999)</i>	95
2.4.8	<i>TeleLearn: Costing Issues in Flexible and Distance Learning (De Vries 1999) and TeleLearn: Case Study Report (Boninsegna & De Vries, 1999)</i>	99
2.4.9	<i>Telecommunications Service organization (1999 - 2002)</i>	101
2.4.10	<i>Marketing organization (2001 - 2002)</i>	103
2.4.11	<i>Transport organization (2002 - 2003)</i>	104
2.5	Synthesis	105
2.6	Conclusions	111
3	Developing the Analysis Framework Approach	115
3.1	Why an E-learning Strategy?	115
3.2	The CES Model: Context for the Analysis Framework Approach	118
3.3	Developing the Analysis Framework Approach	122
3.3.1	<i>The consultant as the prime user</i>	123
3.3.2	<i>Success factors</i>	123
3.3.3	<i>The building blocks</i>	126
3.4	Outlining the Analysis Framework Approach	129
3.4.1	<i>The sub-phases</i>	131
3.5	Summary	141
4	Research design	143
4.1	The Research Context and the Methodology	143
4.1.1	<i>Research context and focus</i>	143
4.1.2	<i>Selecting the research methodology</i>	146
4.1.3	<i>Characteristics of action research</i>	147
4.1.4	<i>Types of action research</i>	149
4.1.5	<i>Limitations of action research</i>	150
4.1.6	<i>The validity of action research</i>	150
4.1.7	<i>The action-research framework</i>	151
4.2	The Case Study Research Method for Data Collection and Analysis.	153
4.2.1	<i>Why a case-study approach?</i>	153
4.2.2	<i>Case-study research design</i>	154

4.2.3	<i>Case-study selection criteria</i>	157
4.2.4	<i>Data-collection principles and resources</i>	158
4.2.5	<i>The data-collection protocol</i>	160
4.2.6	<i>Cross-case analysis schedule</i>	161
4.2.7	<i>Cross-case analyses techniques</i>	162
4.3	Summary	163
5	First Experiences with the Analysis Framework Approach	165
5.1	The Case Study Experience	166
5.2	First Cycle of Case Studies	167
5.2.1	<i>Case # 2 Steel industry: Metal packaging</i>	167
5.2.2	<i>Case # 6 Training sector: Regional college for vocational and adult education</i>	173
5.3	Cross-Case Analysis	181
5.4	The Expert Meetings	193
5.4.1	<i>Expert Meeting 1: E-learning seminar for the business sector</i>	193
5.4.2	<i>Expert Meeting 2: The content validity test</i>	196
5.5	Final Analysis	201
5.5.1	<i>The cross-case analysis</i>	201
5.5.2	<i>Outcome of the expert meetings</i>	206
5.5.3	<i>Conclusions and recommendations</i>	208
5.6	Actions for the Improvement of the Analysis Framework Approach	215
5.6.1	<i>Action 1: Add structure to the analysis</i>	215
5.6.2	<i>Action 2: Develop a user's guide for the consultant.</i>	219
5.6.3	<i>Action 3: Develop an attitude questionnaire for the client</i>	221
5.6.4	<i>Actions not viable in the course of this research.</i>	223
5.7	Summary	223
6	The Second Cycle of Case Studies	225
6.1	The Case-Study Method	225
6.2	The Case Studies	227
6.2.1	<i>Case # 8 Health care: Training institute for company doctors</i>	227
6.2.2	<i>Case # 14 Food industry: Producer of refined oils and fats</i>	232
6.3	Cross-Case Analysis Schedule	239
6.4	Summary	257
7	Conclusions on Version 2 and Recommendations	259
7.1	Summary Results of the Cross-Case Analysis	259
7.2	The SWOT Analysis	267
7.3	Recommendations for the Improvement of the Analysis Framework Approach	273
7.3.1	<i>Dimension 1: Usable in different organisations</i>	274
7.3.2	<i>Dimension 2: Usable in different organizational levels</i>	274
7.3.3	<i>Dimension 3: Usable by different people</i>	275
7.3.4	<i>Dimension 4: Usable in different stages of e-learning development</i>	276
7.4	Summary	277

8	Discussion and Further Research	279
8.1	Looking Back	279
	8.1.1 <i>Experiences from the field</i>	279
	8.1.2 <i>Outcomes of the research</i>	281
	8.1.3 <i>The research questions revisited</i>	283
8.2	The State of Affairs with E-learning	286
8.3	Upcoming Issues	287
8.4	Recommendations for Further Research	287
	References	289
	Summary	299
	Samenvatting	305
	Appendix A: Analysis Framework Approach Version I: Consultants' Users Guide.	311
	Appendix B: Analysis Framework Approach Version I: Student Users Guide.	313
	Appendix C: Analysis Framework Approach Version 0: Interview Items for the Quick Scan Sub-phase.	327
	Appendix D: Analysis Framework Approach Version 1: Interview items for the Quick Scan Phase.	333
	Appendix E: Analysis Framework Approach Version I: Questionnaire on the Use of the Approach.	345
	Appendix F: Analysis Framework Approach Version 0: Overview of the first Cycle of Case Studies.	359
	Appendix G: Analysis Framework Approach Version 1: Attitude to e-Learning Questionnaire.	403
	Appendix H: Analysis Framework Approach Version I: Overview of the second Cycle of Case Studies.	411

List of Figures

Figure 1 Research flow in five stages	vi
Figure 2 Ingredients of an e-learning infrastructure.....	17
Figure 3 Corporate e-learning universe (Urdan & Weggen, 2000, p. 21).....	33
Figure 4 The 'hot spot' of the e-learning market (adapted from De Vries & Oprins, 2001).....	34
Figure 5 The traditional training model.....	36
Figure 6 The 'Learning Model'	37
Figure 7 Classical supply chain link (adapted from Tenenbaum, 1998, p. 89)	41
Figure 8 Value added services (adapted from Tenenbaum, 1998, p. 90).....	41
Figure 9 The relation of e-learning with e-business and e-commerce (Source: Urdan & Weggen, 2000, p. 4)	43
Figure 10 E-learning market gaining market share over time (Source: Urdan & Weggen, 2000, p. 14).....	45
Figure 11 U.S. Technology-based training revenue share by delivery segment, 1998-2004 (IDC, 2001).....	47
Figure 12 Activity framework for the second wave of e-learning (Rebensburg, Busch & Rautenstrauch, 2002, p. 40).....	51
Figure 13 The Learning Value Cycle (Rebensburg, Busch & Rautenstrauch, 2002, p. 40).....	51
Figure 14 The market with most growth in online Learning (Clark, 2003a, p. 4)	52
Figure 15 The most important success factor for e-learning in your organization (Clark, 2003a, p. 9)	53
Figure 16 The technology which is expected to lead in e-learning development (Clark, 2003a, p. 15).....	54
Figure 17 The benefits organizations hope to achieve through online learning (Clark, 2003a, p. 6)	55
Figure 18 The biggest benefits of e-learning according to Hill and Kappler (2004, p. 7)	55
Figure 19 The main successes with e-learning in organizations (Hill & Kappler, 2004, p. 8)	56
Figure 20 The 'Comprehensive Framework' for educational improvement on class and school level (adapted from Veen, 1994, p. 241).....	61
Figure 21 Simplified overview of the phases in the change process (Fullan, 2001a, p 48).....	62
Figure 22 A framework for leadership (Fullan, 2001b, p. 4)	64
Figure 24 Five stages in the innovation process in organizations (Rogers, 2003, p. 421).....	68
Figure 25 Basic components of the technical e-learning infrastructure.....	71
Figure 26 Typical features of a LMS.....	74
Figure 27 Overview of organizations involved in the standardization effort (available at www.imsproject.org)	75
Figure 28 The changing educational business column	79
Figure 29 Visualization of the 3G Approach for predicting project success (Collis & De Vries, 1991, p. 39).....	86

Figure 30 The 3 A model and the stakeholders in the Tele-Coach project 97

Figure 31 The 3 phases of the Corporate E-learning Strategy Model (adapted from De Vries, Moonen, Veen & Van Valkenburg, 2003)..... 120

Figure 32 Overview of the CES Model and the constituting elements of the Analysis Framework Approach (Phase I of the CES Model) 130

Figure 33 Phase I of the CES Model: the Analysis Framework Approach..... 131

Figure 34 Outline of the Quick Scan Sub-phase..... 133

Figure 35 Research flow in five stages..... 152

Figure 36 Case study method (Yin, 2003, p. 50)..... 156

List of Tables

Table 1 Overview of the problem statement, the research objective and the research questions.....	vii
Table 2 Drivers for the development of e-learning on the macro level of economic and social development	20
Table 3 Drivers for the development of e-learning on the process level (adapted from Rosenberg, 2001, p. 6)	21
Table 4 Drivers of e-learning on a strategic level (Deloitte Research, 2002, p.3).....	22
Table 5 Drivers for e-learning on an operational level.....	23
Table 6 E-learning advantages or disadvantages.....	25
Table 7 Characteristics of e-learning and their added value.....	26
Table 8 Percentage of respondents choosing possible barriers for the implementation of e-learning (Source: E-learning Magazine, 2001).....	28
Table 9 The paradigm shift from training to learning (Meister, 1998, p. 22).....	37
Table 10 How e-business changes the training landscape (adapted from Völkl & Castelein, 2002, p. 68)	44
Table 11 Overview of the key enabling technologies for e-learning.....	73
Table 12 The Concerns-Based Adoption Model (CBAM) (adapted by Collis & De Vries, 1993, p. 43)	90
Table 13 Overview of criteria for successful change and innovation for e-learning	106
Table 14 Categories of success factors.....	123
Table 15 Overview of the building blocks.....	127
Table 16 Extract from Version 0 of the Interview	135
Table 17 Overlay for recording interview responses.....	136
Table 18 Format for reporting the results of the interview in Step 1.2.2.....	137
Table 19 Structure for the final report of the quick scan phase.....	137
Table 20 Outline for a Request for Information.....	139
Table 21 Further preparation for the outline for Phase 2 Pilot.....	141
Table 22 Overview of the research objective, the research questions and issues.....	144
Table 23 Case-study selection criteria for in-depth analysis	158
Table 24 Outline of the data-collection protocol	158
Table 25 Cross-case analysis schedule	162
Table 26 Overview of case studies using Version 0 of the Analysis Framework Approach.....	166
Table 27 Presentation of factual information on case study # 2	168
Table 28 Presentation of factual information on case study # 6	174
Table 29 Cross-case analysis schedule, Cases # 1 - 3.....	182
Table 30 Cross-case analysis schedule, Cases # 4-6	186
Table 31 Overview of success and inhibiting factors for e-learning.....	194
Table 32 Example of test scores as presented by the GDR Software.....	197

Table 33 Reactions on the interview questions per category	198
Table 34 Summary results of the cross-case analysis, Cases # 1 - 6	201
Table 35 Summary results of the expert meeting with the business sector	206
Table 36 Summary results of the expert meeting with educational and e-learning experts.....	207
Table 37 SWOT Analysis on the outcome of the experiments.....	208
Table 38 Version 0: Category 'Process' as a selected example of the interview schedule.....	216
Table 39 Version 1: Category 'Process' as a selected example of the interview schedule.....	217
Table 40 Business category in Version 0 versus Version 1	219
Table 41 First page of the Attitude to E-learning questionnaire.....	222
Table 42 Overview of case studies using Version 1 of the Analysis Framework Approach.....	226
Table 43 Presentation of factual information on case study # 8.....	227
Table 44 Presentation of factual information on case study # 14	233
Table 45 Cross-case analysis schedule, Cases # 7 - 9	239
Table 46 Cross-case analysis schedule, Cases # 10- 12	244
Table 47 Cross-case analysis schedule, Cases # 13- 14.....	251
Table 48 Summary results of the cross case analysis, Cases # 7 - 14	260
Table 49 SWOT analysis on the outcome of the cases # 7 - 14.....	267

Introduction

E-learning is a promising, but a multi-faceted and complex phenomenon with a multitude of aspects to be considered to make it a success. The lack of research-based approaches and analysis instruments to cope with this complexity is one of the reasons why implementation suffers from an incomplete and fragmented set of activities (Garrison & Anderson, 2003). Therefore the results often do not meet our expectations and lead to disappointment. There is no doubt though, that e-learning will become main stream and achieving results will no longer be optional, especially in the business sector. With these considerations in mind it was decided to focus this study on the problem of “how to improve the management process of e-learning development in the corporate environment”. From the analysis of the theory on educational change, innovation in general, and e-learning experiences, the decision was made to develop a work method to reduce complexity by systematically analyzing the e-learning context from a holistic point of view with a learning consultant in mind as the prime user. So the objective of this study became “the development and implementation of an Analysis Framework Approach”, to be used as management tool for e-learning development in the corporate environment.

The methodological strategy chosen to support the execution of this research should be flexible, allowing other people to participate and allowing for change during the research process. The methodology should also allow for the use of additional or other methodologies in the different stages of the research. From this perspective the tasks for the research were:

- Descriptive: to develop a view on the state of affairs of corporate e-learning and theory on educational change and innovation.
- Explanatory: the experiences with the use of ICT in education and training and the role content and technology are expected to play in future development.
- Empirical: the process of developing and testing the Analysis Framework Approach in close collaboration with the target group in real life situations.
- Prescriptive: the analysis of the experiences and development of the final version of the framework.

The way the research was executed is outlined in Figure I, which represents the research flow of this study. This flow is a visualization of the sequence and interconnectivity of the different stages and activities which have been undertaken during the research, the stages do not necessarily represent chapters of the dissertation.

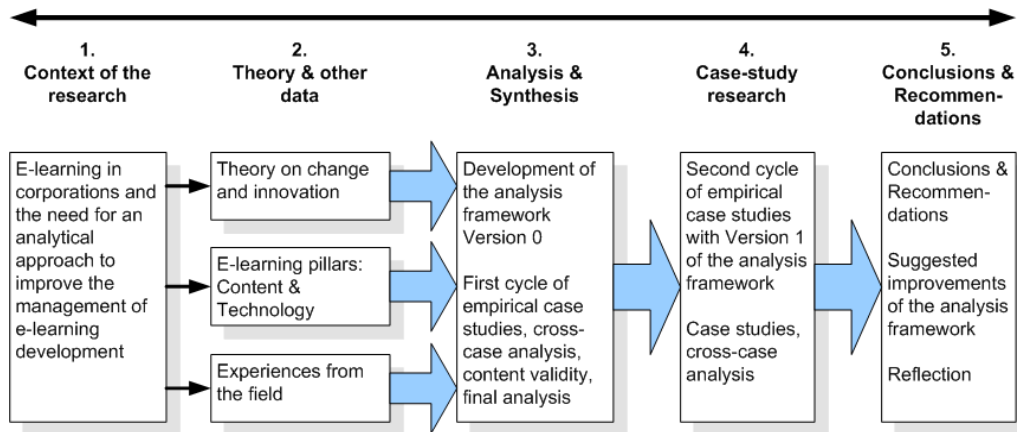


Figure 1 Research flow in five stages

The research was guided by an action research strategy, which together with a case study method for data collection and analysis structured the research flow. Stage 1 relates to the context of the research, starting with a description of the e-learning context. This is an analysis of e-learning as an innovation in the field of training and learning. An important issue is the positioning of e-learning in relation to other innovations and changes initiated by the emergence of technology, like e-business and e-commerce. The next step in this flow relates to the theory and other data. The focus in this stage was on the collection of information from earlier research and experiences, focusing on three layers of data:

1. Theoretical aspects of educational change and the process of innovation
2. Experiences over a period of ten years with the implementation of ICT in education and training and flexible learning
3. Drivers of change in the corporate learning environment, focusing on content and technology.

The findings can be considered the brick and mortar for developing the Analysis Framework Approach. Stage 3 is the analysis and synthesis of the findings. The layers of data have been analyzed and the outcome is used to develop operational criteria for the analysis framework. Version 0 of the Analysis Framework Approach was built on these findings and tested. During this stage the results of Version 0 were analyzed and used to develop Version 1. Subsequently Version 1 was tested during Stage 4. Both versions were used in the daily practice of a real business setting by learning consultants and university students working on their master thesis. The experiences were described using a case study format and a case study method for analysis. Stage 5 presents the conclusions and recommendations. The final analysis took place on the basis of the outcome of the practical tests and experiences, using all information collected, from the analysis of the context of e-learning through the final tests. This

deduction process led to the development of the final recommendations for a next step in the improvement of the analysis framework, including reflections on the study at large and recommendations for further research. An overview of the problem statement, the research objective and the research questions is presented in Table I.

Table I Overview of the problem statement, the research objective and the research questions

Problem statement How to improve the management process of e-learning development in the corporate environment?	
Research objective The development and implementation of an Analysis Framework Approach for corporate e-learning.	
Research questions	Issues
RQ 1 What is e-learning?	Clarifying the context of this study to acquire a good insight in the nature and meaning of e-learning.
RQ 2 What do we know about innovation in general and educational change in particular?	Theories on innovation and educational change being analyzed and reconsidered in the context of e-learning.
RQ 3 What are the characteristics and what roles will content and technology play, as important success factors, in the development of e-learning in the years to come?	Content and technology are considered to be important pillars for the development and success of e-learning.
RQ 4 What have we learnt from the implementation of ICT in education and training?	Analysis of the experiences with the use of communication technology.
RQ 5 What are the building blocks for the Analysis Framework Approach?	The outcomes of RQ 2, 3 and 4 supply input for the construction of the Analysis Framework Approach.
RQ 6 How is this framework being developed and what are the main features?	This is about the creation of the framework approach and the constituting parts using the action research approach.
RQ 7 What is the portability of the Analysis Framework Approach when used by different people, in different organizations, on different management levels and in different stages of development?	An overview of the experiments with the Analysis Framework Approach under different circumstances using the case study methodology.
RQ 8 What modifications should be applied in the development of the final version of the analysis framework?	The development of the final version of the approach, using the outcome of RQ 7.

The organization of the book is as follows. Chapter I, 'E-learning: Understanding the Context', is on the perspective of the study in relation to 'how to improve the management process of e-learning development in the corporate environment?' Chapter 2 focuses on the analysis of how to define the importance of e-learning for education and training and to see what the theory on educational change and on

Introduction

innovation in general could contribute to the discussion. The chapter is therefore called 'The Changing Paradigm of the Educational Business Column'. There were two additional layers for data collection: the role of technology and content in the development of e-learning and the experiences with ICT in education and training during the last decade and more. The outcome was used to position e-learning relative to other developments and learning offerings and was the main source for the success criteria to consider in the development of the Analysis Framework Approach as a tool for management improvement. In Chapter 3 the development process is described, including the development of tools and procedures for conducting the Analysis Framework Approach. Chapter 4 is on research design. The research was guided by an action research approach, which together with the research questions structured the research flow. A case study method was used for the collection and analysis of the data. Chapter 5 is devoted to the first Experiences with the Analysis Framework Approach, using Version 0 of the approach. The outcome was documented in case study reports, and analyzed to define the recommendations for improvement and develop the new Version 1. The second cycle of case studies is described in Chapter 6. Both cycles were conducted, documented and analyzed in the same way. The final analysis is done in Chapter 7 focusing on the improvement of Version 1 of the Analysis Framework Approach. The improvement itself is not included in this study. The final chapter, Chapter 8, contains the discussion and suggestions for further research. This chapter starts with a reflection on the process and the outcome of the research. These reflections and the recommendations from Chapter 7 are the main source for the suggestions for further research.

I E-learning: Understanding the Context

The main goal in this research study is to answer the question of ‘how to improve the management of e-learning development in the corporate environment?’ This is not an easy task, because e-learning is an attractive, but multifaceted phenomenon with a wide range of different interpretations. The first thing to do is to discover the meaning of e-learning in the context of training and learning. The research question for this chapter there for is: ‘What is e-learning?’ A good insight in the nature and meaning of e-learning is essential for the positioning of e-learning in this context and to find ways to make this innovation a successful endeavor. In Section 1.1 we will look at the Internet, as the key aspect of the developments in the communication technology, and as an enabler for old and new learning activities. Socrates believed that interaction was at the heart of the teaching and learning process and with the Internet we seem to be able to get something new back from this old paradigm. Section 1.2 is about the arrival of e-learning focusing on the questions: what is e-learning, why e-learning? Section 1.3 is about the characteristics of e-learning. The primary goal is to define what the meaning of e-learning is and how this might evolve. An important issue is the e-learning market, presented in Section 1.4. This market is young and unpredictable, but essential for the development e-learning. Part of this development is the ‘learning evolution’, described in Section 1.5. Learning seems to take the lead in this evolution, while the need for training is decreasing. The technology bias is an important issue in this development, but not decisive when it comes to learning. Section 1.6 is about the future of e-learning. From the previous sections it has become clear that e-learning is not a stand-alone development, but is firmly related to the development of the new economy in which e-business and e-commerce play an important role. An analysis of the new economy therefore is necessary to be able to judge what the consequences of this development could be for e-learning. This view shows a direction in which e-learning seems to be developing and is an important reference for the following chapters. In Section 1.7 we take a look at the high rising expectations from the late 1990s and compare these with the actual situation of e-learning development. We conclude this chapter with Section 1.8 on future trends and some overall conclusions in Section 1.9.

1.1 Socrates, the Book and E-learning

The book was the first medium to disconnect learning and teaching from a fixed teacher-learner setting. The master and the student no longer needed to be at the same place, at the same time. It therefore became the major carrier for distance learning in the past five hundred years. According to Socrates a book was nothing more than a listing of arguments collected by the author, without the direct teacher-learner interaction. Socrates considered interaction as the best way to learn (Benson,

1992) and viewed the separation of the content owner and the content as contra-productive as far as learning was concerned. Nevertheless, with the emergence of the book, content became portable and allowed for the development of a whole new structure of information and knowledge transfer. It gave rise to the growth of publishing houses and of educational institutions, making use of ready-made educational information products. The need for content has led to the development of a publishing industry specialized in supplying the educational market.

With the emergence of the computer, an interesting development could be observed in the context of its use in education. At first educational software was mainly used to imitate the teacher-book context, because that was the level of thinking before new ideas about educational computing came into being. Later, with the emergence of the Internet, we see a similar development in which the Internet and in particular the World Wide Web were used in education and training as a different way of presenting and communicating about content (Garrison & Anderson, 2003). This observation corresponds with the findings of McLuhan (1995), who argues that the content of a new medium is initially always an older medium. With the materialization of Internet, people and institutions became less dependent on publishing organizations for the production and distribution of content (Kremer, 1999). On the other hand publishing organizations are using the Internet as a new way of knowledge delivery to educational institutions. 'The Internet created an unparalleled opportunity for publishers, large or small, to find and fill users needs of knowledge, to talk directly with customers, and to create information products that serve them The transition from conventional publishing to Internet publishing is leading to many changes and clearly will lead to more changes about the knowledge sectors that participate in the production and consumption of journal articles' (Zhao & Resh, 2001, p. 103). The initial growth of the Internet however was due to the use of the communication facilities of this network, which started in the 70s as a facility for the military to allow communication via networks under all circumstances.

When the business world discovered Internet in the mid 90s, the Internet had the character of a cozy global village (Rheingold, 1995). 'The early adopters' talked about 'The WELL' as the source for improvement of the well-being of individuals, because of the seemingly unlimited options for communication. Rheingold therefore devoted his book on the virtual community to the 'friends and family I've met through the WELL, our virtual community' (Rheingold, 1995, p. 7). Such a community consisted of several newsgroups and the success of these groups depended greatly on what could be called 'the organic principal'. People participated only when they felt a need and depending on the amount of satisfaction, the group would flourish or perish and disappear. This development took place predominantly in the United States and we do not have much evidence of these groups of early adopters in the Netherlands. At least in one case such a virtual community has been documented in a booklet entitled *Truus=Truus* (Legendijk, 1999). This is the biography of the Dutch Internet phenomena *Truus de*

Wit (www.truus.com) in which the experiences are described of Truus participating in several virtual communities in the period 1993-1998, without solving the question of who Truus really was. Taking on a different identity is one of the possibilities which obviously influences the way communication is executed and experienced. The Truus story is just one example of the change in the possibilities for communication and the different options and values that will go on developing in a seemingly unpredictable way.

It is obvious though that interactivity, like for example in chat and forum discussion platforms, enhances the communication of people in a way previous not possible. The book itself, though, lacks the opportunity for communication, which was so highly valued by Socrates, but is more than just a medium for carrying information. 'Learning through reading involves more than a student and a book. The book is a technology that exists in a social context. Together, the book, the student, the teacher, and other expert and novice readers the student encounters form a socio-technical system. If well designed, that system may support learning, but the Internet is just one component of a new socio-technical system with great learning potential' (Bruckman, 2002, p. 60).

The power of the Internet is communication at any time and any place, with new possibilities, like the Truus story reveals. It would be nice to know Socrates' opinion about the value of Internet for learning, because with the emergence of Internet and the World Wide Web, opportunities for communication have jumped to another level. Due to the communication facilities of the Internet, education can now better apply the intentions of Socrates, assuming that he was right about the power of communication for learning. This assumption obviously underlines that one of the strongholds of the Internet for learning is interactivity. The Socrates approach could help to position the Internet as a tool for learning. Masie (2002) supports this thought with the opening sentences in an article about blended learning, saying: 'the future of e-learning is in a return to the past, to the ways our ancestors learned. The success of e-learning systems is in what comes naturally, the ways we learn on our own' (Masie, 2002, p. 58). In the same article Masie refers to a Chinese colleague, who said that the power of e-learning was to return to the blend of training that existed prior to the *industrialization* of the process. Also Collis (1991) describes the classroom as a recent, very industrial manifestation of how people are asked to learn. The ancestors learnt in a blended mode with a mentor or master, lots of practice, peer learning and reading. Reflecting on the past helps to make up our minds. It will take some time though to achieve full understanding of the power of e-learning. It is like Rossett (2002, p. 4) points out very accurately: 'e-Learning is very promising, but we are still about to discover the value for education and training'.

1.2 The Arrival of E-learning

The aim of this section is to develop a balanced view of the meaning of e-learning in relation to the training and learning needs in general and in particular the meaning of this development for the corporate sector.

An issue directly related to the needs is the supply and demand mechanism in the e-learning market. The market development plays an important role and an analysis of the pros and con's can help to sharpen the view on the future of e-learning. How this future will look like depends for a great deal on the so-called 'learning evolution', which can be described as the transition, observable in numerous companies, from 'training' to 'learning', as the dominant medium for personal development.

E-learning is in essence a technology-driven development. Technology creates the need for other learning solutions and at the same time provides the opportunities for solving the problem. It is like the saying: 'You need a computer to solve problems you would not have if there was no computer'. However, the use of technology in education and training has a history of more than three decades of trial and error as well as research. Not many people had the pleasure of success using video, television or computer-based training products. Results were often disappointing and much research (Moonen, 2001) supports the idea that for example the use of multimedia really did not make a statistical significant difference. Reasons for this moderate success were, as Rosenberg (2001, p. 24) puts it:

1. The changes in technology, which made it almost impossible to serve all platforms that were in use.
2. The limitation of both hard- and software, which rendered unauthentic and boring programs.
3. The growing instability of content, which made people reluctant to invest in something that might be out of date by the time of deliverance.
4. And the limitations and problems with computer software, which were in many instances too dominant to be able to produce a didactical sound product.

This all sounds very disappointing, but while this was going on, the understanding of how people learn grew immensely and although network technology poses another challenge, we do not have to start from zero (Moonen, 2001). The challenge will be to combine this knowledge base with the new technology of the Internet. E-learning practitioners should relate to this context and not loose themselves in the not-invented here syndrome.

In Section 1.2.1, we will deal with the question on the meaning of e-learning and in Section 1.2.2 with the reasoning behind the use of e-learning.

1.2.1 What is e-learning?

E-learning is a term with a wide variety of interpretations, which causes confusion in many ways. The term e-learning comes into being half way 1999 following the trend of e-business, e-commerce, e-governance and e-everything. One and a half years later e-learning is used worldwide to indicate the use of Internet technology for teaching and learning. The alternative jargon, consisting of terms like tele-learning, tele-education, web-based learning, online learning, distance learning, became less used. In any event, all of these terms indicated the use of network technology for education and training in one way or another. However, e-learning is more than just a term to indicate that 'electronic learning' is becoming increasingly important. (De Vries & Oprins, 2001, p. 221). The 'e', as in e-business and e-commerce, is not only an indication that network technology plays an important role in the communication, but also that the use of this technology has a profound impact on the organization itself, the level and the sort of services or products and for that reason the character of the education and training organization which embraces e-learning, will differ profoundly from the traditional organization.

How to define e-learning? Hartley (2001, p.1) identifies e-learning as: 'learning enabled by the Internet, intranets, and other electronic networks as well as the development, delivery, and evaluation of content provided through these networks'. He adds the connotation that this definition is directly related to the purpose of his book, which is about 'Selling e-Learning'. What he points out is that most likely a definition should be understood in the context of the 'owner', which might be very confusing when you are in a different context and trying to grasp a basic understanding of what e-learning is. Therefore Völkl & Castelein (2002, p. 65) speak of: 'so many technologies, so many definitions: the e-learning Babylon'. It does not matter where you go or who you speak to, the e-learning definition will differ. Völkl and Castelein (2002, p. 65) give a few examples: 'E-learning is a mix of traditional and technology driven training' or 'Every training delivery mechanism that uses the Web' or 'A type of training that provides for an online exchange between the learner and teacher during the learning process'.

So e-learning definitions differ, do not tell the whole story, but tell a lot about the perspective of the owner concerning teaching and learning. Let us take a look at some other definitions and see if this conclusion can be confirmed. For example the definition used by the American Society for Training and Development (ASTD): 'E-learning (electronic learning) covers a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and Cdrom' (ASTD, 2003). This is a rather difficult and technical definition, which is hard to understand, not only because of the use of a multitude of terms which in themselves need to be defined, like the term 'web-based learning'. Also it is not clear in what way

this definition is used by the ASTD to develop their 'e-learning strategy'. It seems like the ASTD likes to keep everybody on board with their definition, but it does not help the novice user to get a better understanding. When following the ownership point of view, the European Commission (2002) shows a clear context-driven notion in defining their e-learning initiative: 'The use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration'. This is a political view in which equal access and collaboration to support social inclusion and social cohesion are primary goals. Another example is from the business world. IBM relates her definition to the notion that 'Understanding the complex nature of this new learning paradigm has led IBM to adopt a broad definition of e-learning, based on a total systems perspective. Related to our notion of e-business, which is about transforming core business processes by leveraging the net' (Straub, 2002, p. 3). IBM considers customer-relation management, supply-chain management and e-commerce as typical core-business processes. Since e-learning affects the core business processes and the business model relating to learning provision, IBM defines e-learning as: 'the application of e-business technology and services to teaching and learning. It provides digital content and collaboration to support remote learning and to augment class-based learning. It includes infrastructure, e-learning delivery platforms, content development and management. It provides the collaborative framework to enable knowledge sharing and peer to peer learning hubs that can be further supported by mentors and coaches, this supporting informal collaboration, sharing of knowledge and experiential learning' (Straub, 2002, p. 3). This IBM definition of e-learning is in fact a clarification of the role IBM would like to play in the development of the e-learning market. Again it underlines the ownership principle. IBM is a commercial enterprise and their definition fits perfectly in this line of thought.

Rosenberg's (2001, p. 28) approach comes from a slightly different angle. Instead of trying to define e-learning, he describes his understanding of e-learning in a more subtle way by defining three fundamental criteria to be used to see if e-learning is at stake. In his view 'e-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance. It is based on three fundamental criteria:

1. E-learning is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information.
2. It is delivered to the end-user via a computer using standard Internet technology
3. It focuses on the broadest view of learning solutions that go beyond the traditional paradigms of training.'

This definition shows elements of the consultant's approach, who is supposed to guide his client through the different phases of an e-learning implementation. Rosenberg is a scholar, but foremost a consultant. In this context there is an interesting research study by Rebenburg, Busch and Rautenstrauch (2002), about 21 major companies in the German-speaking area in Europe. This study reveals that these enterprises use different definitions or have a different understanding of what e-learning is supposed to be, depending on their primary needs. From these companies 50% use a 'technology' based definition; 19% talk predominantly about 'blended learning', basically understood as a combination of online and on-site learning and teaching activities; 12% talk about 'networked learning' as the dominant activity and another 12 % see 'interactivity' as the main issue (Rebenburg, Busch & Rautenstrauch, 2002, p. 10). Others, like Gery (2002, p. 1), dislike the idea that the educational world all of a sudden turns to what she considers as just one side of a box. Consequently she is not talking about e-learning, but about online learning. Her argument is that:

- There is online instruction, a powerful delivery medium for providing training and education that connects back, directly and indirectly, with traditional classroom models.
- There is electronic performance support, which includes interactive tools that support work processes and provide on demand access to knowledge, data, tools and collaboration.
- There is online reference, a global compilation of the knowledge that increasingly pervades modern business (and challenges us to manage knowledge itself as an asset).
- And there is online collaboration, an emerging phenomenon in which online learning is a by product (sometimes deliberate, sometimes not) of people connected to one another through virtual groups.

Gery works predominantly for the business world, while others are more connected to regular education, other forms of education and training or higher education. So what e-learning is or might be really depends on the organizational context. In addition it is evident that e-learning is still in its infancy, which makes it even more difficult, because depending on the level of development, the appropriateness of a definition might change over time. Therefore it seems more important to determine in which direction e-learning is developing and what expectations people have than to search for the ultimate definition. From this perspective the following two descriptions are helpful. The first definition is from Elliot Masie (2000), director of the Masie Centre, at the TechLearn Euro2000 conference in Dublin. E-learning is: 'The use of network technology to design, deliver, select, administer, support and extend LEARNING.' Masie has a good feeling for new developments and his description is generally accurate when compared with the way network technology is being used for

education and training today. It is a general description with the emphasis on the multitude of user possibilities of the network. In that sense the term LEARNING could be replaced by BUSINESS or COMMERCE and the description would still be true, in this case for e-business or e-commerce. The interesting aspect in this definition is the fact that the technology touches upon the total range of the business column of learning. A business column generally represents the entire activity spectrum of an enterprise, from, in the case of a production company, the purchase of raw materials, through the transportation of the end product to the customer. The same thing is true for the learning business, where the business column of 'learning' is not just about content and the teaching and learning process, but also about organization and administration, infrastructure and the business model. This means that the effect of e-learning as an innovation reaches much further than any previous educational innovation caused by technology. A rather new element is the way the technology adds value with the possibility to support and extend learning on a 24/7 basis. A second description is by Duncan Lennox (2000), CEO WBT-TopClass, also at the TeachLearn Euro2000 conference in Dublin: E-learning is: 'Use of E-business technology to speed the flow of business information and knowledge from creator to learner in a highly personalized, on-demand fashion'. Counting in Internet years, Duncan Lennox can be considered a veteran in the area of learning management systems. He was involved in the production of the first releases of TopClass (www.wbt.com), which came into existence in one of the backrooms in the University of Dublin, but has developed into a learning content-management system known around the world. Lennox emphasizes the necessity to take account of the personal preference of the end user, because learning takes place in different social contexts. Not any longer at a particular time and a particular place, but when and where it is necessary; at the workplace, at home or on the premises of the customer. And again, this is not a definition on what e-learning is, but about what it should do from the perspective of the definition owner.

These definitions can be confusing and sometimes do not really help to arouse interest and understanding, because they are too specific, too vague or too much directed from an ownership perspective to support mutual understanding. Another way to explain to newcomers about the essence of e-learning is to show them the ingredients of an e-learning infrastructure built on network technology. Sometimes it is better to show and discuss an image like the following (Figure 2), which even so needs some explanation and is not free of owner influences.

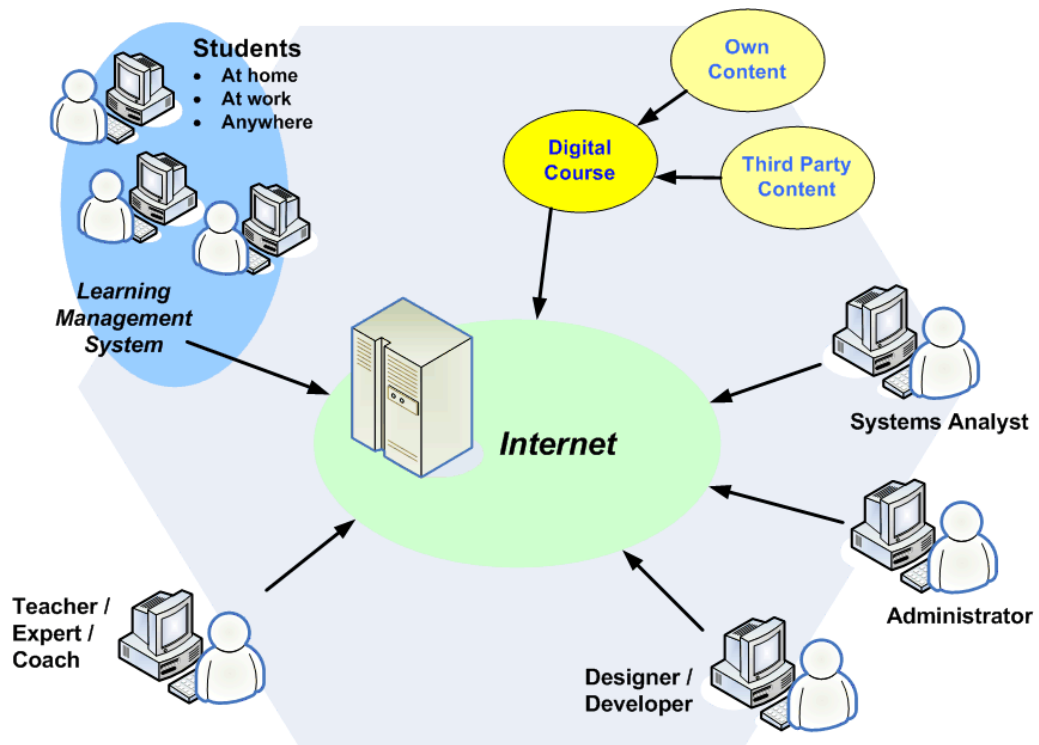


Figure 2 Ingredients of an e-learning infrastructure

At the heart of this technical approach to e-learning is the Learning Management System (LMS). This is software running on a server, which in general provides options for presenting information, communication and administration with tracing and tracking as important elements. People connect to the system via the Internet or intranet. Different expertises are needed to develop such an e-learning situation, in which a digital course or another learning offering can be used by the students. It also shows that the teacher needs no longer to be a teacher in the traditional sense. He or she can take another role as the prime moderator, or can be supported or substituted by an expert or coach more easily than before. The learning offering can take the shape of a course with a clear beginning and end, offered completely online with all resources integrated in one course base. It can also be a mix of course elements online connected to other resources and other content suppliers. This organizational picture of an e-learning infrastructure is a practical approach and shows from a functional perspective what can happen when e-learning is at stake.

Using this functional perspective in connection with a more general, educationally focused definition is to my experience the best combination to explain how e-learning differs from other types of teaching and learning. A very useful example of such a more functional, but this time more educational perspective is the definition used by Collis (1996, p. 19):

“Tele-learning is: *Making connections
Among persons and resources
Through communication technologies for learning related
purposes*”.

At the time this definition was developed, the term e-learning did not yet exist. The term tele-learning though can easily be traded in for the term e-learning when looked at the meaning of the different components (Collis, 1996, p. 9). ‘Making connections’ is about interactivity and intellectual engagement. The ‘persons’ may be peer students, teachers, experts and anyone who can contribute to the learning experience. ‘Through telecommunication technologies’ involve the use of communication channels and the component ‘for learning related purposes’ relay to the fact that ‘tele-learning’ is different from tele-working, tele-shopping or tele-discussion. Taking the definition from Collis as the main source of inspiration, the following description of e-learning can be considered as the point of reference, whenever the term e-learning is used in this study:

‘E-learning is the process of *learning and teaching* in which the *connections* among the participants and with the resources are *supported throughout* by means of communication technology.’

The emphasis has slightly changed when compared to the definition of Collis. The core of the definition is on the new meaning of communication in the teaching and learning process, because that is where e-learning gains most of its advantages compared to the traditional context. The ability to ‘communicate’ synchronously and asynchronously wherever and whenever with others and resources is the denominator. Three elements are important here. ‘Process’ indicates that e-learning is an activity which is taking place with the sense of continuing interaction. It is not an event and therefore suits the idea that learning and learning-related teaching is an ongoing process that fits the societal development of life-long learning better than the traditional classroom paradigm. This also gives way to the notion that e-learning has a lot to offer when it comes to supporting informal learning, which covers 75% of the factual learning at the workplace (Digenti, 2000). ‘Supported throughout’ means that the teaching and learning activity evolves from the use of communication technology, but is not restricted to it. E-learning is hardly ever a solely online event. Most e-learning is a combination of online and other forms of teaching and learning, including the use of other digital sources, computer-based training, paperware and different forms of communication. In most cases the term ‘blended learning’ is being used to indicate such a combination of media and related learning activities at a fixed time and place. The main vehicle for interaction in the learning and teaching process is by means of ‘communication technology’. This is not limited to the Internet, but applies to all means of digital

communication, which are growing rapidly due to technological and product integration and the growth of broadband applications like I-mode for mobile communication.

From the definition it becomes clear that e-learning is not a 'one fits all' solution and can not be considered a product with a time-related shelf life. It is part of a development process with the communication technology in a central role. This process is by all means an innovative process, which builds on the achievements of other technologies in the pre-Internet area (Garrison & Anderson, 2003). Therefore e-learning should be considered an important instrument for the improvement of education and training and not just as a means for the transport of content from one place to another. This perspective has consequences for the way e-learning is positioned and differs from the wide-spread idea that e-learning should be seen as nothing more than a handy, digital supplement to the classroom events.

1.2.2 Why e-learning?

The economy has developed in a period of almost 40 years from a production to a service economy with a clear accent on information and knowledge (Naisbitt, 1985; Naisbitt & Aburdene 1990). In particular the fast technological developments have had a major influence on the kind and the speed of changes in, for example, company processes. This has caused an increase of knowledge inflation and a shortage of qualified workers in the western world (European Commission, 2002). In essence these swift changes in the business organization, the business processes and technology have created an increasing demand for training and learning. The traditional, classroom-oriented training lacks the flexibility to handle the increased need for just-in-time and just-enough learning. Therefore corporations are looking for useful alternatives and consider e-learning to be helpful in developing learning solutions that fit current needs. This is why just-in-time and just-enough training have become critical factors. In addition 'learning' has increasingly been recognized as a strategic weapon to stay ahead of the competition. This is why companies look for better and more efficient ways to train people, while keeping a firm eye on the costs involved.

Operational goals are strong drivers on the operational level, but the strategic drivers have apparently influenced decision making strongly, when it comes to 'rapid-and sometimes reckless-adoption of enterprise e-learning solutions' (Deloitte Research, 2002, p. 6). Therefore it is important to take a closer look at these drivers and start with an analysis on the macro level of economic and social developments (see Table 2). Multiple resources come up with comparable listings giving an indication of the ones that seem most important (Campaign for Learning, 2000; Clark, 2003a & b; Collis & Moonen; 2001; Deloitte Research, 2002; De Vries & Oprins, 2001; Fischer, 2002; Morrison, 2004; Ohmae, 1990; Pieper, Kouwenhoven & Hamminga, 2001; Rebensburg, Busch & Rautenstrauch, 2002; Sander, Bungert, Busch & Meier, 2004; Urdan & Weggen, 2000).

Table 2 Drivers for the development of e-learning on the macro level of economic and social development

Drivers on the macro level	Description
1. Globalization	Due to the growth of the number of international activities of enterprises, universities and even institutions for formal education. An ongoing process which has boomed and become increasingly important during the last two decades (Ohmae, 1990). E-learning helps to coordinate and connect learning and collaboration in a shared manner worldwide. As e-learning becomes more widely accepted and easier to implement, differences between regional markets will be eroded swiftly (Fisher, 2002).
2. Demographic developments	In the next ten years a massive retirement of the baby boom generation will take place in the western world. In some cases retirement might even outpace the firm's ability to hire and promote people (Deloitte Research, 2002). The Central Bureau for Statistics (www.cbs.nl) points out that this generation possesses 80 percent of the available knowledge. The burning question is how to keep this knowledge available and up to date for the present and coming generation of workers? In addition the older and younger generation needs 'learning' to stay at the job. E-learning can be of a crucial importance for the consolidation of this knowledge heritage and the acceleration of knowledge transfer.
3. The fast-changing business environment.	Swift changes in the business organization, the business processes and technology have created an increasing demand for training and learning. The traditional, classroom-oriented training lacks the flexibility to handle the increased need for just-in-time and just-enough learning. Therefore corporations are looking for useful alternatives and consider e-learning to be helpful in developing learning solutions that fit current needs (De Vries & Botke, 2003). In addition employers are switching to e-learning to meet compulsory training requirements, as the enforcement of regulatory standards is toughened (Fisher, 2002). Mergers and acquisitions require an effective integration of people, knowledge and competencies across merged organizations. This requires that companies understand: 'how and where the intellectual capital is captured, formalized, evaluated and distributed' (Deloitte Research, 2002, p. 8). The same is true for partnerships and customer alliances. To make these work one needs a clear strategy for information and knowledge exchange and e-learning can help to overcome barriers.

Table 2 continues ...

Table 2, continued.

4. The changing population of workers	Changes in society and in the business world effect the way workers perceive their role. Besides the demographic issues, workers change in their beliefs, attitudes and expectations in relation to their job and working environment and their learning needs. The traditional life-long career at one and the same organization has become an exception. Instead job hopping seems to be the way, but also the tendency to easily move around within a company, rapidly changing jobs, increases the need for learning opportunities.
5. Share holder value	The structural shift toward a service economy requires healthy learning and knowledge management systems to make sure that employees are prepared (Deloitte Research, 2002). Therefore there is a tendency to see 'learning' as an integral part of the way to do business. IBM (Fischer, 2002; Straub, 2002) considers e-learning as an essential part of corporate strategy and not just a fix for a problem. Share holders know that there is a desperate need to transfer new skills quickly and are increasingly aware of the fact that the learning strategy is one of the elements to look for when a business is being analyzed on the potential share holder value. This development creates a favorable situation for the attention 'learning' receives in a company.

These drivers for e-learning on the macro level of economic and social development are reflected in the arguments on other levels of analysis. To get a more in-depth picture of these drivers, we will spend some time looking at the arguments used on other levels. We will look at the process level, the strategic and the operational level.

Process level

Rosenberg (2001, p. 6) distinguishes five major areas where the technology in business processes affects education and training and where e-learning plays an increasingly important role next to knowledge management. Table 3 summarizes the five areas.

Table 3 Drivers for the development of e-learning on the process level (adapted from Rosenberg, 2001, p. 6)

Drivers on the process level	Description
1. The transition from training to performance.	The effect is that 'learning' is considered accountable for the same primary measure as any other function: business value.
2. The improvement of the access to learning.	No-predetermined class schedule and fixed places, but a 24 hour service 7 days a week on every location and for everybody.
3. The transition from paper to electronic information	Paperware is still alive, but competes with the online availability of information, including tailor made lesson materials, with possibilities for quick updating and distribution.

Table 3 continues ...

Table 3, continued.

4. The emergence of virtual teaching and learning networks.	Classroom learning will not disappear, but will change to a more specific role with the focus on higher-thinking processes, team training and social skills.
5. The acceleration in the production and distribution of content and knowledge.	The cycle time for content and knowledge development has become so short that the only way to stay up to date is real-time development. In that sense 'learning' has become a continuous process with e-learning as a vehicle for radical change in education and training.

Strategic level

E-learning very often is considered an add-on or an extension of the existing possibilities for training and learning, which can be achieved by installing a learning management system. Deloitte Research argues that 'many firms are overlooking the important step of creating a solid learning strategy before getting caught up in the whirlwind of e-learning technology. The optimal learning approach depends on an organization's strategic objectives – as well as its immediate practical needs' (Deloitte Research 2002, p. 3). Factors which influence a firm's decision to take a more strategic approach to e-learning might include the following, shown in Table 4.

Table 4 Drivers of e-learning on a strategic level (Deloitte Research, 2002, p.3)

Drivers on a strategic level	Description
1. The increase of the overall volume of training.	E-learning allows for large-scale training.
2. Geographic distribution	E-learning can serve large audiences which are broadly distributed. In case of the need for sharing knowledge throughout the company's value chain, e-learning becomes increasingly critical for success.
3. Requirements for customer and supplier training by extending e-learning throughout the value chain.	Especially for companies which are trying to manage their strategic relationships.
4. Reusability of content.	This is to increase the return on e-learning, like for example in cases where new employees need a company introduction.
5. Business value of content.	Content with a high business value and an immediate bottom-line impact is more likely to add value.
6. Certification requirements.	E-learning can facilitate verification in companies where certification is critical. An e-learning solution enhances the process of monitoring certification needs, schedule and deliver training and administer and present the outcomes for different stakeholders.
7. Intensity of change.	Companies which are under the increasing load of rapid change are served well with highly strategic, well planned, flexible and comprehensive learning solutions.
8. Multiple e-learning projects.	To add cohesion in development of e-learning, by bringing different initiatives together to ensure that internal programs complement and build upon one another.

Operational level

Drivers for change identified by Rosenberg (2001) on the process level and by Deloitte Research (2002) on the strategic level correspond with the needs and expectations companies have on an operational level of training and learning and are indicative for the urgency of the problem (Campaign for Learning, 2000). It is confirmed that it is not just about 'learning', but also about knowledge management and the idea that each company should be a 'learning organization' to keep pace with the developments. The next overview (Table 5) is far from complete, but shows an accurate indication of the sort of expectations companies have on the operational level, when considering e-learning and can be considered important drivers for the development of e-learning (Campaign for Learning, 2000; De Vries & Oprins, 2001; Urdan & Weggen, 2000).

Table 5 Drivers for e-learning on an operational level

Drivers on a operational level	Description
1. Better access and more possibilities for learning	A computer with access to the digital learning environment and other resources and tools. Close to the workplace, at home or anywhere else.
2. Less dependence on time and place	Increase in organizational flexibility. Some companies work with a five-shift system, which makes it very difficult to organize a classroom session due to time pressure.
3. Support for more independent learning activities close to the workplace	Making learning more accessible by using the company's network and computers, provides the learner with many more possibilities for learning.
4. Better view on learning progress and results	Using a learning management system helps to collect information on the user (time, progress, results, support), but also makes it easier to deliver up-to-date progress reports to the manager.
5. Better transfer of work and learning experiences	The combination of working and learning, made possible close or at the workplace, helps to bridge the gap between theory and the actual work context.
6. The use of workplace relevant content that fits the daily practice and innovation processes	Content which carries evidence that it is the real thing. This kind of content helps to link learning with the day-to-day practice at the workplace and becomes much more valuable for learning and as a source for information.
7. More possibilities for competency-oriented development	Because of the wider range of possibilities for learning and (self-), testing, learning offerings can be tailored better to the 'specific' needs of an user or by the user, than in the traditional classroom setting.
8. A stimulus for the mobility of the worker (employability)	Prerequisites for an increase in mobility are training and learning. So the success of moving from one to another work place, depends for a great deal on the possibilities for training and learning.

Table 5 continues ...

Table 5, continued.

<p>9. The connection or integration with knowledge management</p>	<p>Digital information can be retrieved and used more easily and therefore other resources are increasingly utilized for learning-related purposes. Fast changes in the business organization and business processes are reasons for an explosion of information. This information, managed via knowledge management procedures, is increasingly valued as up-to-date learning material which can be used in an educational context but not produced as educational content.</p>
<p>10. In general better results and more effect in relation to business goals</p>	<p>For e-learning to be effective it needs a context so the end user can relate to it. The most common context in a business environment are the business goals.</p>
<p>11. Contribution to the idea of becoming a learning organization</p>	<p>Learning is a continuous process in formal and informal situations. For a company to become a learning organization, learning has to be integrated in the business organization and business processes. E-learning helps to achieve these goals, because of the flexibility and the omnipresence of learning facilities.</p>

These drivers give a more practical hint about where e-learning should be heading and are sometimes more useful in a discussion about e-learning than the more-or-less academic definitions used before. Businesses in general do not care much about definitions, but about sustainable solutions for problems and if e-learning is the ‘problem solver’, they will use it. In practice though there are companies that have turned to e-learning just following the myth, desperate as they were to find a solution for their training problems (De Vries, 2002; Rosenberg, 2003).

1.3 E-learning Characteristics

The focus in this section is on the characteristics of e-learning, which are described from different perspectives. Section 1.3.1 is about the advantages and disadvantages mentioned to justify the use or rejection of e-learning. Section 1.3.2 is about the added value of e-learning compared to the traditional learning and teaching environment and in Section 1.3.3 we look at the barriers for e-learning development.

1.3.1 Advantages or disadvantages?

Very often e-learning is characterized by a listing of advantages and disadvantages. From the previous discussion about the question of what e-learning is, it became clear that the meaning of e-learning very much depends on the perspective of the owner of the definition. Examples of arguments which are very often used to justify the use of e-learning are presented in Table 6. The so-called benefits or advantages of e-learning are not necessarily advantages for everyone and in every stage of development. E-learning is a process which develops over time and other factors will emerge, as advantages or disadvantages or should we rather speak about enabling and inhibiting factors? It is from this perspective that the different elements are discussed in Table 6.

Table 6 E-learning advantages or disadvantages

Advantages or disadvantages?	Discussion
1. More flexibility	An important question is: 'For whom'? For the school- or training organization, the teacher, the trainer, the student? Flexibility has a certain bandwidth. This means that when a student receives more opportunities to choose for example his own time and place for learning, the teacher or coach will need to accommodate. Students can be virtually around all the time. In addition the administration has to be ready to capture this flexible behavior of the student.
2. It becomes cheaper	'Save opportunity and travel costs, because from now on you can learn at home or at the workplace!' This sounds good, but what often happens is that the load is shifted to the end user. And the question is if this will be acceptable in the long run?
3. Advantages of scale	The wonderful thing about e-learning is, that is does not really matter if you serve a 100 or 200 students. The more the better. The other side of the coin is that the content and learning activities will necessarily be of a more-general nature. This implies that it becomes more difficult to take in consideration the heterogeneity of the target group Tailor-made solutions will increase the costs and reduce the advantage of the economies of scale.
4. A better tuning of demand and supply	Developing content for e-learning is a very time-consuming activity. This means that a lot of good material that does not fit the e-learning template will stay unused. If it will ever be used depends on the speed of developments and available resources. This certainly will in the coming years decrease the opportunities for better tuning supply and demand on the content level.
5. Re-use of content	Interesting enough the interpretation of what the (smallest) exchangeable unit of meaningful content should be is still widely discussed. The progress made in the development of standards is very promising, but leaves room for interpretation. So re-use very often means re-build.

Flexibility for example can be considered an advantage, allowing people to participate in an e-learning course when and where they want. It is not suitable though to ignore the total context in which the e-learning activities take place. To decide if flexibility really is an advantage, one should take into account the interest of all the different stakeholders. So in the case of flexibility, the student and the employer might be happy, but the training organization and the trainer or teacher might not feel so good about it, because of the increased pressure on performance and time. Also one should be cautious about the weight of an advantage and consider the facts to see if advantages and disadvantages compensate each other sufficiently. This means that the decision if 'flexibility' can be considered an advantage, depends very much on the actual situation. Nevertheless there are compelling reasons why organizations start using e-learning.

1.3.2 The added value

Instead of focusing too much on the advantage-disadvantage comparison, we will take a closer look at the way e-learning in general differs from the traditional learning and teaching environment, because it adds meaning to the kind of supplementary value e-learning might present. Table 7 shows this kind of analyses.

Table 7 Characteristics of e-learning and their added value

Characteristics of e-learning	Explanation
1. E-learning is scalable and can quickly be accommodated.	A basic safety course can be offered in company at all times and for everybody at the same time, or at times needed when new people arrive or a refresh is necessary. If there are any specific demands concerning the content, then it can be customized or edited and distributed easily and quickly.
2. Constant quality	Everybody receives the same thing and is not bothered by the difference in performance of teachers or trainers. Updates reflect the same standards and will be available for everybody at the same time.
3. Participation and results can be reviewed easily.	Almost all learning management systems can produce management reports with information on the rate of participation, progress and results at any time of the day. This information can be viewed by the student, the coach and other stake holders. Some systems offer options for the comparison of results.
4. E-learning is a better fit for business processes.	Just-in-time production demands a 'just-in-time' option for learning. To be able to learn when necessary, about a relevant topic and in easy digestible learning bites, connected to information like workplace instructions. Setting up a 20-minute classroom session has never been a solution for this instant learning need and will never be.
5. More tailor-made offerings.	The learner has a wider range of choices concerning the time for learning, the speed, with or without repetition. This 'e-learning service level' cannot be matched by the traditional educational or training organization. This is virtually impossible on the organizational level and the cost involved would make this service not feasible in the traditional context.
6. E-learning demands less direct investment	E-learning is a good fit for scaling up and delivering tailor-made solutions. As soon as the technological infrastructure is available and the content is ready, learning can take place everywhere, as long as there is a computer with access to the Internet. There is no need for physical buildings, classrooms, and the tele- teachers and trainers are not bothered by the time and place constraints to interact with students.

It is true that not every characteristic will carry along enough added value for the form of e-learning being considered for a given context for each practitioner and at all

times, but it is worthwhile to make these kind of considerations and see if other items do bring the expected added value.

1.3.3 Inhibiting factors: barriers for development

The drivers mentioned before stimulate the development of e-learning. The success depends for an important part on the ability to avoid or circumvent barriers or inhibiting factors which prevent e-learning from becoming a success. Not all inhibiting factors have the same influence at all times and in all situations and will also depend on the core activity, be it education, a company or government. The context in which these factors operate is decisive for the weight of the factor and if this factor can be influenced or not. For example: If bandwidth is a problem, the chances are very low that a company will increase bandwidth solely for the sake of e-learning. This means for example that content developers should stay away from the use of video, which would drastically increase the reaction time of the Internet connection for the end user.

A term often used for the discussion about success and inhibiting factors is 'readiness'. In other words: when is a company or another organization ready to make e-learning a success? Anderson (2002, p. 1) talks about the 'The five Cs of successful programs'. In his view culture, content, capability, cost, and clients are factors which can derail even the best-intentioned e-learning initiative. Collectively, they are the make or break success factors that determine whether e-learning will persist or perish in an organization. Anderson emphasizes that each of the five C's requires individual consideration, as well as an evaluation of the interplay between factors. 'Initially, issues should be discussed separately to provide training professionals and business leaders with a starting point to evaluate e-learning initiatives. Next, it is important to take a close look at complex interrelationships between the factors to evaluate the merits and feasibility of the whole initiative' (Anderson, 2002, p.5). The conclusion from Anderson's analysis can be that the factors should be looked at separately, because not everybody has something to do with all factors, but the outcome of the analysis should take into account all factors as interrelated elements to make sure that the outcome of the analysis is valid.

The E-learning Magazine (2001) had a slightly different approach in trying to get some overview of possible barriers by asking participants of the E-learning Conference & Expo 2001 about e-learning use in their organizations. 53% of the survey group was employed by corporations and companies; 19% worked in the government/military and 12% were in higher education. This group was asked about the major challenges for the use of e-learning. Their reactions, divided by market sector, are shown in Table 8.

Table 8 Percentage of respondents choosing possible barriers for the implementation of e-learning (Source: E-learning Magazine, 2001)

Market Sector	Challenges	%
Corporation/Company users	<ol style="list-style-type: none"> 1. Bandwidth 2. Cultural resistance 3. Lack of interaction 4. Lack of engaging content 5. Measuring ROI 6. Firewalls 7. No standards 8. Browser problems 	<ol style="list-style-type: none"> 58% 42% 42% 34% 33% 22% 13% 10%
Government/Military users	<ol style="list-style-type: none"> 1. Cultural resistance 2. Bandwidth 3. Lack of interaction 4. Firewalls 5. Measuring ROI 6. Lack of engaging content 7. Browser problems 8. No standards 	<ol style="list-style-type: none"> 71% 64% 42% 20% 16% 13% 13% 13%
Higher Education users	<ol style="list-style-type: none"> 1. Cultural resistance 2. Bandwidth 3. Lack of interaction 4. Browser problems 5. Lack of engaging content 6. Firewalls 7. No standards 8. Measuring ROI 	<ol style="list-style-type: none"> 63% 44% 30% 22% 19% 19% 15% 7%

Obviously cultural resistance, bandwidth and the lack of interaction are considered important challenges. The questionnaire guided the user by restricting the choices, so these items are not an ultimate list of barriers but a priority selection. Still it is obvious that there is a clear coherence in the choices of those interviewed. What we can learn from this observation is that some barriers, of which cultural resistance is the most prominent, cannot easily be solved. Behavioral change takes time and energy. This means that if not taken care of, these barriers can significantly frustrate the development of e-learning and reduce the likelihood that it will become a success.

There are additional observations about inhibiting factors which are brought up by different authors (Rebensburg, Busch & Rautenstrauch, 2002; Rosenberg, 2001 & 2003; Rossett, 2002; Sander, Bungert, Busch & Meier, 2004; Van Adelsberg & Trolley, 1999) as being important issues and worth mentioning in this context. These include:

- On the organizational level

Company management does not always have much confidence in the training department and consider training often as a cost instead of investment. This it

might be difficult to convince management that the training department will be able to bring a relatively complex innovation like e-learning to a good end. It often did not work out well with the introduction of the computer and CD-ROM.

- On the process and didactical level

Trainers feel threatened and this can be an important restraining factor for the implementation of e-learning. Partly this can be avoided by using help from outside, but as soon as task-oriented training is at stake, one cannot do without the cooperation of the local trainers. E-learning is not for everybody or for every teaching or learning activity the best solution. This certainly will improve with the accumulation of knowledge and experience on online learning and the technological improvements.

- On the technical level

The technology is becoming better, but stays rather complex and it needs a certain amount of knowledge and experience to keep a learning management system running and to stay up to date with the latest developments.

- On the business level

The valuation of e-learning is still difficult to quantify. There are no waterproof accounting models that go beyond the simple calculation of basics like travel and opportunity costs. There is a need for tools to be able to estimate the return-on-investment in time.

1.4 The Market

The market is young and unpredictable. This is a qualification frequently heard and experienced. The discussion about the meaning of terms such as e-learning, blended learning, mobile learning, e-learning technology, content, services, educational value chain, shows the difficulty of predicting how things will evolve. This market with a continuous stream of new products, new services, new companies, mergers, new partnerships, new names and new strategies, suffers from a lack of transparency for both the customer and the vendor (Hills, 2002; Urdan & Weggen, 2000). Hills describes this situation as: 'How do you make sense of a marketplace where half the suppliers seem to sell the same thing and the other half sell services that do not seem to be differentiated?' (Hills, 2002, p.2).

The e-learning market is complex because the same is true for the learning market (Levis, 2003). The industry is highly fragmented, with millions of small suppliers. Learning takes many forms, users of products and services are generally not the customers, companies are in general not very knowledgeable about their training expenditures and market research is based on 'small, statistically insignificant samples and biased towards suppliers inflated estimates' (Levis, 2003, p. 3). The conclusion can be that the market is still in an early stage of development, but shows signs of maturity and is growing steadily (Hill & Kappler, 2004). It is not the predicted healthy growth rate from the late 1990s, but it seems to achieve a sustainable level. The forecast from

the International Data Research Centre (IDC) for the corporate e-learning market in Europe is a 31% compound annual growth rate up the year 2007 (Kolding, 2003). Under the current market conditions there is a tendency of e-learning vendors to enhance their position through partnerships and acquisitions. This has also to do with the preference of buyers to deal with one main supplier only. There is more attention for the specific needs in the different sectors of industry and there is a growing tendency in the business world to outsource training, which is a vendor opportunity (Hill & Kappler, 2004; Kolding, 2003).

In the following sections we will take a closer look at the supply side (Section 1.4.1), the demand side (Section 1.4.2) and the area in which e-earning is supposed to show a strong growth (Section 1.4.3).

1.4.1 The supply side

The dominant sectors in the e-learning industry are content, services and technology (Fischer, 2002; Goldman Sachs, 1999; Hasebrook, Herrmann & Rudolph, 2003; Urdan & Weggen, 2000). Some vendors offer one-stop-shopping, which means that the vendor supplies all three elements. Others restrict themselves to one or two elements. The vendors have been attracted to the market because of the prediction of rapid growth, but are partly new to the use of technology or to the business of training. In most cases the origins of the company can be derived from the products they sell.

Originally technology was the most important grow factor on the e-learning market, but has been overtaken by 'content' (Clark, 2003b; Urdan & Weggen, 2000). Predictions show that this will stay this way for the next couple of years (Clark, 2003b; Fischer, 2002). So 'content' is an interesting segment on the e-learning market. The segment 'services' shows momentarily the strongest growth (Bersin, 2004; Clark, 2003a; Urdan & Weggen, 2000). In reality most companies carry a mix with an emphasis on the segment in which they were present on the market already before the Internet and e-learning hype. The new comers have the tendency to focus on one market segment or to introduce new business models, like the e-learning portal provider and the so called learning solutions provider.

In most cases e-learning companies seem to be 'old dough in a new jacket' (Hills, 2002). They were already present on the training market in the pre-Internet time as supplier of training and teaching material, including computer-based training for the traditional and more classroom-bound activities. There are new players, like the software and hardware companies. But again most of these have their roots in the industries that existed before (Hills, 2002; Urdan & Weggen, 2000), in particularly related to content services and technology.

- Content

The content providers produce tailor-made solutions and off-the-shelf products. The off-the-shelf category was important to speed up the development of e-learning in the United States (Levis, 2003). This mass product is for a broad range of customers but is less suitable for the European market because of the different languages and culture. The variety in educational and didactical approaches, workplace regulations and laws, technology integration, and comprehensiveness of services and solutions (CEDEFOP, 2001; Völkl & Castelein, 2002). Some vendors use content produced by the traditional well-known names in for example the publishing industry and universities and develop an e-learning version of this material to be delivered under their responsibility. Also content providers have started delivering additional services like curriculum development, competency-development frameworks, e-learning strategy and development, the development and implementation of blended learning, the support of the integration of e-learning company-wide, coaching, mentoring, ROI analysis and hosting. The biggest share of money spent on e-learning went to Information Technology-courses, but this is changing (Clark, 2003b; Urdan & Weggen, 2000). Not only the industry is making progress, also the customers and the end users are coming to see that the use of network technology for learning does have its advantages.

- Services

There are companies delivering all kinds of e-learning services like learning portals and other professional services like the development of specific content and consultancy. A portal is in fact the web entrance to offerings of courses and learning activities which are based on the demands of the customer. Only this customer can enter the portal and pays for the services. The supplier takes care of the financial organization in case another supplier delivered the content. The portal supplier will in many instances produce specific content, but for more-generic courses like on topics such as Microsoft Word, larger content providers have good-quality mass products for an attractive price. The 'learning service provider' is going a step further by offering for example assessment and test services, online tutoring and coaching, and more-technical support like tools for content development, content and learning management systems and the hosting of these systems. The other services offered concentrate on the development of tailor-made content, consultants, IT-network services and technical support.

- Technology

This sector focuses on the development and support of software tools, like content-development tools, content-capture tools, content and learning management systems, online-testing tools, video-conferencing systems, assessment, simulation and other technology products. In most cases these

providers also take care of the integration of these tools with the other business systems like the human resource information systems, enterprise resource planning systems and other applications. Next to the vendors which have been active on the learning market, also the established enterprise resource-planning firms are entering, which is a sign that e-learning is being adopted on a wider base (Adkins, 2001; Bersin, 2004; Clark, 2004). New players are the ones that try to sell their new product to the unknown e-learning market, like the suppliers of videoconferencing systems which are introduced as virtual classrooms and of course the suppliers who are active in the areas of knowledge management and who present their software as content-management systems, which in reality look very much like outdated knowledge-management systems. The range of e-learning technology applications is quite broad, fragmented and difficult to handle for the newcomer on the e-learning market.

In general e-learning companies have their backgrounds in the field of education and training, publishing and IT. A few cover almost all segments, including content, services and technology, and offer a one-stop-shop solution. Other, smaller companies, work in general closely together with other e-learning providers in their own sector or other sectors and in this atmosphere of collaboration, partnerships have become an almost natural way to become an attractive company on the e-learning market. E-learning is such a myriad of tools, know-how, content, didactical expertise, technical expertise, change-management, that it is almost impossible to find everything at the same time and same place. Figure 3 shows an overview of e-learning companies as they are divided in the three major sectors.

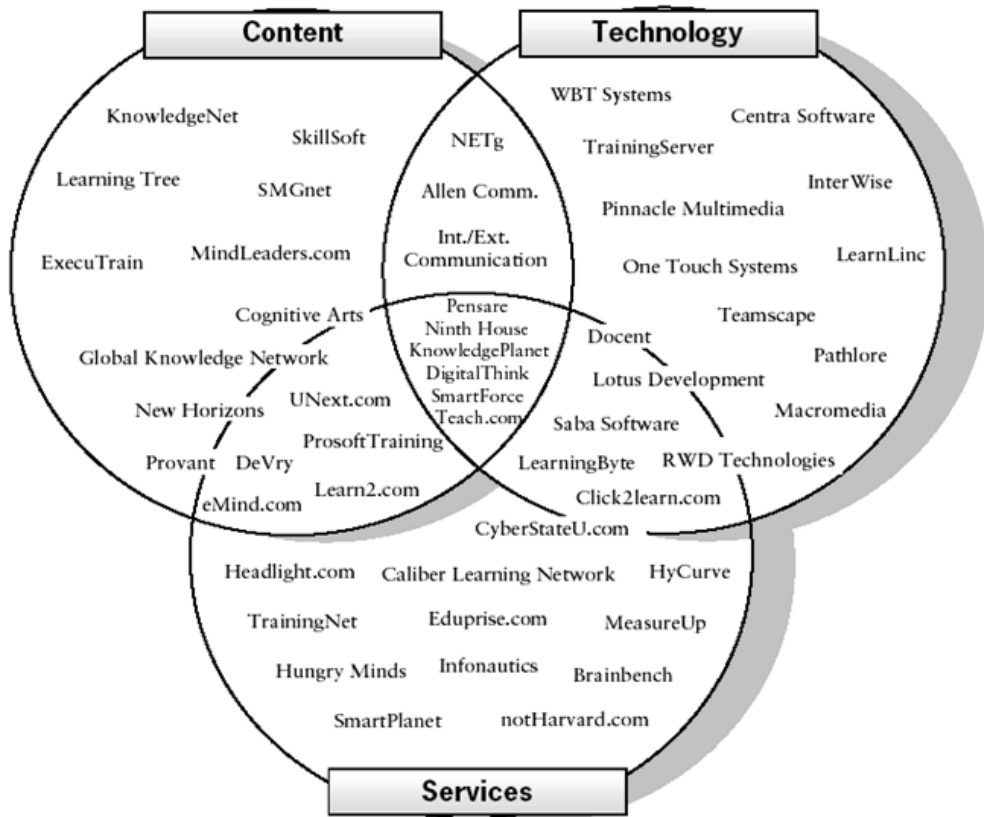


Figure 3 Corporate e-learning universe (Urdan & Weggen, 2000, p. 21)

Although a lot of companies have merged, changed their names and their focuses since this overview was produced by Urdan and Weggen (2000), the division of e-learning companies over the three main sectors is indicative for the variety of companies, although an acceleration of consolidation activities and formation of partnerships can be observed (Clark, 2003a; Rebensburg, Busch & Rautenstrauch, 2002; Sander, Bungert, Busch & Meier, 2004; Urdan & Weggen, 2000).

1.4.2 The demand side

In general a distinction is being made between customers in the private sector, the business sector and government. Each of these sectors has their own priorities when it comes to supply and demand. Nevertheless they have one thing in common and that is the confrontation with the e-learning market. As mentioned before it still is not easy to operate on this market where offerings differ, products change quickly and pricing is still unpredictable. In addition it is difficult to keep track of what is going on because of the mergers, partnerships, new names and change of strategy and the fact that there is a tendency that early customers, like universities, discover the opportunity to become vendor themselves to generate some extra cash (Hills, 2002). So sometimes it

is even difficult to find out what role an organization has. Is it a potential customer or a potential vendor who even might become a competitor? The lack of transparency of the market is also affected by the novice customers, who hardly know their needs or are not yet able to describe their needs. Vendors mostly are not able to support the customer at this point. In most cases it is even not in their interest, because they have to make their targets and if someone is acquiring the wrong product that is a problem for later (Hills, 2002). Also the product development is going so rapidly, especially compared with the relatively slow development of the e-learning implementation, that the customer might even never discover the deficiencies of the acquired product and if this was worth the money.

Customers who have had their first e-learning experiences, are better able to define what they want and need (Adkins, 2001; Hills, 2002). This helps to improve the quality of services, because the vendors get a better picture of the needs and most likely this will also have a positive effect on the pricing. So, on the one hand there is more information coming available on 'best practices', but also more information about less-successful stories (Adkins 2001; Hills, 2002). Customers are alerted with the news on failures, never-ending implementation problems and a technology that does not work: a sign of the increasing awareness at the supply-and-demand sides of the essentials of the e-learning market.

1.4.3 The e-learning hotspot

Urdan and Weggen (2000) predicted that e-learning will develop strongly in areas where it is complementary or even integrates with other important business processes like knowledge management and business communication. This essentially is about the communication directly related to the core business of the company or organization. The area in which e-learning, knowledge management and business communication show an overlap was considered the hot spot for e-learning development (see Figure 4). So, e-learning was expected to flourish especially in the area where a connection can be made with activities that belong to the primary business processes.

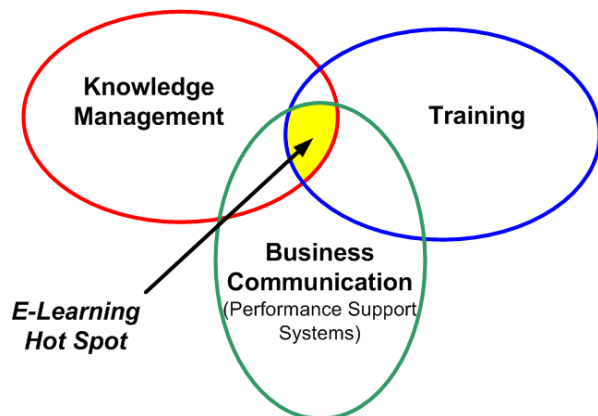


Figure 4 The 'hot spot' of the e-learning market (adapted from De Vries & Oprins, 2001)

This figure could be extended with other balloons like human resource development. HRD in general, but in particular the need for 'employability', causes an increasing demand for education and training. This means that e-learning might approach or even has already acquired a place on the corporate agenda. The effect might be that other people start looking at 'learning' as an interesting issue. This also means that the number of actors that have interest in the 'e-learning' strategy of the firm increase and so does the competition with KM or HRD managers. No wonder why the 'Big Five' (Deloitte & Touche, Ernst & Cap Gemini, KPMG, Price Waterhouse, Coopers & Lybrand) had their eyes on e-learning. When a consultant meets his customer for knowledge management and human resource issues, why not talk about e-learning? So the hot spot attracts others beyond the regular learning vendors, although the economic downturn and the policy of strict separation of the different services like accountancy and consultancy has lead to a reduced interest for e-learning by the consultancy firms. Several different sources (Bersin, 2004; Clark, 2004; Hill & Kappler, 2004; Kolding, 2003) expected and have shown that the e-learning market is growing with an average of 15 – 30 % per year. Numbers differ all over the world, so there is not one figure. In addition it is becoming increasingly difficult to distinguish e-learning from blended-learning solutions, cross marketing and integrated technologies, like Adkins (2001) expected.

1.5 The 'Learning' Evolution

Many changes in society and the economy are brought about by the development and influence of information and communications technology. In Section 1.5 the interrelation is described between the developments which shaped the new economy, including e- business and e-commerce, and the effect these developments have on education and training. From this discussion it became clear that with some delay education and training are affected by information and communication technology as well. The definition of e-learning used as reference in this study is indicative for the changes e-learning provokes: "E-learning is the process of learning and teaching in which the connections among the participants and with the resources are initiated by means of communication technology." Key words are 'process, connections and communications', indicating that learning in the digital age is a continuous process and not an event, with interconnectivity and interaction as important features. An increasing number of companies are involved in the renewal of their development and training program by making the transition from the traditional training mode to the learning model, as the dominant paradigm (De Vries & Oprins, 2001, p. 225). So there is a need to develop a learning environment which enables the paradigm shift and allows the implementation of e-learning as an important tool for the enhancement of the current training and the coming learning activities. The important difference is that training in most instances is an event, restricted in time, place and content, while learning is an ongoing activity facilitated by the use of technology. Kelly (1998) predicts

that the end user will be the ultimate engine of the new economy. His vision is that only the businesses that work on the basis of 'peer-to-peer' (P2P) have a future. Translated to the educational situation, this would mean that communication and interaction between 'learners' will partly determine the quality of education and training. Kelly (2000) uses this line of thought in his allegation that pre-cooked content is killing for education and training. In his view it is all about 'presumption'; the combination of production and consumption of content as a result of interaction between learners and other actors, like teachers, coaches, experts and other sources, involved in the learning teaching process. The learner is moving into a situation in which he is becoming more in power by contributing to the learning process at large. In this context Collis and Moonen (2001) introduced the concept of the 'contributing student'. Learning is no longer an isolated process. The learning experience is built upon interaction with the learning community being the teacher, the coach, peer students, experts, discussion groups, and so on.

The transition from 'training' to 'learning' will not take place overnight, but it is not good to underestimate the power of the drivers. One interesting point is to see what this transition will evoke when looking at the main actors in the traditional training model compared with the main actors in the new learning model. The traditional model is clearly the model we all are very familiar with. The teacher takes care of the training event, supplies the students with content, which has to be digested and will in the end grade the students according to the requirements set by the governing bodies. Figure 5 shows the constituting parts of the traditional training model.

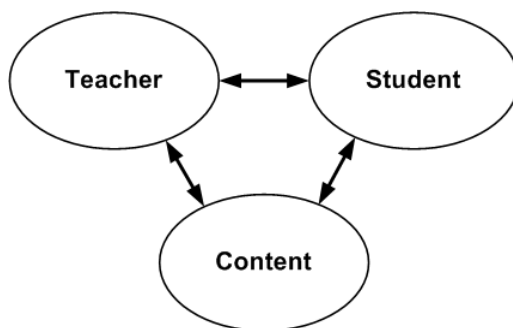


Figure 5 The traditional training model

This model lacks the flexibility to cope with the demands for new training/learning solutions. If we try to put the new learning environment into a similar model, then it will look like the following (see Figure 6).

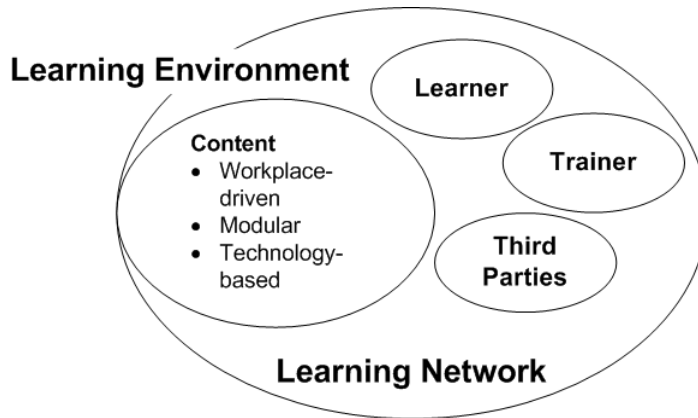


Figure 6 The 'Learning Model'

The division of tasks between the actors in the learning environment becomes less obvious than in the traditional situation. The pattern of interaction loses the linearity well known in the traditional situation and becomes a floating pattern of collaboration between the actors. The interaction as such depends for an important part on the kind of learning activities that are executed. Far from complete but helpful to clarify the transition from training to learning is the overview of changes shown in Table 9.

Table 9 The paradigm shift from training to learning (Meister, 1998, p. 22)

Training	Subject	Learning
Classroom	<i>Place</i>	On demand learning, anywhere, any place
Skills	<i>Content</i>	Competencies
Listen	<i>Methodology</i>	Action learning
Individual internal employee's	<i>Audience</i>	Teams, customers and suppliers
External Professionals	<i>Faculty</i>	Internal managers, consortium of professors and consultant's
One-time event	<i>Frequency</i>	Continuous learning process
Build individual skills	<i>Goal</i>	Business issues and job performance

An interesting observation here is that in the traditional situation clearly the book was the ultimate medium to package content. Print publications are 'page centered' and therefore very linear, which fits perfectly in the traditional interaction pattern. On-line publications are mainly 'hyperlinked' and therefore non-linear, which is very useful in a situation where linear interaction is becoming obsolete. There is another phenomenon which influences the changing pattern of training and learning. Knowledge management and up-to-date information are becoming increasingly important in business processes and in such an environment the learning process, formal and informal, is about flexible collaboration and information exchange, instead of a linear teacher-content-student

pattern of interaction (Clark, 2003a; De Vries & Oprins, 2001; De Vries, 2002; Rebenburg, Busch & Rautenstrauch, 2002).

The traditional educational business column was a very linear course of action. There were only a few actors capable of influencing this 'supply and demand' process: the content owner, the publisher, the educational or training institution and the authorities. The end users, being teacher and student, had virtually no influence in this. In the new situation with e-learning as an important vehicle, there are different and more actors who can practice influence: the software and hardware industry, the telecommunication companies, the e-learning businesses and not to forget the end user.

The other way of thinking about 'learning' has to do with new insights in how people learn and what they should learn (De Vries & Oprins, 2001; Garrison & Anderson, 2003). This is part of the continuous process of research, new findings and experiences. The speed and direction in which this evolution is taking place is provoked by technological developments, not different from the influx of technology on the way we do business in the digital economy. Changes in the production process, in management and in marketing are aimed at improving processes and services to increase the service for the customer. In most cases this is about tailoring the product and service to the individual demands of the client.

1.6 The Future of E-learning

After the term e-learning came into being in 1999 and was quickly adopted worldwide, it has, like the other activities since the events in the beginning of the new millennium, suffered from a downturn in the economy, which particularly affected the IT and the Internet business. Other voices (Hall, 2001; Clark, 2003a) claim that during this business downturn, securing support and funding for e-learning may be increasingly difficult - but even more crucial. Since e-learning can save costs over classroom instruction it will get more attention as a way to consolidate the amount of training needed, without an increase in expenses (Hall, 2001). We will discuss the relation between the new economy and e-learning in Section 1.6.1. In Section 1.6.2 we deal with e-business, as an important driver for the new economy and in Section 1.6.3 we look at the consequences for e-learning.

1.6.1 The New Economy

Since the emergence of the first virtual communities, the Internet world has changed fast and profoundly. And by now it has become clear that the Internet is not just an extra commercial outlet, but has fundamentally changed the way we live, think, talk, go to school, shop and do business (Collis & Moonen, 2001; Garrison & Anderson, 2003; McGrath, 1999). From an economic perspective, the Internet has become the basis for a new dogma: the New Economy, affecting not only high-tech organizations but also the 'old economy type' of businesses like the steel industry, the drugstore around the

corner, the bookshop and, not to forget, education and training (Kok, 2001; Pieper, Kouwenhoven & Hamminga, 2001). Kelly (1998) wrote: 'While the fast-forward technological revolution gets all the headlines today, something much larger is slowly turning beneath it. Steadily driving the gyrating cycles of cool techno gadgets and gotta-haves is an emerging new economic order. We now live in a new economy created by shrinking computers and expanding communications' (Kelly, 1998, p. 1). His definition of the essence of the new economy is simple, but powerful: 'because communication – which in the end is what the digital technology and media are all about – is not just a sector of the economy, communication is the economy' (Kelly, 1998, p. 1). Although this is written some years ago, and circumstances have changed dramatically, this broad perspective still helps to picture the significance of the technology and in particular the Internet for the economical development. In general the new economy has three distinct characteristics: 'It is global, it favors intangible things like ideas, information and relationships and it is intensely interlinked' (Kelly, 1998, p. 2). These characteristics relay to a number of associated aspects as Collis and Moonen (2001, p. 192) put it:

- Access to network technology has become essential.
- Interrelated knowledge is available on demand and new knowledge can be rapidly disseminated.
- Technology is fundamentally changing the ways in which business, communication and other forms of human recreation and interaction occur and new opportunities for market growth are rapidly arising.
- The traditional chains for products are changing, middle men are being eliminated or emerging in new forms, transactions are quicker and more efficient, and transaction cost can be reduced. Whether cost benefits are being passed to the consumer is less clear.
- Because of technology, the buyer has access to an oversupply of products and services. The issues now are gaining attention and selection.
- Organizations are rapidly changing because of these aspects; they must adept. Often, adaptation involves mergers or alliances.

Although the Internet was well underway in 1995, it took the new economy several years to become noticeable. In the meanwhile there was a strong debate about the productivity of the huge IT investments. We know now that IT has been misused as a numbers and cost-cutting mechanism, when organizations failed to optimize its full potential (Crainer, 1998). Also other issues should be taken into account before the full impact of a new economy can be documented, for instance: (a) 'new methods and processes are needed for measurements related to technology and its impact' ;(b) 'a critical mass needs to develop both in terms of humans and infrastructure' ; (c) 'an incubation time is needed for an innovation to occur since it is lengthy in complex

processes in which organizations and humans are players'; (d) 'many applications of technology were poorly chosen, for example trying to replace human skills with computerized routines' (Collis & Moonen, 2001, p.194). From this perspective it is expected that with a certain delay in time the characteristics of the new economy will also show up in the educational sector. The pace of change however will be different from the business world, less profit oriented and slower in the change process, which will tend to increase the already existing divide between the two (De Vries & Oprins, p. 2001). Regardless of the economical evolution over the last couple of years, a new economy marks the shift from the information to the knowledge economy, and asks for a different approach towards efficient business processes (Hasebrook, Herrmann & Rudolph, 2003, p. 66). To get a better understanding of the context of e-learning in relation to the new economy, we will explore e-business, being the driving force for e-developments in the business sector.

1.6.2 E-business: Driver of the new economy

The emergence of the Internet provoked the appearance of a new vocabulary: new economy, e-business, e-commerce and stimulated the reuse of other terms like 'value chain'. According to Kumar (2001, p. 58) 'a supply chain is a network of organizations and their associated activities that work together, usually in a sequential manner, to produce value for the consumer'. Supplying value to the consumer, that is, goods and services, is the essence of business. Supply chains have existed ever since business has been organized to bring products and services to consumers. This is also true for the education and training market. Since the discovery of the printing press, books and other paperware could be produced in an ever greater variety and quantity. For the educational sector this led to the development of a supply chain in which information was packaged by the publisher and sold to the educational and training organization to be used in a classroom for the student and paid by the student. The deliverance of goods or services to the consumer, however, does not terminate the chain. The scope of the supply chain extends from the upstream sources of supply down to the point of consumption, and finally retirement and recycling. Tenenbaum (1998, p. 90) illustrates (see Figure 7) how 'a classical supply chain link vendors, distributors, resellers, and customers in a rigid pipeline with custom system integration required in each step. On the contrary, in (what he calls) a supply web (see Figure 8), participants publish information about their products, prices and availability directly on the Internet. This arrangement encourages open markets where companies can rapidly assemble the best suppliers for specific market opportunities. It also encourages value-added services that are inconceivable in a world of closed trading-partner relationships' (Tenenbaum, 1998, p. 90).

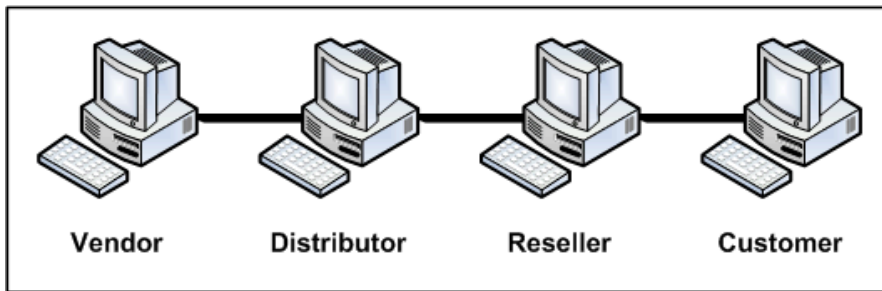


Figure 7 Classical supply chain link (adapted from Tenenbaum, 1998, p. 89)

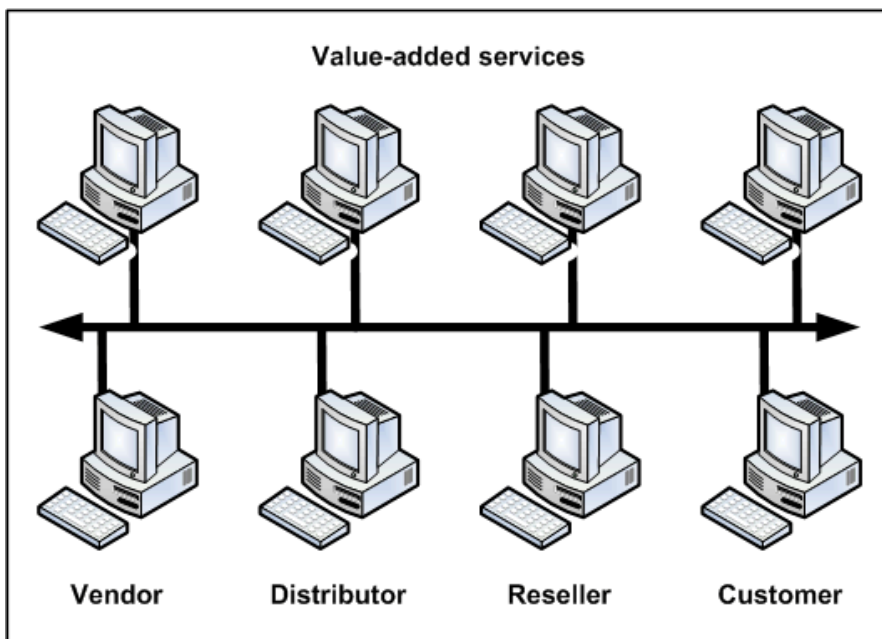


Figure 8 Value added services (adapted from Tenenbaum, 1998, p. 90)

Main reasons for this evolution of the supply chain are:

- Globalization and regionalization: Markets are becoming more global but at the same time it is necessary to take into account the specifics of a regional market
- Customer orientation: Customers expect individualized products and therefore it is necessary to react backwards in the delivery chain
- Cooperative efforts: There is a growing need for cooperative efforts increasing the need for communication
- ICT potentials: better communication through the Internet works as a push-factor

- Available resources: when cooperative actions are taken there is a need for adaptation of production capacity and stocks storage across company boundaries.

'The modern supply chain has to respond to a greater uncertainty of demand and variety, higher product quality, and much shorter response times or cycle times at the least possible cost. Innovative use of ICT can dramatically change the cost and value equation for a supply chain' (Kumar, 2001, p. 59).

Referring to Castells (1996), technological revolutions are characterized by their pervasiveness across all domains of human activity; not simply their impact on what is done, but on how it is done—that is, they must change processes in some fundamental way. From that perspective e-business is not going to create a revolution. 'Most likely the evolution of e-business is an incremental one, automating existing business-to-business (B2B) processes and extending the few business-to-customer (B2C) successes. We need to focus on making a clearer distinction between where the Internet has simply changed the cost of making specific transactions and where it has transformed the fundamentals of the transactions themselves. The real areas of change are those where old institutions—hierarchies within firms, established supplier relationships, ordering and payment systems—can be co-opted by technology in ways that transform not the business, but the psychology of the business and the fundamental costs of what defines the business. Such areas of change do exist, but they are far fewer in number than e-evangelists thought' (Coltman, Devinney, Latukefu & Midgley, 2002, p. 73).

1.6.3 Consequences for e-learning

The technology bias of e-learning is comparable with the other e-activities like e-business and e-commerce which are the main drivers for the new economy. The issue here is how does e-learning relate to what has been said in the previous section about e-business and e-commerce? Urdan and Weggen (2000), while discussing e-learning, see a clear connection between the different e-activities when looked at from a supply- and-demand perspective (see Figure 9). In this approach e-learning is seen as the result of the demand for training needs and the supply of technology and services. E-business and e-commerce play an important role to make both ends meet in the e-learning market place.

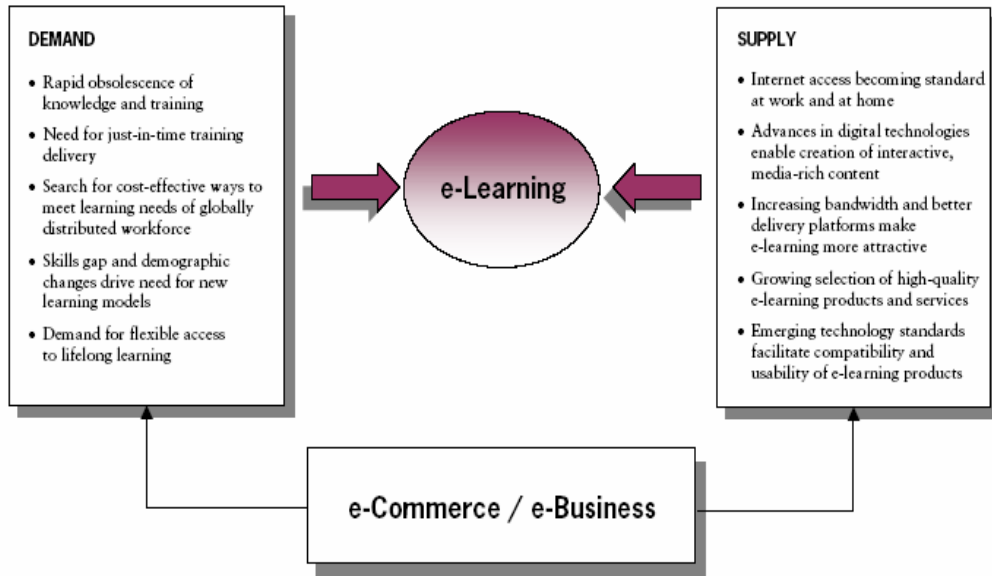


Figure 9 The relation of e-learning with e-business and e-commerce (Source: Urdan & Weggen, 2000, p. 4)

From this analysis a number of interesting observations can be made:

- A distinction should be made between existing learning activities that are now automated using technology, in particular computer based training, and new activities that were not possible earlier but have come to life because of the potential created by communication technology
- A distinction will exist between activities within a learning organization, between learning organizations and between a learning organization and the students.
- An overall e-learning strategy will have to link and optimize activities mentioned in the points above.

Another interesting observation is that e-learning is moving beyond the boundaries of the traditional training function and becomes part of a firm's overall business-to-employee (B2E) efforts. This is where the supply-chain function is extended and gains momentum. 'Business managers are looking for end-to-end solutions for training and learning that match the entire human resources value chain. The proliferation of e-business and its extension to HR and to training and development is changing the learning landscape considerably. Professionals in the field are being asked to transform traditional training and learning processes in a way similar to what e-business has done for general business processes' (Völkl & Castelein, 2002, p. 67). Völkl and Castelein (2002) list a few examples of these changes in the 'training landscape' (see Table 10).

Table 10 How e-business changes the training landscape (adapted from Völkl & Castelein, 2002, p. 68)

	Past	Today
Training Department	<ul style="list-style-type: none"> ○ Tactical ○ Stable processes ○ Administration 	<ul style="list-style-type: none"> ○ Strategic ○ Continuously changing business requirements ○ Service and delivery
Roles	<ul style="list-style-type: none"> ○ Administrator ○ Trainer 	<ul style="list-style-type: none"> ○ Consultants ○ Coaches and performance coaches
Content	<ul style="list-style-type: none"> ○ Could be planned in an entire year in advance ○ General ○ Predefined curricula 	<ul style="list-style-type: none"> ○ Constant demand for new learning ○ Personalized ○ Modular learning objects
Learners	<ul style="list-style-type: none"> ○ Employees of the company ○ Passive recipients 	<ul style="list-style-type: none"> ○ Business community: employees, suppliers, customers ○ Self-serving, active agents
Training systems	<ul style="list-style-type: none"> ○ Offline, stand alone solutions ○ Asynchronous data management 	<ul style="list-style-type: none"> ○ Networked systems ○ Real-time tracking and analysis

Maybe the specific kinds of change and the speed of supply chains and supply-chain management are different in businesses compared with education and training, but the question involved is basically the same. The reasons mentioned in Section 1.6.2 for the evolution of the supply chain (globalization and regionalization, customer orientation, cooperative efforts, ICT potentials, and available resources) are as crucial in the evolution of education and training as they are in business. But, in comparison with business, e-learning will not replace traditional learning. In the end it will complement other aspects, using people and technology. Eventually the target will again and simply be 'learning'.

E-learning is a subset of e-business and therefore the characteristics of e-business apply also to the education and training market. Certainly it is advisable for the education and training community to look very closely at what is happening in the business world and vice versa and learn from best practices. How do these businesses manage to use the technology in a sound way, what can we learn from them and what does this mean for the education and training business? What are the possibilities and what are the consequences? The education and training community cannot ignore what is happening in the outside world, pretending that this has nothing to do with learning. The technology is not decisive, but without a thorough knowledge and understanding of the possibilities and functionalities of the technology using the technology in a smart way and expanding the possibilities through the accommodation of the organizational environment an impact can occur.

Certainly the burst of the e-commerce bubble in 2000 and beyond was a warning to be taken seriously for the e-learning community as well. Also in education there is a substantial difference between predicted revolutionary change and real change, as has been seen for many decades (Argyris & Schön, 1978). In any case, the learning

communities should think very seriously about where their main e-application domain will be.

1.7 Separating the Hype from Reality

Urduan and Weggen (2000) predicted that: 'E-learning is the fastest-growing and most promising market in the education industry' (Urduan & Weggen, 2000, p.1). In their view there was a tremendous potential especially for corporate e-learning within the education industry. In fact it was a confirmation of what had been predicted in earlier publications of Goldman Sachs (1999) and McCrea, Gay, & Bacon (2000). A survey presented by Urduan and Weggen (1999), suggested that 'the overall share of classroom training will decline from 80% to 60% in 2003, doubling the current share of electronic delivery to 40%' (see Figure 10).

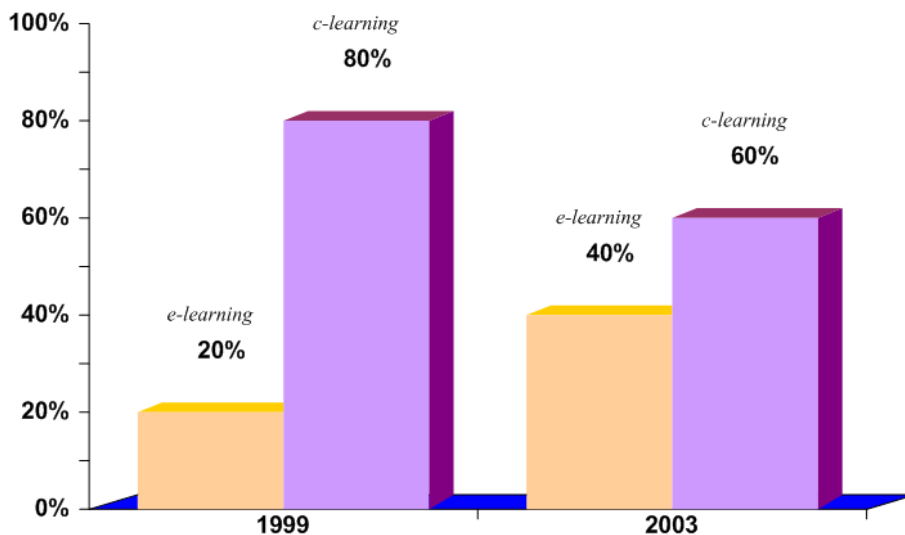


Figure 10 E-learning market gaining market share over time (Source: Urduan & Weggen, 2000, p. 14)

The analysis and predictions of Urduan and Weggen were confirmed by Kelly (2001) saying that the volumes of the e-learning market would double each year until 2003 (see Figure 10). This prediction was reviewed in spring 2002 in a special report on e-learning by the Financial Times due to the developments after the eleventh of September 2001 and the economic down turn in the IT industry. Fisher (2002) presented in the Financial Times report the opinions of several different market research organizations, he notes that IDC still spoke about an 'aggressive growth' and Gartner talked about: 'The e-Learning market is poised for explosive growth', indicating that the market will have a volume of 4.2 billion dollars in 2002 and will grow dramatically to 33 billion in 2005. IDC furthermore indicates that the European market would grow from 409 million in 2001 to 3.2 billion dollars in 2006. A slightly different picture is given by CEDEFOP (www.trainingvillage.org), the European Centre

for the Development of Vocational Training, which presented at the end of 2001 the following numbers and opinions.

- The worldwide corporate e-learning market will increase to 8 billion euro by 2005.
- The European share will be 32 %.
- On a world scale Western Europe is spending the most per person on education and training.
- The e-learning share on the training market will increase from 20 to 40%, based on a decrease of traditional forms of education and training.
- The e-learning market in Europe is on the brink of breaking through.
- Chances are good for businesses that offer e-learning content, technology and services.

This 2001 survey of CEDEFOP is followed by the 2002 survey executed by Massy (2002) to discover the latest developments in e-learning focusing on the situation in vocational training and continuing professional development. From her analysis it becomes clear that there is a trend towards a steady increase in the use of e-learning in the countries of the European Union; there is a raise in the share of e-learning of the current and capital expenditure on training development; and there are remarkable positive intentions about plans to purchase a Learning Content Management System (LCMS) in 2003.

Although the predictions of the research institutions differ, all seemed to be certain about the expected explosive growth of e-learning with a major share for primary and secondary education and corporate e-learning. These expectations are supported by the role e-learning was expected to play as the link between initial and post-initial education and training. According to the European Commission (2002), e-learning is expected to play an important role for lifelong learning, which is considered a road builder to make the transition into the knowledge economy and knowledge society a success. Fisher (2002, p.7) refers to the research bureau Gartner, which claims that 'the web will become the life-long learning platform for most of the world'. Reasons enough to believe that e-learning had a bright future. Levis (2003) though is rather skeptic about the reports published in the years 1998 – 2000. In his view these reports 'contain a great deal of exaggeration and the forecasts are largely fantasy'. Nevertheless these reports provide 'a useful sanity check on the maximum levels of some markets. The main reason why the market volume is difficult to assess is the fragmentation of the training industry and the companies that use many different forms of formal and informal training, mostly conducted in-house (Levis, 2003, p. 1).

The overall downturn in the growth of the 'digital economy', which started in 2000, was heavy on the IT and Internet industry. It was expected that the e-learning market would also suffer from the general economic slowdown and effects were

noticeable in a decrease of expenditures in the educational sector. E-learning though seems to profit from the process of integration, which was already underway, in which the old and the new economy had met and a symbioses developed of Internet technology with traditional businesses, including education and training (Clark, 2003a; Hasebrook, Herrmann & Rudolph, 2003; Levis, 2003; Pieper, Kouwenhoven & Hamminga, 2001).

An IDC Research analysis (2001) showed that although education and training in general suffered from the flaw in the economy, it also appeared to be a reason for an increased interest in e-learning. IDC noticed that there was a growing need for online IT training, because companies hoped to keep pace with the developments by means of a better use of technology and e-learning was considered a way to save money. From Figure 11 it becomes clear that the use of e-learning was expected to increase at the cost of more traditional technologies.

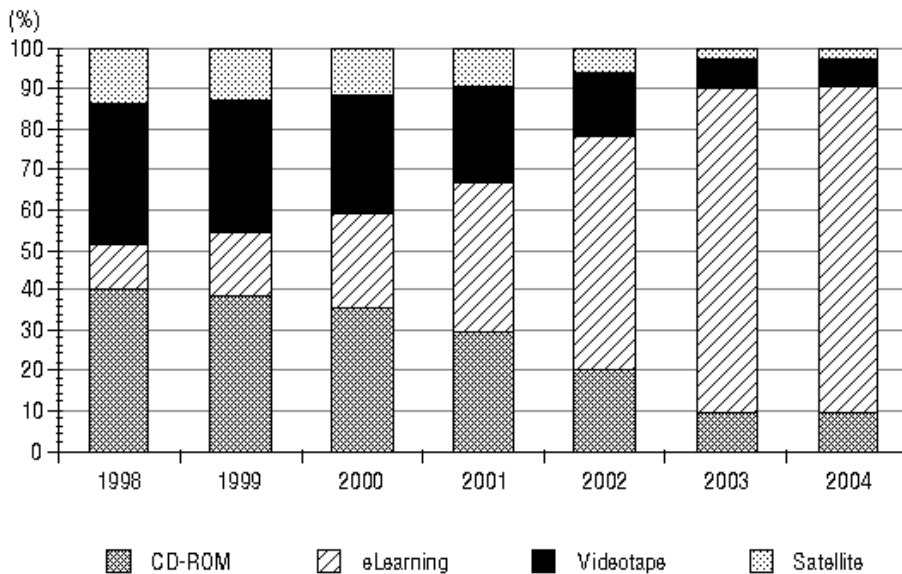


Figure 11 U.S. Technology-based training revenue share by delivery segment, 1998-2004 (IDC, 2001).

So part of the magic of e-learning seems to be the ability to save resources. Less-time and-place dependent, shorter learning courses, less classrooms, less teachers, less travel, less energy, less paper, less variety and, of course less money. Less is not always better and a one-sided orientation on cost savings does not bring better results (Fischer, 2002). Levis' (2003) analysis is that 'the e-learning industry has focused much more on improving the efficiency of the learning process than on learning effectiveness.' This observation is supported by Hasebrook, Herrmann and Rudolph (2003, p. 42). 'In general E-learning will make education more effective but not better, because technology is aimed to enhance the efficiency of processes whereas didactics'

objectives are to enhance the quality of the steps and tools involved in the learning process’.

Another interesting element in the discussion on the achievement of e-learning is the connection with areas adjacent to learning such as knowledge management. In practice it is shown that e-learning can be applied to a continuum of applications, but the most competitive advantages of e-learning are those that extend beyond traditional education (Hasebrook, Herrmann & Rudolph, 2003, p. 10). Richards (2002) shows an example of how this extension works out in the relation of e-learning and knowledge management. ‘According to a study released in 2001 by Capital Works LLC, a human capital management service, those companies funding formalized e-training programs would have been better off spending their money on less costly informal and self-study methods. That is because, according to the study, informal methods were shown to increase employee knowledge and productivity far more than formal educational methods’ (Richards, 2002). From a practical point of view, the study confirms what many have long sensed: that the majority of new employment skills are learned informally through discussions with co-workers, mentoring by managers/supervisors, rummaging through and finding knowledge gems buried in shared directories, e-mail threads and the like. Only about 25 percent of employee skills are learned from formal training methods such as workshops, seminars and synchronous classes (Cross, 2004; Digenti, 2000). The qualifications of e-learning are predominantly derived from the results in formal education. It can be expected though that it will not take long before e-learning will increasingly be used in connection with informal and more workflow-based learning (Cross, 2004).

According to Clark (2003a) e-learning was over-hyped, then de-hyped and seems to be under-hyped now. E-learning reality at this time is that the market has matured. As Bersin (2004) indicates, as much as 20% or more of corporate training is being conducted online. When compared to 2003 when estimates showed 16%, the growth rate was nearly 30%. This is less than expected in the early days of e-learning development, but it still shows a significant growth, although we should be careful with the interpretation of numbers as has been revealed in the past. In any event there are clear signs of the increased maturity of e-learning (Bersin, 2004, Clark, 2004). Buyers tend to purchase e-learning products for the solving of a specific problem and are less interested in the ‘one size fits all’ solutions. This indicates a shift from the bulk-delivering publisher to the smaller, regional and more-specialized vendor. Another sign is the steady raise in the quality of e-learning products. Buyers know better now what they are looking for and vendors are better able to deal with tailor-made solutions. It is still difficult though to find the right vendor, because there are still so many. Other signs are that we know more about the organization of e-learning, about teaching and learning processes, the technology is improving, the e-learning tools become better and not in the least, it is the networked businesses and administrations which push for more online activities. E-learning is here to stay. It will never meet the expectations

from the early days, but seems to be moving steadily into a more-mature phase, slowly entering the daily lives of many.

1.8 Future Trends

E-learning has arrived and is applied in different circumstances, in different ways, in different settings and with different results. E-learning was over-hyped, which led to disappointments but has proved to be a useful tool for the solution of the increasing demand for training and learning in business world. In the meanwhile companies have collected valuable experiences and 'The rationale for taking a more thoughtful approach to learning is so powerful in all industries, and the savings and other benefits in many cases so significant, that a few sectors will be untouched. However, for many companies and industries, adoption will be much slower and more tactical. For them, e-learning will be a useful means of training more people more quickly and less expensive, rather than a transformational experience' (Levis, 2003, p. 3).

What are the key trends? According to Hasebrook, Herrmann and Rudolph (2003, p. 39) the major trends with the biggest impact on the global markets and technologies are:

- The increasing demand for academic degrees.
- The growing numbers of students attracted to educational hubs.
- The rapid growth of non-traditional, especially elderly, target groups.

One of the core assumptions is that e-learning does not replace traditional classroom education. Instead it will expand the market for educational products and services to assist the growing population of non-traditional learners, many of whom divide their time between work and school, to pursue an education. 'Corporate training, career development, and expert enhancement are areas ripe for sustainable growth' (Hasebrook, Herrmann & Rudolph, 2003, p.40).

From the initial situation in which e-learning was an uncertain innovation, e-learning is moving into a different phase of development, which is described by IBM as the 'next big wave' (Straub, 2002). Learning is increasingly recognized as a lifelong process and 'today e-learning is considered a key enabler for this transformation' (Straub, 2002, p. 2). E-learning provides a new learning environment with key elements like:

- People-centric elements like pedagogy, didactics, cultural factors, social elements like collaboration.
- Content-centric elements, such as rich media content, authoring tools, and learning-object management, content management.

- Process-centric elements like learning management systems, online testing and reporting
- Technology-centric elements, such as hardware and software, infrastructure (servers, routers and end-user equipment), databases, delivery platforms.

This broader perspective for e-learning is a necessity 'to avoid pitfalls – deploying the latest technology does not solve a learning need if there is no sound pedagogical approach associated with it' (Straub, 2002, p. 4). It is this holistic approach of e-learning which, according to IBM, is basic for the creation of the new learning environment. This vision is business related, but shows a wide-ranging understanding of the characteristics of e-learning as an innovation. Rebensburg, Busch and Rautenstrauch (2002) discuss the same issue from a slightly different perspective and call it the 'Zweite Welle' (second wave). In their view the first wave of e-learning ended with the dot.com collapse. For their study they interviewed 21 companies about their recent experiences and the outcome gave rise to the opinion that e-learning had found its place in the business sector and will be of increasing importance in the years to come. E-learning is becoming an important building block for learning and human resources, but how to prepare for this second wave as an important trend in e-learning development? Rebensburg, Busch and Rautenstrauch (2002, p. 37) gave the following recommendations:

- Develop a strategy focusing on vision development, goals setting, management and politics.
- Learning management systems tend to develop more and more as an enterprise resource planning system (ERP) for human resource development.
- The discussion about blended learning and the use of print media, computer-based training, web-based training and other sources shows that media will increasingly be used in complementary ways instead of being replaced by solely online resources.
- The use of more than one learning management system (LMS) is not advisable, also because an LMS can become too complex and difficult to integrate with the existing information-technology infrastructure, human resource processes, the organization and maintenance of content and the competence structure.
- Change management is the key word when it comes to the development, implementation and integration of e-learning. An adaptation in the 'learning' culture is needed to create 'space' for learning, independent of the phase of the e-learning project.
- Next to the quality and achievements control is the control on 'human resource development'. There is a great need for more transparency of the strategic, content, process and financial aspects of learning.

Figure 12 shows an overview of these recommendations, which together constitute an e-learning activity framework.

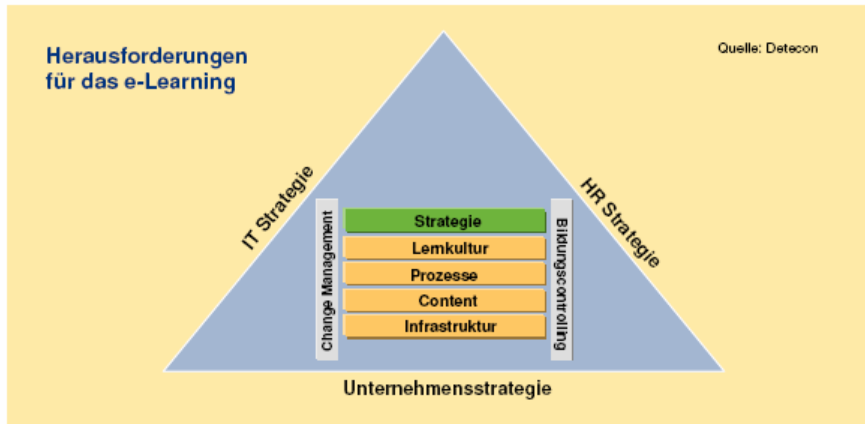


Figure 12 Activity framework for the second wave of e-learning (Rebensburg, Busch & Rautenstrauch, 2002, p. 40)

The challenge for companies will be to recognize content, infrastructure, processes and culture, as basic elements of a learning value cycle (see Figure 13). Rebensburg, Busch and Rautenstrauch believe that if these aspects are taken into account, e-learning can develop into an important management instrument for the company (2002, p. 41).

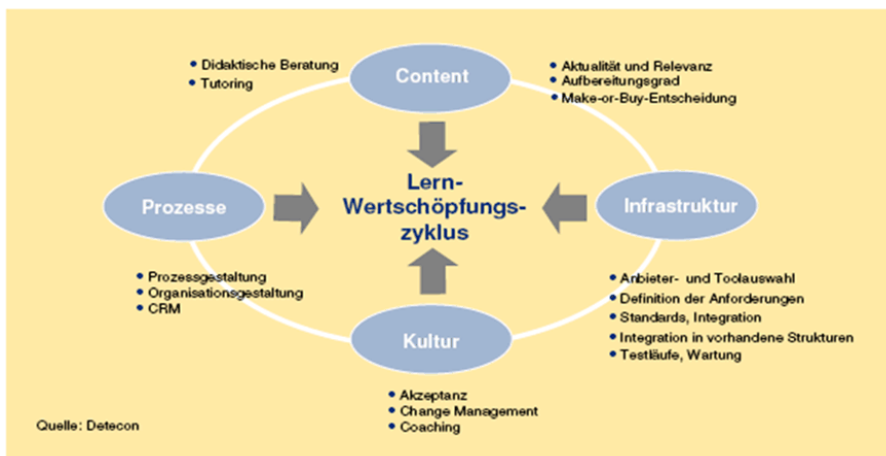


Figure 13 The Learning Value Cycle (Rebensburg, Busch & Rautenstrauch, 2002, p. 40).

The findings by Straub (2002) and Rebensburg, Busch and Rautenstrauch (2002) are confirmed by a more recent publication on the ‘Strategies for an Integrative Human Resource Development’ by Sander, Bungert, Busch and Meier (2004). The outcome of their research action among 27 German enterprises showed that e-learning is

emerging as an important instrument for human resource development, which means that e-learning, is becoming a strategic issue for companies. On the operational level e-learning comprises electronic learning and the management of learning, including aspects as planning, controlling of human resource development and the organization. On the management level it means that e-learning will have to deal with primary business objectives. The consequence is that return on investment is becoming a real issue (De Vries & Botke, 2003; De Vries & Oprins, 2001; Sander, Bungert, Busch & Meier, 2004). These strategic analyses are being supported by the observations of other authors (Bersin, 2004; Clark, 2003a & 2004; Cross, 2004; Levis, 2003; Masie, 2002; Morrison, 2004; Shepherd, 2003), looking at future trends in e-learning in general. To complete this review on future trends, some additional observations can be made under the headings: e-learning market, content, technology and business aspects.

The e-learning market

- The market will continue to be fragmented, but the market share of a small number of large suppliers will rise significantly, partly due to mergers and acquisitions.
- A convergence will take place with knowledge management.
- Skills development will become main stream.
- Companies tend to outsource and automate wherever that is cost-effective.
- Corporate training departments will become facilitators more than training institutions.
- Services will be based on an understanding of business and learning needs.
- Customer training is growing in importance.
- Workflow integrated learning is growing in importance.

Figure 14 gives an overview of the expected market growth in the different sectors. With a little variance the potential for growth seems to be evenly spread across the sectors.

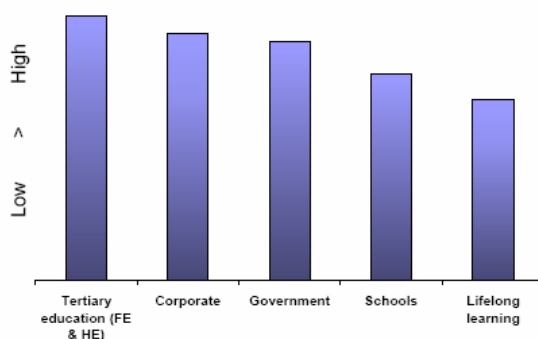


Figure 14 The market with most growth in online Learning (Clark, 2003a, p. 4).

Content

- When content is king, context is queen (Masie, 2003)
- Blended-learning solutions improve and increase.
- Content integration continues to be a challenge.
- Rapid e-learning as a set of training applications must be developed in weeks to solve problems of information distribution and critical information transfer (Bersin, 2004).
- Customized courseware has the capability to improve learning effectiveness and business performance.
- Application simulation seems to be experiencing a revival due to better tooling, like video-based e-learning and interpersonal simulations.
- Improved instructional design is essential for learning effectiveness.

Figure 15 shows the most important factors for the success of e-learning in organizations.

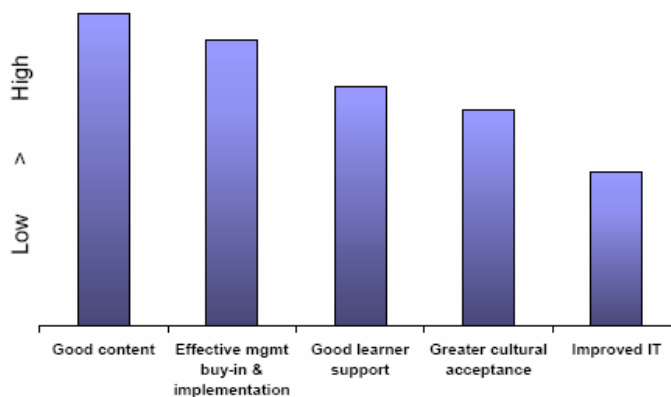


Figure 15 The most important success factor for e-learning in your organization (Clark, 2003a, p. 9)

From the survey of Clark (2003a) it is clear that 'content' is considered the most important success factor. The industry matures, the technology improves and there is an increase in the quality of content.

The technology

- Technology is not leading anymore.
- Enterprise-wide planning systems will converge with learning management systems (LMS).

- Hosted application server-provider services will have to compete with the tendency to integrate learning management systems with enterprise resource-planning systems (ERP).
- Learning content management systems (LCMS), which include authoring tools, offer more benefits than the regular learning management system.
- The marketplace for LMS's stays fragmented and complex.
- ERP players like Oracle, Peoplesoft, SAP and Siebel did not make a significant impact on the market, but are expected to improve their situation when the integration of e-learning technology and ERP becomes a trend (Bersin, 2003, 2004; Rebensburg, Busch & Rautenstrauch, 2004).

Figure 16 presents an overview of the technology which is expected to lead in e-learning development.

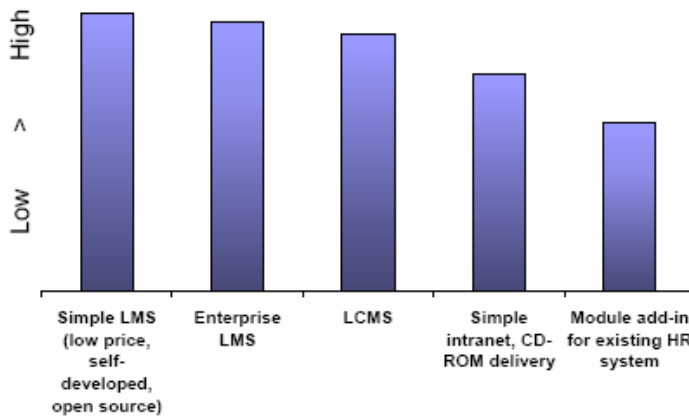


Figure 16 The technology which is expected to lead in e-learning development (Clark, 2003a, p. 15)

The trend is to use simple and low-priced learning management systems, which might be developed in-house using open source. This confirms the fact that the large, multi-functional learning management systems are losing ground (Clark, 2003a, p. 15).

Business aspects

- Companies are turning towards e-learning as a strategic way to reduce training costs, increase reach, and leverage Internet investments (Bersin, 2003, 2004)
- Most companies are well past their first e-learning project, working on the optimization of content development and program management. A significant number though are still new to e-learning.
- There is a lack of tools and methodologies to make measurement easy (Bersin, 2003; De Vries & Botke, 2003)

Figure 17 shows an overview of the benefits organizations hope to achieve with e-learning.

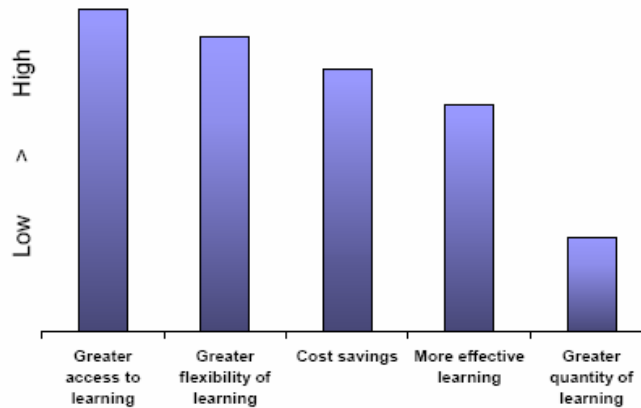


Figure 17 The benefits organizations hope to achieve through online learning (Clark, 2003a, p. 6)

Interestingly enough it is not cost savings, but greater access and flexibility which lead the pack of the most-wanted benefits. There is a striking similarity when compared with the more recent findings of Hill and Kappler (see Figure 18), who surveyed 500 companies in the United Kingdom. Hill and Kappler (2004) did not ask for the most-wanted benefits, but for the benefits that companies have experienced adopting e-learning. In addition Hill and Kappler (2004) looked at the companies' experience and attitudes towards e-learning. The findings are that e-learning is growing. Companies who are using e-learning see an average increase from 15% to 29% of all training delivered. The growth is expected to be stronger in the companies with more than 5000 employees than in smaller organizations.

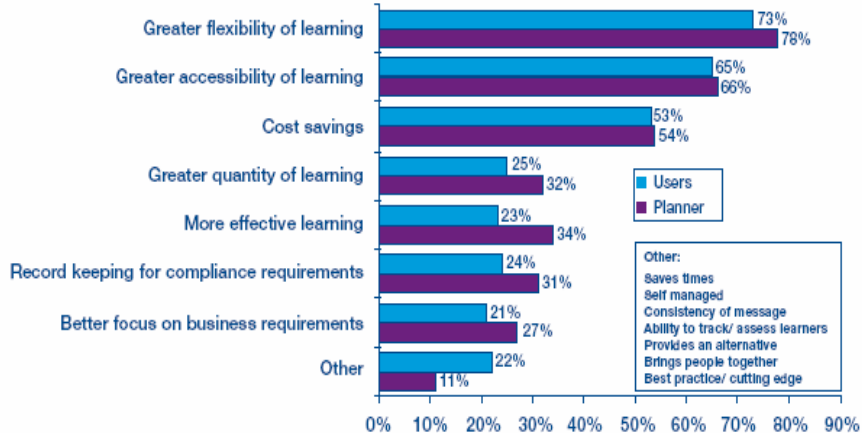


Figure 18 The biggest benefits of e-learning according to Hill and Kappler (2004, p. 7)

Interesting is the finding that most companies perceive the changing of attitudes towards learning and training as the greatest achievement of e-learning (see Figure 19). It demonstrates that the training function can add real value in a variety of ways.

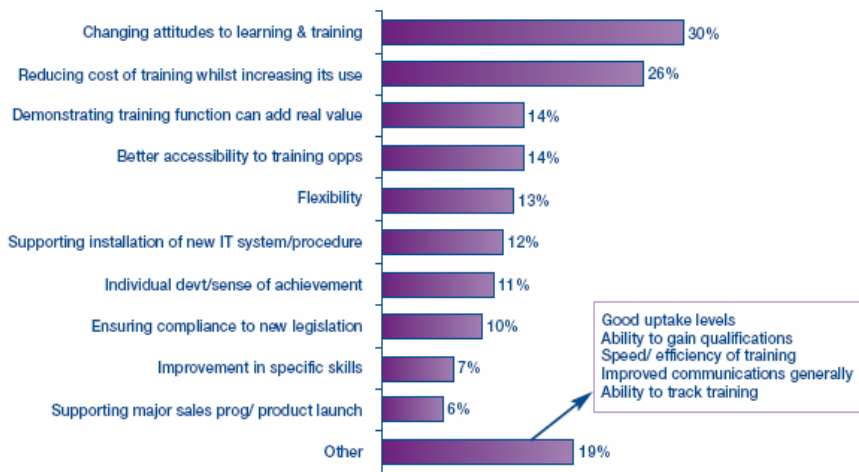


Figure 19 The main successes with e-learning in organizations (Hill & Kappler, 2004, p. 8)

1.9 Conclusions

An important conclusion can be that e-learning is here to stay (Clarke, 2003a; Morrison, 2004; Rebenburg, Busch & Rautenstrauch, 2002; Sander, Bungert, Busch & Meier, 2004), and therefore the likelihood that everybody in the western and corporate world will sooner or later experience e-learning is far greater than expected. As such, e-learning is very promising, but as Rossett (2002, p. 4) puts it: 'we are still about to discover the value for education and training'. It is evident that we need a balanced view on the meaning of e-learning for education and training, but as long as the growth of e-learning is being described as explosive, unprecedented, and above all, disruptive (Garrison & Anderson, 2003), we are not that far yet. So for our judgment of the importance of e-learning we need more than a fragmented approach for studying and understanding this phenomenon. The primary research question in this chapter therefore was: 'What is e-learning?' Furthermore this research started with an analysis of the relation of e-learning to the training and learning needs in general and in particular the meaning of this development for the corporate sector.

E-learning is in essence a technology-driven development, currently influencing the way that learning is approached. In practice e-learning is a multi-faceted phenomenon, which is hard to grasp in a simple definition or description. In this chapter e-learning is being looked at from different angles and perspectives to reveal the diversity in order to grasp the real meaning. To avoid confusion, we have developed a definition of e-learning to be used as the main point of reference right through this study: 'E-learning is

the process of learning and teaching in which the connections among the participants and with the resources are supported throughout by means of communication technology.'

When looking at the rationale for e-learning it becomes clear that swift changes in the business organization, the processes and technology have created an increasing demand for more and different training and learning, which cannot be dealt with by the traditional organization. In addition, 'learning' is increasingly recognized as a strategic weapon to stay ahead of the competition. Drivers for the use of e-learning can be found on every level: the macro level of socio-economic development and the strategic and operational level of companies and organizations. E-learning seems to offer unlimited options to deal with the increased and different needs for training and learning. To really realize the full potential a solid learning strategy is needed, before getting caught up in the whirlwind of e-learning technology (Deloitte Research, 2002). This is confirmed when looking at the success factors and the inhibiting factors for the implementation of e-learning. Depending on the stage of development and changes in the context, success factors might become inhibiting factors and vice versa and can damage the project if there is no holistic view on the goals and aims. Clearly we are only experiencing e-learning in its early forms and still have much to learn of its inherent capabilities and the creation of a new 'learning ecology' (Brown, 2000).

The e-learning market as well is still in an early stage of development and is often qualified as young and unpredictable, with a lack of transparency, both for the customer and the vendor. An increasing number of organizations though have had their first experiences and are alerted about less successful stories, implementation pains and successes. In short, they become more knowledgeable and are better able to define what they need and to uncover the essentials of the e-learning market.

The final section of this chapter was on the future of e-learning. Not so much about predictions, because the high expectations for the growth of e-learning turned out to be unrealistic, but about the connection with the new economy. E-business is the driver for the new economy. This economy is not just about high tech organizations. The real revolution is on its way, because a majority of the 'traditional' enterprises are finding their way in using the Internet for their business processes (Pieper, Kouwenhoven & Hamminga, 2001). Aspects of the new economy are becoming visible in the educational sector and the main carrier of this development is e-learning, relying heavily on e-business activities. So the impact of the new economy on e-learning is an important issue when looking at the future.

Starting in the year 2000 an explosive growth of e-learning was expected, but this forecast contained a great deal of exaggeration. Then it was expected that e-learning would also suffer from the overall slow down of the economy, but the fall in the economy also appeared to be a reason for an increased interest in e-learning (Clark, 2003a; Fischer, 2002; Levis, 2003). In addition e-learning seems to profit from the process of integration of Internet technology with traditional businesses, including the educational sector. Thus what is the future of e-learning? The general opinion is that e-

learning has found its place in the business sector and will be of increasing importance in the years to come (Bersin, 2004; Levis, 2003; Morrison, 2004; Shepherd, 2003; Straub, 2002). It is expected that e-learning will develop as an important instrument for human resource development and therefore become a strategic issue for companies. One of the consequences is that demonstrating the return-on-investment will be a substantial issue.

2 The Changing Paradigm of the Educational Business Column

Swift changes in business organizations, business processes and technology have created an increasing demand for training and learning. The traditional, classroom-oriented training lacks the flexibility to handle the increased need for just-in-time and just-enough learning. Therefore corporations are looking for useful alternatives and consider e-learning to be helpful in developing learning solutions that fit current needs. E-learning distinguishes itself from other educational innovations by the focus on the use of information and communication technology (ICT) for the improvement of the company's learning processes. The complexity of the implementation is not about the use of chat or personal homepages, but about the integration of e-learning with the learning strategy of the company, the business organization, the business processes and the ICT structure (Habermann & Kremer, 2001). Therefore a thorough analysis is needed of the existing situation (A) and the desired situation (B) and what is necessary to make the transition from A to B. When the different aspects of the e-learning value cycle, like processes, content, culture and infrastructure (Rebensburg, Busch & Rautenstrauch, 2002) are not taken into account, the innovation might fail. But what should be analyzed and how, to make sure that change will happen and bring about improvement? This chapter is about the changing educational paradigm, looked at from the perspective of what can be called the educational business column. The educational business column is used as a metaphor and should be understood as the organizational framework which is generally put in place in a company as the training organization to analyze the needs and develop and deliver training and learning to the workforce. The traditional training organization does not have the ability and flexibility to use e-learning as a tool for improvement and innovation.

This chapter is about the educational change process and what is necessary to make this process a success. The term E-learning is new and to date the research-based constructs that lead into an in-depth understanding of e-learning, are still emerging (Garrison & Anderson, 2003, p. XII). However the study of ICT in education and training has been evolving over three decades, using the terminology of computers in education (CBE) and ICT in education. Much of the research summarized in this chapter refers to ICT rather than e-learning. In defining the research questions this belief was taken into account. In Chapter 1, we dealt with research question one (RQ 1) on the issue: 'What is e-learning?' The structure of this chapter is related to the following research questions:

- RQ 2: 'What do we know about innovation in general and educational change in particular?'

Theories on innovation and educational change are analysed and reconsidered in the context of e-learning.

- RQ 3: 'What are the characteristics and what roles will content and technology play, as important success factors in the development of e-learning in the years to come?'

The role and meaning of content is heavily discussed in relation with e-learning and is expected to remain a decisive issue for the success of e-learning. E-learning is not a technical issue, but the technology is an enabler, which e-learning cannot do without.

- RQ 4: 'What have we learnt from the use of ICT in education and training?'

The analysis focuses on the experiences with the use of ICT during the last ten years. The experiences of the author in collaboration with researchers and colleagues in the educational sector are taken as the main frame of reference.

This three-layer of data collection and analysis on change and innovation in the educational sector in relation to ICT is used to be able to answer the research questions and deliver input for the development of the analysis framework for corporate e-learning, which is dealt with in Chapter 3.

Section 2.1 starts with the discussion on the innovation theory developed by Fullan (1992) and the theory developed by Rogers (1995, 2003). From there we will look at the role of technology in Section 2.2 and the role of content in the context of e-learning in Section 2.3. In Section 2.4 we focus on an analysis of e-learning projects in the past 10 to 15 years to develop a clear idea about the experiences with ICT in education and training over a longer period of time. The chapter ends with a synthesis of the findings in Section 2.5. and the conclusions in Section 2.6 in preparation of the development of the analysis framework, which is described in Chapter 3.

2.1 Implementing change and innovation in education and training

This first section, Section 2.1.1, focuses on the theory of educational change, followed by Section 2.1.2 on the factors which influence the implementation of change and innovation. Section 2.1.3 is on the key change items and in Section 2.1.4 we will focus on the theory of the diffusion of innovations. This section ends with a reflection on the role of actors in the innovation process in Section 2.1.5.

2.1.1 An analysis framework for educational change

The implementation of ICT in education and training is considered a major change affecting most parts of the educational and training organisation. The emergence of ICT emphasized the fact that knowledge on the implementation processes of planned and structural innovations in education and training was rather moderate. There was a variety of resources on factors and characteristics, but an integrated schedule of factors was lacking (Fullan, Bennett & Rollheiser-Bennet, 1990). Therefore Fullan, Bennet and Rollheiser-Bennet founded the Learning Consortium to develop a 'comprehensive framework for educational improvement on class level and school

level' showing a coherent set of the most important factors affecting educational change' (Veen, 1994, p. 239). They used this framework approach as an analysis and activity instrument. The interesting thing about this comprehensive framework of Fullan, Bennett and Rolheiser-Bennet (see Figure 20) is the interconnectivity and the dynamics of factors on the teacher level and the school level. The dynamics are shown by the toothed-wheels structure and the sizes of the wheels indicate the impact, the bigger the wheel, the bigger the impact. To summarize the outcome: 'There are factors on school level and teacher level, these are dynamic, coherent factors, which concentrate on the perception of the people involved about content and didactics and on for example didactical and interaction skills' (Veen, 1994, p. 241).

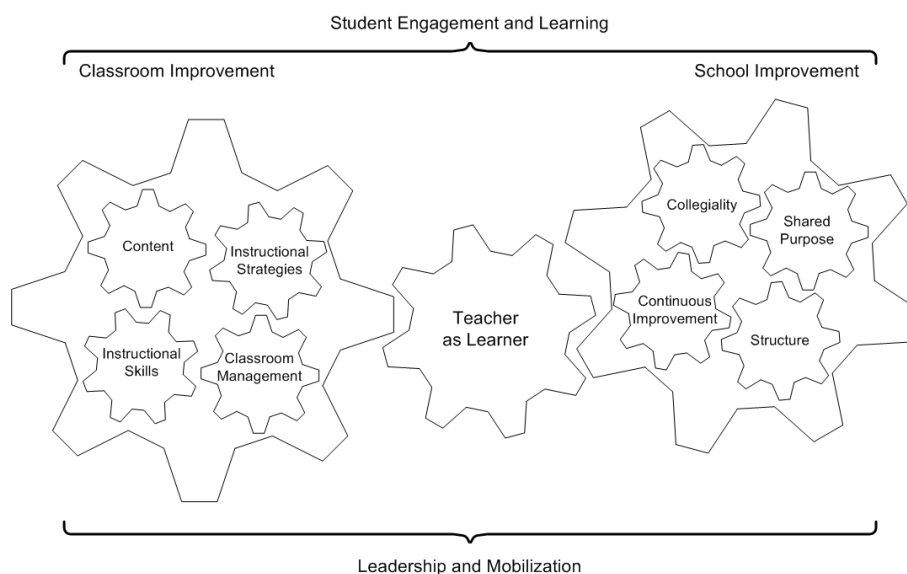


Figure 20 The 'Comprehensive Framework' for educational improvement on class and school level (adapted from Veen, 1994, p. 241)

This framework approach was used by Fullan to develop his major work (1991, 1993, 2001a) on 'the new meaning of educational change', accompanied by publications that focused predominantly on the issue of 'change' (Fullan, 2001b). To help to understand educational change, Fullan (2001a, p. 48) uses a simplified overview of the change process (see Figure 21).

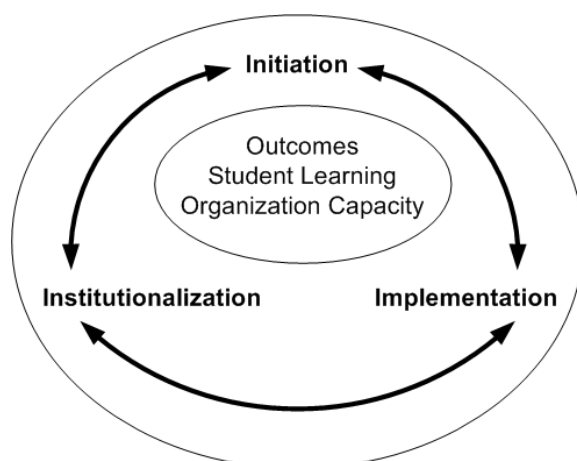


Figure 21 Simplified overview of the phases in the change process (Fullan, 2001a, p 48)

Fullan distinguishes three phases in the change process:

1. The initiation, mobilization, or adoption phase, consisting of the process that leads up to and includes a decision to adopt or proceed with change.
2. The implementation or initial-use phase, involving the first experiences of attempting to put an idea or program into practice.
3. The continuation, incorporation, re-utilization or institutionalisation phase, referring to whether the change gets built in as an ongoing part of the system or disappears by way of a decision to discard or through attribution.

According to Fullan (1991, p. 49) such a change process from initiation to institutionalisation can take, even with moderately complex changes, a period from three to five years.

2.1.2 Factors for implementing change and innovation

Fullan (2001a) focuses on philosophical and policy issues related to educational change, particularly curriculum changes in school environments. But, rather than offering prescriptions for change, his writings serve more as a framework for viewing the change process. It is in his opinion the complexity of these processes that prohibits a prescriptive approach to change. One can prepare for it but, because of the unique environment for each change situation, one cannot prescribe a blueprint. The Fullan lessons for change in education and training are helpful for the analysis and for building a strategy for the development and implementation of e-learning. His eight basic lessons of the new change paradigm (Fullan, 2001a, pp. 157-158) are:

- ‘You cannot mandate what matters and the more complex a change the less you can force it.
- Change is a journey, not a blueprint; it is non-linear, leaded with uncertainty and sometimes perverse; change does not involve a checklist of items to be marked off one-by-one.
- Problems are our friends: they are inevitable, you can’t learn or be successful without them but they only help if you do something about them; you need to have an attitude of acceptance to alter your course.
- Vision and strategic planning come later; premature visions and planning can “blind”
- Individualism and collectivism must have equal power—no one-sided solutions or groupthink; a tight-knit shared culture is not a desirable endpoint.
- Neither centralization or de-centralization works—both top-down and bottom-up are necessary.
- Connection with the wider environment is essential.
- Every person is a change agent—change is too important to leave to the “experts”; no one person can understand all of the complexities of change in a dynamic system.’

These lessons clarify that change is a comprehensive effort, which takes place under uncertain conditions. So change is per definition complex, but specifically it means rapidly occurring, unpredictable, non-linear change (Fullan, 2001b). The success of change does depend on the way one is able to handle the total of different factors that make up change.

2.1.3 Key change themes

There are deep theoretical reasons why change occurs as it does. Understanding these themes will help to influence them for the better. According to Fullan (2001b), leadership is of crucial importance to create positive change. Therefore he has developed a framework for leadership, which is constructed on a small number of core aspects. The interesting thing for this research is that Fullan’s framework is based on the finding that both in business and education remarkable convergences can be observed about how to lead in a culture of complex change (Fullan, 2001b). Fullan’s framework consists of five components of effective leadership. We will discuss these in line with the overview shown in Figure 22, starting with the component *moral purpose*. *Moral purpose* as the first argument stands for acting with the intention of making a positive difference in the lives of employees, customers, and society as a whole. Fullan believes that to be effective in complex times, leaders must be guided by moral purpose. He underlines this argument with case studies from the business and educational sector to demonstrate that moral purpose is critical to the long-term success of all organisations.

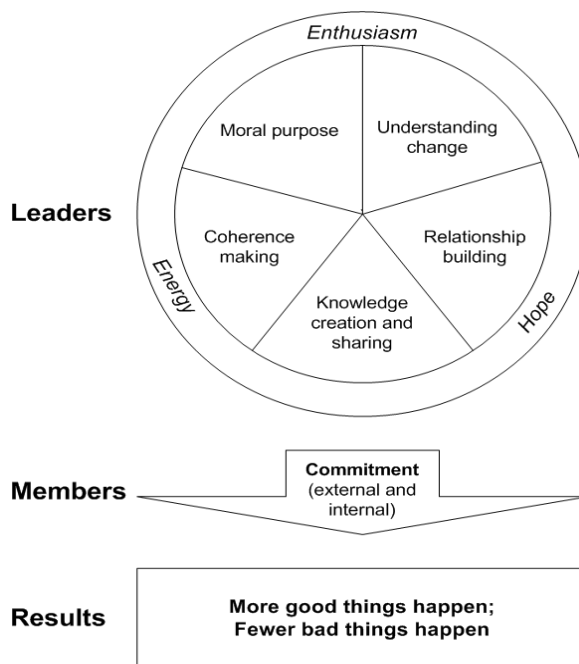


Figure 22 A framework for leadership (Fullan, 2001b, p. 4)

However moral purpose with no *understanding of the change process*, the second component, 'will lead to moral martyrdom' (Fullan, 2001b, p. 5). Fullan presents six guidelines which should help the leader to start thinking differently. These are:

- The goal is not to innovate too much
- It is not enough to have the best ideas
- Appreciate early difficulties of trying something new (the implementation dip)
- Redefine resistance as a potential positive force
- Reculturing is the name of the game
- Never a checklist, always complexity

The third component is *relationship building*. If relationships improve, things get better. If not, things might get worse. Relationship building with diverse and different people fosters purposeful interaction and problem solving. The fourth component is *knowledge creation and sharing*. Successful organisations are 'knowledge organisations' committed to constantly generating and increasing knowledge inside and outside the organisation. Turning information into knowledge is a 'social' process and for that you need to understand the change process and to create and share knowledge, one need

good relationships. The fifth component is *coherence making*. This is a permanent search for valuable patterns worth retaining.

These five components should operate in a certain balance to be effective. Too much moral purpose for example could affect the outcome negatively. So it is necessary that leaders incorporate all capacities in their daily practice with a scent of enthusiasm, hope and energy. The central issue is if the leaders are able to mobilize people's commitment to 'putting their energy into actions designed to improve things' (Fullan, 2001b, p. 9). Leading in a culture of change means creating a culture of change. Changing the way we do things is a main point and Fullan calls this 'reculturing'. (2001b, p. 44). Reculturing takes time and effort and to be able to reach an agreeable level, leaders need to possess, what Fullan labels as, 'the energy-enthusiasm-hopefulness constellation' (2001b, p. 7).

The next layer in Figure 22 is about commitment. Argyris (quoted by Fullan, 2001b, p. 8) has helped to make the crucial distinction between *internal* and *external* commitment: 'These differ in how they are activated and in the source of energy they utilize. External commitment is triggered by management policies and practices that enable employees to accomplish their tasks. Internal commitment derives from energies internal to human beings that are activated because getting a job done is intrinsically rewarding' (Argyris, 2000, p. 40). Effective leadership generates internal commitment over external commitment and external over blind commitment. Blind commitment is still commitment, but works only well in relation with short term 'fewer bad things to happen.' Fullan (2001b, p. 10): 'In the case of business, good things are economic viability, customer satisfaction, employee pride, and a sense of being valuable to society. In schools things are: enhanced student performance, increased capacity of teachers, greater involvement of parents and community members, engagement of students, all-around satisfaction and enthusiasm about going further, and greater pride for all in the system. In both cases it means fewer aborted change efforts; less demoralisation of employees; fewer examples of piecemeal, uncoordinated reform; and a lot of wasted effort and resources.'

Fullan (2001b) is convinced that leaders will increase their effectiveness if they continually work on the five components. This line of thought can be considered an important element in the analysis framework. Part of the analysis will be to verify whether the people involved will be able to handle the change process. Fullan's approach supplies the themes to be looked at from the leadership position. A valuable observation for our research is that in his view education and business show a remarkable convergence considering the culture of change. This means that the experiences from both sectors are valuable resources to become knowledgeable about the change process. In this case it is about change evoked by the development and implementation of e-learning.

2.1.4 The diffusion of innovations

As we have seen, Fullan's view is based on research and experiences in the educational world with an extension in the business world in later years. Therefore his vision is very helpful to come to grasp with educational change in the business world (Fullan, 2001b). A researcher who has worked in the same line of thought as Fullan is Rogers (1995, 2003). Both believe that change and innovation cannot be prescribed, but should be described. Rogers has developed a general and more operational approach to change, focusing on the implementation of innovations. His findings are the result of three decades of research on the phenomenon of how and why innovations in for example technology, agriculture, transportation and education, are adopted or rejected by the target group. Rogers (1995, 2003) claims that an innovation presents an individual or organisation with a new alternative, with new means of solving problems. The individual problem solvers do not exactly know the possibilities of the new alternative being superior to previous practice. Typically an innovation starts with the recognition of a problem or a need. Rogers (1995, 2003) introduced a set of five distinct attributes, which are strong predictors of an innovation's acceptance and for the innovation to become a success. These factors are:

- *Relative advantage* is the degree to which the innovation is perceived as better than the existing situation. The advantage can involve speed, efficiency, profit, better time management and more of these and does not necessarily be the same for each of the potential adopters.
- *Compatibility* is about the degree to which an innovation is perceived as being familiar. The potential adopters are able to recognize the innovation as something new, but still within reach. It does not evoke uneasiness, because it requires little adjustment.
- *Complexity* is about the degree to which an innovation can easily be understood and used. The threshold for the adoption of the innovation should be relatively low in relation to the target audience.
- *Trialability* is about the opportunity for the potential adopters to use and experiment with the innovation at favourable times. It supplies them with the occasion to figure out if this is what they are looking for and how it works in their own environment.
- *Observability* is about the degree to which the innovation can be made visible or recognizable. The adopter should be able to see and show the advantage in comparison with the present situation. This will affect the opinion of the people involved.

Lewis and Orton (2000) describe how these factors have been used in connection with the introduction of e-learning at IBM. IBM's perception of e-learning is that it is fundamentally an innovation and consequently all e-learning design and launches have

been guided by the 'Diffusion of Innovation principles' of Rogers, as described in this section. Rogers furthermore elaborates on the innovation-decision process. 'The innovation-decision process is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to the formation of an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision. The five main steps are: (I) knowledge, (II) persuasion, (III) decision, (IV) implementation, and (V) confirmation' (Rogers, 2003, p. 20). Figure 23 gives an overview of these steps and the adjoining elements.

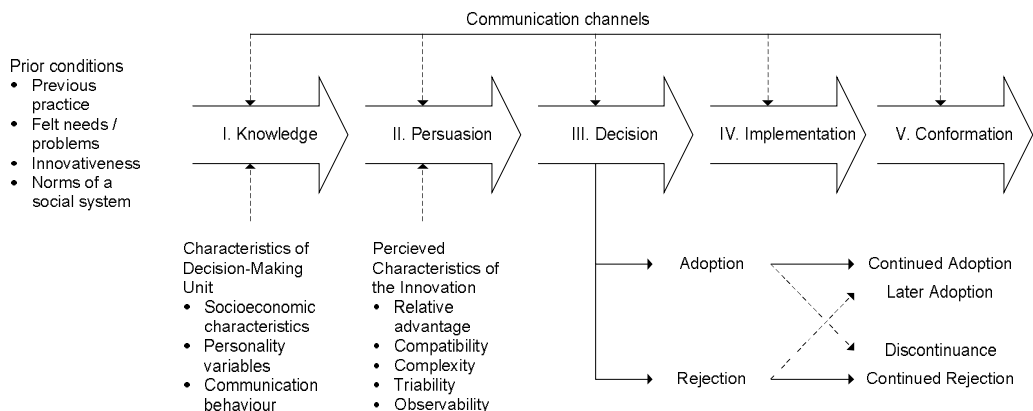


Figure 23 Model of five stages in the innovation-decision process (Rogers, 2003, p. 170).

1. *Knowledge* occurs when an individual (or other decision-making unit) is exposed to an innovation's existence and gains an understanding of how it functions (awareness-knowledge, How-to knowledge, and principles-knowledge).
2. *Persuasion* occurs when an individual (or other decision-making unit) forms a favorable or an unfavorable attitude towards the innovation.
3. *Decision* takes place when an individual (or other decision-making unit) engages in activities that lead to a choice to adopt or reject the innovation. (Adoption is a decision to make full use of an innovation as the best course of action available. Rejection is a decision not to adopt an innovation)
4. *Implementation* occurs when an individual (or other decision-making unit) puts a new idea into use.
5. *Confirmation* takes place when an individual seeks reinforcement of an innovation-decision already made, but he or she may reverse this previous decision if exposed to conflicting messages about the innovation.

Research on the diffusion of innovations started in the 1940s. There were different innovation studies: rural sociologists investigated the diffusion of agricultural innovations to farmers, while educational researchers studied the spread of new

teaching ideas among school personnel. Despite the distinctive nature of these approaches to diffusion research, each researcher uncovered remarkably similar findings, for example, that the diffusion of an innovation followed an S-shaped curve over time and that innovators had higher socioeconomic status than did later adopters (Rogers, 2003, p. 39). An interesting element in the innovation research is the stages that can be recognized, from agenda setting to routinizing as the final stage. Figure 24 gives an overview of these stages.

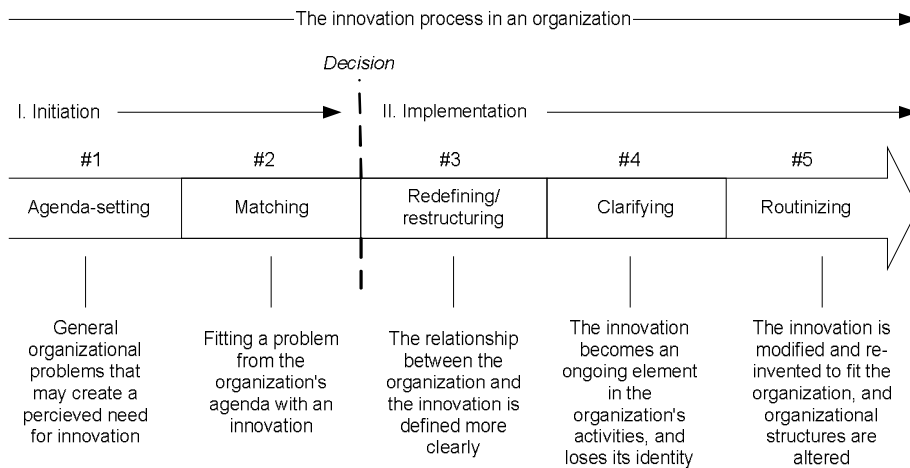


Figure 24 Five stages in the innovation process in organizations (Rogers, 2003, p. 421).

The innovation process in an organization consists of two broad activities:

1. *Initiation*, consisting of all of the information gathering, conceptualization, and planning for the adoption of an innovation, leading up to the decision to adopt, and
2. *Implementation*, consisting of all of the events, actions, and decisions involved in putting the innovation into use.

The decision to adopt, shown as a dotted line, divides the two stages of initiation from the three stages of implementation.

Rogers's theory on the diffusion of innovation is a very helpful piece of work in the thinking process on the development of our analysis framework. His lessons represent a set of general factors one needs to consider to increase the likelihood of successful implementation of change and, in this context, the implementation of e-learning in corporate education and training. Next to the general factors, there are also personal factors, which play a role in an innovation process. In this context the vision of Ely (1990) is interesting, as he zooms in on the requirements on a more-personal level. In his view there are eight factors that influence the successful implementation (adapted from Al-Najjar, 2002, p. 48):

1. Dissatisfaction with the existing situation
2. Existing knowledge and skills
3. The available resources
4. Available time
5. Rewards or incentives are available
6. Participation is expected and encouraged
7. Commitment of all actors
8. Leadership is evident

In his later work Fullan also emphasized the importance of considering the more personal factors. 'It isn't that people resist change as much as they don't know how to cope with it', (Fullan, 2001b, p. xi). The personal factors of stakeholders, people or organisations which are directly involved, are important issue, as we will see in the next section.

2.1.5 Why are actors so important?

Moonen and Kommers (1997, p. 2) argue that until 1997 an analysis of the criteria which have a positive influence on the use of ICT in education did not clarify the interrelation between these criteria and their effect. They therefore suggest using another approach based on the identification of the actors who play a significant role and the criteria that play a dominant role in the performance of these actors. Although the study of Moonen and Kommers did not include the network technology issue and e-learning, the approach is promising and will be used in this study, because it is believed that actor dominance has proven to be decisive in the support of new developments. The shift of actors, which is taking place at this very moment in the process of change involving the increasing use of technology and in particular e-learning, is therefore crucial for the direction and speed of innovation in education. The transformation which is taking place supplies us with the opportunity to figure out how education can benefit from a dependence on the different and sometimes new actors and move to a whole new situation in which the business goals and the end user become powerful players.

In the traditional educational business column there were only a few actors present who could influence the process. These were: the content supplier, the publishing company and the educational institution. The end user, being the student, had virtually no say in this process. In the new situation there are many more actors who could influence the outcome. New actors are members of the soft- and hardware industry, the telecommunication operators and not to forget the end user. In Chapter 1 it was already mentioned that Kelly (1998) emphasized the emerging importance of the end user. Another of the distinctive new actors is the e-learning company. In general focusing on the corporate education and training market, these companies are

moving very quickly into a position in which they might become important actors. Currently they represent an initiative that covers a broad field of activities on issues like technology, content and services. We will return to this issue in detail in Section 2.3 on the importance of content in the development of e-learning.

2.2 Technology in the Context of E-learning

There is no e-learning without technology, but it takes time to outbalance the position technology is supposed to have as an important component of the e-learning environment. 'E-learning technology directly affects the display, the interaction, the cost and design of the educational outcomes, but remains one factor of the many' (Garrison & Anderson, 2003, p.32). This qualifies e-learning as a critical component, which cannot be left out when looking at the possibilities of e-learning. The technology will influence the way e-learning looks, now and in the future. This is not a new phenomenon. McLuhan (1995, p. IX), looking at media in general, emphasized the fact that 'the medium is the message', indicating that the technology has a profound influence on the way the content can be presented and used. 'We shape our tools, and thereafter our tools shape us.' (McLuhan, 1995, p. IX). This is an interesting thought, because educationalists tend to deny the technical bias of e-learning, but McLuhan is right, the technology will no doubt direct the 'character development' of e-learning, if we like it or not.

The conclusion that technology has a major influence on the development of e-learning is underlined by the definition of Garrison and Anderson on e-learning technology. 'E-learning technology: those tools used in formal educational practice to disseminate, illustrate, communicate or immerse learners and teachers in activities purposively designed to induce learning' (2003, p. 34). If we leave out the word 'formal', this definition becomes much more valuable for the thinking process about technology and learning. To be able to bridge the distance between the time-and-place independent students, teacher, content and other resources, technology is needed to bring these together. The main technology used in e-learning is the Internet. The emergence of the Internet and the browser technology lowered the threshold for communication and information exchange world wide. Although access is not evenly spread, with a predominance in the western world, Internet and the possibility to use this technology for training-related purposes has quickly been accepted. In that sense, technology has become a major component of educational innovation. This is different from the experiences in the recent past with the use of information technology to produce for example computer-based training (CBT). CBT and related products never reached this status due to the limitations and problems associated with computer technology, which Rosenberg (2001, p. 24) describes as the 'short and often frustrating history of technology for learning'. No standards, limited possibilities of hardware and software, boring and unauthentic content, the instability of content and the lack of

awareness of instructional-design approaches. This made people return to traditional teaching techniques.

Besides the emergence of the Internet, the threshold for e-learning development was lowered by the increasing number of computers in our society as a whole and increasingly more user-friendly software. But also the experiences in the business world with e-commerce and e-business and not to forget the experiences in the educational world with the use of CBT and prior communication technologies were helping to give e-learning a promising start. Urdan and Weggen (2000, p. 6) describe this as: 'Technology has revolutionized business; now it must revolutionize learning'.

In Section 2.2.1 we will focus on the components of the technical e-learning infrastructure. Section 2.2.2 deals with the different types of e-learning technology, Section 2.2.3 with learning standards and Section 2.2.4 is on the future of the e-learning technology.

2.2.1 Components of the technical e-learning infrastructure

To be able to do e-learning one needs a basic technical infrastructure. In most cases access to Internet and a website, including some form of asynchronous communication possibilities like email and discussion forums, could do the job. When the number of people involved increases and more and different sorts of content and combinations of content, resources, experts, come into being, it is likely that some dedicated software is needed. The basic infrastructure consists of the following elements (see Figure 25).

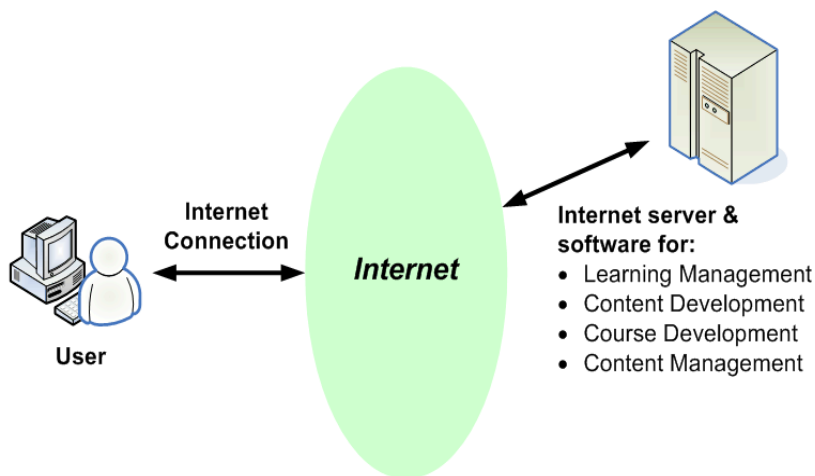


Figure 25 Basic components of the technical e-learning infrastructure

E-learning depends for a great deal on the stable functioning of the technology. This is a weak aspect so to say, because the technology does not give a 100% security for the delivery of learning, also because its performance can be influenced by the user. It requires certain skills to be able to develop, maintain and use the e-learning technology in an appropriate way. In addition there is a whole array of technological

products which are often used in combination with e-learning applications, causing positive and negative effects. Therefore it is wise to include technology in the implementation strategy to consider the various options early on in the development process (Garrison & Anderson, 2003; Meister, 1998; Rosenberg, 2001). A lot of attention should be given to basic issues like hard- and software configuration, the connection speeds, plug-ins to be used, intra- or Internet, hosting issues, security concerns, sound cards, video cards, operating systems and the myriad of hardware and software available on the work floor, in the office, at home and at school (McGrath, 1999; Rosenberg, 2001). Decisive though is not just plain technology, but the operational environment in which e-learning is taking place. So part of this technology strategy involves important questions like (Meister, 1998, p. 76): (a) Does the technology fit the learner's needs? (b) Is it available and justifiable? (c) Does it simulate real working conditions?

Because technology is such an important element in the delivery of online learning, it is necessary to seriously consider the additional requirements needed to profit from the added value, instead of suffering from a techno-phobic attitude. A serious e-learning user and e-learning developer should incorporate the technology not as an add on but as a structural component of the e-learning environment. Denying technology skills as a prerequisite for e-learning is blaming the technology for the individual not being able to enjoy the added value.

2.2.2 Types of e-learning technology

Although the e-learning market is still very young and unpredictable, the amount of e-learning systems and tools which have entered the market is substantial. The prediction is that there will be an integration and consolidation of the different technologies (Bersin, 2004; Clark, 2003a; Levis, 2003; Masie, 2003; Rebensburg, Busch & Rautenstrauch, 2002; Sander, Bungert, Busch & Meier, 2004; Urdan & Weggen, 2000). It is extremely difficult for anyone who wants to do e-learning to make the right choice. One reason is that almost all systems and tools are not completely new, but originate from previous products initiated on the basis of particular educational philosophies, particular educational contexts and market orientations (Clark, 2003a; Urdan & Weggen, 2000). Another issue is the rapidly changing technology, which makes it difficult to be correctly informed about the state of the art. This development is being accelerated by mergers taking place on the e-learning market, mergers not only of competitors, but also of companies which want to expand their offerings with new options. IBM for example has acquired two communication companies and added their products to the Lotus Learning Space learning management system, part of the Lotus Notes product group. The next move was to bring these technologies under the organizational umbrella of the 'learning solutions department' and at this time (2005), learning has become one part of the broader IBM market strategy, which is 'on demand' (see www.ibm.com).

The questions of which technology to use, when, how and at what cost are difficult to answer, but should be carefully considered, because technology is a decisive factor in the e-learning operation. Table 19 shows a quick reference of technologies and tools very often used in relation to the organization of e-learning and the development and maintenance of content. The ASTD (American Society of Training and Development) glossary definitions have been used for a first description of the meaning of the terms used (see www.learningcircuits.org/glossary.html). This glossary is updated periodically and reviewed by a panel of e-learning experts selected by the ASTD.

Table 11 Overview of the key enabling technologies for e-learning

Key enabling technologies

Most technologies used for e-learning can be classified as general technologies. The PC for example and the ever-increasing number of personal computer per 100 inhabitants to enhance the rate of access. In the context of e-learning it is the Internet which has a prominent role with related technologies like Private Networks, Virtual Private Networks, Local Area Networks and wireless LANs. Together with the upcoming mobile networks, these can be qualified as the key enabling technologies (Hasebrook, Herrmann & Rudolph, 2003, p. 31).

Management tools

- Content Management Systems (CMS)
'Software application that streamlines the process of designing, testing, approving, and posting content on Web pages' (ASTD, 2003). This application can handle content for huge web sites and focuses on version handling, workflow and publishing. It can be very helpful to organize the development of e-learning content with a large team of people. Also it supports the maintenance of large amounts of (learning) content.
- Learning Management Systems (LMS)
'Software that automates the administration of training events. The LMS registers users, tracks courses in a catalog, and records data from learners; it also provides reports to management. An LMS is typically designed to handle courses by multiple publishers and providers. It usually doesn't include its own authoring capabilities; instead, it focuses on managing courses created by a variety of other sources' (ASTD, 2003). More specific the LMS allows monitoring of the interaction between learner & content and between learner & instructor, tracks learner progress, records test scores, and indicates course completions and assessment of the performance of the learners (see also www.e-learning.com). Typical features include (see Figure 26):
- Registration for the enrolling and administration of learners online for web-based, instructor-led, and all other learning activities.
- Scheduling courses and defines curricula to address individual and organizational learning needs. Also off-line resources can be included (classrooms, books, coaches, experts, i.e.).
- Delivery of online courses and assessments or schedule instructor-led courses. Tracking progress of learners and create reports. Communication by chat, discussion forum, mail, screen sharing and e-seminars. Testing and assess competency, learning styles and student commitment.

Table 11 continues ...

Table 11, continued.

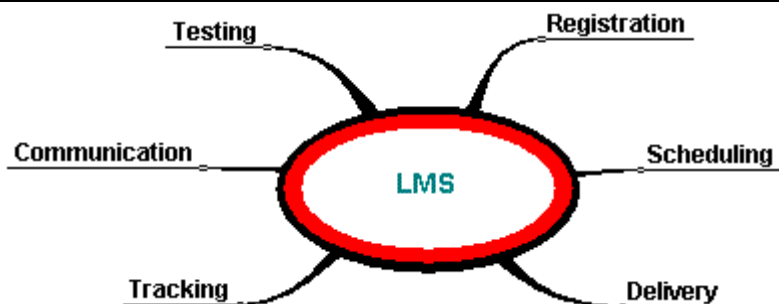


Figure 26 Typical features of a LMS

- In general every LMS is developed from a different point of view and besides the common functionalities each will have strong and weak points. So it is rather complicated to make a choice between the different systems for a particular learning context.
- Learning content management system (LCMS)
A software application (or set of applications) that manages the creation, storage, use, and reuse of learning content. LCMSs often store content in granular forms such as Learning Objects (ASTD, 2003). The LCMS was the next trend, combining learner administration capabilities of an LMS with the feature to create and store content of a CMS. The LCMS is better in delivering personal learning because of the more advanced management of learning objects. IDC Research (2001) defines a LCMS as: 'A system that is used to create, store, assemble, and deliver personalized e-learning content in the form of learning objects'.

Learning objects

Learning objects are: 'reusable, media-independent chunks of information used as a modular building block for e-learning content. Learning objects are most effective when organized by a meta data classification system and stored in a data repository such as a learning content management system' (ASTD, 2003).

Learning objects are becoming the e-learning standard for content. This development intertwines with the development of standards, which are crucial to allow the exchange and the usage of e-learning content in connection with different LMS systems without any technical adaptation. More about the importance of standards in Section 2.2.3.

Development tools

Another series of necessary tools are these to create and accomplish e-learning. A few examples:

- Web editors
Tools to develop straightforward HTML to produce web pages. These can be considered as first generation tools for creating content, but need a lot of programming knowledge.
- Authoring tools
These tools automatically take care of the programming, making it easier for the developer who does not have the programming skills to create content. These tools also can create content applying standards like AICC and SCORM.

Table 11 continues ...

Table 11, continued.

- Tools for developing animations and simulations
 These tools will make it easier to create learning objects, which are very useful to enhance the learning effect.
- Other tools are testing tools and communication tools for chat and forums. Interestingly enough a lot of regular tools for computer use like the Office suite are increasingly prepared for content delivery on the Web and can as such also be used for the delivery of learning material.

2.2.3 Learning standards

The incompatibility of software and hardware was an important barrier for the development of computer-based training (Rosenberg, 2001, pp. 21, 44). The advantage of the Internet as the main carrier for e-learning is that the network in itself is a standard. The most important Internet standards are HTTP, HTML, FTP, and TCP/IP. In most cases this means that an e-learner only needs Internet access and a browser to use the World Wide Web. The use of standards in relation to e-learning tools like learning management systems and authoring tools as such was not there from the start. Especially large organizations like the US army were bothered by the fact that without standardization, content would have only limited value if it could not be used throughout the organization in different systems and at different places without too many technical-adaptation problems. Worldwide this was felt as a major problem. Therefore large bodies are working on the development of e-learning specifications, in most cases initiated by main players like the US Army, the European Commission, vendors and the organizations already dealing with standardization in general or especially for learning purposes. One of the organizations is the IMS (Instructional Management System) Global Learning Consortium, which is a coalition of government organizations dedicated to defining and distributing open architecture interoperability specifications for e-learning products. In Figure 27 an overview of key organizations involved in the standardization effort is shown. For more details, see www.imsproject.org.

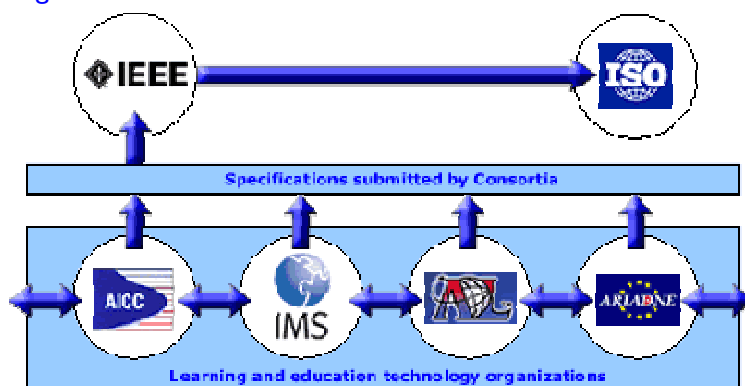


Figure 27 Overview of organizations involved in the standardization effort (available at www.imsproject.org)

What is a standard? ISO defines standards as: “Documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose”. Standards for e-learning are very important for the up scaling of e-learning. Without the use of standards we will not be able to exchange and re-use content and learning objects or collect and store user information in one place. Internet-supported learning depends on standards and so does the e-learning market (vendors of tools, customers, developers of content). LMSs should be able to talk with content, CMSs with LMSs. Learning standards will make it possible to achieve a high level of (Learning Consortium, 2002, p. 8):

- **Accessibility:** access instructional components from one remote location and deliver them to many other locations
- **Interoperability:** use instructional components developed in one location, with one set of tools or platform, in another location, with a different set of tools or platform
- **Adaptability:** tailor instruction to individual and situational needs
- **Re-usability:** incorporate instructional components into multiple applications
- **Durability:** operate instructional components when base technology changes, without redesign or recoding
- **Affordability:** increase learning

2.2.4 The future of e-learning technology

‘E-learning technology is but a critical component of the educational context’ (Garrison & Anderson, 2003, p. 34). E-learning technology influences directly the way e-learning is being executed, but remains one factor among all the other factors which together shape the evolution of e-learning. Technology is important and will influence the way e-learning is developing, but should not be overestimated. At the same time the technology covers a broad area of applications from network technologies like Local Area Networks and Virtual Private Networks to dedicated e-learning applications like online testing tools. So, whenever e-learning is at stake, technology plays a role and will continue doing so (Hasebrook, Herrmann & Rudolph, 2003).

According to Clark (2003b) there are several myths concerning e-learning technology, which have been discredited. The first myth was that the Learning Management System (LMS) as a necessary condition for success. In practice a LMS is helpful for the management of learning, but as Clark puts it: ‘a LMS only serves learning and business problems in the way in which a word processor serves a novelist’ (2003b, p. 43). The second myth is about the fact that standards will lead to a ‘tipping’ point in the e-learning market. This might still happen, but there are still too many standards and this causes confusion, instead of interoperability. Myth 3 is the reusable learning object will allow for the reuse of content to rebuild courses easily. In

practice a learning object is hard to define and even more difficult to build in such a way that it can be used over and over again. Also blended learning has become the new paradigm, but a rational and sophisticated method for determining blends is still missing (Clark, 2003b, p. 43).

When looking at the key technologies, the technology penetration has been the greatest in the workplace. The home and community centers are as well increasingly wired up. OECD countries have in the past four years invested particularly in hardware and infrastructure. There is a rapid increase in the number of schools connected and in higher education 90% of the students have access to Internet. Although the biggest opportunities are for content producers and distributors, there are also opportunities for software developers of learning and testing platforms, author's tools, and virtual campuses, e-learning portals, online universities, and mobile learning. Private networks and virtual private networks are expected to play a significant role as well. Products and services may also be enhanced by speed recognition, text-to-speech, and natural-language technologies (Hasebrook, Herrmann & Rudolph, 2003, p. 33-35). Especially in the corporate sector it is evident that there is a consolidation and integration underway of technologies used for learning purposes and the enterprise systems (Sander, Bungert, Busch & Meier, 2004).

Technology is at the heart of e-learning and is expected to continue to play an important role. Maybe not decisive, but as McLuhan said: 'We shape our tools, and thereafter our tools shape us' (1995, p. IX). So we can imagine that new technological developments will clearly influence the way e-learning will progress, although it will not be easy to manage the new opportunities and manage the speed of integration of the technology with e-learning.

2.3 Content in the Context of E-Learning

When 'Content is king', then 'Context is queen' (Masie, 2003). From the educational perspective it has become clear that e-learning content needs context to increase the likelihood that it will be used and understood. As we will see the character of content in the e-learning context differs from the old paradigm and has become more fluid, non-linear and is expected to play a prominent role in trying to increase the value of the (e-) learning experience. From the market perspective content has, as predicted, the biggest growth potential (Clarke, 2003a; Hasebrook, Herrmann & Rudolph, 2003; Urdan & Weggen, 2000). Yet, the characteristics of the production process are of a completely different nature than they were in the days before the Internet. It is not that the book will disappear, but the emphasis in the technology for e-learning will in general shift from the networks to tools for content creation, maintenance and storage, which is in line with the developments presented in Section 1.5 on the 'learning evolution' in Chapter 1.

Content is no longer just a static resource with a considerable shelf life, but a dynamic process in creating, storing and maintaining information and that is what

makes the difference. In addition there is a tendency to qualify all kinds of materials as content, if they contain necessary information to do the job well. Content production is not just gathering a pile of documents, but involves developing an easily accessible resource bank of information, links with other systems and resources and communication opportunities in which the user can obtain what is necessary and in a format that allows on the one hand for simple search and on the other for a step-wise, guided tour built on sound didactical principles. It is like Rosenberg argues in his chapter on knowledge management: 'Sometimes information is better than instruction' (2001, p. 63). In his view the combination of training (classroom and/or online), knowledge management, and performance support is an especially powerful force for learning (2001, p. 77).

Although the influence of e-learning in the day-to-day school or working life is not yet revolutionary, the trends indicate that we can expect major changes in the years to come (Clark, 2003a; Garrison & Anderson, 2003; Sander, Bungert, Busch & Meier, 2004). In general, educational trends reflect societal developments with a context-related selection of the major societal changes and with a certain period of delay. Due to the rapid development in the commercial world and the profound societal impact of ICT, we might expect for the second time since the printed book was introduced, profound changes in the way education is organized. This transfer is visualized in Figure 28, from a strictly linear production and delivery system to a situation in which integration of the educational business column is becoming a dominant factor. The traditional business column in the educational sector is reflected in Situation A. The content owner delivers the content to the publisher, who takes care of the production and the distribution. Basically the publisher collects, selects, structures and distributes the content. The educational institution receives this content from the publisher and organizes the knowledge transfer to the student, being the end user. Situation B reflects the post-traditional system of production and delivery of content to the end user in the educational context. The main difference between A and B is the non-linearity. This means that in the process of content delivery and instruction, both the publisher and the school are losing ground. The content owner could by means of networking facilities skip these two strongholds in the educational business column and directly supply the end user with content and instruction. The box named 'intermediate organization' suggests this activity. The traditional educational business column is disrupted as pointed out in Figure 28. This disruption has additional consequences in the sense that the source of content not necessarily is the author or producer.

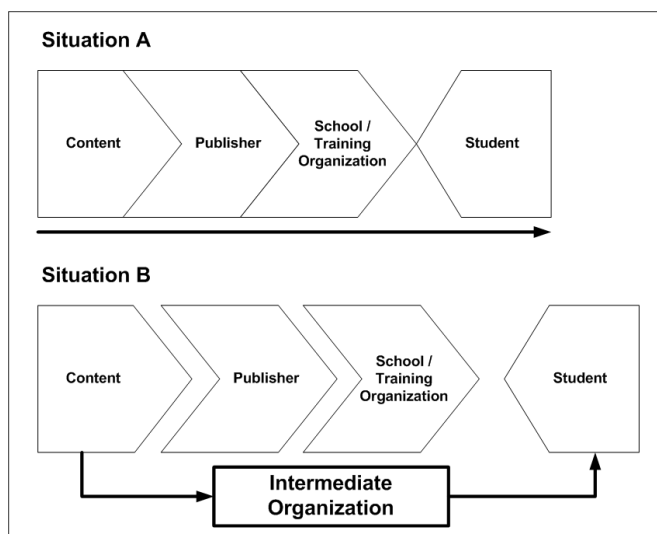


Figure 28 The changing educational business column

Other resources, like libraries, data bases, portals, forums, and communities, have developed and supply the end user timely with a myriad of information and communication opportunities. ‘Google’ for example, the Internet search engine, has been named ‘e-learning product of the year’ (Clark, 2003b; Masie, 2003). What has become common practice in for example the banking and airline industries, under the pressure of global competition, is the ‘unbundling’ of products and services. Although the education industry has been slow to follow, the process of unbundling and the transition from linear to non-linear content production and usage is quickly becoming reality. The building of learning or knowledge objects is a good example of this development in which reusability is an important issue (Rosenberg, 2001). Directly related is the discussion on standards. To increase mutual access of resources, the technology needs to be able to exchange data without too much hassle and for content to be used in different situations and under different circumstances, standardization is also an issue. The expectations were high, but in practice the standardization and the learning-object development are bothered by the difficulty of bringing all the initiatives under one roof.

According to Hodgins (2003) the next big thing is ‘getting small’. In his view it is all about the personalisation of the learning experiences, so ‘anyone can reach out and find the ‘nugget’ they need to help them perform’. The trick is to bundle small components into just the right assemblies. Such an approach is central in the Three-Space Design methodology developed by Moonen (2001) in which an end user becomes the final designer of learning material. In this approach new learning material has to be developed as ‘half-products or adaptable products’ which then, using available tools, can be assembled and customised by the end user according to his/her needs. In the same spirit existing learning material or parts of it, for instance available

through the Internet, should be taken as building blocks to be assembled by the end user into material that fits his/her needs. Hodgins suggests an 'MC squared model'. MC stands for Mass Contribution: content comes from all of us, but needs to be 'Mass Customised' to make it useful and relevant 'just for me'. This approach coincides with the contributing student pedagogy developed by Collis and Moonen (2001). Masie (2003) qualifies this development as the 'Nano business', breaking it apart into small chunks.

With this preview of future trends it is evident that standardisation and the development of knowledge and learning objects are at the heart of advancement in e-learning. Content is like technology an important factor, but by itself not decisive for the success of e-learning. It is important to keep aware of changes in the contour of content, which by now has many different shapes and characteristics and continues to grow with the emergence of new technologies, new insights in the e-learning process, the better understanding of compelling content, the provision of more context and last, but not least, the gradual development of the knowledge society.

2.4 The Changing Paradigm: Lessons from the Past

Change in education and training is a process that needs time. It is the past which can shed some light on the reasons why innovation acts like it does, and what to do to make it better. The focus in this section therefore is on the research question:

RQ 4: 'What have we learnt from the use of ICT in education and training?'

The analysis focuses on experiences with the use of ICT during the last ten years, with previous work of the author being the main frame of reference. In total 11 research and project activities, in which the researcher was involved, are reviewed and used as a source of information. This process is part of the three-layer data collection which is used to bring together the criteria for the development of the Analysis Framework Approach as described in Chapter 3. Each review has a set of conclusions, which are brought together in an overall overview at the end of this section.

The collection of experiences shows a development in time, with a dominance of technical problems to start with, and from there moving into a situation where, with the emergence of the Internet, the technical problems became less dominant. There was a shift to more organizational, didactical and content-related issues, also because more and more people and organizations were able to use 'e-learning'. What happened next was that the investment in time, effort and money increased and the question about the return on investment became a pressing issue. Maybe not so much in formal education yet, but in the business world this has become a decisive issue. This line of development is recognizable in the research and projects described. What can be seen as well is that the researcher changed focus in the course of the developments from mainly regular education to the business world.

The 11 project descriptions in the Sections 2.4.1 to 2.4.11 have been made anonymous where they involve commercial businesses.

2.4.1 'Telematics' as a basic provision (De Vries, 1991)

Context

The need for a holistic approach in the analysis of the changing market for education and training caused by information and communications technology is something that has been on our minds for a long time. In a first publication on this issue (De Vries, 1991), I suggested 'telematics', as the combination of telecommunications and informatics and one of the first terms to be used in this context, to become a universal service which should be considered as basic for all citizens. The reasoning was that telematics were becoming increasingly important for the participation in the economic and social life and therefore should be equally accessible for everyone. Not just in a technical sense, but also in the sense that there should be no barriers for people to apply the increased opportunities for communication and information exchange in an effective way.

Education and training should provide the support needed for people to get familiar with the new opportunities. Firstly, education and training have been for ages the instruments to organize the transfer of information and skills in a structured and effective way. Education and training should be used to take the telematics hurdle in providing people with the necessary knowledge and skills. Secondly, telematics opened up new possibilities for the teacher and trainer to extend the learning beyond the boundaries of the classroom in a more integrated fashion with the outside world without losing grip on the learning process. Thirdly, telematics was seen as a great opportunity to close the gap between formal education and training, and the demands of the labor market.

Over the years numerous commissions (for example Commissie Rauwenhoff, 1990) have dealt with this gap, but rather ignored the fact that the use of telematics might be of a great help. As an example: a committee lead by Colthof announced: 'distance learning in our country (Netherlands) would not be very fruitful' (Commissie Colthof, 1990, p.12). This idea dominated the minds of a majority of people on the decision-making level involved in the introduction of ICT in education and training. Although ICT was well underway to revolutionize business processes, the education and training community was still locked up in the classroom-teacher-content-student metaphor. Already in 1990 it was clear that an effective use of ICT would require a fundamental redesign of the education and training business column. This understanding was based on the experiences in several telematics projects, research and the acknowledgement that what was happening in businesses while introducing ICT was of great value for all organizations and especially these in which knowledge and information became or was already, like in education and training, the main commodities.

Conclusion

'Telematics' could be a great blessing for the innovation of education and training (De Vries, 1991, pp.31). But at the same time it might increase the information gap, or in economic terms, increase the gap between supply and demand on the education and training market if the educational sector continues to ignore the development. At that early phase in the development cycle, it was the teacher and the trainer who did the job, working overtime in trying to make nice things happen in the classroom. The notion that making effective use of ICT would only be possible with an integrated effort of all actors along the business column of education and training, was rather unknown (De Vries 1991, p. 31). Later research (Collis & De Vries, 1991, 1992, 1993) confirms this conclusion on the necessity of a holistic approach.

2.4.2 The PTT – NIVO project (Kanselaar & Zwijgers, 1992)

Context

Dutch Telecom made a major contribution to the NIVO project (New Information Technologies in Secondary Schools) in 1989 (Kanselaar & Zwijgers, 1992). The goal of the project was to supply 110 secondary schools in the northern part of the country with hardware and software. In addition the schools were given the opportunity to experiment during two years with two kinds of data-communication systems. One was Viditel, a videotext- based national information and communication system. The other was Memocom, an ASCII-based communication system which could be used for international message exchange. This 'telematics' package consisted of software, hardware, additional telephone lines, hands-on user courses and ongoing technical and organizational support. This support was partly realized by an information window for the project in Viditel. It provided a help desk, descriptions of NIVO courseware, information about schools and study packages. There were a few online courses, a management game and a Viditel simulation for student use to get familiar with the system.

Goal of the project

The main goal of this Telematics project was to 'contribute to changes in secondary education by introducing new technical and social developments in the area of telecommunications' (Kanselaar & Zwijgers, 1992, p.39). By means of this project:

- Teachers and students should become familiar with the user possibilities of the Viditel and Memocom Telematics services.
- These services should serve as an example for existing courses and management.
- The educational institutions should use the services for internal and external communication

- The project activities should have additional value in relation to the existing curriculum.

The project was evaluated and the main conclusions were:

- Schools were positive about the facilities and support
- The knowledge on the systems was fair to good
- Only a small group of enthusiastic teachers were using the facilities, not the management
- Telematics was added to the computer-science curriculum at more than 50% of the schools
- Telematics services were hardly ever used for other school subjects

Recommendations were:

- Promote the use of telematics only for computer science
- Use the Viditel simulation and the telematics study package (partly online) for the promotion on a national scale
- Organize a spearhead campaign for subject-oriented applications in particular for languages and geography
- Stimulate the business community to offer education-oriented products and service information
- Develop and maintain telematics courses for schools to familiarize teachers with these applications
- Use applications for specific target groups
- Use special user rates
- Develop special offers concerning telephone lines and communication costs.

Outcome

This was the first telematics project in the Netherlands on a substantial scale. Interesting was the role of Dutch Telecom. From my position as a member of the supervising project team and at that time working for the University of Leiden, it was obvious that Telecom was investing in her relation with the educational community and not aiming at a substantial increase in the sales of telephone lines. The connection between the business world and education worked out well. The results were not overwhelming, but you will still find (former) teachers, involved in this project who have since then been operating as innovators in the field of communications technology and education.

- The additional time and resources spend on 'marketing and communication' in the project, which involved 110 schools and approximately 400 teachers (who

received training), was crucial for the results of the project in this early stage of telematics use.

- Telematics at that time only seen to be useful for the computer-science teachers. Apparently it was not very useful for management purposes. The dilemma was: how to convince management?
- What was missing was the preparation and organization of the follow up. Although Telecom moderately continued the support after the two experimental years, there was no framework for the continuation of this development.
- Surprisingly the Dutch Ministry of Education fully ignored the project and denied any support for the follow up.

2.4.3 Preliminary research: Telematics in Education (Collis & De Vries, 1991) & Analyzing European Projects in secondary education (Collis & De Vries, 1992)

Context

Collis and De Vries (1992) summarized the trends which came out of an analysis of over 60 European projects and surveys relating to telematics in education and interviews with project leaders and other educators involved in telecommunications use in secondary education. A literature and project-report review, conducted on a worldwide basis, provided an additional framework for analysis. A summary of the outcome of this analysis:

- Those involved showed a strong enthusiasm, but there was little evidence for telecommunications use spreading beyond the project boundaries.
- Almost all the projects were internationally oriented and had a major motivation in the development of better social understanding and communication skills.
- The projects were communication oriented rather than involving access of online databases.
- Good instructional preparation was seen as a teacher prerequisite.
- And eye catching in the research was that of the many different projects and activities, most worked in strong isolation from one another, not having ways of communicating with each other, either technically or through other methods of information exchange.
- With the exception of a few of the large projects and services, most of the projects seemed based or at least strongly fueled by the efforts and vision of one or two key persons. If this person was not able to continue or did not attract the resources necessary, the project stopped.

- In line with this notion objective measurement of the educational effectiveness was difficult to carry out. So the most frequently cited 'results' were: increased motivation, greater awareness and doing the activity.

Outcome

Interesting enough there was a great similarity in the obstacles people experienced at that time. And obviously these restraining factors have played an important role over the years, emphasizing the necessity of a broader approach to innovation in education and training by means of ICT. This broader approach would combine organizational, didactical and technical issues, and not leave it to the teacher/trainer to innovate in isolation. These restraining factors are divided in so called first-order and second-order obstacles (Collis & de Vries, 1992, p. 30). Unless they are solved, both kinds of obstacles prevent the development of ICT use.

- **First-order obstacles**

They include unavailable or unusable equipment, unknown or difficult or too-costly network connections, no access to telecommunications equipment. No access for teachers for familiarization and instructional preparation, not enough time for teacher personal skill development relative to use and preparation, not enough time during regular class periods and within the curriculum, limited technical familiarity of teachers with ICT. Limited perceived relevance, limited awareness by teachers of strategies for instructional management of ICT use, time and financial costs, not enough on-site support and technical help, not enough evidence of educational value.

- **Second-order obstacles**

Once the 'first-order obstacles' were managed, the 'second-order obstacles' came to critically affect the process of telecommunications use. These are more-subtle difficulties than the first-order problems and may be more difficult in the long run to solve. It is clear that the outcome of ICT use depends heavily on the organizational and pedagogical insight of the teachers involved. It requires the teacher to have sufficiently developed information-handling skills and lesson plans prior to any computer use in a teaching context. The student needs to be prepared to be able to handle the different teaching contexts and learning activities. These skills go far beyond the difficulties of computer use for telecommunication.

On the basis of the analysis described, Collis and De Vries (1991, 1992) made some major recommendations to support the use of ICT in schools. These were:

- Establish a strategy for the continual consolidation, evaluation, and dissemination of experiences from the many projects and activities going on in the schools
- Improve the communication among the projects.
- Collect and disseminate models of good instructional practice.
- Stimulate and support a limited number of research activities in particularly relating to the identification of effective on-line information services.
- Improve access to telecommunications networks and services in and for schools.

What can be made of all these results, experiences and restraining factors with respect to further decision making? Collis and De Vries (1991, p. 38) suggested in their study on the use of telematics in secondary education, one of the first ever done in this field in the Netherlands, to apply a simple but useful conceptual approach often cited in the business world and at that time used by the Ministry of Economic Affairs as a way to predict successful projects. In Dutch the scheme is called the 3-G formula: Gemak (making the participant's life easier), Genot (the extent to which the participants enjoy it and Gewin (a meaningful gain for the participants). According to this formula some will characterize a successful project as needing all of the 3-Gs, but not necessarily displaying strengths in each of these areas.

The 'success vector' in Figure 29 shows the probability of a project becoming a success, reaching or coming close to the dotted line of the 'success threshold'. If any of the a., b. or c vectors reaches the 'project failure threshold', the value of the success vector decreases substantially. This approach gave guidance to some interesting conclusions in this research study. Besides the first- and second-order problems projects showed in general a high score on Genot (attractiveness). Most users were highly motivated and were convinced that the use of telematics served a good purpose. But this is not enough to reach the majority of potential users or the 'success threshold'.

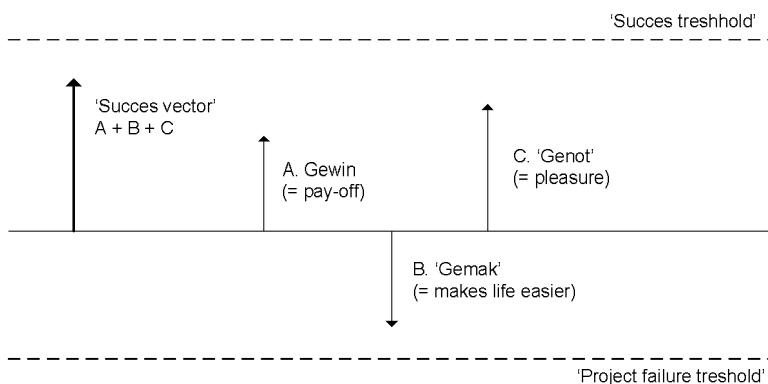


Figure 29 Visualization of the 3G Approach for predicting project success (Collis & De Vries, 1991, p. 39)

It was expected that the Gemak (accessibility: ease of use of the hard- and software) would clearly stay negative. Gewin (advantage: professional/educational pay off) was likely to play an important role and looking at the two main telematics activities, electronic communication and the use of online information, it was expected that online information, even in this pre-Internet era, would be a more-convincing application to persuade teachers than the electronic communication. At that time this 3-G approach was seen as a possible, useful framework for exploring and predicting the likelihood of a complicated educational project becoming a success or not. The interpretation of Collis and De Vries (1991, p. 39) is that the system must approach some unit in the sum of positive and negative vectors in order to increase the prediction of project success. It was clear though that this approach could only be used as a figurative support for making predictions. In the years after this 1991 project, Collis and De Vries (for example 1992, 1993) have used this model and Collis and Pals (2000) and Collis, Peters and Pals (2000, 2001) have executed subsequent research to investigate issues such as how to quantify these vectors, using what kind of metric? The outcomes were very promising and reason enough to consider the use of this 3-G model as one of the building blocks to develop the framework for analysis in this study. The 3-G model will be touched upon again in the rest of this overview of relevant research projects and will consequently return in an updated version and in a slightly different format to be used for the conceptualization of the framework for analysis. The English version of the model was called the 3-A model where the three vectors represented the concepts: attractiveness, advantage, and accessibility. See Chapter 3 Section 3.5 for a description of this framework for analysis.

Conclusion

In the early days of telematics use, a project existed because there were one or two enthusiastic pioneers involved, devoted to the communication with the rest of the world, but working in great isolation in their own school or institution. The projects were hardly ever evaluated and the results noted were restricted to: increase in motivation and awareness and doing the activity. At the same time it is clear that the restraining factors play an important role in this moderate success. First-order or technical problems and second-order problems with the organization, the learning-teaching process and the content. Also the inability of proving that the use of telematics did make a significant difference was a restraining factor. To overcome these difficulties one needs a strategy, which involves all the actors who have an interest in the outcome of a project. Part of this strategy is to investigate what the actors consider to be the success factors. In other words, find out why person A will consider a project a success, because this will not necessarily be the same for person B. The 3-G model, described in detail above, was considered to be useful for exploring and predicting a project's success, while taking in account the different success factors.

This model will therefore be used as one of the building blocks for the development and application of the analysis framework which is the central topic in this study.

2.4.4 The Emerging Trans-European Network for Education and Training: Guidelines for Decision Makers (Collis & De Vries, 1993).

Context

An interesting follow up was the research study (Collis & De Vries, 1993) for the European Commission entitled: 'The Emerging Trans-European Network for Education and Training: Guidelines for Decision Makers'.

Goals

The purpose of this study was 'to stimulate deliberation and more informed decision making among those responsible at some level for eventual policy and support of a so-called 'Trans European Network for Education and Training' (Collis & De Vries, 1993, pp. 6). Instead of adding another publication on issues related to technologies and systems functionalities, the focus was on decision making about the use and support of such a network by the so-called supply sides and demand sides. In our view the network in itself would only have a slight influence on the market development. It is the users, those who will use it and those who will supply it with information and component services that can make the market for the network to emerge. It is not possible to consider the needs and decision contexts without also considering the management and policy of the network service itself.

Outcome

Collis and De Vries collected their information in interviews, conferences and received and synthesized a variety of reports and other literature. Also different groups already confronted with the assimilation and support of different types of on-line services into their activities related to education and training were questioned. Although the focus was on Europe, the collection of experiences and opinions were also obtained from North America, Asia and Australia and from different groups of constituencies, such as commercial publishers, vendors of instructional material, PTTs, distributors and brokers of online services, researchers and not in the least from the end user community of teachers and students and those who administer, counsel and support them.

In our view the critical-mass perspective, focusing on the supply and demand issue, was a crucial prerequisite for the development of a viable network. One of the items was to find out if there was a general demand. According to Van der Brande (1993) a need clearly existed, especially relative to the steadily increasing 'training gaps' and inequitable access to training. Also for the shift occurring from training as information transfer, towards more communicative models, communication and interactivity via networks was becoming increasingly important. Supply and demand though seems to

be poorly organized and fragmented. In a study sponsored by the EU-DELTA Project, Lloyd (1993, p. 22) concluded that the market for flexible training products and services is quite immature, dynamic, complex and fragmented. 'Nobody seems to know what it is, is it one market, lots of markets or a segment of the general training market? Most suppliers are having difficulty surviving, let alone growing in these circumstances. So are purchasers. Managers inside larger organizations, which are equally fragmented, dynamic and complex, do most purchasing. These managers have little better idea than suppliers about how to integrate flexible training in their organizations' broader human-resource development activities, let alone re-position flexible training as a tool for business improvement.' This sounds rather dramatic indicating that there was a market, but it clearly operated at a novice state of development. It is good to realize that at the time there was no coherent vocabulary to describe what 'flexible training products' might look like. Therefore, instead of defining what 'the network for education and training' would be like, it was tried to envisage what such a network might look like from the perspectives of the various groups of its users and suppliers who might be potentially involved with the network. Such lists of expectations help to define the network relative to the needs and wishes of the prospective users and can help to identify critical issues for decision makers relative to the network. In fact the same approach has been used on a more-superficial way in the study at hand in trying to shed some light on the term e-learning. Although there are a lot of definitions, in most cases these do not help very much to explain what e-learning is all about, because the perspective of the definer is dominant and in most cases very different from how other users experience or view e-learning. So shaping the future outlook of this European network was done by listing the perspectives from both the demand side, like policy makers and curriculum specialists, and the supply side, like traditional print publishers and educational software houses. Increasing demand in numbers and the variety of users was assumed to be a strategic operational goal, but how to increase this demand momentum? Collis and De Vries (1993, p. 42) offer three concepts that 'together may help to focus decision making relative to the stimulation of demand for the network'. The first is the idea of 'trigger events', the second is a general strategy model for moving usage to a critical mass of users and third is the 3-A model. The 'trigger events', or market-attractive key services, are applications of an innovation that provide both the supply and demand sides with a demonstration of potential effectiveness. A 'general strategy model', such as the CBAM (Concerns-Based Adoption Model), is helpful to anticipate the stages individuals will go through in order to reach a meaningful level of adoption of an innovation (Hall, Lord, Rutherford & Huling-Austin, 1987). All of the levels are characterized by different kinds of 'concerns'. This can be used not only to anticipate, but also to figure out in what stages of development users already are. The model also helps to build a strategy, which can handle differences in speed or eventual reach of

the innovation in a group or institution. An overview of the stages of the CBAM can be seen in Table 12.

Table 12 The Concerns-Based Adoption Model (CBAM) (adapted by Collis & De Vries, 1993, p. 43)

Stage	Type of Concern	Action toward the Innovation
1. Unawareness	None	Total inaction
2. Information level	'Should I know something about this?'	Casual interest in obtaining some information
3. Initial personal skills level	'How does this work? Will I be able to figure it out and handle it?'	Wants to have the chance to try it out and have enough skills to do so
4. Level of routine use of some aspect of the innovation	'Is there a manageable way that I can come to regularly use this innovation so that some need of mine is met?'	Has found a use for the innovation and a handy way to execute that use, so that it becomes routine.
5. Extended impact level	'Are there other aspects of my educational practice that could benefit from a broader use of this innovation?'	Begins to change aspects of professional routine to incorporate more of the innovation's potential
6. Contributor's level	'How can I work together with others to exploit the value of this innovation?'	Becomes involved in collaborative activities associated with the innovation
7. Leadership level	'How might educational practice be changed through exploiting this innovation? How should the innovation itself be altered?'	Develops a leadership role, after reflection, contributes to the evolution of the innovation itself.

Collis and De Vries (1993, p. 44) added the following comment with respect to this CBAM model: 'Research supports the observation that the majority of users when confronted with an innovation do not go beyond Stage 4. If they become users at all, they find some application that suits a particular purpose that has value to them, they work out a way to use that application for the purpose, and make that way of usage routine and if they become users. Relatively few, regardless of the sorts of support and training offered, go beyond into the higher level of adoption of an innovation, until the environment around them has done the adoption for them.'

The interesting exercise developed in this study is that of the combination of trigger events with the CBAM approach. How do you connect the trigger events characteristics with the strategically vital development of a critical mass of users moving from Stage 1 to the level of routine-use of some aspects of the innovation of Stage 4? The key idea is to find the right events to provide the mechanism for moving from one to another stage and in particular from Stage 3 to 4. This strategy is supported by the '3-A model', which was used in this European study to explain the likelihood-of-use decision and how it can help decision making for the development of

the Trans-European Network for Education and Training. Therefore, this model is an additional framework of reference for the actions to be taken to increase the likelihood that the adoption of an innovation becomes widespread. In such a situation, supply and demand established a healthy development of the market mechanism, which in this study is considered crucial for the development of a viable network.

To conclude this evaluative description it is worthwhile in the light of this dissertation to cite the general guidelines given for decision makers relating to online services for education and training. One should remember though that this study was executed in a period in time (1993) in which the Internet was not commonly available. The ultimate frame of reference was the myriad of Bulletin Board Systems, Videotex Systems and all kinds of other systems, which were developed in a more-or-less isolated fashion with the purpose of digital communication and information exchange among a community of interest. The European national telecom companies favoured their own communication systems, hardly accessible for educational purposes, bug-rich technology, very user-unfriendly and with pricing which was not within reach of most educational budgets. In addition, most companies were operating on a national scale, and as became obvious at the dawn of the Internet development, were not very willing to admit that their investments were wrongly targeted. The general guidelines with which Collis and De Vries (1993, p. 59) conclude their study are still very useful, although these, as indicated, were developed in what the Internet addict would call the middle ages of global communication.

Recommendations:

- Be well informed about the experiences of others and pay particular attention to signs of market acceptance or rejection relating to problems of access and ability to use.
- Be alert for opportunities to stimulate the sharing of experiences and insight, taking particular effort to represent a mix of perspectives.
- Be realistic about the role and influence of the network.
- Listen more to decision makers and those with experience in implementation problems in the workplace and classroom, and comparatively less to experts and technologists.
- Be prepared for subsidization for a long period
- Remember the '3-A's of advantage, accessibility and attractiveness.
- Search carefully for trigger events and facilitate them as carefully as possible and disseminate their results effectively.
- Continue the development of a powerful metaphor for the Trans-European network for Education and Training.

Conclusions

Operating on a novice market is difficult, especially when the product you try to sell is not yet well defined and the market is still in its infancy. In that sense this study about 'the emerging European Network', was a challenge. But instead of trying to define the network, an inventory was made of the wishes of the perspective users and suppliers. This inventory of critical issues was used to define the network relative to the needs. This somewhat different approach was very helpful at that time and has been used again in this study to 'define' e-learning (see Chapter 1).

A second central element was the focus on the decision-making process concerning the supply-and-demand mechanism. A sustainable network would need a critical mass of users, but how to stimulate the demand? The strategy used was based on the following concept: three different models were interconnected to outline the approach to be used to critically stimulate the demand. Model 1 was indicating the different phases an individual goes through before adopting an educational innovation. To attract this person one needed trigger events (Model 2). The 3-A model (Model 3) was used to get a better understanding of the likelihood of use. The use of these different models worked out well to guide the discussions and develop concepts. Therefore this model approach plays an important role in the way the framework for analysis in Chapter 3 is being developed.

2.4.5 Intermission: Moving from education to training in businesses

The studies looked at so far were predominantly from the educational sector. What we have learned from these projects was the complexity of the innovation. The fact that the change process was not just about technology, but included content, teaching and learning processes and organisational issues, which showed that a holistic and systematic approach was needed to increase the likelihood that e-learning would become a success. The pressure for change in regular education is not as high as in other sectors and it seemed that the use of technology for training and learning would have a better change in an environment where the business is the prime process. Subsequently the author became more involved in the vocational education and training sector and in the business sector. The projects and studies referred to in the Sections 2.4.6 to 2.4.11 are therefore predominantly in the vocational training or business sector.

2.4.6 CISO-Project: Recommendations for an On-line Service for Dutch Education (Collis, Veen & De Vries, 1993; De Vries, Collis & Veen, 1993)

Context

Following this exercise on the development of a European network for education and training, there was another interesting project (Collis, Veen & De Vries, 1993) sponsored by the Dutch PTT Telecom and PRESTO. PRESTO was a project group

under the framework of the Dutch Ministry of Education and Science, whose focus was in particular on the application of new technologies in vocational education in the Netherlands.

Goals

The purpose of this so-called CISO Project, where CISO stands for the Dutch words for 'an (online) communication and information system for education', was to make recommendations for a CISO Service for the overall Dutch educational system up to higher education, involving both technical and human organization. The analysis resulted in a series of reports and in a set of recommendations and guidelines for such a service, elaborated in the final report 'CISO Project: Recommendations for an On-line Service for Dutch Education' (Collis, Veen & De Vries, 1993). It is worthwhile to summarize the main lines of work and take a particularly close look at the outcome. Actually it was quite-extensive research, giving a good overview of the state of affairs in 1993. The first research focus was on the investigation of CISO-type services outside the Netherlands.

Outcome

The main conclusion (Collis, Veen & De Vries, 1993, p. 8) was, that at that time already centrally supported CISO-type services were well established in many countries, with both educational and technical staff and included a central service to provide the technical access to various types of information services, file transfer capabilities and networked access to distributed resources and other online systems and the coordination of access to appropriate online information sources, online discussion and conferences. Such a service becomes a focal point for professional support and growth relative to telecommunications applications in education in its region or country.

The second research focus was on the investigation of the Dutch context for telecommunications in education. The main conclusions were (Collis, Veen & De Vries, 1993, p. 38) that there was good experience in the Netherlands with telecommunications in education and there is a strong experience with telecommunications applications in higher education, in training and in society more broadly but there was also clear evidence that without a strong, on-going, efficiently run CISO-type of service with time to develop its services and the support of its users during predictable start-up problems, the benefits of telecommunications for the Dutch school sector may not be realized.

Among the vital aspects that influence the Dutch context were: a highly fragmented situation, on-going curriculum reform, the policy of giving schools considerably more autonomy and responsibility for their own educational and professional choices, decentralization of the ICT initiatives, costs and the general lack of support for teachers to have guided and affordable access to the upcoming Internet

system. Clearly the Dutch context was not in favour of telecommunication developments in education and this situation has actually continued until the end of the 1990s, when the national educational network 'Kennisset', Dutch for 'Knowledge Net', was established.

The third research focus was on an extensive examination of the experiences and ideas about the educational use of telecommunications of a group of eight teachers, from four middle-vocational schools. They received on-going technical and organizational support and went during a period of one-and-a half years through the initial in-service activities, extending their experiences through self-selected themes and activities to develop opinions about the overall implications of telecommunications use for education. This activity provided an important range of insights for a CISO service (Collis, Veen & De Vries, 1993, p. 9). Among the many considerations that emerged were:

- The particular benefits of a focus on telecommunications use for professional support of the teacher and school; and
- The problems and needs teachers will have, both in the school and the home, in obtaining adequate access to online use for their own instructional preparation and professional activities.

The fourth research focus was on the synthesis and clarification of the research results with respect to the development of an effective set of recommendations. This led to a set of major conclusions from the CISO project which is summarized below:

- A centralized service brings important benefits of more professional and efficient online and support services, and the likelihood of a broader range of resources and experiences in a more time- and cost-saving way than is the case with no integrated service.
- Although students benefit, a major value for a CISO service at that time was in support of the professionalism of the school and teacher. The strategy should focus on school and teacher needs and characteristics.
- Many online services were operating, but in an uncoordinated and not-Internet-networked way on limited budgets and voluntary commitment of individuals. An integrated CISO service could enhance the existing services and strengthen them through benefits of scale, interconnectedness and professional organisation.
- The service should be run as a professional support operation, requiring stable funding with low costs for schools and teacher.
- Specific help focusing on access both from school and home is needed, in order to realize the CISO services' capacity for supporting professional growth.

- The phasing-in strategy should be focused on particular needs, like sources of actual frustration for teachers and school leaders, and on accessibility problems as a critical barrier to telecommunications use in education.

An important item is this project was the strategic and theoretical framework. Following the experiences in the research on the European network, the item discussed in Section 2.4.4, the supply-and-demand dynamic again became an important strategic organizer. The eventual practical test would be: Is the service used? This sounds like a very logical conclusion, but in practice most telecommunications projects at the time of this research never ever reached a level on which this test could be applied. In our view this test is the ultimate proof for the rightness of an investment made, which in the end will be a main consideration in a decision-making process, where the enthusiasm of students and teachers is just one, and most likely a minor variable on the list of criteria.

The theoretical framework used was the Concerns-Based Adoption Model (Hall, Lord, Rutherford & Huling-Austin, 1987). This framework has been extensively validated with respect to computer use in education, including in the Netherlands (Doornekamp & Carleer, 1993). Again the 3-A model was used to develop guidelines in order to move from a conceptualisation to an implementation strategy. As the general methodology for the study the 'multi-perspective illumination' approach (Melton & Zimmer, 1987; Parlett & Dearden, 1977) was chosen. This approach focuses on an issue as a whole and tries to 'illuminate' it from a variety of perspectives. In the case of the CISO service, this was a very helpful mechanism to use the different sources of information to illuminate the situation in its natural context.

Conclusion

The question was: 'Do we need an educational network in the Netherlands?' The answer was: 'yes'. True, the Dutch context was not in favour of such an effort. One restraining factor was the opinion of the officials arguing that the use of telecommunications in education in this small country had no future. But, we identified a clear need and if such a network would be established, then the focus should be on professional support for the teacher. Again the supply-and-demand concept was used as a strategic organizer, which was very helpful to structure and prioritise the different factors, the conclusions and recommendations. In addition there was one clear notion. The ultimate test for the success of such a network was and still is: 'Is it used?'

2.4.7 TeleCoach: A Conceptual Framework for the Development of a Flexible Learning and Teaching Environment (Project 1996-1999)

Context

The motivation for the project was found in the 'push' and 'pull' sensed in companies of which workers participated in a middle level vocational training program. The main

purpose of this general technical and administrative program was to upgrade the workforce in a shorter period of time with better results. An inventory clarified that the 'push' in the companies was generated by: fast (technological) developments, increasing dominance of the market forces, increased competition, the desire to improve the entrepreneurial attitude of employees. The 'pull' on the training market was generated by: the increased need for new knowledge and skills, the time pressure on training, the need for training on or close to the work place. These factors were translated into managerial terms to identify the focal points, which were: development of a knowledge infrastructure which would allow employees to upgrade their knowledge and skills any time any place, and which allows for a better time-to-market training process. One additional factor here was the notion that training had become a cyclical process, a process, which, depending on the 'weight' of the training, varies between the continuums of a do-it-yourself refresher to a completely outlined, tailor-made course in preparation, for example, of structural changes in a company.

Goals

The demand for a more tailor-made program recognizing the special wishes from the business world, was in 1993 the motivation for the development of the so-called 'Versneld MBO Traject' (VMT), which is Dutch for a fast-track middle-level vocational training program. This VMT offered a part-time program with certification in a shorter period of time, 3,5 years instead of the regular 4 years, and with additional flexibility in the organization and the content to suit the client. Although the program was very successful (De Nederlandsche Bank, 1997) getting scores of up to a 100% of students passing their exams compared to the 70% score of the regular program and the original prognosis of the VMT of 85%, the need for more flexibility increased. One of the clients was the Dutch Telecom Company (KPN), which announced the need to reduce in particular the costs caused by the absence of the employees from the workplace. KPN calculated that these 'training' costs took up to 45% of the total. To attain this flexibility a group of representatives of the different organizations involved in the VMT program, including CINOP (Center for the Innovation of Education and Training), sat together and worked out a framework for the development of a new learning and teaching environment which would supply the VMT with the necessary flexibility and could be used for other target groups as well.

Outcome

The main goal of the Tele-Coach project was to develop a viable concept to increase the flexibility of the learning and teaching environment of the VMT program. Basically this meant that the student and teacher would be able to access this (digital) environment from school, at work and at home, while using a mix of media consisting of paper-based material, tele-CD-ROM and online services.

Conclusion

The experiences in the research projects described in Section 2.4.1 – 2.4.4 were used to establish a framework for development in Tele-Coach. Therefore at the start, one of the important notions was that to become successful, all participants should be able to recognize the added value of the project in relation to their interest for participation. In fact the 3-A model was extended in the sense that not only the student or the teacher, but also the training organisation and the client would be satisfied, being an integral part of the organization. The model is presented in Figure 30.

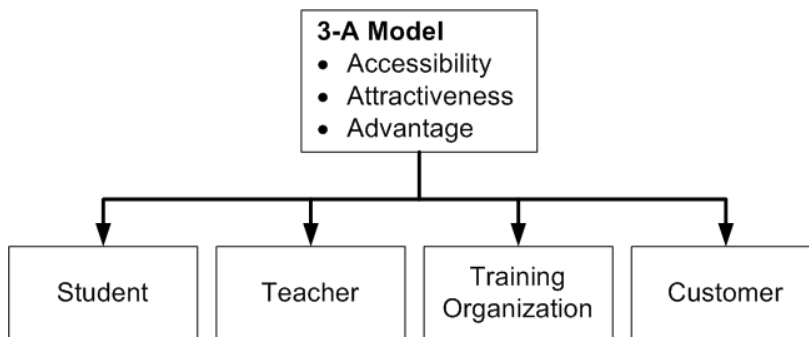


Figure 30 The 3 A model and the stakeholders in the Tele-Coach project

The notion of mutual interest of all participants was considered to be crucial and is reflected in the organisational framework and development of the project. Before going into detail on the outcome, some detail on the project itself will help to understand more of the background of the framework for analysis in Chapter 3. Taking the 3-A's as a starting point, the Tele-Coach concept was built upon the idea that one needed:

- An integral approach, combining issues on a organisational level, a content and didactical level and the level of the technical infrastructure
- A clear cost-and-benefit analysis
- A viable concept, not just another project, but a first step towards the implementation and operationalization of a flexible new teaching and learning environment.

The main difference between the old and the new situation was supposed to be the change in interaction between the three traditional didactical focal points, being teacher/trainer – content – student. In contrast with the tendency to describe the change of the didactical focus in terms of a transition from being 'teacher- or content-oriented' to a more 'student-centred' situation, the TeleCoach philosophy was that change was not about a switch between these focal points, but about communication becoming the most important issue in this concept of flexibility. In other words, the

change and the emphasis would be on communication, instead of the other focal points. This perception is being supported by the fact that the flexibility for a large part is being created by the decrease in dependency of time and place, which means that the constituting elements are drawn apart. This affects all the ingredients which together make up the learning and teaching environment. In practice this emphasis was worked out in a change of content, learning activities with the emphasis on skills, not on knowledge, the use of more and very different media, including paperware with visuals as an integral part. Other important items were the independence (e-)learning abilities, coaching (topic, study development, career), testing and assessment.

Furthermore, part of the TeleCoach bandwidth was the specific didactical approach. A major emphasis was put on the attractiveness of the learning material, the active interaction, systematic feedback, the use of well-known terms, direct usefulness at work. And in the background there was this consciousness of change in the context, the social environment and the logistical outlay.

Conclusion

Not the student, not the teacher, not the content, but the communication gets most attention. This was the central idea which was worked out in a prototype of the TeleCoach learning and teaching environment. The project was planned for a development cycle of three years. The first year was devoted to the development of concepts on eight different products. The second year was reserved for the production of half fabricates, which formed the basis for building the prototype. The third year was supposed to be a transitional year, going from a semi research and experimental product-developing environment to the introduction of the concept on the market. The results were very promising. Products were delivered in time and the project seems to evolve in the way it was planned. The systematic approach worked especially well in relation to motivating the teachers. Some of them became advocates for the project. Also the companies involved showed appreciation for the work done and started preparing for the use of this new approach. A prototype of the new teaching and learning environment was discussed extensively and has been used as an example of how such an environment might look like and function. The prototype still is a source of inspiration, although at the time this product was developed, Internet was only known in the world of scientist and not yet in the educational sector.

The substantial support the project had received from the government during the first two years was not awarded for the third year. The main reason was that the commercial activities started to intermingle with the research and experimental activities. Although one of the criteria for governmental support was to develop a viable product, by the time this issue was on the table the state became very reluctant and decided not to deal with this question and not award the support that was required for the third year. This was from a research and development point of view the end of the project.

This not-too happy ending of the project shows a dilemma which was from the beginning on an issue: we wanted to develop a viable, new environment, based on a clear cost-and-benefit analysis for all the stakeholders involved. In the course of the project this became an issue we were not really prepared for. One of the main stakeholders and contributors to the project experienced a shift in its focus, from project oriented to business oriented, in a period too early in the project. What we have learnt here is that the question of return on investment (ROI) ultimately will play a decisive role. Especially when businesses are involved, the added value will be decisive. Traditionally the educational and training world has not spent much energy on this ROI issue and the theories and tools to date were rather poor. From this point on we have been interested and involved in several projects where ROI played an important role.

2.4.8 TeleLearn: Costing Issues in Flexible and Distance Learning (De Vries 1999) and TeleLearn: Case Study Report (Boninsegna & De Vries, 1999)

Context

TeleLearn was a two-year project (spring 1997 - spring 1999), partially funded under the 'Transnational Survey and Analysis Projects' strand of the Leonardo da Vinci Program from the European Commission.

Goals

The goal of the project was to successfully establish an European Observatory for the collection and collation of resources relating to costing issues concerning the introduction of telematic-based lifelong learning into vocational training and adult education. The working hypothesis was that there was not enough knowledge and know how available to policy makers and decision makers in order for them to make informed decisions about costs. The emphasis in this project was on the identification of key factors leading towards sustainable and scaleable telematic-based learning services. The outcome of the project should help organizations to decide about the use of technology to make their services more flexible and open.

Outcome

The project was executed by a group of researchers from five different European countries. The work involved: collecting research work that has been conducted on costing issues; identifying the key factors which are leading towards sustainable and scaleable telematic-based learning services in vocational training and adult education; identifying existing projects and sustainable uses of telematic-based learning in the vocational training and adult education area in order to collect data on cost and related issues and converting into case studies; creating a European-wide "community

of interest” and on-line discussion group to stimulate further interest, understanding and research in this area.

A variety of resources was collected on a national and international level in order to create an ‘added value’ common resource base on costing issues. In addition several case studies were developed. These were published in a separate Case Study report (Boninsegna & De Vries, 1999). To support the data collection, concept management tools (mind mapping: www.mindman.com) were used to organize the data. The ‘Brain’ tool (www.thebrain.com) was used to put the resources more into context. This is an instrument for hyperbolic mind mapping which is not hierarchical, in contrast with the mind-mapping tool. The Brain tool allows interactive mind mapping, which makes it possible for the community of interest to maintain and further develop the resource bank after the end of the project period.

A list of key cost factors was created on the basis of the findings while analyzing the resources and case studies. This activity included a review of earlier frameworks and models for costs of on-line training.

The main observations of the TeleLearn project were:

- There are circumstances in which on-line training is cost-effective, and much can be said in detail about these.
- The “key cost factors” can be given in considerable detail, at a narrative level, within the main frameworks currently used.
- Far too little accurate costing data is yet available.
- An “algorithmic” model remains to be built.
- Partners in consortia for work in this area must be chosen carefully.
- Work on costs of on-line training needs to be carried out internationally and in close linkage with work on costing of on-line education.

The TeleLearn project, like several others, suffered from the notorious difficulty of getting accurate costs information from companies using on-line learning.

Conclusions

To the present it is the costing issue in e-learning which gets less attention than necessary. Although one of the advantages is supposed to be the cost saving-factor, the education and training community still has a hard time to make this visible, beyond the clear-cut issues like travel costs. Not unimportant, but from an educational perspective it would be very helpful to be able to say that people learn better, faster or have a higher retention using e-learning. The TeleLearn project originally was a two-step project. The first step was to get an overview of the state of affairs on this issue. The second step would be to collect, develop and test tools which could help to

make the business case. The European Commission which was the supporter of this project, decided to skip the second step. The main reason at that time was the political situation concerning the Leonardo program. An important notion of the TeleLearn project was that most e-learning activities occur without a sound financial background. This causes major problems. The cost issue should be on the top of the list. Especially with e-learning it is the myriad of activities and the myriad of different and sometimes new types of costs that might kill the project in the first year of implementation.

2.4.9 Telecommunications Service organization (1999 - 2002)

From here on the descriptions is anonymous, because it involves a commercial organization.

Context

To improve the opportunities for training and learning on the level of higher education, the company started working on the development of a virtual business academy in close collaboration with institutions for regular education. Almost 50% of the employees were qualified on a lower vocational-training level, but were actually working on a middle-vocational level. The company offered these employees the opportunity to acquire a diploma on the middle level. At the time 1300 employees participated in a customized, but certified programme with subjects related to the core business of the company. This initiative was successful and fitted the company's policy to become a learning organisation offering permanent opportunities for training and learning. Therefore it was planned to extend the middle-level offer and develop a Virtual Academy, which would include higher education as well, while using e-learning as an important enabler.

Goal

The primary goal was to extend the learning possibilities for the employees on different, but integrated levels of formal education in close collaboration with formal education, while focusing on subjects related to the core business of the company.

This Virtual Business Academy should allow for:

- Continuing training and learning possibilities
- A reduction of the training costs for the formal training of minimal 10%.
- Training and learning via the regionally located learning labs
- Enlargement of the flexibility and performance of the employees
- Integration of knowledge and learning at the workplace
- Development of an integrated (internal and external) Knowledge and Learning Network, including for example 'learning labs' at the institutions for formal education.

Chapter 2: The changing paradigm of the educational business column

- In a second phase, using the knowledge base on a commercial basis as third-party content for other organisations.

These long-term goals became operational in a first set of short-term goals focusing on:

- Transformation of a minimum of 10% of the existing training and learning goals into e-learning offerings with access via the regional learning labs and the Internet.
- Development of an integrated administrative system for (automatic) inscription and result reporting.
- Support of the communication between teachers and students
- Access for the developer of the courseware database

Outcome

This was a very ambitious project supported by a group of stake holders, which was in the position of making it work, both from the company and from the educational organisations. After a period of two years it was decided that the mega idea of developing a Virtual Business Academy was not feasible under the changing economic circumstances and the changing business organisation of the company. Also the group of educational institutions started to focus more on their individual wishes than on the project goals. In the meanwhile a lot of work was done. The first online courses were developed, although most of these were of a blended mode; the administrative system was up and running; a learning management system was selected and put in place. Students were enrolled and attending the blended courses, while using the emerging Knowledge and Learning Network. These were valuable developments, but especially the changing organisational and economic circumstances prevented the project from progressing at the desired rate. Part of the problem was the myriad of different interests which did not necessarily follow a parallel development. The project was stopped as a collaborative action, but continued by the different educational institutions on an individual basis. Furthermore it was decided by the company to increase the outsourcing of the training substantially.

Conclusions

It was an ambitious project. The group of stake holders was well represented, but the time needed to develop added value, so the project would reach the position of a differentiator, was too long. Organisational and economic changes in both the company and the educational organisations lead to a different situation in which individual preferences emerged and killed the project. Points of reflection are:

- Too many different interests and views
- A missing link on the top level of the company
- The changing context. The project was not well prepared to cope with external changes.
- Time was an important issue. It took too long to move from an idea to realization due to the complexity of the project. Less-ambitious goals and shorter time slots could have helped.

2.4.10 Marketing organization (2001 - 2002)

Context

This study is about an international marketing company, producing and selling their products worldwide. The department we were connected with was responsible for management development of one segment of the company. The main issues this department was working on were:

- The effectiveness and efficiency of the training programmes.
- The retention strategy using 'learning' as an important enabler to supply the high potentials with a promising career development plan.

Goal

Several projects were executed in the context of effectiveness and retention with the focus on the use of e-learning. The primary goal was to develop e-learning solutions to improve the effectiveness of the current programme. This was done for a programme on 'Advance Marketing and Sales'. The strength and weaknesses of this programme were assessed via a survey among participants worldwide. This survey and additional programme information supplied the necessary information to develop the e-learning components for the enhancement of the programme. A second major activity was the development of a 'learning resources portal'. The main goal was to improve access to learning within the company, either formal or informal. This activity is directly related to the idea of supplying newcomers and the existing management with a highly accessible learning-resources environment. This was a first step towards the development of a learning portal for continuous organisational learning.

Outcome

An e-learning framework was developed for the Advance Marketing and Sales programme. The suggested e-learning solutions were implemented, but a thorough evaluation was not carried out. The learning resources portal was considered a very good basis for further development. Again it appeared to be very difficult for the staff to really implement this application beyond the status of a prototype. Management development suffered from the daily practice of quick solutions for urgent problems, which is not in favour of innovations like e-learning. Although 'learning' was high on

the agenda, it had not yet the status of a business differentiator and therefore at the time not all key players were committed to e-learning.

Conclusions

Although there was enough room for experimentation and the strategy was well defined, the urge for new, alternative solutions for training and development was not yet important enough. The context of an international company certainly is a difficult one for the innovation of secondary activities and for the key players to jump on the band wagon, e-learning should show a certain level of business urgency. The integration with business objectives is therefore a must.

2.4.11 Transport organization (2002 - 2003)

Context

Aircraft-transport organisations need to train employees each year for their winter operations. The main training effort consists of the mandatory (ISO9002 / Jar-Ops) de-icing training for three types of operations in relation with the use of a de-icing vehicle: driver, 'de-icer' and a controller for ground clearance. The target audience is composed of personnel out of a variety of departments within the transport organisation and temporary employees contracted via employment agencies. This constitutes a heterogeneous group of people of both experienced and inexperienced de-icers. For this group a full training (initial) and a refresher course (refresh) are offered with a mandatory examination. The license is valid for one year.

The traditional training consisted of a one-day classroom session (15 per session) followed by a one-day platform session (2 per session) on a fixed timetable. The coordination effort for this training was considerable: operational planning, employment agencies, trainers, certification, and classification reports of the de-icing crew to different supervisory authorities. This resulted in a shortage of certified people during most of the winter season.

Goals

The main issue was to find a timely solution to be able to train and certify a sufficient number of employees to avoid major operational problems for winter operations, which are very unpredictable. After a first analysis the choice was made for an online course, combining e-learning with specific management tools for registration and planning.

Outcome

An online course was developed, consisting of eight e-learning modules, substituting the traditional classroom sessions. In addition a module was developed for the introduction of the de-icing vehicle, to reduce time during the practical training of which this vehicle was a main subject. Students could study 24 hours a day, 7 days a

week anywhere in the world. By customizing and tracking and tracing individual student training, managers and trainers were able to measure (and zoom in on) the progress and training certifications (individually). This was essential for the planning of employee availability for the winter operations.

The online training appeared to be very effective, because for the first time in many years a sufficient number of employees was trained and certified in time for winter operations. According to the transport organisation, the training fitted very well in the daily operational routine; the online course allowed eventually also for a consistent training of de-icing worldwide; the course was adaptive regarding to the personal profile of the student; management information was available in real time. A reduction was achieved of idle classroom time, travel expenses and training expenses.

Conclusions

A major organisational problem of training people in a timely and appropriate manner was tackled by a combination of e-learning and some administrative tools. The investment in time and money could be recovered in one training cycle for all employees participating in winter operations. The results as such were very positive. An important reason was the mutual urgency and understanding of the problem by all stakeholders.

2.5 Synthesis

The purpose of this chapter was to discuss four research questions, RQ 2 – RQ 4. RQ 2 was about the current knowledge on innovation in general and educational change in particular. This led us to investigate several theories to derive usable information on the criteria for successful change and innovation. The third question was about the characteristics of e-learning technology and e-learning content, being important success factors in the development of e-learning. The fourth question was about the experiences with ICT in the educational sector during the last ten years for which the experiences of the author were taken as the main frame of reference. These questions have been dealt with in subsequent sections of this chapter and in this section the outcomes are summarized in the context of e-learning. The goal of this synthesis is to develop criteria which can be used as building blocks for the development of the analysis framework for e-learning. This process is discussed in Chapter 3. To be able to answer these questions a three-layer source of references was used consisting of:

- Theories on educational change and innovation.
- An analysis of the role of technology and content in e-learning development.
- A review of research, projects and publications on ICT in education and training accomplished by the author during the last ten years, very often in collaboration with colleagues, project partners and with other and different organizations.

The analysis of the collected information gave rise to a list of criteria for a successful development of e-learning and is presented in Table 13. In this list there is one column showing the findings and in the other column one can find the ‘translation’ of these findings as criteria for the success of e-learning. In the third column this information is ‘connected’ to the relevance for e-learning, in the form of a ‘building block for e-learning analyses’. This connection is an interpretation of the value of the focal point for the development of e-learning and is used as a building block in Chapter 3 to develop the analysis framework.

Table 13 constitutes the data for the analysis of the changing paradigm of the educational business column influenced by e-learning. This column should be understood as a metaphor for the organizational framework needed to deliver training and learning, which is comparable with the business column for the production of shoe cream, beer bottles or a car-rental service.

Table 13 Overview of criteria for successful change and innovation for e-learning

Resources	Focal points for change and innovation with ICT.	Building block for the e-learning analysis
	Theories on educational change and innovation in relation with e-learning	
Habermann & Kraemer, 2001	Complexity of e-learning is the integration with the learning strategy, business organisation, processes and IT structure.	E-learning effects all organisational and activity levels in an organisation.
Rebensburg, Busch & Rautenstrauch, 2002;	The e-learning value cycle comprises processes, content, culture and infrastructure.	Confirmation for the need of a integrated multilevel approach for change with e-learning
Fullan, 1991, 1993, 2001a, 2001b	Implementation of ICT affects most parts of an organisation	Holistic approach favoured
Fullan, 1992; Veen, 1994, p. 241	Factors on school level are dynamic, coherent and concentrate on perceptions of people about content and didactics	Dynamic interrelated factors which are personally bound
Fullan, 2001a, p. 48	Three phases change process: initiation, initial-use and institutionalisation.	These phases constitute a framework for viewing the change process
Fullan, 2001a, b	Basic lessons for change: not prescriptive but descriptive.	Iterative process
Fullan, 2001a, b	Change is a journey. Top down and bottom up. The wider environment is essential. Every person a change agent.	Actors and factors connected in a context.

Table 13 continues ...

Table 13, continued.

Fullan, 2001b	Framework of leadership is based on the finding that the culture of change in business and education show remarkable convergence.	Experiences in education and businesses are interchangeable.
Ely, 1990	Factors on a personal level: satisfaction, knowledge and skills, time, rewards, commitment, leadership.	Very personal and therefore different perception of change and innovation.
Rogers, 1995, 2003	Communicating the innovation.	Information exchange crucial
Rogers, 1995, 2003	The acceptance factors of innovation: perceived as better, familiar, understood and used, experiment, visible and recognizable.	Factors to be used as measuring stick for the level or complexity of innovation.
Lewis & Orton, 2000	E-learning is fundamentally an innovation. The 'diffusion of innovation principles' can be applied.	E-learning is innovative and requires a major change to make it work.
Rogers, 2003, p. 421	Five stages in the innovation process in organisations: stage 1 & 2 is initiation and stage 3 – 5 is mplementation.	A set of general factors built into stages of the innovation process.
Ely, 1990	Personal factors playing a role in the successful implementation, like: dissatisfaction, knowledge, skills, resoures, time, rewards, etc.	A set of personal factors to consider in the innovation process.
Fullan, 2001b, p. xi	It isn't that people resist change as much as they don't know how to cope with it.	Involvement and communication is crucial.
Moonen & Kommers, 1997, p. 2	Identify the actors and 'their' factors with a decisive role in the change process.	Interrelations and the ability to influence these, empowers the change process.
Technology & content		
Urdan & Weggen (2000)	Technology has revolutionized business; now it must revolutionize learning	Technology use in education and training is inevitable.
Garrison & Anderson, 2003, p. 32	'E-learning technology directly affects the display, the interaction, the cost and design of the educational outcomes, but remains one factor of the many'.	Technology is an enabler, we cannot do without, but it is not decisive.
McLuhan, 1995, p. IX	'We shape out tools, and thereafter our tools shape us.'	Technology is not to be underestimated in the 'character development' of e-learning.

Table 13 continues ...

Table 13, continued.

Levis, 2003; Clark, 2003a; Bersin, 2004; Rebensburg, Busch & Rautenstrauch, 2002 ; Sander, Bungert, Busch & Meier, 2004; Masie, 2003	It is predicted and partly proven that there will be an integration and consolidation of the different technologies.	Never isolate the discussion about e-learning technology from the existing IT-structure.
Clark, 2003b	Reusability is a myth; therefore blended learning has become the new paradigm.	Too many standards and confusion about the added value. The liaison with traditional practices is strengthened.
Meister (1998, p. 76)	Technology strategy needed (infrastructure, needs, justifiable, close to the workplace?)	The technology is a decisive factor for success. So include this early on in the development process.
IDC Research (2001)	Tools for deploying e-learning are essential, but the added value depends on the integration with other actors, factors and resources.	Integrate the technology in the general strategy of development and implementation and connect to the (success) factors (what worked well until now?)
Masie, 2003	When 'content is king', then 'context is queen'.	Content needs context to be used and understood
Kelly, 2000	The end user is king, not the (ready made) content.	End user as decisive actor in the acceptance of e-learning solutions
Moonen, 2001; Masie, 2003; Clark, 2003a; Hasebrook, Herrmann & Rudolph, 2003; Rebensburg, Busch & Rautenstrauch, 2002; Sander, Bungert, Busch & Meier, 2004.	Content is becoming more fluid, non linear and unbundled. The linear book is being exchanged with non-linear, reusable online learning objects and a whole array of other digital resources, including various possibilities for information exchange and communication.	Content is changing character and so is the developing process. The Internet adds flexibility and non-linearity as a basic provision, including other resources and communication.
Rosenberg, 2001, p. 77	The combination of training (classroom and/or online), knowledge management, and performance support, is especially powerful for learning.	The context plays an important role to achieve added value with e-learning.
Hodgins, 2003, Moonen 2001, Collis & Moonen, 2001	Need for personalisation of the learning experiences. The MC-squared model: 'Mass Contribution' (content comes from all of us) needs 'Mass Customisation' to make it useful and relevant 'just for me'.	An approach for handling the content explosion by bundling small components into the right assemblies. Not yet reality.

Table 13 continues ...

Table 13, continued.

	Lessons from the past	
De Vries (1991)	Integrated effort of all actors involved. A plea for the holistic approach.	The use of ICT evokes changes along the business column.
Kanselaar & Zwijgers (1992)	Communication on and marketing of the innovation is crucial, including the preparation and organisation of the follow up.	Develop a communication plan right from the start, using existing and new channels. Integrate this plan.
Collis & De Vries (1991, 1992)	Restraining factors to be divided in first-order (technical) and second-order (process). The need for a strategy built around success factors to show the 'significant difference'.	Make an inventory of restraining and enabling factors and clarify and communicate the success factors.
	The 3-G model as a measuring stick for personal involvement as a dominant success factor.	
Collis & De Vries (1993)	<ul style="list-style-type: none"> o The Concerns Based Adoption Model as a measuring stick for the level of adoption. o Define the 'innovation' from the perspective of the user and supplier. o Built on a supply-and-demand mechanism in need of a critical mass of users. 	<p>Take a stepwise approach for upgrading the knowledge and skills level.</p> <p>Work from the start with the end user and supplier.</p> <p>The market mechanism is the most powerful incentive for a successful innovation.</p>
Collis, Veen & De Vries (1993)	<ul style="list-style-type: none"> o The opinion of decision makers as restraining factor. o Priority for professional support of the teacher. o Supply and demand as a strategic organizer. 	<p>Management support is a decisive factor.</p> <p>Teachers and trainers are the first to support.</p> <p>The market mechanism should be considered up front.</p>
TeleCoach project (1996-1999)	<ul style="list-style-type: none"> o Use an integral approach (organisation, content, technology) o Have a clear cost and benefit analysis. o Look for a viable concept to be able to meet the market mechanism. o Watch for conflict of interest, when different actors are involved. 	<p>The holistic approach gives way to deal with a whole range of actors and (success) factors.</p> <p>Projects with limited time and scope are out of date.</p> <p>The cost and benefit issue will evoke conflict if not taken care of.</p>
De Vries (1999)	<ul style="list-style-type: none"> o The costing issue is neglected. o With ICT (e-learning), the handling of the myriad of different costs has become a decisive success factor. 	Start with an inventory of cost-and-benefit indicators. Find a bookkeeper who can handle this issue.
	Experiences in different business organisations (1996 - 2004)	
Technological and socio-economic developments	<ul style="list-style-type: none"> o The need for new knowledge and skills is an important driving force. o The traditional classroom model is not 	Increasing need for training and learning, which can not be supplied by the traditional learning offerings?

Chapter 2: The changing paradigm of the educational business column

	<p>flexible enough.</p> <ul style="list-style-type: none"> ○ Traditional model is a threshold for the transfer of working and learning experiences. ○ Globalisation of the business world. ○ Demographic developments like early retirement 	
The paradigm shift from training to learning	<ul style="list-style-type: none"> ○ The transition from the traditional training mode to the learning model ○ Basically a company-wide concern. Part of an integrated effort to enhance learning in line with business goals due the increased need for learning. 	The need for a better integration of training with business goals makes the shift from training to learning inevitable.

Table 13 continues ...

Table 13, continued.

	<ul style="list-style-type: none"> ○ Learning becomes a business priority, with different actors and factors playing a role. ○ Learning develops as a business differentiator 	A new learning solution is an innovation that needs time, space, support, added value for all and a stable and transparent financial situation.
The internal and external market	<ul style="list-style-type: none"> ○ Drivers come from the business world instead of the training departments. Costs and revenues will be judged comparable with other primary business activities. ○ Supply and demand as the organisational framework. ○ Too many different interests and values will negatively influence the development. 	Improving the supply-and-demand mechanism is a main focus in new (e-) learning solutions. Demand driven development ties in with real needs. Reduce the number of stakeholders and keep a line to the top.
Time	<ul style="list-style-type: none"> ○ Cycle time instance has become an important driver (just-in-time, just-enough, time-to-volume, time-to-order, just-in-case). ○ Shift in time: most training takes place at the wrong time. Moving to a new situation of learning when needed. ○ Major organisational problems are time related. (For example five shifts a day). ○ Context is a time-related issue. 	Time has become a quality factor and should be treated as such. Mutual urgency and understanding of the problem by all stakeholders. The context changes over time and so does the urgency of an e-learning development.

2.6 Conclusions

While working closely together with people in the educational field, it was obvious that at the time when ICT was introduced, there was much more at stake than a minor change in the way education was organized and conducted. This was not as such perceived by the majority, because they were not or did not want to be involved. It all started with minor projects aimed to support the forerunners. Very quickly though it became clear that there was a great similarity in the problems experienced by these forerunners and that some sort of tailor-made work method would help them to select and plan their activities at the right time. When the technology became more accessible, the solo activities expanded into institute wide or even broader ICT-implementation projects. It was obvious that with the lack of communication and transfer of knowledge, people tend to go through the same experiences as their predecessors. Therefore it was decided to start using a systematic approach in ICT development for learning-related purposes. Moving along this line and starting to work for larger institutions, in larger projects and for businesses, it became obvious that to

develop a viable approach, it was necessary to really get to know the situation and the stakeholders. Practical instruments for such an analysis were not available, so we started developing our own. This is the background for the work being done in this area, which ultimately has been brought together in this dissertation.

Apart from the listing of influential factors (Table 13), what can further be the main conclusions from our analysis? E-learning is a relative new development with a massive approval, but what is surprising is that we know so little about the use of this medium to facilitate learning (Gilbert, 2000). Or like Garrison & Anderson put it: 'To date, published research and guides consist of innumerable case studies and personal descriptions and prescriptions but little in the way of rigorous, research based constructs that into an in-depth understanding of e-learning in higher education' (2003, p. XI). So the first conclusion is that e-learning is relatively new and there is not yet an extensive resource base of research findings. An important reason for the three-layer approach used in this study, which basically is a combination of theory, analysis of authentic e-learning trends in technology and content as two major success factors, and long-time experiences with ICT in the educational sector.

Furthermore, from the analysis it becomes clear that the complexity of e-learning is the need to integrate with the learning strategy, the business organization and business processes and the IT structure to make it work. These are dynamically interrelated factors which need to be viewed in context, because the perceptions of people who are involved are decisive for the outcome. Therefore change is an iterative process and the theories on change and innovation are but a framework for viewing the process. An interesting finding is that the culture of change in business and education show remarkable convergence, which means that experiences and research from both sectors can be used interchangeably. Change is very personal and that is why involvement and communication are crucial. As Moonen and Kommers (1995) pointed out, the identification of the actors and their 'factors' is important to be able to influence these to empower the change process.

The technology is an enabler e-learning cannot do without. It is the medium which influences the presentation of the message, so technology can be considered a main 'character developer' of e-learning and should be included in the development process from the beginning on. Content is considered to be the other pillar of e-learning. Characteristic of e-learning content is fluidity and non-linearity, which means that in some instances other resources which are not particularly developed for learning are being used including communication. This is why content becomes much more valuable as an e-learning appliance when offered in 'context'. A central role in the context is played by the end-user, who has become a very decisive factor for the success and should be taken into account from the start on. E-learning content often is made up of small 'learning objects' which are supposed to be bundled in small components into just the right assemblies. Like technology, content is an important factor, but by itself not decisive for the success of e-learning. It is the combination and

integration of elements like technology, content, and context that is needed to make e-learning a success.

From the experiences with ICT in the last decade it becomes clear that the market mechanism of supply and demand is the most powerful incentive for a successful innovation. This is not surprising, but very often ignored. This mechanism should be considered upfront, while using the question of supply and demand as a strategic organiser in the course of the development. These conclusions give rise to the conviction that for e-learning to become successful, it needs an integral approach where elements like organisation, users, technology, content and market, play an important role. So in this more-or-less holistic approach one needs to deal with a whole range of actors and (success-) factors in which the cost-and-benefit issue will evoke conflict if not taken care of.

In line with these experiences are the experiences in different business organisations where the increased need for learning and training is compelling but cannot do without a better integration with business goals. Therefore a shift from traditional training to a more-flexible learning context is inevitable and causes a major change in the educational paradigm. The supply-and-demand mechanism basically is a demand driven approach. From the experiences it becomes clear that, although not yet well developed, there is a tendency for this approach to become the dominant policy for e-learning development. If so, time will become an increasingly important quality factor to cope in a timely manner with the urgency of market demands. The increasing maturity of e-learning will inevitably lead to a loss of the 'e'. Like e-business and other related e-words, e-learning will become mainstream and loose its separate identity to become 'learning in the knowledge society'.

The collected criteria in this chapter will be used in the next chapter, Chapter 3, to develop operational criteria which are the building blocks for the development of the overall e-learning strategy and the analysis framework which is the first phase in this strategy and the main issue in this research study.

3 Developing the Analysis Framework Approach

The problem statement we are dealing with is the improvement process of managing e-learning development in the corporate environment. The way we want to do this is by using an Analysis Framework Approach as a method for the learning consultant to support the client in a systematic way. The focus in this chapter is on the development of the Analysis Framework Approach. This Analysis Framework Approach constitutes the first phase of a comprehensive strategy model for corporate e-learning, the CES Model. The first research question to be answered in this chapter is RQ 5: “What are the building blocks for the analysis framework?” These blocks are the result of a deductive analysis process on the outcome of Chapter 1 and 2, which dealt with the context of e-learning and the theory and experiences with change and innovation in the use of ICT in education and training. The first step in this deduction process is the analysis of the outcomes regarding relevant components for successful e-learning development. The next step is to convert these components into a set of operational categories. The categories are called the buildings blocks, which are used as the main frame of reference for the development of the Analysis Framework Approach. The next research question (RQ 6) is: “How is this framework being developed and what are the main features?” The building blocks are used to construct the Analysis Framework Approach, which is predominantly a process and not a product. This process is described including the main features. In Chapter 5 we will continue looking at this analysis framework, but then focusing on the first experiences with the approach.

In Section 3.1 we will look at the question why an e-learning strategy is needed. The Section 3.2 is on the context for the development of the Analysis Framework Approach, and in Section 3.3 the development process is described. The focus in Section 3.4 is on the procedures and tools for executing the approach, and in Section 3.5 the most important issues are summarized.

3.1 Why an E-learning Strategy?

The reason why companies in general embrace e-learning is because it is considered a very promising alternative compared to the existing training and learning offerings. And, as discussed in Chapter 1 and 2, e-learning can help to acquire more flexibility to handle the increased and different needs for training and learning, which cannot be supplied by the traditional classroom model. Experiences in different business organization showed that a shift from traditional training to a more flexible learning context is inevitable, causing major changes in the educational business column. This made us conclude that development and implementation of e-learning is not an easy task, which can be confirmed by looking at some of the characteristics of e-learning, which emerge from the writings of a number of prominent e-learning researchers, critics, suppliers and users, explored in Chapter 1 and 2 (Clark, 2003a,b & 2004; Collis

& Moonen, 2001; Cross & Dublin, 2002; Garrison & Anderson, 2003; Kelly, 2000; Masie, 2002; Rebensburg, Busch & Rautenstrauch, 2002; Rosenberg, 2001, 2003; Rossett, 2002; Sander, Bungert, Busch & Meier, 2004). These characteristics underline the distinction between the traditional pedagogical model and e-learning as a new way of dealing with training and learning needs:

- **A new way of thinking about learning**

The organizational model for teaching and learning based on the linear design principles of training programs and content like books, videos and most computer-based training, needs to be reconsidered. The old didactical paradigm of interaction between trainer-student-content cannot supply the flexibility needed to meet the ever-changing needs of more and different training and learning because of the fast technological and organizational changes in the business world and other organizations.

- **Redesign of the teaching and learning environment**

The perceived value of e-learning can only reach an acceptable level when the old organizational learning structures are reconsidered. Classroom teaching has been a standard organizational structure but its inflexibility restrains the possibilities for 'just-in-time' and 'just-enough' learning. This does not mean that the 'classroom is out'; the inflexibility of a fixed time and place is out, and it is on that level that the added value of c-learning (classroom learning) cannot compete with the advantages of e-learning. Therefore blended learning seems to fulfill the desire to ease the transition from classroom-bound actions to more-flexible learning activities in a mix of different settings: at the workplace, in the classroom, on the road or at home.

- **A more-personal set of teaching and learning capabilities**

To take advantage of the improved access to teaching activities and learning solutions, the teacher and the learner will regularly change places and roles, use different resources, act in different groups, use different forms of interaction and have a changing perspective on the value of the teaching and learning activities.

- **Different and new actors, different content and different technology**

The traditional didactical triangle should be replaced by a situation in which each of the participants, teacher, coach, moderator, learner or expert, can or has to regularly change position. The same is true for the content resources, modes of communication, and even the working and learning place. Therefore the learning setting becomes more fluid and as a result more flexible. Content is no longer stored in just a book or a folder, but can be accessible at all places, change over time, be manipulated by the trainer as well as the student. Content, like the interaction between the participants, becomes fluid, gains value along the way and is owned by many. Internet technology is widely used in every-day life and, although not developed for learning in the first place, is becoming an omnipresent

tool for learning. In addition, the Internet is increasingly being integrated with other technologies, which is broadening the scope for the fusion of technology with learning.

- **An open mind for experiments**

There is no blue print for the optimal e-learning situation, as the phenomenon is still in its infancy. As a consequence, in most cases the activities have an experimental character. This requires a different approach, causing uncertainty and the need for flexibility of the stakeholders.

- **A view on the e-learning market**

Although the e-learning market is developing rapidly, it still is very immature. The training world is confronted with a whole group of newcomers and new products from knowledge-capture tools to learning- and content-management systems, which are hard to position or value in a situation where traditional training and learning is still dominant. Implementing e-learning in a corporate environment requires careful and flexible planning. The lack of clearly defined e-learning strategies and the relatively slow pace of implementation are testing the elasticity of the prospective market.

- **A sense for new business models**

The traditional training and learning business model was well defined in terms of time, number of participants, costs and income. The situation is changing due to the increasing flexibility in the organization of training and learning. In practice this means that it is less clear when, how long and how many students participate at a certain point of time in certain training and learning activities.

- **The 'awareness' that e-learning is not an event, but a process**

Looking at these characteristics, there is one important element which should be added. E-learning is not a product. It is part of a continuous professional-development process of employees who have become a crucial asset for the sustainability of the company. Hence, the innovation of training and learning using e-learning is more and more becoming integrated in the businesses processes, aiming at a more flexible teaching and learning environment which better fits the needs of the company and their employees.

These characteristics illustrate that e-learning is of a complex nature, involving different stakeholders, different expertise and different cycles of development: it takes time, effort and resources to establish the conditions to allow for a systematic and balanced development. To be able to do so, a strategy is needed. According to Rosenberg (2003), an e-learning strategy is a: 'systematic and comprehensive plan of action designed to ensure the success of a broad-based e-learning initiative that adds value to the organization in ways that are supportable and sustainable'. Important in this definition is the notion of 'success insurance'. E-learning is a complicated innovative activity which needs careful consideration to become successful.

There is yet another element which needs consideration in this strategy discussion. E-learning is not the ultimate tool for all training demands and problems, but can help to find solutions which were not in reach in the pre-Internet time. It is a mistake to assume that e-learning will replace all previous training activities. In a majority of cases e-learning applications will be combined with existing training and learning activities, in general indicated as 'blended learning'. It is therefore essential to 'position' e-learning in a correct way, because the success depends to a great extent on the right 'mix' with other training and learning offerings, like classroom sessions, open learning, computer-based training, seminars, and alike. Hence another reason for using a strategy is: 'to plan and guide e-learning into a good position relative to existing training offerings' (De Vries, 2002, p. 41). This argument might even be the most important reason to use the term strategy in relation to the development of e-learning. Webster's (1974) dictionary describes strategy in relation with stratagem as: 'the science of planning and directing large scale military operations specifically of maneuvering forces into the most advantageous position prior to actual engagement'. This means that strategy is not just a term to indicate the need for a systematic approach because of the rate of complexity of the development of e-learning. It also underlines the need for an approach in which the positioning relative to other activities in the same context is considered an important success factor.

3.2 The CES Model: Context for the Analysis Framework Approach

Before going into detail about the Analysis Framework Approach, as the main issue in this research, it is necessary to clarify the broader context. The Analysis Framework Approach is part of the Corporate E-learning Strategy Model (De Vries, Moonen, Veen & Valkenburg, 2003). This model defines the strategy to be used by the learning consultant for the development and implementation of e-learning in a corporate environment. The development of the CES Model itself has been an iterative process based on experiences with e-learning in the educational sector and the business sector. It is a strategy framework for the operational management process of e-learning development being used at the Faculty of Technology, Policy and Management at the Delft University of Technology and at CINOP¹, a consultancy firm for innovation of training and education in the Netherlands, where the author was employed as consultant before moving to the Delft University of Technology. The CES Model consists of three phases of development: a starting phase, a pilot phase and an

¹ CINOP is the national Center for the Innovation of Education and Training in the Netherlands. It is an expertise center employing over 200 academic trained professionals in the sectors General and Further Education, Vocational Education and Training, (VET), Education and VET research, ICT and business management training and capacity building.

integration phase. It is based on the change-process approaches of Fullan (2001a) and of Rogers (2003). Fullan's contribution has its roots in the educational world. Rogers predominantly operated in the business world. Both theories were dealt with in detail in Section 2.1.

Fullan (2001a, p. 48) explained the three-phase change process as follows:

- Phase 1: This is the initiation, mobilization, or adoption phase. Consisting of the process that leads up to and includes a decision to adopt or proceed with change.
- Phase 2: The implementation or initial-use phase, involving the first experiences of attempting to put an idea or program into practice.
- Phase 3: The continuation, incorporation, re-utilization or institutionalization phase. Referring to whether the change gets built in as an ongoing part of the system or disappears by way of a decision to discard or through attrition.

According to Rogers (2003, p. 39), the innovation process in an organization consists of two broad activities:

- Phase 1: Initiation: consisting of all of the information gathering, conceptualization, and planning for the adoption of an innovation, leading up to the decision to adopt. Activities are: (a) Agenda setting and (b) Matching.
- Phase 2: Implementation: consisting of all of the events, actions, and decisions involved in putting the innovation into use. The activities are: (c) Redefining and Restructuring, (d) Clarifying and (e) Routinizing.

There is much overlap between Fullan's and Rogers' process descriptions. The marked difference for our purposes is that Fullan regards the activity 'Routinizing', which is in Rogers' approach part of Phase 2, as part of the third phase in his model. It was decided to use the three-phase division in line with Fullan because the distinction between the three phases is very recognizable in many technology-supported teaching and learning activities (Collis, 1996; Collis & Moonen, 2001; Morrison, 2004). Using a clear distinction between the phases helps to strengthen the focus and consider the transition from one to the other phase as an important move in the strategic development process involving different stakeholders and experts.

The three phases of the CES Model and the division of activities over the different phases reflect the approaches of Fullan (2001a) and Rogers (2003). When this phase-wise approach is projected on e-learning, then the first phase plays an important role as the period of analysis in preparation for the decision-making process for the e-learning strategy. The second phase is a period of testing the ideas and visions in practice and Phase 3 is the period of integration of e-learning as a structural part of

the teaching and learning offerings in a company or organization. As a consequence of the phase-wise approach, analysis and evaluation play an important role in all the three phases. The CES Model is shown in Figure 31. This model supports the systematic development and implementation of e-learning aiming at acceptable results in the short term and a future strategy for long-term development. It is a stepwise, problem-oriented approach, starting with small actions and progressively finding the way to extend e-learning to all the corporate-learning activities.

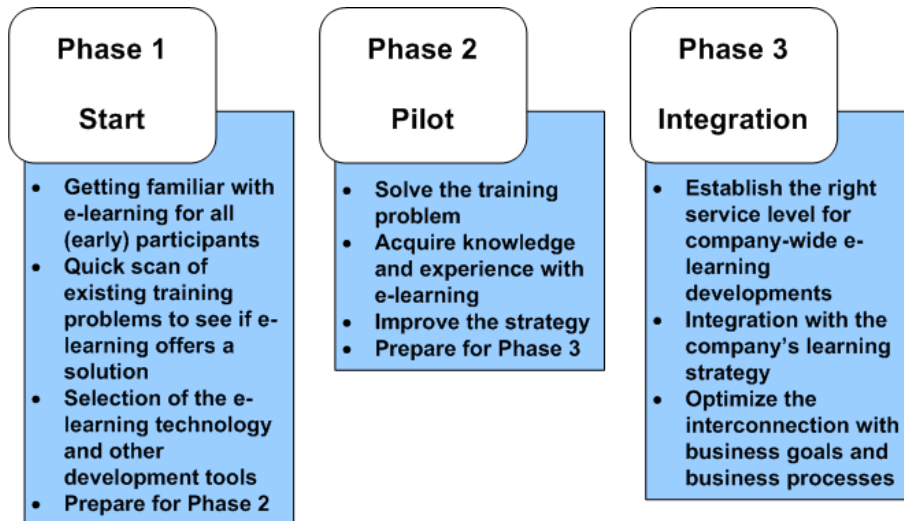


Figure 31 The 3 phases of the Corporate E-learning Strategy Model (adapted from De Vries, Moonen, Veen & Van Valkenburg, 2003)

This model can be used at different levels. It can support the policy development at a strategic management level as well as the development of a small-scale e-learning initiative on the operational level. The three phases help to focus on the essentials of the different steps needed and support the development of consensus. Each of the steps require specific expertise, which means that at each stage different people might be involved and consensus helps to move from one to the other phase without too much delay while key players change places. In practice this model functions as a quality system which supports the daily activities of learning consultants and allows for improvement of the methodology. It is a three-phase model with a certain preference for a linear approach, but this is not necessarily the way things go in practice. New people, new projects, new insights, new experiences and new wishes, can cause the need to go backward and rethink the steps to be made in the new context.

The CES Model is taken as the outline for research but with a clear focus on Phase 1 as the phase to be tested and further developed within the framework of this study. Following is a closer look at the different phases of the CES Model. Each of the phases consists of a number of sub-phases and these sub-phases have different activity steps.

At this time we will only look at the phases and the sub-phases. In Section 3.3 we will take a closer look at the different steps of the sub-phases of Phase I in preparation for the further development of the research.

Phase I: Start

- Sub-phase I-1. Familiarization

This entry is to develop a vision and even more important to develop 'consensus' about the need to consider e-learning as an option for innovation.

- Sub-phase I-2. The Quick Scan

A semi-structured interview for indepth analysis which is at the heart of the analysis framework and built around the 'educational business column'.

- Sub-phase I-3. Selection of technology and content

The outcomes of I-1 and I-2 are used to develop criteria for the selection of technology and content as part of the preparation for a follow up.

- Sub-phase I-4. Preparation for the next phase

It is necessary to bridge the gap between the starting phase and the follow up. As a consequence, the preparation for the next phase also comprises a good close of the current phase.

In Section 3.5 this sub-phase will be discussed extensively.

Phase 2: Pilot

- Sub-phase 2.1. Problem orientation

When the decision is made to start using e-learning, it is advisable to take the time to gather additional knowledge and experience before moving on to a broader or even a corporate-wide implementation. Companies are very reluctant to experiment without the likelihood of solving a real problem. For this reason but also for the sake of the development policy and communication it is helpful to choose a clear-cut training problem as the main issue.

- Sub-phase 2.2. Acquisition of knowledge and experience

In practice the solution of the training problem comes first, while second is the pilot characteristic which consists of a close observation of the project to acquire additional knowledge and experiences which help to improve the strategy.

- Sub-phase 2.3. Improving the strategy

The pilot project should supply sufficient and adequate information for the stake holders to decide about improvements and changes to be made to the strategy. Consensus and communication about the achievements are of prime importance.

- Sub-phase 2.4. Preparation for the third phase

The pilot period is concluded and in preparation for the transition to the next phase it is important to have a good view on the requirements for the next phase. The success of Phase 3 will largely depend on the ability to meet these requirements in a suitably and timely manner.

Phase 3: Integration

- Sub-phase 3.1. Establish the right service level.

The final phase aims at the implementation of the right service level for company wide e-learning developments. It is in this stage that the company should be able to position e-learning as an option relative to or in combination with other learning offerings.

- Sub-phase 3.2. Integration with the overall learning strategy

E-learning should be integrated with the company's learning strategy, being an integral part in the decision-making process about learning and training offerings in relation with business goals and business processes.

- Sub-phase 3.3. Alignment with business goals and business processes

The ultimate objective is to achieve the role that training and learning are supposed to deliver to the primary processes of the company or organization. Moving up the hierarchical ladder of an organization means new chances, but also new obligations. A verifiable alignment with business goals and processes therefore becomes an inevitable requirement.

Phase 3 is not an implementation phase, but as Fullan describes it, a phase of incorporation or institutionalization (Fullan, 2001a, p. 5). The implementation process of e-learning begins right at the first move in Phase 1, familiarization. Phase 3 is about the level of maturity e-learning needs to achieve to meet the requirements for a full integration with the teaching and learning offerings of the organization.

3.3 Developing the Analysis Framework Approach

The aim of the introduction of the CES Model in the previous section was to clarify the broader context of this strategy. From now on we will focus on Phase I of the CES Model as the main object of research. Phase I is the starting phase, which supplies the framework for analysis of the possibilities for e-learning for the company or organization. Therefore the first phase is called the 'Analysis Framework Approach' because it is not a blueprint but an outline for the analysis process which can be changed and adapted if necessary depending on the situation. In this section we will take a close look at the considerations which have been used for the development of this framework into an operational process with supporting actions and tools. Chapter 1 and 2 were the main sources of information.

In Section 3.3.1 we will describe the perspective of the consultant as the prime user of the Analysis Framework Approach. The most relevant factors for successful management of e-learning development are presented in Section 3.3.2, and in 3.3.3 we will look at the building blocks for the development of the Analysis Framework Approach.

3.3.1 The consultant as the prime user

The learning consultant is the main user of the Analysis Framework Approach and therefore it is necessary to clarify the perspective from which this person will operate. It has been decided to test the approach in real-life situations to increase the usability of the results for the improvement of the approach. This will lead to situations in which the investigator has little or no influence. This might weaken the outcome but that is inherent to this research strategy.

In practice the approach starts with the consultant, who acquires an assignment from a company to conduct the Analysis Framework Approach. This is a supply-and-demand mechanism in which in general the client plays a dominant role. It is a first step in a collaborative effort between an e-learning consultancy firm and a company in search of a solution for her training and learning needs. This collaboration is shaped according to the strategy both parties agree upon. In this case the CES Model is used as the frame of reference for the phases in the development process. In practice a consultant will hardly ever be able to acquire an assignment that includes all the phases of the CES Model under one agreement. Most likely the client favors a stepwise approach. And even then it is highly possible that the client has certain preferences in the way the phases will be conducted.

3.3.2 Success factors

Chapter 1 and 2 are the main sources of information and the synthesis of the outcome of these chapters includes the most-relevant factors for successful management of e-learning development. In this section we will define these factors and group these into major categories (see Table 14). These categories emerged as an umbrella-like coverage from the analysis of the most important factors as summarized in Section 2.5, Table 13.

Table 14 Categories of success factors

Synthesis of the original data: the success factors	Major categories
<ul style="list-style-type: none"> ○ E-learning is here to stay and will increasingly become part of the learning and teaching context of the business sector and of other organizations. ○ We are still to discover the value for education and training. ○ E-learning is a multi-faceted phenomenon which can only be understood in context. ○ The complexity of e-learning demands a solid development strategy with short and long term objectives. ○ Confirmation is needed for an integrated, multilevel approach for change with e-learning. ○ A holistic approach is favored. ○ Projects with limited time and scope are out of date. 	<p>I. Organizational context. The meaning of e-learning for the company or organization.</p>

Table 14 continues ...

Table 14, continued.

<ul style="list-style-type: none"> ○ Time has become a quality factor and should be treated as such. ○ The context changes over time and so does the urgency of an e-learning development. 	
<ul style="list-style-type: none"> ○ Learning in the corporate sector is becoming business critical. ○ E-learning has found its place in the business sector and will be of increasing importance in the years to come. ○ E-learning is expected to develop as an instrument for human resource development and become a strategic issue. ○ Increasing need for training and learning, this cannot be supplied by the traditional learning offerings. ○ The need for a better integration of training with business goals makes the shift from training to learning inevitable. 	<p>2. Business context. The meaning of e-learning in relation to the business goals and business processes.</p>
<ul style="list-style-type: none"> ○ Dynamically interrelated factors which are personally bound: stake holder involvement. ○ Develop a communication plan right from the start, using existing and new channels. Use this plan as integrated part of the project. ○ Make an inventory of restraining and enabling factors and clarify and communicate the success factors. ○ There must be mutual urgency and understanding of the problem by all stakeholders. 	<p>3. The stake holders. Who are the stakeholders in the context of e-learning and how to deal with them?</p>
<ul style="list-style-type: none"> ○ The complexity of e-learning demands a solid development strategy with short and long term objectives. ○ The diversity of success and inhibiting factors demands a holistic view on the goals and aims. ○ The holistic approach must deal with a range of actors and (success) factors. ○ The number of stakeholders should be reduced ○ Be sure to keep a line to the top. ○ Work from the start with the end user and supplier. ○ The use of ICT evokes changes along the business column. ○ Management support is a decisive factor. 	<p>4. The organization of the teaching and learning activities.</p>
<ul style="list-style-type: none"> ○ Teachers and trainers are the first to support. ○ The three phases of the change process (initiation, initial-use and institutionalization) constitute a framework for viewing this process. ○ Innovation is an iterative process. ○ Actors and factors are connected in a context. ○ Incorporation of a wider environment is essential. ○ Experiences with the culture of change in education and businesses are interchangeable. ○ Change is a very personal experience and therefore people have different perceptions of the meaning of change and innovation. 	<p>5. The definition of teaching and learning processes.</p>

Table 14 continues ...

Table 14, continued.

<ul style="list-style-type: none"> ○ For communicating change, Information exchange is crucial. ○ Factors to be used as a measuring stick for the level of complexity of the innovation are: better, familiar, understood and used, experiment, visible and recognizable. ○ E-learning is innovative and major change is necessary to make it work ○ Interrelations and the ability to influence these empower the change process. ○ Innovation is a process of subsequent (general) stages of development. ○ The end user is the decisive actor in the acceptance of e-learning solutions. ○ Personal involvement and communication is crucial for the success of the change. ○ A stepwise approach for upgrading the knowledge and skills level is needed. 	
<ul style="list-style-type: none"> ○ Content needs context to be used to achieve added value for e-learning. ○ Content is changing in character and so is the developing process. ○ The Internet adds flexibility and non-linearity as a basic provision, including additional resources and option for communication. ○ There is a need to handle the content explosion by bundling small components into the right assemblies. 	<p>6. The definition and meaning of content.</p>
<ul style="list-style-type: none"> ○ E-learning profits from the integration of the Internet technology with traditional businesses. ○ The same is true for the penetration of key technologies like Internet, in society as a whole. ○ Technology use in education and training is inevitable. ○ Technology is an enabler but is not decisive. ○ Technology is not to be underestimated in the 'character development' of e-learning. ○ Never isolate the discussion about e-learning technology from the existing IT structure. ○ There are too many standards which causes confusion. ○ The liaison with traditional practices should stay intact. ○ The technology is an important factor for success. So include this early on in the development process ○ Integrate the technology in the general strategy of development and implementation and connect to the (success) factors. 	<p>7. The learning technology</p>
<ul style="list-style-type: none"> ○ The e-learning market suffers from a lack of transparency but customers are becoming more knowledgeable about the essentials of the market. 	<p>8. The e-learning market of supply and demand.</p>

Table 14 continues ...

Table 14, continued.

<ul style="list-style-type: none"> ○ E-learning is the main carrier for the new economy in the educational sector. ○ The consequence of the increasing relevance of e-learning for businesses is that return on investment continues to be a complex issue. ○ The market mechanism should be considered up front. ○ The cost-and-benefit issues, like expenses for hard- and software, additional teacher training, and the pricing of online courses, will evoke conflict if not taken care of. ○ The market mechanism is the most powerful incentive for a successful innovation. ○ A new learning solution is an innovation that needs time, space, support and added value for all and a stable and transparent financial situation. ○ Finding balance in supply-and-demand is a main focus in new (e-) learning solutions. ○ Demand-driven development ties in with real needs. 	
<ul style="list-style-type: none"> ○ Be wary about the requirements for the first practical e-learning exercises. ○ Criteria for pilot projects to be successful: Better than the existing solution, familiar context, understood and used, room for experiment, advantages visible and recognizable 	9. Getting started with e-learning

The next step will be to use these categories of success factors to define the operational categories to be used as the main sources of information for the exploitation of the sub-phases of the Analysis Framework Approach.

3.3.3 The building blocks

The major categories of the success factors (see Table 15) are blended into a set of operational categories, and these categories are used as the main building blocks for the Analysis Framework Approach. This blending has been an iterative process, using the findings as described in Chapter 1 and 2, the prior experiences of learning consultants, reactions and comments from other experts and field experiences in the interaction with clients. The need for this blend has to do with the fact that these building blocks should function under all circumstances as the main frame of reference for the development of e-learning in the context of the Corporate E-learning Strategy (the CES Model). As a result there should be a compact set of categories to support the conduction of Phase I, the Analysis Framework Approach, with the different sub-phases including different activities, procedures and tools.

Table 15 Overview of the building blocks

Main factors for operational use	Building blocks
<ul style="list-style-type: none"> ○ E-learning will become main stream in an ever-changing learning market. ○ Learning is becoming business critical and will be judged likewise. 	1. E-learning context
<ul style="list-style-type: none"> ○ E-learning effects the whole organization which means that the number of stakeholders will be significant and needs to be taken into account right from the beginning. ○ An educational innovation is a complicated, iterative process which takes time to develop and needs a stepwise approach. ○ Change and innovation are part of a learning process for all stakeholders which starts right at the beginning. 	2. Familiarization of all stakeholders with the innovation. Purpose is involvement of stakeholders, a shared vision and consensus about the short- and long-term goals and expectations.
<ul style="list-style-type: none"> ○ E-learning will affect all training and learning stakeholders. The urge to connect to business goals adds stakeholders and so does the need for technology. ○ The organization has to decide about investments and goals. ○ Past experiences in the organization can help to increase the likelihood that e-learning does what it should do: Add value and support or replace the existing training activities. ○ Communication about the innovation is a decisive factor. 	3. Organization is responsible for policy development, the decision making process plays an important role in the organization and administration during the start up. From there it is the day-to-day operational process, which decides if the innovation works. Communication is a prerequisite and success factor.
<ul style="list-style-type: none"> ○ E-learning will affect the ways training and learning processes have been organized and executed. The administration, the teacher, the trainer, the student will all be confronted with new possibilities, demands and the need for new skills. ○ Paradigm changes from training to learning. 	4. Process: what is the dominant teaching and learning model and how successful was it? What are the possibilities and what is the readiness for change?
<ul style="list-style-type: none"> ○ Paperware has been a main source of information, but this is replaced by digital information sources with multiple possibilities for access. ○ Non-linearity is the trend in the possibilities for information exchange, the use of workplace-bound documentation, and communication with other sources and experts. 	5. Content: not only the medium requires a different approach to content: The way it is collected, stored and communicated and also the role of content in training and learning is changing.
<ul style="list-style-type: none"> ○ The technology is omnipresent and the C in ICT makes the difference compared to traditional training and learning settings. ○ Classrooms and other facilities are still valid items and part of the existing infrastructure. 	6. Infrastructure, and in particular the use of technology, in training and development is compared to other business processes in an embryonic stage.

Table 15 continues ...

Table 15, continued.

<ul style="list-style-type: none"> ○ The stronger connection with business goals increases the market mechanism and the drive to control supply and demand and to get a better view of the cost and benefits. ○ The market mechanism is expected to become the strategic organizer and therefore considered a critical success factor. ○ The time frame for development and implementation has become a critical success factor. 	<p>7. Business model: what is the existing situation and what would be the most favorable new model(s)? This exercise will guide the developments more than ever before and help to built a company-wide consensus. The time frame will play an important role in the success of the formula</p>
<ul style="list-style-type: none"> ○ Connect the different phases in a development process in such a way that complexity will not kill the project. 	<p>8. Outline pilot project: to ease the transition to the next phase, a pilot outline can help to make consensus visible and transformable.</p>

The building blocks are the result of a deductive process. The process started with the analysis in Chapter 1 on the question what e-learning really is and the analysis on change and innovation in Chapter 2. Next was the synthesis of this analysis to come to a condensed set of important factors for the management of e-learning which were combined into nine major categories. To increase the usability of this information for the consultant in practice, these categories were reviewed in relation with Phase I, including the sub-phases, and in relation with the practical use of this information by the consultant. As a result eight operational categories were defined as building blocks which have been the main frame of reference for the development of Phase I, as the Analysis Framework Approach. The approach is developed with the purpose to support the learning consultant in doing the right thing at the right time. From this perspective there were additional considerations which played a role in this definition process:

- The building-blocks categories give structure and allow for a systematic approach of the analysis process for e-learning.
- The Analysis Framework Approach is not a blueprint, but a process outline. The e-learning strategy therefore will depend to a great extent on the context of the company or organization. In practice this means that the consultant will be confronted with unforeseen situations and questions. The building-block reference should support the consultant in finding solutions and answers in line with the Analysis Framework Approach.
- The building blocks are not monolithic, but should be reviewed and updated regularly so the Analysis Framework Approach stays in line with the broader developments in the field of e-learning. This review process is not necessarily the work of the consultant but for an e-learning specialist able to conduct this deductive process and transform the findings into the operational categories for direct use by the consultant in the day-to-day practice of working with the Analysis Framework Approach.

- The building blocks focus on different activities each with a particular orientation or specialism which on a general level are connected with all the primary stakeholders. Bringing this group together at the start is a good thing to do, but a consultant will in the course of a project not be connected with all these people at the same time, at the same level or the same intensity. So the categories also indicate a division in activities, knowledge levels and skills levels and the kind of expertise needed for a sufficiently comprehensive analysis.
- This division in operational categories is also applicable for the internal organization of the consultancy company. During the different stages of a project different competencies will be needed and as a consequence different people will be involved.
- The categories are related and supplement each other and together they make what is called the 'Educational Business Column'. This term is used as a metaphor and should be understood as the organizational framework which is generally put in place in a company as 'the training organization' to deliver training and learning to the workforce. In such an organization people have different roles and positions and these are reflected in the different categories.
- Also these categories help to segregate the different fields of expertise so the people involved only have to deal with a selection of the complexity and not with the whole. The combination of the buildings blocks should help the consultant to establish an overview which is needed to manage the process of e-learning development.

After defining the building blocks, we can now use this information to develop the Analysis Framework Approach.

3.4 Outlining the Analysis Framework Approach

The Analysis Framework Approach is Phase I of the CES Model and has been developed with the learning consultant in mind as the prime user. For the consultant to be able to use the approach, a work method has been developed, including organizational models, procedures and tools to perform in a skilful and consistent manner. Consistency is an important issue, because e-learning development is a multi-actor and complex achievement, which will take time and therefore standardization in the development process is needed. In this section we will take a closer look at the different components of the Analysis Framework Approach. An overview of the CES Model and the constituting elements is presented in Figure 32.

In Section 3.4.1 we will discuss the sub-phases and in Section 3.4.2 we will look at the steps, which are part of the sub-phase Quick Scan.

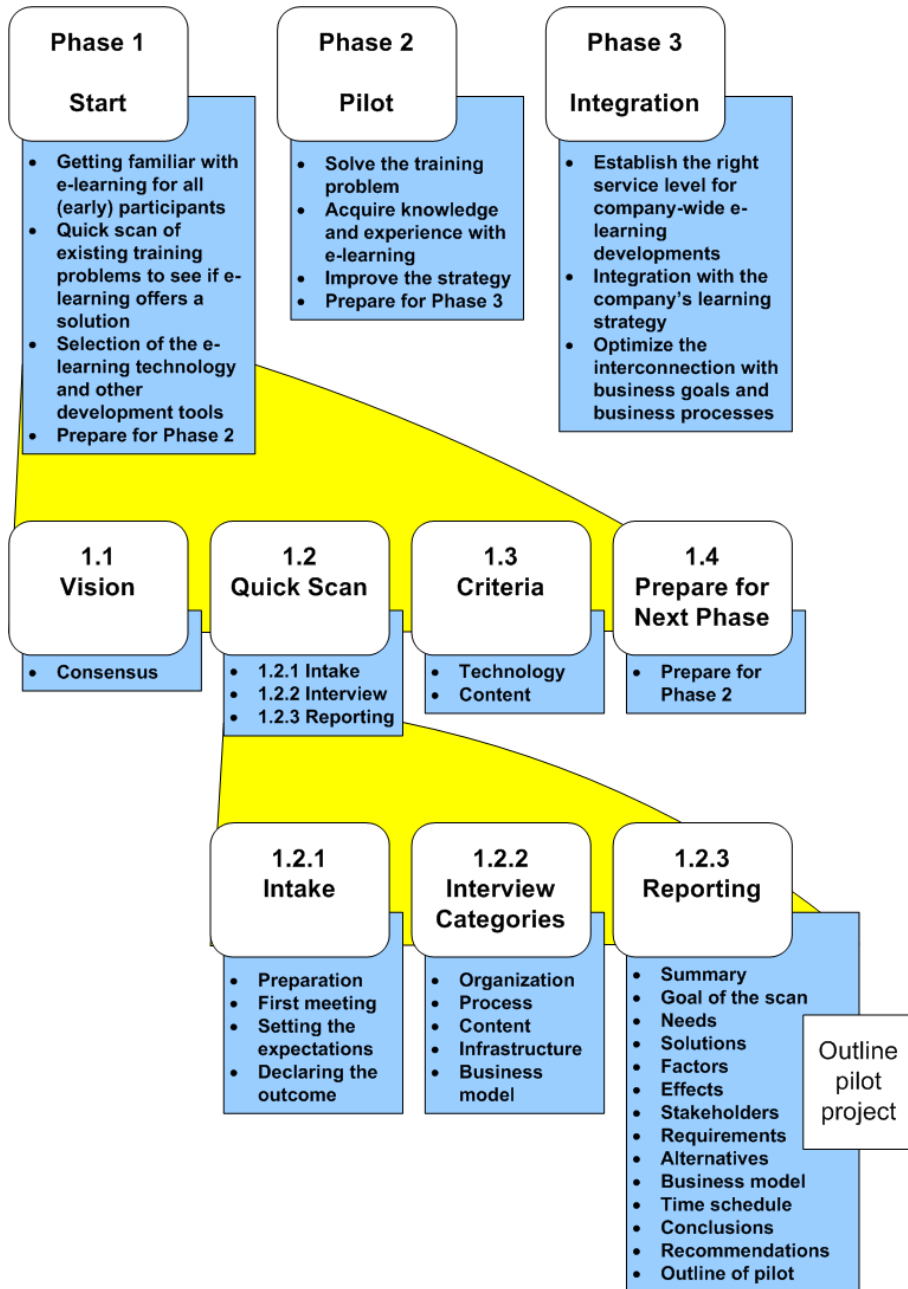


Figure 32 Overview of the CES Model and the constituting elements of the Analysis Framework Approach (Phase 1 of the CES Model)

3.4.1 The sub-phases

Figure 33 presents an overview of the sub-phases of the Analysis framework Approach, which will be discussed in this section.

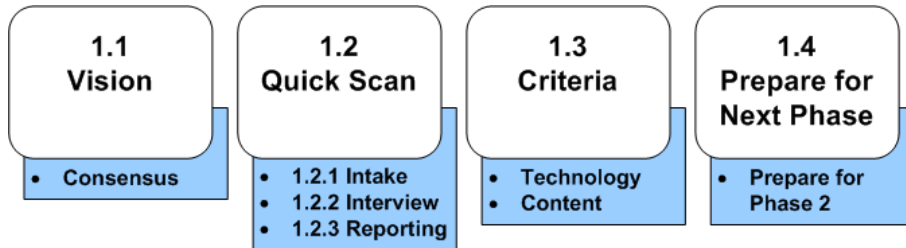


Figure 33 Phase I of the CES Model: the Analysis Framework Approach

Sub-phase I.1. Vision

The essence in this initial phase is to familiarize the community of interest of the company, being the main stakeholders, with the characteristics of e-learning and develop consensus about the specific added value of e-learning for this company. A two-or-three-page vision paper should help to conclude this step, summing up the long-term and short-term learning goals in line with the business goals and the expectations people have concerning e-learning. This exercise is helpful to develop a common knowledge base on e-learning as an innovation which will in the short term require some decision making by managers and in the long term affect most parts of the organization.

This is a first sub-phase after the company has decided that e-learning might be a good option to better deal with their training and learning demands. The consultant prepares this phase in close collaboration with the client. Decisions are made about the objectives, the familiarization activities, the tools and the resulting products.

Objectives:

The development of a vision on training and learning is a way to get the primary stakeholders at the same table. The main purpose is to discuss the business goals in relation to the training and learning goals so consensus can develop about where to go and if e-learning is a good option. This requires that the participants have a sense of what e-learning is about. So familiarization with the topic is important to attain a certain level of information which is needed for the discussion and to reach consensus. Familiarization is very helpful to achieve the right mind set, but not decisive when it comes to decision making in a first phase. The prime decision makers should therefore be involved from the beginning. The getting-familiar session helps the consultant to get to know the people involved, to

see them functioning in their roles, to get a sense of the organizational structure and willingness to start using e-learning.

Activities:

The familiarization can be organized in different ways, like a short presentation on e-learning characteristics, short hands-on exercises with an e-learning application, a discussion about the training and learning demands and an inventory of the thresholds in the existing situation.

Tools:

A useful tool in this situation is one or more e-learning applications. A Power Point presentation might help to clarify some terminology but can not compete with an e-learning application when it comes to understanding what e-learning is about. This does not necessarily have to be an application from the sector. This might even dilute the discussion.

Products:

The outcome of such a session is a short memo on the main issues, views and questions with a first qualification of the problem-solving capacity of e-learning. Most likely, a selection has been made of stakeholders to interview (Sub-phase 1.2), the main topics of the interview, and the procedures including activities and planning to come to the deliverance of the final report (Sub-phase 1.3).

Sub-phase 1.2. The Quick Scan

This is a more-practical sub-phase aiming at the analysis of the gap between the existing situation and the desired situation and the way e-learning might help to close the gap. This scan plays an important role in the analysis process which is a central issue in this research. The quick scan plays an important role in the Analysis Framework Approach as the upfront analysis tool to see in an early stage of the process if and how e-learning can contribute to the solution of a training problem.

The quick-scan sub-phase consists of three consecutive steps (see Figure 34). The first step (1.2.1) is the intake. This is to prepare for the interview and set the expectations. It is crucial to clarify what the procedures are and what to expect as the outcomes. Step 2 (1.2.2) is the interview based on interview items of the different categories and Step 3 (1.2.3) is the delivery of the outcome.

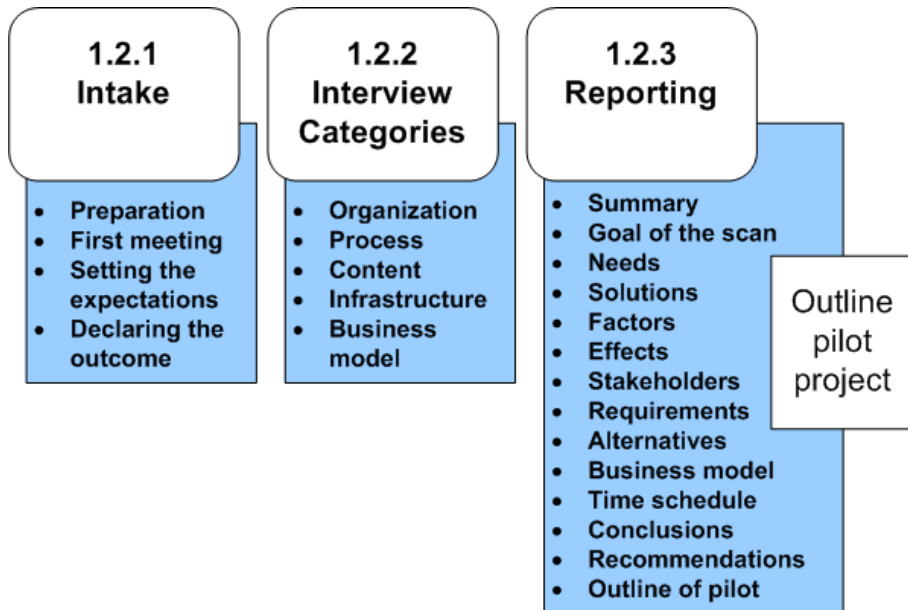


Figure 34 Outline of the Quick Scan Sub-phase

The quick scan supplies the client with an analysis of the existing situation and the desired situation, an indication of the solutions and information on what role e-learning can play to achieve these goals. The outcome of the interview should be a strong statement about the likelihood that e-learning can help to achieve the training and learning goals. It should also give a strong indication for the outline of the first pilot project as a representative example of how e-learning can work for the benefit of the training and learning needs of the company. The quick scan is also a tool to familiarize the client in a business-related manner with the benefits of e-learning, to supply him or her with the right arguments for the internal discussion and prepare for further collaboration. It also helps to get to know the client better and get a good overview of the opportunities in the company for consultancy work.

Step 1.2.1 The intake

Objectives:

The intake should help to achieve consensus with the client about the procedures, the activities and the planning, and to clarify the outcome of the quick scan. Expectation management is an important part of the intake but is rather unknown in practice.

Activities:

The intake is used to prepare together with the client the procedures, the planning of activities and the timing. The Internet is a good source for a first overview and information on HRD and training and learning. Most companies offer a year report and additional public information. This will help to prepare for the intake and for the decisions to be made with the client on the selection of the stake holders and to prepare for the subsequent interview.

Tools:

- A search engine like Google for a first inventory of the companies' policy on training and learning.
- The outline of the quick scan (see Figure 34) is used in the discussion about the planning and expectations.
- Internal publications on training and learning.

Products:

A short memo with an outline of the activities, the people involved the planning and the expected results.

Step 1.2.2 The interview

The consultant uses the interview for the analysis process of the needs, the solutions, the success factors and the effects of e-learning in the existing situation. To be able to do so the consultant will need to interview a representative group of people which is not necessarily is the same group of people as the ones involved in the intake, Step 1 of 1.2.1.

Objectives:

The consultant makes an inventory of the existing situation, the desired situation; the thresholds and the contribution e-learning might deliver in solving the problems. Stakeholders should include all primary users of e-learning, including the end user, who in the case of e-learning are is considered a crucial factor for success.

Tools:

The core of the quick scan is a semi-structured interview, using the information collected in Step 1.2.1 to adapt the interview to the context of the company or organization. The interview consists of five different categories:

1. Organization - corporate organizational capacity to innovate
2. Process - instructional and learning processes

3. Content – other and non-linear resources including communication
4. Infrastructure – classrooms, hardware and software and (e-) learning technologies
5. Business model – market mechanism as a strategic organizer

These categories contain to a large extent all the factors used for the development of the eight buildings blocks. The reduction in the number of categories has to do with the division of activities and roles in the organization of training and learning, most prominent in the business column for training and learning.

The interview is carried out using a semi-structured format. This format is constructed around the different categories mentioned. Each category is divided into sub-categories and each sub-category has a set of questions. These questions are reminders and give guidance for the interviewer to stay on track during the course of the interview. Not necessarily all questions need to be covered. This interview is not an objective measurement of the readiness for e-learning, but part of an analysis process which should allow the interviewer to develop an understanding of the training and learning context and get a hold of the pro and cons of e-learning as an additional option for delivering training-and-learning. Table 16 shows an extract from Version 0 of the interview format. On the top left the category ‘Process’, includes three sub-categories: Training needs, Training model and Teaching and learning activities. In the middle column are items for possible in the column on the right some explanatory information.

Table 16 Extract from Version 0 of the Interview

2. Process	Items	Discussion
a. Training needs	<ul style="list-style-type: none"> ○ Analyses of the training needs or problem (kind, volume, target group and others, time, planning) ○ Link with core business ○ Link with HRD ○ Evaluation of results 	Important success factor for e-learning is the focus on real and recognizable problem. Do not focus on niche or isolated demands and problems.
b. Training model	<ul style="list-style-type: none"> ○ Analyses of the existing training (organization, administration and maintenance) ○ Offerings (classroom, open learning center, on the work floor) ○ Tests (what kind and what is the importance?) ○ Certification process (internal or external) ○ Mentoring/coaching? ○ Examples of success stories and success factors. 	Try to find out what role ICT is playing and what goes well and what doesn't.


Table 16 continues ...

Table 16, continued.

c. Teaching and learning activities.	<ul style="list-style-type: none"> ○ Training model (teacher, coach) ○ General activities? ○ Specific activities? 	ICT as an integral part or as an add on?
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The guiding principle in the interview is to bring the ‘pain’ to the surface and start this collaborative thinking process about a solution which could be e-learning. All the categories and questions are discussed from the perspective of a gap analysis, without measuring the gap in real terms. The overlay used to record the responses from the interview is shown in Table 17.

Table 17 Overlay for recording interview responses

Existing situation	Desired situation	Thresholds	Solutions
			

Products:

The main product is the information collected via the interview with the stakeholders. This information is then used for reporting purposes, which is Step 1.2.3.

Step 1.2.3 Reporting

The reporting activities consist of an interim and a final report delivered by the consultant in close collaboration with the client. This quick-scan report should constitute a firm basis for further development and contain recommendations for the follow up. The consultant has to demonstrate the ability to develop an accurate report on the outcome of the interviews. These reports are pieces of evidence to show that the analysis has been a thorough process to support decision making on the use of e-learning. The report serves different purposes. It will help the client to collect evidence for his development strategy and use it to persuade others, including the management. So it should read well and look good, because this is ‘evidence’ for the qualification of the consultant in the relationship with the client.

Objectives:

- Development of an interim report and discuss this report with the client and additional stakeholders to make sure that the interpretation of the analysis of the interviews is correct and can be used for the final report.
- Development of the final report. This report is the end result and should contain all the main issues, including an outline for a pilot project in preparation for the next phase, which is phase two, the pilot phase.

- Presentation of the outcome of the analysis to a representative group of stakeholders.

Activities:

- Development of the interim report on the basis of the interview results.
- Discussion of the interim report to make sure that it reflects the actual situation and the client agrees on the content.
- Development of the final report.
- Development of a presentation on the outcome for a representative group of stakeholders.

Tools:

- The format shown in Table 18 is used to write down the interview results in line with the interview categories (Step 1.2.2).

Table 18 Format for reporting the results of the interview in Step 1.2.2.

Category	Existing situation	Desired situation	Thresholds	Solution
Process				
Sub category Training needs
Sub category Training model
Sub category Training and learning activities

Following the coding of the results of the interview an outline is prepared for the final report. The outline is meant to give an overview of the items that need to be covered in the final report, so the client can use the report for communication purposes with other stakeholders and other departments in the company or organization. Table 19 shows the structure for the final report.

Table 19 Structure for the final report of the quick scan phase

o Structure for the final report	Discussion
o Management summary	Most readers will stick to this summary. Therefore it must be clear on the goal, the results and the follow up
o Introduction on the purpose of the scan and the people involved	This is to manage the expectations and be clear about the involvement of stakeholders.

Table 19 continues ...

Table 19, continued.

○ The training and learning question or need	The quick scan is a problem-oriented approach. The problem therefore should be stated very clearly.
○ The solutions	What are the solutions and are they attainable?
○ The enabling and inhibiting factors	Clarify the thresholds. Getting these under control is half the job, but there should be consensus about it.
○ The effect on the existing situation	The existing situation has many owners and in most cases these are identical with the stakeholders. Underestimating the impact of change on the willingness to cooperate is not a wise thing to do.
○ The stakeholders	These are not foreigners to the company and are of imminent importance for the success of e-learning. Qualify these as change agents for the good.
○ The requirements	What is needed to make it work? Resources, knowledge, technology.
○ The alternatives	Could an existing program with minor modifications or a CD-ROM do the job as well?
○ The business model	Other and new cost categories, other cost flows, changes in revenues and personnel (coach, mentor, expert,), an important issue when initial expenses are increasing.
○ The time schedule	Time is a critical issue, because e-learning is a demanding enterprise from an organizational and financial perspective. A quick win connected with long-term objectives seems to be the best strategy.
○ The outline of a pilot project	Use the consensus and the momentum to look forward and outline the next step so it becomes a natural thing to move ahead.
○ Conclusions and recommendations	This is the Holy Grail of the quick scan. It should be convincing, understandable, achievable and most important, clarify the added value

Products:

The products of Step 1.2.3 are:

- Interim report on the outcome of the interview
- Final report
- Power Point presentation of the major results

Sub-phase 1-3: Criteria for the selection of technology and content

When it is clear from the analyses what the company wants to achieve and in which direction they want to go, it becomes much easier to decide about the selection criteria. The context in which e-learning is supposed to make a contribution is identified, the role e-learning should play is acknowledged and so are the requirements for a first pilot. The technology and content will play an important role and are considered to be key factors for the pilot to become a success (Collis & Moonen, 2001; De Vries, 2002; Oprins & De Vries, 2001). The quick-scan report is helpful because of the analysis on the role e-learning could play and the outline for the pilot project. This information is the main reference for the selection of technology and content. The technology and content suppliers

are not necessarily vendors from outside. Still, to make sure that what is obtained will meet the requirements it is suitable to develop a Request for Information (RfI) and a Request for Proposal (RfP) to be able to select the best supplier.

Objectives:

The quick scan report plays an important role in the selection of technology and content. The requirements mentioned in the report for a successful e-learning development are applied in the selection process which is guided by the use of a RfI and RfP. Suppliers are selected on the basis of their reaction on the RfI and later on the RFP.

Activities:

The activities start with the development of a RfI, which is based on a template in which the outcome of the quick scan is used to define the criteria for the selection. In some cases there will be an additional session with the stakeholders to prioritize the criteria, to avoid a too-rigid selection. The RfI is then distributed among the suppliers and depending on their reaction, two or three suppliers are invited for a final interview. The same procedure is used for the RfP.

Tools:

The tools for sub-phase I.3 are:

- Procedures for conducting the RfI and RfP process.
- Template for the RfI.
- Template for the RfP.

Table 20 shows the outline for a RfI.

Table 20 Outline for a Request for Information

Outline Request for Information (RfI)	Discussion
1. Goals and objectives of this Request for Information <ul style="list-style-type: none"> ○ Company profile ○ Correspondence ○ Instructions and conditions ○ Additional information 	It is important to clarify precisely what the goals and objectives are, so the supplier can prepare and react in an accurate way. The company profile should at least mention the number of potential users. The section on instructions and conditions specifies what the supplier can expect from the company and vice versa.
2. Project description <ul style="list-style-type: none"> ○ Target audience ○ Overall goals or objectives 	This section comprises a summary of the kind of projects, the target group and the main objectives, so the supplier better understands the context.
3. Expected deliverables	This is a listing of the deliverables the supplier is expected to submit.

Table 20 continues ...

Table 20, continued.

<p>4. Process and key criteria for evaluation</p> <ul style="list-style-type: none"> ○ Key criteria 	<p>This section deals with the criteria the company will use for the selection of the supplier. The criteria are directly taken from the Quick Scan report as the most important factors for the successful development of e-learning. One of the criteria is a so called 'costing case', which should supply information on costs under different circumstances (number of teacher and users).</p>
<p>5. Quality aspects</p> <ul style="list-style-type: none"> ○ Experiences and references ○ Time of deliverance and after sales 	<p>The e-learning market is a novice market with suppliers that come and go. The supplier is asked for information on, for example, previous experiences with comparable companies, references, their short and long term development plans and a warrantee statement.</p>
<p>6. Vendor information</p>	<p>Mentioning the consultants involved and other factual information from the company.</p>

Products:

- Completed Rfl and RfPs

Sub-phase 1.4. Preparation for Phase 2, Pilot

In general companies do not like experiments. With an innovation like e-learning, it is necessary to take the time to define and achieve consensus about the outcome of the analysis and the definition of a pilot project. The prime stakeholders are supposed to fully support such a transition to a first pilot project to increase the likelihood that it will become a success. The quick scan report contains a section on the follow up in the form of a pilot outline, an important attempt to consciously prepare for Phase 2, the pilot phase. The e-learning consultant most likely is the person who will be involved throughout all the phases of the CES Model. This is not true for most of his colleagues because depending on the phase and even depending on what step in these phases other expertise and skills are needed. E-learning is by definition a multi-disciplinary activity, which means that one of the burdens of an e-learning project is to cope with this variety of tasks and people. The same is true for the client. The readiness of a company to achieve good results depends largely on the ability to involve the right people at the right time. For the consultant this might mean, moving from Phase 1 to 2, engagement with different people and expertise in the consultancy firm as well as with different stakeholders at the client's site.

Objectives:

The consultant needs to prepare for the transition to the next phase. The starting point is the outline of the pilot project as described in the quick scan report. The conclusion of the actual phase and the preparation for the next phase is crucial for the success of the project and the continuation of the consultants' effectiveness in supporting the development process. In practice this means that the consultant

should try, in close collaboration with the client, to develop a proposal to acquire the assignment to develop the first part of the pilot.

Activities:

The quick scan report (see Table 19 for the outline) should be used in the discussion and planning for the next phase and to keep the project focused and avoid repeated discussions about issues which have been already decided upon. The consultant will develop the outline of the pilot into a proposal to acquire the assignment for the development of the first part of the pilot. Involvement of the stakeholders in this phase is important because in the next phase most likely other people and expertise will be needed.

Tools:

The outline for the pilot consists of two phases. The first phase is for the development of a prototype. When there is consensus about the prototype, then the second phase can start to further develop the intended learning offering, like a course or learning activities. Table 21 shows the outline for the pilot phase.

Table 21 Further preparation for the outline for Phase 2 Pilot

Part 1	Using the results of the final quick scan report design a prototype of the meso-level of the prospective teaching and learning environment. The prototype should allow all the people involved to get a clear idea of what to expect when the product is ready. It will demonstrate: <ul style="list-style-type: none"> ○ A small selected part of the content ○ Applicable classroom and online learning activities ○ Elements of testing and coaching.
Part 2	Based on the reactions of the stakeholders on the prototype prepare a proposal for the Phase 2 Pilot. <ul style="list-style-type: none"> ○ Detailed design ○ Production aspects ○ Implementation plan
Result	Go/ no-go decision based on the prototype and the proposal.

Products:

A proposal prepared by the consultant for conducting the pilot and the acceptance by the company or organization.

3.5 Summary

The aim of this chapter was to develop the work method of the Analysis Framework Approach, including the procedures and tools, to be used and tested in the course of this research. The approach is the first phase in the Corporate E-learning Strategy

Chapter 3: Developing the Analysis Framework Approach

model (CES model), a comprehensive model for the development and implementation of e-learning in the corporate environment.

The development of the approach was based on the results of the Chapters 1 and 2, indicating the major success factors for managing e-learning. Important action in this chapter was to categorize the different factors and consequently develop on the basis of these categories a set of operational categories to be used as building blocks for the development of the Analysis Framework Approach and as a practical reference for the consultant to conduct the approach.

The building blocks are interlinked and complement each other and were used for the development of Version 0 of the Analysis Framework Approach. The main features of the approach include suggestions for the familiarization of the prime stakeholders with e-learning, procedures for interviewing and reporting and actions for the preparation of the transition to the pilot phase, which is the second phase in the CES Model. In Chapter 5, we will look again at the main features of the Analysis Framework Approach, but then focus on the experiences with the framework in daily practice. However, first, in Chapter 4 we will look at the strategy being used for conducting the research and the method for the collection and analysis of the data.

4 Research design

This chapter is about the design of the research strategy. The research context will be discussed first in Section 4.1, followed by the considerations for the selection of the research methodology. From this analysis it becomes clear that this research needs to combine two approaches. One is action research for the overall strategy; the second is the case-study method, especially meant to deal with the collection and analysis of data. Notable for action research is that it proceeds through a spiral of planning, acting, observing and reflecting (Masters, 1995, p. 3). The case-study method is especially valuable in situations where the researcher has little or no control over the events (Yin, 2003, p. 9), and this is exactly the situation in which the Analysis Framework Approach is applied, namely in the daily practice of a learning consultant working for a company or another organization. Both the action-research approach and the case-study method are discussed in relation to this research. Following in Section 4.2 is the design of the process for collecting and analyzing information, the data. This plan is needed to avoid situations in which the evidence does not address the research question. The focuses for the design are the research questions 8, dealing with the portability of the approach and 9, dealing with the changes for improvement to be made to develop Version 0 and in the second round Version 1. The outcome supplies information on the main recommendations for further development of the Analysis Framework Approach. This design includes the data-collection protocol, the outline for reporting and the cross-case analysis schedule. The chapter ends with a description of the techniques used in the cross-case analysis (Section 4.3).

4.1 The Research Context and the Methodology

Section 4.1.1 is on the context and the focus of the research, which is followed by the selection of the research methodology in Section 4.1.2. The characteristics of the action research approach are discussed in section 4.1.3. Section 4.1.4 is about the types of action research and in Section 4.1.5 the limitations of this type of research are discussed. This is followed by Section 4.1.6 on the validity of action research. Section 4.1.7 concludes with a description of the action-research framework used in this study.

4.1.1 Research context and focus

The main issue in this research study is to develop the Analysis Framework Approach to improve the management of the implementation process of e-learning in the corporate environment. An important concern in this process is the lack of appropriate instruments to verify if e-learning is a good alternative instructional strategy relative to the existing learning solutions. The underlying question is whether e-learning can contribute to the solution of training problems and training needs in organizations. Therefore it was decided to develop an approach which would support

this verification process in a systematic way, including strategic considerations for future development and implementation of e-learning. This approach consists of an analysis framework which should help organizations to decide about the use of e-learning and support the decision-making process on implementation issues.

The Analysis Framework Approach should be adjustable so it can be applied by different people, in different organizations, on different management levels and in different stages of e-learning development. It is an approach to guide the analysis process which can repeatedly be used in new and different situations. Therefore the framework should be functional on a strategic-management level, as well as on tactical and operational levels. It is developed from the perspective of the e-learning consultant who should be able to use the approach in daily practice in direct collaboration with his or her colleagues and clients. It can be a company internal consultant or somebody working for a consultancy firm coming from the outside. It is assumed that this person has a firm basic knowledge of e-learning and possesses consultancy skills. The consultant is always part of a group of experts, because e-learning per definition is a multidisciplinary activity based on team work. The framework also shapes the process of information exchange between the team members and between the consultant and the client in the course of a project, in the different phases and on different levels.

To be able to relate the research-design discussion in this chapter with the research objective and the preceding activities, a consolidated overview (Table 22) is presented of the research questions and the related issues.

Table 22 Overview of the research objective, the research questions and issues

Problem statement	
How to improve the management process of e-learning development in the corporate environment?	
Research objective	
The development and implementation of an Analysis Framework Approach for corporate e-learning.	
Research questions	Issues
RQ 1 What is e-learning?	Clarifying the context of this study to acquire a good insight in the nature and meaning of e-learning.
RQ 2 What do we know about innovation in general and educational change in particular?	Theories on innovation and educational change being analyzed and reconsidered in the context of e-learning.
RQ 3 What are the characteristics and what roles will content and technology play, as important success factors, in the development of e-learning in the years to come?	Content and technology are considered to be important pillars for the development and success of e-learning.

Table 22 continues ...

Table 22, continued.

RQ 4 What have we learnt from the implementation of ICT in education and training?	Analysis of the experiences with the use of communication technology.
RQ 5 What are the building blocks for the Analysis Framework Approach?	The outcome of the RQ 2, 3 and 4 supply input for the construction of the Analysis Framework Approach.
RQ 6 How is this framework being developed and what are the main features?	This is about the creation of the framework approach and the constituent parts using the action research approach.
RQ 7 What is the portability of the Analysis Framework Approach when used by different people, in different organizations, on different management levels and in different stages of development?	An overview of the experiments with the Analysis Framework Approach under different circumstances using the case study methodology.
RQ 8 What modifications should be applied in the development of the final Version of the analysis framework?	The development of the final Version of the approach, using the outcome of RQ 7.

The focus in this research, as can be seen in the overview of the research questions and issues in Table 22, is on the development of an analysis-framework approach for corporate e-learning. The approach is developed in a cyclical manner in close collaboration with learning consultants as the prime target group. The brick -and-mortar for the development of the first Version, Version 0 of the framework approach, are the findings concerning the state of affairs of corporate e-learning, theories on educational change and innovation and experiences with information and communications technology in education and training. Additional attention is given to the role of content and technology, considered to be important pillars for further development. Next is the development of a first Version of the approach, Version 0, which will be discussed and rated by different experts and representatives from the corporate world.

Version 0 has been widely tested by consultants and the consultant-investigator in their daily consultancy practices. The outcome of these tests and first experiments provide the information needed to develop Version 1. This Version was consequently being used in practice by different consultants, students and the consultant-investigator. This practical use provided information for the next round of improvement of the Analysis Framework Approach, which should lead to the development of the final recommendations for the improvement of the framework approach in the context of this research.

The tasks for this research are:

- Descriptive: to develop a view on the state of affairs of corporate e-learning and theory on educational change and innovation.

- Explanatory: the experiences on the use of ICT in education and training and the role content and technology are expected to play in future development.
- Empirical: the process of developing and testing the Analysis Framework Approach in close collaboration with the target group in real life situations.
- Prescriptive: the analysis of the experiences and development of the final version of the framework.

The methodological paradigm chosen should support the execution of these tasks, which means that the strategy must be flexible, allow for other people to participate and allow for change during the research process. The methodology should also allow for the use of additional or other methodologies in the different phases of the research.

4.1.2 Selecting the research methodology

Given the research tasks as the main point of reference, action research seems to be a relevant approach for a reliable execution of these tasks. This choice is supported by the comparison of different research strategies for social sciences (Hamel, Dufour & Fortin, 1993; Kock, McQueen & Scott, 1997; Stake, 1995; Yin, 2003). These strategies include: experimental research, survey research, archival analysis, historical research, case study and action research. Although these strategies in general show a large overlap, there are characteristics which make a strategy more appropriate in a certain situation than others. The goal is to choose the strategy which is really more advantageous, compared to others. According to Yin (2003, p. 5) the strategies differ in (a) the type of research question posed, (b) the extent of control an investigator has over actual behavioral events and (c) the degree of focus on contemporary events as opposed to historical events. How does action research (AR) differ from other strategies and why does this make AR the more appropriate one? Let us take a look at the main contrasting characteristics of these strategies while using the context of the research as the main point of reference.

Experimental research demands a strong control over the environment, which is feasible in the scientific practice of biologists and physicians. In the underlying research of this dissertation, the control over the research environment is extremely fragile. Survey research, predominantly used by economists and sociologists, is based on the collection of a wide array of data which allows for quantitative analysis, necessary for the validation of models and hypotheses. Our research focuses much more on quality than on quantity. An important reason is that the amount of quantitative data will be limited and conclusions will be predominantly based on interpretation and cross comparison than on factual data. Archival and historical researches both focus on past events and situations, while this research focuses on the present situation. Case-study research is an approach where preferably 'how' and 'why' questions are posed, with little control over the events and the focus on contemporary phenomenon within

some real life-context (Yin, 2003, p. 1). These characteristics reflect closely the conditions under which the research of this dissertation will take place. The last strategy mentioned was action research. According to McTaggart (1992,1997) and Dick (1997) action research is a paradigm which allows for developing knowledge or understanding as part of practice and can be used for 'preliminary or pilot research, before using some other research approach' (Dick & Swepson, 1997, p. 2). This seems to fit nicely into the research objective which focuses on the development of an approach that is part of a continuous process of innovation and improvement. The combination of action and research, as the core of the action-research strategy, properly fits the research objective.

The outcome of this brief discussion on which research strategy to select, leads to the choice of action research as the main strategy for this research in combination with the case-study approach for data collection and analysis.

Action research is a natural way of acting and researching at the same time and therefore has components which resemble consultancy or change agency and some which resemble field research (Dick, 2000, p. 1). It is intended to achieve both action and research in situations where action, in the form of change, and at the same time understanding takes place which informs the change and is an addition to what is known. So action research alternates between action and critical reflection which consists of 'first analyzing what has already happened and than plan what next step to take' (Dick & Swepson, 1997, pp. 2-3). Hughes (1997, p. 2) points out that action research is not a research method, so other means or methods of data collection may be used in action-research projects. Following this thought we decided to use the case-study research method for data collection, as the most appropriate within the framework of action research. This choice will be further clarified in the following sections discussing the action-research approach and the case-study method.

4.1.3 Characteristics of action research

Masters (1995) provides three selected action research definitions which can be considered exemplary for what action research stands for. McCutcheon and Jung (1990, p. 148) define it as 'a systematic inquiry that is collective, collaborative, self reflective, critical and undertaken by participants in the inquiry'. Kemmis and McTaggart (1990, p. 5) talk about 'a form of collective self-reflective inquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices, as well as their understanding of these practices and the situations in which these practices are carried out. The last definition Masters presents is the one by Rapoport (1970, p. 499): 'Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework'. Essentially, these definitions present four basic themes: the empowerment of participants; collaboration through participation,

acquisition of knowledge, and social change. Zuber-Skerrit (1991, p. 2) describes the action-research flow or the process a researcher normally goes through to achieve these themes as a spiral of action-research cycles consisting of four major phases: planning, acting, observing and reflecting.

According to Grundy and Kemmis (1981), as cited by Masters (1995, p. 3), there are three minimal requirements for action research:

1. The project takes as its subject matter a social practice, regarding it as a strategic action susceptible to improvement.
2. The project proceeds through a spiral of cycles of planning, acting observing and reflecting, with each of these activities being systematically and self-critical implemented and interrelated; and
3. The project involves those responsible for the practice in each of the moments of the activity, widening participation in the project gradually to include others affected by the practice and maintaining collaborative control of the process.

Summarizing the discussion Dick (2000, p.2) notes that action research can be characterized as follows:

1. Cyclic: similar steps tend to recur, in a similar sequence;
2. Participative: the clients and informants are involved as partners, or at least active partners in the research process;
3. Qualitative: it deals more often with language than with numbers; and
4. Reflective: critical reflection upon the process and outcome are important parts of each cycle.

Not all characteristics will be present in each research in the same manner. The known cycle of 'planning – acting – observing and reflecting', will appear in practice in more-or-less similar steps, followed by a plan for the next cycle. According to Dick (2000), researchers have different opinions about how to make research participative and that in practice for example different participative methods could be used. In some instances there may be a genuine partnership, in other occasions participation may be limited to the role of an informant. Most action research is qualitative, but some mix qualitative with quantitative data. The advantage of qualitative data is that it is easier to be flexible and responsive to the research situation (Dick, 2000). The cyclical approach allows for reflection in a way that this process can add value to the outcome by building on evidence collected in previous cycles and can help to solve an actual problem.

4.1.4 Types of action research

There are three major types of action research (McKernan, 1991, p. 16-27; Hughes, 1997):

- Type 1: the scientific-technical view of problem solving;
- Type 2: practical-deliberative action research; and
- Type 3: critical-emancipatory action research.

The main goal of the scientific-technical approach is to test an intervention used by a practitioner in the field. The researcher uses a pre-specified theoretical framework, identifies a specific intervention and then involves the practitioner to implement the intervention. The practitioner's relation with the project is instrumental. The focus of this action-research approach is the accumulation of predictive knowledge and validation and refinement of existing theories. The practical-deliberative action research focuses on the identification of potential problems. The researcher defines the problem in collaboration with the practitioners, with the goal to understand practice and solve immediate problems. Grundy explains this type as 'Practical action research seeking to improve practice through the application of the personal wisdom of the participants' (1982, p. 360). The critical-emancipatory type of action research aims at the increase of the closeness between the actual problems at a specific setting and the explanation and solution of the problem. Secondly it seeks to empower the participants in the identification of the problem and making it explicit by raising their collective consciousness.

The different types of action research mentioned above all share the basic action-research approach, but differ in the relationship between the participants and the source and scope of the guiding 'idea'. In the technical approach the 'idea' often resides with the facilitator or researcher. In the practical approach the 'idea' is shared between a group of equal participants and in the emancipatory approach the 'idea', often perceived as 'power', resides within the group, not the facilitator and not the individuals in the group. According to Grundy: 'change in power relationships within a group causes a shift from one mode to another' (1982, p. 363). From the way our research is being developed, it seems that the practical-deliberative approach comes closest to what is happening in practice. Much action research is participatory in the sense of a collective reflection by participants on their efforts to change the ways they work. In the context of the research, in which a consultant is hired to conduct the Analysis Framework Approach, this would be a too long of a process, although part of the investigation is to see whether this framework approach does change the opinion that the participants have on e-learning.

4.1.5 Limitations of action research

The emergent nature and responsiveness of action research contain strengths and weaknesses. The advantages of this research approach have already been mentioned, but the researcher should equally be aware of the limitations and take these into account when looking at the process and outcome of the research. Orlikowski & Baroudi (1991) and Strijker (2004) refer to several constraints, which require attention:

1. Contingency of research findings: the validity of the findings in a research context is limited. Most projects involve a small number of people, who deal with a rather specific topic in one organization.
2. Control over the environment: action research tends to follow the environmental development instead of stabilizing the research setting. Therefore it is seen as an approach which cannot produce strong theories.
3. Personal involvement: one of the characteristics of action research is the participative role of the researcher. This personal involvement brings in a bias which might affect the outcome and should be considered a serious limitation of the validity of the research if not taken care of.
4. Informal planning and structure: the combination of action and research, the cyclical approach and the critical reflection in each cycle leads to changes in the research process and context. Rapoport (1970) considers the ad-hoc approach as a lack of scientific discipline which is in general regarded as of low academic interest.
5. Interference with the research environment: the pattern of interaction between the researcher, the participants and the organization is considered an advantage in the action-research approach, but can bias the outcome. The bias of findings is difficult to be identified and to be replicated by other researchers in different settings (Rapoport, 1970).
6. Time planning: action research projects are difficult to plan and in general take time because of the specific character of the action-research process.

These limitations will affect the portability of the outcome of the research, but being aware of the effects will help to avoid a strongly biased outcome. In addition it is the nature of action research to combine research with action and if action contributes to solving problems, the research exercise shows to be of value.

4.1.6 The validity of action research

The limitations mentioned relate to one of the major criticisms on action research and that is the restricted reliability, because of the frequent inability to generalize from action research. Action research though is not looking for global relevance, but for local relevance. But still if in several studies in diverse settings similar findings are

showing up, then this will allow for a greater 'generalisability' than single studies alone (Dick & Swepson, 1997). In general it is the reliability for the designated situation that counts and not the question if the findings will evoke the same results in Situation B as it did for Situation A. Nonetheless the reliability question has been an important issue in the world of action research. McTaggart (1997, p. 13) describes how validation in action research can be accomplished: it is 'a variety of methods, particularly those reported in methodological literature of interpretive inquiry and including triangulation of observations and interpretations, by establishing credibility among participants and informants, by participant confirmation, by the deliberate establishment of an 'audit trail' of data and interpretations, and by testing the coherence of arguments being presented in a 'critical community' or a 'community of critical friends' whose commitment is to testing the arguments and evidence advanced in the account on this study.' McTaggart's description is rather comprehensive.

In practice not all methods can be used, but what should be done to do action research, which can be qualified as good? Good action research according to Dick (2000) is empirical. In other words it is responsive to evidence which is critically used rather than uncritically. A cyclic process then is important and allows this critical thinking to happen more easily than in other research approaches. Therefore the quality of evidence can be increased by the use of multiple sources of evidence within all or most cycles (Dick, 2000, p. 5). This can help the investigator and the participants to achieve a better understanding. The recommendations from Dick (2000, p. 5) for good action research are: Use multiple cycles, with planning before action and critical analysis after it. Use within each cycle multiple data sources and try to disprove the interpretations arising from earlier cycles.

4.1.7 The action-research framework

McTaggart (1997, p. 13) is very comprehensive in his description of what to do to increase the validity of action research or what he qualifies as good action research. To allow for a transfer of what McTaggart is saying into operational terms, we use the summary of the action research discussion made by Dick (2000). According to Dick (2000, p.2) action research can be characterized as follows:

1. Cyclic: similar steps tend to recur, in a similar sequence;
2. Participative: the clients and informants are involved as partners, or at least active partners in the research process;
3. Qualitative: it deals more often with language than with numbers; and
4. Reflective: critical reflection upon the process and outcome are important parts of each cycle.

How does this relate to our research? Let us take a look at the research flow which has been developed to structure and visualize the sequence of the research activities.

The purpose of this flow is to indicate the different stages and the interconnectivity. The stages though do not necessarily represent the chapters in this dissertation. An extensive discussion on the flow can be found at the end of Chapter 1. Linking this flow with the research questions (see Figure 35), then RQ 1 on the e-learning context is dealt with in Stage 1. Questions 2, 3 and 4 fit in Stage 2 dealing with theory on innovation and change, the role of technology and content in e-learning development and our experiences with ICT in education and training. Stage 3 is covered by the Questions 5 and 6 on developing the analysis framework. Stage 3, 4 and 5 coincide with Question 7 and 8, on the portability and improvement of the analysis framework.

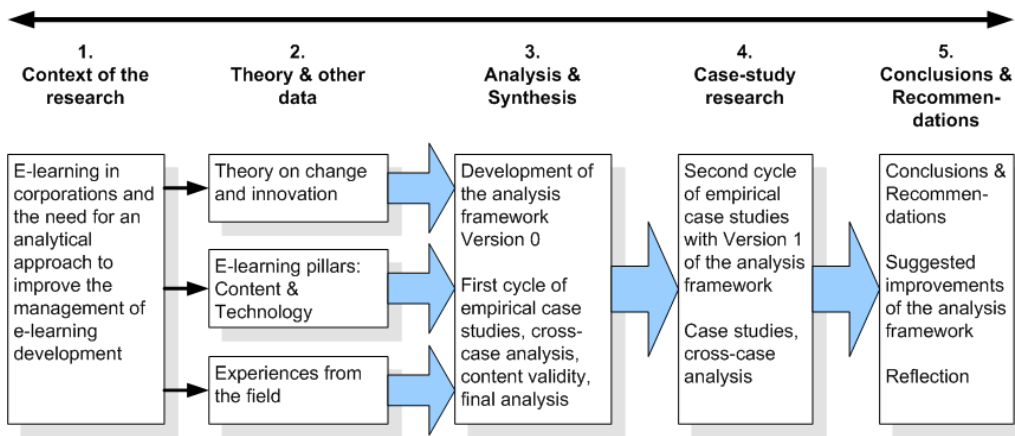


Figure 35 Research flow in five stages

When looking at the flow, it is clear that in Stage 1 and 2 action research is used as a preliminary research to ‘first analyze what has already happened and what next step to take’ (Dick & Swepson, 1997, p. 2-3). The following stage is a critical reflection on the outcome of Stage 1 and 2. The outcome then is used for the development of a first Version of the Analysis Framework Approach (reflective). What follows is a set of experiments, including an acceptance test by a representative group of clients and a content validity test by the target group, which are professional learning consultants. These activities reflect the participation of the target group and the clients as active partners in the research process (participative). The same involvement is expected during the other experiments in this stage in which Version 0 of the Analysis Framework Approach is used in a consultant – client situation. The intention is to conduct the analysis in a real-life situation, in which the consultant has a contract with the client to conduct the analysis. This will increase the validity of the test, certainly when the test can be repeated several times (cyclic). The outcomes of these experiments will be analyzed and discussed with the participants (critical reflection), which will lead to a set of changes to be made (qualitative) to improve the analysis framework and develop Version 1. Subsequently in the next stage, the practical tests will take place following the same pattern as with the first experiments in Stage 3

(cyclic, participative, qualitative & reflective). Stage 4 and 5 are predominantly qualitative and reflective to be able to develop the recommendations for a next Version of the analysis framework, which is not included in this research.

4.2 The Case Study Research Method for Data Collection and Analysis.

The arguments for the decision to use a case-study approach are presented in Section 4.2.1. The research design is discussed in Section 4.2.2 followed by the presentation of the selection criteria for the case-studies in Section 4.2.3. Section 4.2.4 deals with the data-collection principles and resources, Section 4.2.5 with the data-collection protocol, Section 4.2.6 with the cross-case analysis schedule and finally Section 4.2.7 with the cross-case analyses techniques.

4.2.1 Why a case-study approach?

The goal of this research is to develop and apply an approach which supports the management process of implementing e-learning in the corporate environment. The aim of this study is not to prove the success formula but to test the development and the application of this analysis-framework approach in different corporate and organizational settings. As described in the previous section, several research strategies for social sciences have been looked at to see which one would be the most appropriate in this context (Hamel, 1993; Kock, McQueen & Scott, 1977; Stake, 1995 Yin, 2003). The conclusion was that multiple research strategies can be used in any given study, they are not mutually exclusive. When choosing a specific strategy, it should be apparent that this strategy has clear advantages. For this research we have decided to use the action-research approach as the research method and the case study method for data collection and analysis. According to Yin (2003) the case-study has a distinct advantage above other strategies when 'A 'how' or 'why' question is being asked about the contemporary set of events, over which the investigator has little or no control' (Yin, 2003, p. 9).

In our situation the 'how' question is an apparently important issue in the analysis approach, which is being tested in real-life situations over which the researcher has virtually no control. The researcher might be able to select the people, assuming they are important stakeholders, but cannot decide about their role or participation in the research activities. Another element which is important in the decision to use the case-study strategy is the opportunity to use a full variety of evidence (Yin, 2003, p. 8), like documents, artifacts, interviews, observations, and in some cases participant observation. The complexity of the research setting makes it necessary to use different sources to allow for the comparison of evidence, because obviously the researcher is not in control of the situation as in laboratory like experiments.

Before moving on to the research design for the case-study strategy, we take a close look at the critical technical features of the scope of the case-study method and

relate this to the study at hand. Yin (2003, p. 13) defines the case study as: 'An empirical inquiry that ...Investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident'.

The setting in which the research takes place is very much context related. The Analysis Framework Approach, in Yin's words the phenomenon (Yin, 2003, p. 13), is used by different people, like (e-)learning consultants and master students, in different organizational and management levels and in different phases of e-learning development. All these elements will influence the research outcome in one way or another. As a result, these considerations must be taken into account in the research process of trying to establish an understanding of the usability of the Analysis Framework Approach. Because the phenomenon, the Analysis Framework Approach, and the real-life situations are not always distinguishable, other sources of evidence are needed which Yin (2003, p.13) describes in the second part of his definition as follows:

'The case study inquiry ...

- Copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result;
- Relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result;
- Benefits from the prior development of theoretical propositions to guide data collection and analysis.'

The Analysis Framework Approach will be used in different settings, with multiple sources of evidence, using insights gathered from previous theoretical study materials, as described in Chapter 1 and 2, to develop the data-collection process and analysis.

4.2.2 Case-study research design

The research design is a plan which guides the investigator in the process of collecting and analyzing information and helps to avoid situations in which the evidence does not address the initial research question (Yin, 2003, p. 21). The first component of such a design is the research questions. The questions to be dealt with in the case study are:

- RQ 7. What is the portability of the Analysis Framework Approach when used by different people, in different organizations, on different management levels and in different stages of development?

This question focuses on the actual usage of the Analysis Framework Approach in practice by different people under different circumstances. The information, which can be gathered during these experiments is the input for the next step which is the

analysis and synthesis of the collected evidence to be used to develop the final Version of the Analysis Framework Approach for this study.

- RQ 8. What modifications should be applied in the development of the final Version of the analysis framework, based on the experiences with Version 1?

This question deals with the outcome of the experiments. The data have been collected using different resources, methods and tools. The outcome is evaluated in relation to the objective of this study, which is to develop and use an analysis framework for corporate e-learning.

The study proposition is the examination of the Analysis Framework Approach on the usability which includes elements like the acceptance of the outcome of the analysis for decision making on further development. Something which should be taken into account is the fact that for the user-consultant, a follow up in the form of a new assignment is part of the success of the approach. Propositions are important elements of the general analytic strategy. The unit of analysis is the case study and the technique of 'pattern matching' is helpful to link the data from the different cases, although Yin (2003, p. 27) argues that the theory on linking data to propositions and criteria for interpreting the findings has not yet developed sufficiently. This approach is helpful when 'different patterns are sufficiently contrasting' (Yin, 2003, p.27).

The main issue in this study is the development of the Analysis Framework Approach which should be applicable by different persons in different situations. To be able to collect sufficiently reliable evidence it was clear that a multiple-case design was more suitable than a one-case approach. A multiple-case strategy can be considered as an activity existing of multiple experiments. The underlying logic is that each case must be selected carefully so that it either predicts similar results, or predicts contrasting results but for predictable reasons (Yin, 2003, p. 47). Important element in the multiple-case study strategy is replication. The replication approach to multiple-case studies is illustrated in Figure 36. The initial step in Figure 36 is to develop a theory, which in this case is identical with the development of the Analysis Framework Approach. This approach is the end product of Step 3 in the research flow (see Figure 35), which has actually taken place in Chapter 3, dealing with the development of the analysis framework.

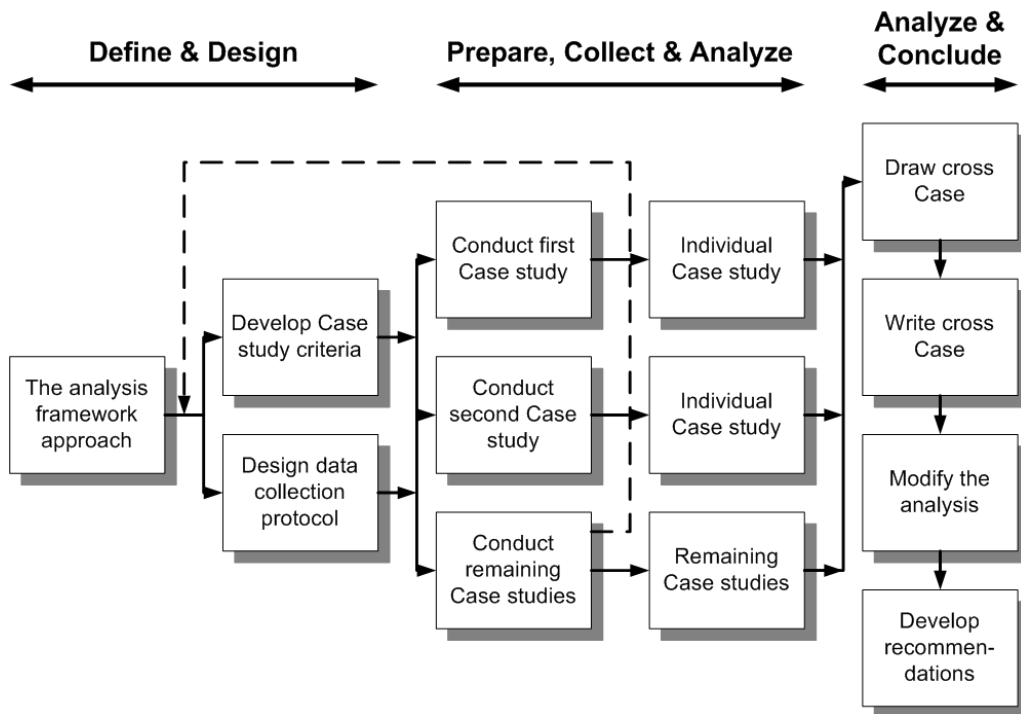


Figure 36 Case study method (Yin, 2003, p. 50)

This end product relies on the work being done in the previous chapters which dealt with Research Questions 1 through 4; focusing on the context of e-learning (RQ 1); on innovation in general and in particular educational change (RQ 2); on the role technology and content will play in the development of e-learning (RQ 3) and on the experiences we have with the implementation of ICT in education and training (RQ 4). For RQ 5 and 6 we are using the previously collected information to decide about the buildings blocks for the analysis framework (RQ 5) and the development of the framework (RQ 6). Both can be considered part of the 'Define and design' phase in Yin's model (Figure 36).

The next step is the selection of the cases and the design of the data-collection process followed by the preparation, collection and analysis of the data from the subsequent case studies. Each study should produce convergent evidence regarding the facts and the conclusions for the case. Next is a cross-case analysis and conclusions which supply the investigator with the evidence on the basis of which the recommendations can be developed for a next Version of the Analysis Framework Approach. The summary report focuses on both the individual cases and the multiple-cases results. The last step in this method is the construction of recommendations for further research and development of the Analysis Framework Approach. The dotted line is the feedback loop. During the individual case-study research, new elements and

new insights may occur which should be taken into account and may lead to redesign. This might include for example change in data-collection methods.

4.2.3 Case-study selection criteria

The Analysis Framework Approach should be tested in several instances, by different people of which the e-learning consultant is an important reference, in different sectors, on different organizational and management levels, covering the range of assignments a learning consultant might be confronted with in daily practice. The companies or organizations should differ in their main activities. Different people in our case means: the researcher, a diverse group of learning consultants and a diverse group of students working on their master thesis being the people to test the approach. The approach should be applied on different organizational levels: the level of a company-learning strategy, the training organization, a training program, a training course. The same is true for the management level. The approach should be used on a strategic level. The decision to start using e-learning is taken at this level. The tactical level is about the choices to be made on how to develop and implement e-learning and the operational management level focuses on the processes on the work floor. Because e-learning is no longer a novelty, organizations will increasingly have had their first experiences and continue working on development and implementation. Therefore the analysis framework should also be applicable in situations where the organization has already progressed in e-learning development. The approach should allow for analysis in the different phases of development and not only as an upfront analysis, but also in the middle of an e-learning pilot phase or at any other moment of development.

The background for the analysis framework is the CES Model (see Figure 31), which distinguishes three major development cycles to start from zero to the integration of e-learning in an organization. The three phases are: the starting phase, the pilot phase and the integration phase. This division helps to position the analysis in the development process, even if the organization is using another phasing.

These considerations deliver important criteria for the selection of cases to be studied in this multiple case-study approach. Table 23 shows a summary of the criteria being used. The same table will be used in the Case-study report, because these are important characteristics for the individual cases and the cross-case analysis.

Table 23 Case-study selection criteria for in-depth analysis

Case	Main activity	Consultant	Organizational level	Management level	Development level
Name of company or organization	<ul style="list-style-type: none"> ○ Industry ○ Services ○ Education 	<ul style="list-style-type: none"> ○ Researcher ○ Learning consultant ○ Master student 	<ul style="list-style-type: none"> ○ Company ○ Training organization ○ Training program ○ Training course 	<ul style="list-style-type: none"> ○ Strategic ○ Tactical ○ Operational 	<ol style="list-style-type: none"> 1. Starting phase 2. Pilot phase 3. Integration phase

4.2.4 Data-collection principles and resources

The next step in the case-study method is the development of the data-collection protocol. Such a protocol is essential to conduct a multiple-case study. The outline of the protocol is presented in Table 24. First we will look at the decisions being made in preparation for the development of the protocol and then further discuss the protocol.

Table 24 Outline of the data-collection protocol

<p>A. Context of the case study</p> <p>A1 Case study company</p> <p>A2 Main activity of the company</p> <p>A3 Consultant</p> <p>A4 Available resources</p> <p>A5 Organizational level</p> <p>A6 Management level</p> <p>A7 E-learning development</p> <p>A8 Stages of awareness</p>
<p>B. Data-collection procedure</p> <p>B1 Names of sites and contact persons</p> <p>B2 Data-collection plan: data, time, effort</p> <p>B3 Preparation of the visit</p>
<p>C. Case-study observations and experiences</p> <p>C1 Rational for the use of the Analysis Framework Approach</p> <p>C2 Observations in the execution of the Analysis Framework Approach</p> <p>C3 Experiences of the interviewer</p>
<p>D. Synthesis</p> <p>D1 Execution of the Analysis Framework Approach</p> <p>D2 Relevance for the research questions</p>

For the actual data collection the following principles were used (see Yin, 2003, p. 83):

- Multiple sources of evidence, coming from two or more sources
- A case-study database with a formal assembly of evidence distinct from the final case-study report
- A chain of evidence, which is about the linkage of the questions asked, the data collected and the conclusions drawn.

The sources of evidence most commonly used in case-study research are: documentation, archival records, interviews, direct observations, participant-observation and physical artifacts (Yin, 2003, p. 85). These are complementary resources. The main point of reference for data collection in this study is the process of conducting the Analysis Framework Approach. In short this is about a learning-consultant or master student using the Analysis Framework Approach in relation to e-learning development in a corporate setting. Given this context, the following four types of sources are chosen for collecting data:

Documentation

- Company information.
The company's web site with general information on the company, including its human resource and training policy.
- Specific documentation.
This concerns information on the training policy and the recent activities concerning change and improvement which might include e-learning as one of the items of interest.
- Interviewer's report.
This comprises the concept and the final report of the interviewer.
- Outline for an e-learning pilot project.
These are the recommendations for a follow up as part of the final report (see Table 19, Section 3.4)
- User's guide
The user guides which have been developed for the interviewers (see Appendix A and B).
- Format for the Request for Information and the Request for Proposal (see Table 20, Section 3.4)
- Interview items
Interview items are developed for the quick-scan phase (see Table 16, Section 3.4 and Appendix C and D).

Evaluation Interviews

- Interviews will be conducted with the clients and the consultants and the students who have completed the Analysis Framework Approach in at least one case (see Appendix E).

Observations

The investigator will be present in a number of cases as a participant in the meetings as a participative observer or just observer in the analysis interviews and as a chairman in the expert meetings where Group Decision Support Software will be used. In some cases the investigator will not take part in the actual execution of the approach but will meet with the consultants and students to prepare for the approach. The five forms of observations were:

- Meetings
The investigator will conduct preparatory meetings with the consultants and students. He will participate in some intake meetings and the concluding meetings.
- Meetings using Group Decision Support Software
The software is used to support expert meetings on selecting the most important factors for success and decide about the content validity of the quick scan questionnaire.
- Participative observation
The investigator will in some occasions be present when a consultant is conducting the Analysis Framework Approach.
- Observation
The investigator is observing but not participating in the conduction of the Analysis Framework Approach. The aim is to observe the interview process, to see how the interviewer and the interviewed communicate and what the results might be from a consultant's perspective.
- Management briefing
A management briefing in support of the decision making process for the follow up.

Taped quick-scan interviews

The interviewers will record their interviews with the stake holders. This tape can be used in part as an additional 'direct-observation' source.

4.2.5 The data-collection protocol

A data-collection protocol is intended to guide the investigator and to increase the reliability of the research. In general, a case-study data protocol includes an overview

of the case-study project, field procedures, case-study questions and a guide for the case-study report (Yin, 2003, p. 69). This section is restricted to the description of the outline of the protocol (see Table 24) which will be used to structure the data-collection process in line with the data-collection principles (see Section 4.2.4) and for the production of the case-study report. The Analysis Framework Approach contains several procedures, which can be used as a direct source for issues covered in the data-collection protocol.

The data-collection protocol is used to conduct the multiple-case study so that the individual studies can be reported upon in a similar way in preparation of the cross-case analysis, all being part of the general analytic strategy. The context of the case study (A.) includes the criteria for the selection of the cases to be used for in-depth analysis. Part of the research is to verify if the Analysis Framework Approach can be used by different people, under different circumstances and in different stages of development. Since the event takes place in a real-life situation, it is necessary to focus on a combination of selected cases to be able to deal with the verification for multiple uses of the approach.

The data-collection procedure (B.) is about the arrangements to be made, the planning and preparation of the visit. This procedure coincides for the largest part with the preparation by the consultant for conducting the Analysis Framework Approach. In some instances, the investigator also played a role as consultant, which as a consequence has an effect on the way the direct observations could be conducted.

The case-study observations and experiences (C.) comprise the questions to be asked as an investigator and not as a consultant and focus much more on the process than the outcome of the analysis. Direct observations are made as an observant or a participative observant or by means of taped interviews from the consultant with the client. C3 covers the collection of experiences of the consultant and the client with the Analysis Framework Approach. The synthesis (D.) is a reflection on the process and outcome of the case study.

4.2.6 Cross-case analysis schedule

The analysis schedule in a multiple-case study strategy is used to express the collected data of a case in such a way that these can be compared with other cases. On the basis of the outcome a cross-case analysis is feasible. Such a schedule is directive in the sense that the outcome should supply the necessary information to be able to answer the research questions at stake. These questions are:

- RQ 7. What is the portability of the Analysis Framework Approach when used by different people, in different organizations, on different management levels and in different stages of development?
- RQ 8. What modifications should be applied in the development of the final Version of the analysis framework, based on the experiences with Version I?

The main source of information for this analysis schedule is the data-collection protocol. The development of the protocol and the schedule has been an iterative process, to make sure that the data collected can be analyzed in a way that the outcomes support the verification process of the usability of the Analysis Framework Approach. Table 25 shows the format for the cross-case analysis schedule.

Table 25 Cross-case analysis schedule

Case-study number and name	Case study 1 <name>	Case study 2 <name>	Case study <n> <name>
1. Context			
A1 Company			
A2 Main activity			
A3 Consultant			
A4 Available resources			
A5 Organizational level			
A6 Management level			
A7 E-learning development			
A8 Stages of awareness			
2. Procedure			
B1 Sites and contacts			
B2 Data, time, effort			
B3 Preparation of the visit			
3. Observations and experiences			
C1 The rational			
C2 Observations			
C3 Experiences of the interviewer			
4. Synthesis			
D1 Execution of the approach			
D2 Relevance for the research questions			

4.2.7 Cross-case analyses techniques

The technique which will be used for the case-study analysis is a combination of pattern matching and explanation building (Yin, 2003, p. 116). Pattern matching compares an empirically based pattern with a predicted one, or with several alternative predictions. When the patterns correspond it can help to strengthen the internal validity of the case study. The goal of the second technique, explanation building, is to analyze the case study by building an explanation about the case. This procedure is relevant for explanatory case studies to develop ideas for further study. It is an iterative process, using the findings of an initial case for revision and compares the revision to the facts of a second, third and more cases.

The explanation-building process leads to starting a cross-case analysis, which is another technique specifically applied for the analysis of multiple cases. One possibility is to create word tables that display data from the individual cases according to some uniform framework (Yin, 2003, p. 134). This technique has been used in the 'cross-case analysis schedule' (see Table 26). A limitation of this cross-case synthesis is the reliance on argumentative interpretation. Therefore the investigator should develop strong arguments, which can be supported by data.

According to Yin (2003, p. 137), there are four principles which underlie good social-science research work. First, the analysis should show the use of all evidence. Second, it should address all major rival interpretations, similar to the observation of a fellow consultant being in contrast with the observation made by the investigator. Third, the analysis should address the most significant aspect of the case study and fourth, one should use one's own prior, expert knowledge to show awareness of the issue being studied.

4.3 Summary

The aim of this chapter was to describe the selection of the research strategy for the identification of the problem domain, which is the management process for the implementation of e-learning in corporations. The research objective is to develop and implement an analysis-framework approach to support the management process. Action research is chosen as the overall research framework with the case-study method as the strategy for the collection and analysis of the data. The research is being conducted from the perspective of the professional learning consultant who has to operate in real-life situations. The Analysis Framework Approach should support the consultants to do their work well. This means that the experiences, as much as possible, will be gathered under professional consultancy conditions.

The action-research approach will be made operational in the context of this research by relating all research activities with the four main characteristics of action research, which are: cyclic, participative, qualitative and reflective.

The goal of the Analysis Framework Approach is to support the management process of implementing e-learning in the corporate environment. An important element is the portability of the approach (RQ 7) and the changes to be made to increase the usability (RQ 8). It is the case-study method which should help to collect evidence in these issues. A case-study protocol and a cross-case analysis schedule have been developed to support this verification process. The principles used are: multiple sources of evidence, a case-study database and a chain of evidence, which is about the linkage of the questions asked, the data collected and the conclusions drawn (Yin, 2003, p. 9). The analysis strategy is based on a cross-case analysis, followed by a set of conclusions and recommendations. A SWOT analysis is used to prioritize actions for further development in relation to RQ 7 and RQ 8.

Chapter 5 is about the first experiences with Version 0 of the analysis framework and the development of Version 1. As a result of the cyclical approach, Version 1 will be tested in the same way as Version 0. The experiences with Version 1 will be described in Chapter 6 and 7. Using Version 0 there were six case studies executed of which five in the steel industry and one in a training institution. Using Version 1 there were eight case studies executed of which one in the steel industry, one in the glass industry, two in service organizations, one in a health care organization and one in the food industry.

5 First Experiences with the Analysis Framework Approach

The Analysis Framework Approach is used at the beginning or during the course of an e-learning development. The aim is to assist the learning consultant with the improvement of the management process of e-learning implementation. In the two previous chapters, Chapter 3 and Chapter 4, we have discussed the origins of the Analysis Framework Approach and the research methodology. This chapter is about the experiences with the first version (Version 0) of the analysis framework in practice. There were two kinds of situations where information was gathered about the use of the analysis framework. The first situation involved carrying out the Analysis Framework Approach by a learning consultant in a company or organisation. These were real-life situations in which the consultant worked in line with the demands of the client on the basis of a contract. These experiences were documented in the form of case studies based on the case-study research model by Yin (2003). The cases were developed using a special format and subsequently used in a cross-case analysis. The second situation in which information was gathered were the meetings held with different experts to test the approach and check the content validity of the analysis framework.

The overall goal of this practical research is to improve the Analysis Framework Approach and to collect empirical evidence for the verification of the portability of the approach, so it can be used by different people, in different organisations, on different organisational levels and in different stages of e-learning development, basically covering the research questions 7 and 8. The case studies discussed in this chapter are conducted using Version 0 of the analysis framework. The outcomes of the case studies and the expert meetings were integrated and used for a final analysis. The outcome of this analysis was tested against a SWOT analysis to be able to prioritise the actions needed to develop the improved Version 1 of the approach. This chapter concludes with a discussion on the improvements made with this Version 1 of the Analysis Framework Approach so that a new cycle of case studies can be carried out, which will be described and analysed in the same way as in this chapter with Version 0. Chapter 6 then will contain the second cycle of case studies, based on Version 1. The cyclical approach in testing the analysis framework is part of the action-research strategy used in this study.

Section 5.1 is an introduction to the cases which have been executed. Two case-study reports are presented in Section 5.2. The outcome of the cross-case analysis is shown in Section 5.3 with in Section 5.4 the results of the expert meetings. The final analysis is described in Section 5.5 followed by Section 5.6 on the actions for improvements and a short summary of the chapter in Section 5.7.

5.1 The Case Study Experience

In total six case studies have been developed on the basis of multiple sources of information. For the collection of the information the data-collection protocol has been used (see Table 24) to enclose a uniform presentation of the findings and a uniform basis for analysis of the different resources. An overview of the case studies is shown in Table 26. Each case study is based on an analysis by the learning-consultant of the e-learning situation, using Version 0 of the Analysis Framework Approach. In all situations the consultant conducted the analysis based on an official assignment of the company or organization. Four of the six cases were conducted in different production units of a steel company. Although these units were independent organizations with very different management, working and training processes, they all were involved in the fabrication of steel products. Two cases were different. Case # 3 is about the corporate training center of the steel company. Case # 6 is about a regional college for vocational training and adult education. In reality this case was a collection of in total six different analyses, but considering the similarity in the outcome, we have decided to combine these into one case study. The case in itself covers more opinions, but the different units of the college show a close resemblance in the organizational setting of their e-learning activities.

Table 26 shows the overview of cases with in Column 1 the case number, Column 2 shows the time period in which the analysis took place, Column 3 is about the main activity of the company or organization, next is the Version of the analysis framework which has been used, and the last columns show who was involved: a consultant, a student or the investigator.

Table 26 Overview of case studies using Version 0 of the Analysis Framework Approach

#	Period	Company or organization	Version	Consultant	Student	Investigator
1	Sep -Oct 2001	Steel industry: metal strip production	0	X		X
2	Oct -Nov 2001	Steel industry: metal packaging	0	X		X
3	Oct -Nov 2001	Steel industry: training organization	0			X
4	Nov -Dec 2001	Steel industry: product staining	0	X		
5	Jan -Feb 2002	Steel industry: product coating	0	X		X
6	Apr -June 2002	Training institution: regional college for vocational and adult education	0	X		

Each of the cases is described in a case-study report, using the data-collection protocol (Table 24). Two case study reports are selected and shown in Section 5.2. The complete collection of this first cycle of case studies can be found in Appendix F.

5.2 First Cycle of Case Studies

The case studies shown are: case # 2 Steel industries: metal packaging, in Section 5.2.1. The second case, shown in Section 5.2.2, is case # 6 which took place in a regional college for vocational and adult education.

5.2.1 Case # 2 Steel industry: Metal packaging

The analysis is presented in terms of the categories of the case-study protocol (see Table 24) and these are labeled accordingly.

A. The context of the case study

A1 Company or organization

This case study is about one of the production units of a steel producing company. The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third-largest steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills and providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The metal-packaging production unit is a supplier of light-gauge steel for packaging and non-packaging applications. This production facility is part of a business unit with other production plants abroad. As a result there is an international orientation. An important issue is the collaboration with customers in partnerships to help streamline business chains and focus on providing innovative solutions. The unit in the Netherlands has 1100 employees.

The initiative to carry out an Analysis Framework Approach related to e-learning was taken by the central training organization of the company which also funded the activity. On the site of the company in the Netherlands there are two business units, consisting of several different production units. The training center wanted to use the analysis to gather information about the state of affairs on e-learning and offer the different units the opportunity to think about e-learning as an alternative for solving training problems. The initiative followed the request of several units which were

already experimenting with e-learning but wanted the training center to support them on issues which most likely could be solved more easily on a central level than by each unit individually. One can think of the purchase of a learning management system, testing software, the collection of experiences and making this available on the web site, and others. It is this initiative which led to the execution of in total seven analyses in the business units and different plants of the steel company.

A3 Consultant, student, investigator

A learning consultant and the consultant-investigator executed the Analysis Framework Approach.

Table 27 shows the results of Items A4-A8.

Table 27 Presentation of factual information on case study # 2

A4 Resources	Available	Additional information
a. Information on the organization	X	Online information
b. Analysis framework report	X	Report is available following the original outline.
c. Specific information on learning and training	X	Overview of training activities.
d. Outline e-learning pilot	X	In preparation of two pilots.
e. User's guide		
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the approach' (interviewer)	X	Both the consultant and the project leader have been interviewed by means of the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Consultant-Investigator)	X	Actively involved in conducting the Analysis Framework Approach.
j. Taped interviews	X	The interview session was taped.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM	X	
c. Training organization	X	Training organization of the production plant
d. Training program	X	Current program
e. Training course	X	Outline for Pilot project
f. Customer training		
g. Other ...		

Table 27 continues ...

Table 27 continued.

A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	
c. Operational	X	The emphasis was on the operational level, with some tactical implementation issues.
A7 E-learning development phase	Present	Additional information
a. Start	X	Although the production unit had extensive experience in the use and development of learning programs on CD-ROM, the e-learning development was still premature and therefore on the 'starter' level.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level	X	Most participants were on the information level, with the human resources officer on the level of initial personal skills
c. Initial personal skills	X	
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data-collection procedure

B1 Sites and contact persons

The production unit is part of an international business unit focusing on packaging and non-packaging applications. The main contact person was the Human Resources Officer, with a leading position in the training department of the production unit. The Analysis Framework Approach produced the outline for two pilot projects. Involved in the initial development phase of the pilots were representatives with a direct responsibility for training and the manufacturing manager of the packaging, warehousing and distribution sector, where one of the pilots was going to take place.

B2 Data-collection plan

The Analysis Framework Approach took place from September – October 2001 and was the second experiment in a row of experiments in the steel industry. The time spent for the total procedure was 80 hours. This included the preparation, the intake, the execution of the analysis, the reporting, and the initial discussion on the pilot projects with the stakeholders, and finally the presentation of the results. The main contact person acted as an active partner in motivating the participants for the pilot

projects. This positive attitude was of crucial importance for the outcome of the Analysis Framework Approach.

B3 Preparation of the visit

The corporate training centre initiated the organisation of the Analysis Framework Approach. The centre wanted to obtain more information about the state of affairs in the unit considering the use of ICT, the contribution e-learning could make to solve the emerging training problems and the role the centre was expected to play in this development. The unit itself wanted to analyse its training situation more thoroughly to see where and how e-learning could help to improve the training organisation and services. These considerations led to the decision to select some of the interview items as items which should be discussed under all circumstances.

C. Case study observations and experiences

CI Rational for the use of the Analysis Framework Approach

Apart from the motivation of the corporate training centre to conduct the analyses, the focus here is on the arguments of the production unit. This unit is faced with a continuous process of change and innovation, and feels the need to prepare the employees for dealing with these changes. An important issue is the change in tasks and the need to improve and extend the facilities to train the workforce in a timely and adequately way. Therefore training and learning should become a continuous process with the possibilities to store relevant information and experiences at any time and at any place. This and other business information should be made easily accessible. There is a need for a transparent reporting system on the progress and achievements of the learner, so the employee and the supervisor can keep track of what is going on. Experiments with systematic training methods, the use of instructional technology and the development of in-house instructional materials were less successful than expected, and one of the reasons was the investment in time and money. The same thing could happen to e-learning development, so a thorough analysis is required to make sure what contribution e-learning could make in solving the training problems.

The use of communication technologies is considered a key for the solution of the training problem. The unit has experiences in the use and the development of digital learning materials for CD-ROM, and although the results were not spectacular, one expects e-learning to help out with both content and organisational issues. The fact that the Analysis Framework Approach uses an integral approach, meaning that all the elements of the business column training and learning are taken into account, was decisive in the decision to conduct the analysis.

C2 Observations in conducting the Analysis Framework Approach

The analysis was conducted after two intake sessions. There was an interim and a final report on the Analysis Framework Approach, including the outline for two pilot projects. The report also contained an analysis of one of the pilots, which was planned to take place in the distribution sector of the unit. This analysis was later on used to develop the pilot and appeared to be very helpful to get an overview of all the issues at hand to make the pilot project work.

The Analysis Framework Approach procedure and report appeared to supply insight and information on the contribution e-learning could make to solve the training problems. It led to the development of two pilots, one on the routing of products in the distribution centre and one on reporting issues like registration and progress reports for the training organisation.

C3 Experiences of the consultant using the analysis framework

It was the second experiment. A consultant and the consultant-investigator executed the analysis. The corporate training center took the initiative for this Analysis Framework Approach and was as participant observer involved in conducting the analysis. The selection was too small to be representative. It did not seem to change the outcome of the analysis, but involvement of a broader group of participants would have improved the level of information and the decision-making process for the follow up. The broader group should include for example the HR manager and a representative collection of middle management. Linked with the issue is the notion that when, like in this case, a forerunner is to promote the innovation, the connection with the other potential supporters needs to be taken care of.

The questions need to be operational and allow for a 'selection' of the most important issues in the eyes of the interviewee. The interviewer will not at all times be able to anticipate the situation fully when inside information is hard to regain. It was difficult to figure out if the Analysis Framework Approach led to an improvement of the level of understanding, although the proposals for the pilots showed a knowledgeable consideration of e-learning. In the situation at hand, where the interviewee is an experienced training person, the interviewer needs to be an e-learning expert to guide the dialogue which is an important aspect of the analysis. The fact that there was only one informant involved in the analysis process made it difficult to get a clear view on the ins and outs of the training activities. Later on in the development of the outline and the preliminary pilot projects, more people got involved.

The reports were produced and there was a follow up with two pilot projects. The primary client, the human resources officer from the production unit, and the corporate training center, were satisfied with the procedure of the analysis as well as the results. In some instances it seems to be difficult to bridge the gap between the

question, the understanding of the question by the interviewed and the understanding of the answer by the interviewers. The main reason for this seems to be the information gap of the interviewer concerning the training culture and organization.

The Analysis Framework Approach was doable, but the need for additional information on the context in which one is operating is a point of concern.

D. Synthesis

D1 Conducting the Analysis Framework Approach

The corporate training center took the initiative for this analysis and was present as participant observant. The analysis served two goals: the training center needed information about the state of affairs on e-learning and the unit wanted to know how to use e-learning to solve their training problems. Although the unit had extensive experience in the use and development of learning programs on CD-ROM, the e-learning development was still premature and therefore on the 'starter' level. There was one main contact person. Even though this person was very motivated, the involvement of a broader group of participants would have improved the level of information and the decision-making process for the follow up.

The interviewee was an experienced training person, with over 20 years of training involvement. The interviewer needs to be an e-learning expert to be able to conduct such an interview in an acceptable way. Guiding the dialogue is a main operating feature of the Analysis Framework Approach.

The outcome of the analysis was influenced by the fact that the interviewers felt that they had an information gap regarding the training culture and organization. Training has traditionally been a strong element in this corporation. The Analysis Framework Approach though was successful and there were two pilots developed as a follow up.

D2 Conclusions concerning the portability and the changes to be made in the Analysis Framework Approach (RQ 7 & 8).

The analysis was used for a second time in the steel corporation, but for another production unit. This meant a different type of organization and a different training-and-learning context. Participants were the consultants, a representative from the corporate training center and the human resources officer from the production unit.

Concerning the portability:

- The analytical value of the analysis depends for a great deal on the quality of the interview, for which the preparation of the interviewee and the interviewer is an important element. Being better informed about the context of the training situation and the position and background of the people

interviewed support the portability and indeed the flexibility to use the analysis in different situations.

- Two pilots were chosen, being the most urgent. A lot of other pilot ideas were discussed. The selected pilots were on: the routing of products in the distribution centre and the other one on reporting issues, like registration and progress reports for the training organisation. The outcome of the Analysis Framework Approach allowed for different kind of pilots and not one sort of solution.

Changes to be made:

- The intake should be carefully prepared to be able to have a representative group of people taking part in conducting the analysis. It is not just about the state of affairs, but also about the 'ability' of the organization to mobilize the right people and resources. This should be emphasized in the 'analysis user guide'.
- How to deal with and help a forerunner? The analysis should have a focus on the motivation and resources issue and the means for a sustainable development.
- For operational purposes the questions/interview items should be better stated. More operational in this case means that the items should serve as a guideline and not as a set of questions which should successively be dealt with.

5.2.2 Case # 6 Training sector: Regional college for vocational and adult education

This section follows the same organization as the previous case using the categories of the case-study protocol (see Table 24).

A. The context of the case study

A1 Company or organization

This organization is a large college for vocational and adult education in the Netherlands, serving a particular geographical region. The abbreviation for the type of college in Dutch is: ROC (Regionaal Opleidings Centrum).

A2 Main activity of the company/organization (profile)

The organization consists of 50 educational centers with 1800 staff members, serving over 20.000 students from age 16 onwards. The college has 7 business units offering different kinds of courses and a central administrative apparatus, including an educational development unit and a central division for student support. The college

offers a large number of courses in the vocational (workforce) areas at different levels (there are 4 levels) and as full- and part-time courses and apprenticeship. The areas covered are: engineering, economics, care, health and tourism. The unit of adult education has about 4.000 students, offering courses in basic adult education (numeracy, literacy), Dutch as a foreign language, general secondary adult education, training for the unemployed.

A3 Consultant, student, investigator

A senior consultant from CINOP executed the Analysis Framework Approach in close collaboration with the project leader for e-learning at this ROC. The intention was to prepare the project leader to use the Analysis Framework Approach independently. In total six Analysis Framework Approaches were carried out. Three analyses were done by the consultant and the project leader together. The remaining three were done by the project leader, who wrote all the reports with the help of the consultant. The investigator was not directly involved having a remote, reflective role.

Table 28 shows the results of items A4-A8.

Table 28 Presentation of factual information on case study # 6

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis Framework Approach report	X	There were six reports, from six different units, using different outlines. The original outline was changed to fit the context better.
c. Specific information on learning and training	X	The main teaching model
d. Outline e-learning pilot	X	Development of unit project plans using the outcome of the analysis.
e. User's guide		
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the Analysis Framework Approach' (interviewer)	X	Both the consultant and the project leader have been interviewed by means of the questionnaire.
h. Observation (Investigator)	X	Both the consultant and the project leader have been asked to give their opinions about the concept case-study report. The outcome of these discussions is used in this final report.
i. Participative observation (Investigator-consultant)		
j. Taped Analysis Framework Approach interviews	X	A few sessions were recorded.

Table 28 continues ...

Table 28, continued.

A5 Organizational level	Present	Additional information
a. Company learning strategy	X	Background was an organization-wide e-learning initiative. Progress and results will to be reported to the management team.
b. HRD & HRM		
c. Training organization	X	Each unit can be considered an independent organization.
d. Training program	X	Each unit organizes different training programs within their main area.
e. Training course	X	Focus was on operational pilots in particular subject areas or organizational settings (part time, coaching)
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	Although there was a direct connection with the management board, the execution of the e-learning activities was delegated to the internal project leader. He operated mainly on the tactical level with most of his co-project workers functioning on the operational level.
c. Operational	X	
A7 e-learning development phase	Present	Additional information
a. Start	X	The majority of the participants can be qualified as starters, although there were variations between the different people and units. At large the college is in the first, starting phase of e-learning implementation while working on defining the pilot phase.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level		
c. Initial personal skills	X	A majority of the participants are on the level of Initial personal skills. This is the level on which there is a desire to try out the possibilities of an innovation.
d. Level of routine use of some aspects	X	There is a small number of people, who are on the level of routine use of some aspects of the innovation and can be qualified as the 'fore runners'.
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data-collection procedure

B1 Names of sites and contact persons

- 50 sites in the center of the country, but the meetings took place on one central location
- contact person: project leader for the overall e-learning project

B2 Data-collection plan

- April – June 2002
- Time investment for the consultant was 30 hours
- The project leader did the most time-consuming activities, like the selection of the participants. Part of the effort was to prepare the project leader on how to conduct the Analysis Framework Approach.

B3 Preparation of the visit

The consultant was familiar with the organisation and has worked together with the project leader for several years in different settings. The preparation of the Analysis Framework Approach was done in the form of a discussion on the objectives, how the sessions would be organised and the division in tasks between the consultant and the project leader. Financial resources for the external consultant were restricted and led to a reduction of consultancy time and involvement.

C. Case-study observations and experiences

C1 Rational for the use of the Analysis Framework Approach

The actual organizational and educational model is predominantly linear and not flexible enough to deal with the changes taking place. The reduction of the number of students, the increased heterogeneity of the student population, the increase in part-time students and the quickly changing needs of regional companies, being the main job suppliers for students, press for more flexibility in the organization and the use of other, and more diverse educational models. E-learning is expected to help out on these issues and the Analysis Framework Approach should support the discussion and facilitate the analysis on the state of affairs. The analysis was considered a guide for the interviews and a help for making implicit thoughts more explicit, like perspectives on e-learning and expectations of the added value and results.

The college has some experience in the field of e-learning and considers it a good alternative to make education more flexible, offer more tailor-made learning solutions, become more effective, increase quality and improve the image and attractiveness of the college. To achieve these goals, the college has started an e-learning project, which includes three phases:

- Phase 1: Preparation of the pilot phase (April 2002 – December 2002)
- Phase 2: Pilot period (January 2003 – July 2004)
- Phase 3: Implementation-/enlargement until July 2005

The Analysis Framework Approach was used in Phase I in preparation for the unit project plan for the pilot period.

C2 Observations in conducting the Analysis Framework Approach

The decision was made to start a college-wide e-learning project. The next step was to settle on the procedures for Phase I. The college decided to do a Analysis Framework Approach for a 'zero-analysis' of the state of affairs. In other words: where are we with e-learning development? The Analysis Framework Approach was considered a good instrument to deal with the status of the different units concerning e-learning, but less accurate pertaining the willingness of the participants to contribute and support this development. The Analysis Framework Approach did not contain specific-enough interview items on this issue and therefore it was decided to combine the Analysis Framework Approach with the matrix model of Tichy, which is a diagnostic model for the inventory and analysis of success factors and inhibiting factors for organizational change. The combination was called the 'Monitor e-learning' and was described as the analysis instrument for Phase I of the e-learning project.

The Analysis Framework Approach contains interview categories which normally are used in a fixed sequence. The project group decided to change the sequence and start with the category 'content', instead of 'organization'. Looking at the outcome of the 'monitor e-learning', it seems that this change of sequence caused a greater focus on primary process issues than expected, causing some imbalance.

The outcome of the monitor e-learning was:

- A strong emphasis on organizational flexibility and tailor-made learning offerings as a prime concern.
- E-learning should help to manage this diversity.
- Coaching can be upgraded, not only for the traditional internships.
- Put forward flexible (content and speed) learning offerings for other and new target groups.

Thresholds:

- How to define e-learning? How to discriminate between e-learning and other activities?
- The discussion seems to focus on a mixture of wishes and goals which are only partially guided by clear business objectives.
- The financials need clarification and need to become more transparent.
- There is a lack of e-learning skills. How to prepare the teacher and how to integrate these skills in the process?
- E-learning content is only sparsely available, how to proceed?
- Dependence on well functioning IT support.

Each unit developed an e-learning implementation plan on the basis of the outcome of the 'monitor e-learning'. According to an internal monitoring report, quite some progress is being made with conducting the original pilot projects in line with the planning.

C3 Experiences of the consultant using the analysis framework

There was an intake meeting with the project leader who took care of the selection of participants from the different units. A meeting was organized with these e-learning representatives to discuss the procedures of the monitor e-learning, on which all agreed. Additional information on the organization was used in preparation. The representative selection of people was also the group to work with after the Analysis Framework Approach. The consultant did not have the opportunity to talk to the responsible manager to verify what support to expect on the highest level in the organization.

Version 0 of the Analysis Framework Approach was used in an adapted format. The sequence of categories was changed and interview items were adapted, replaced or added, depending on the goal, the target group and wishes of the project leader.

The Analysis Framework Approach is a semi-structured interview to allow for dialogue. This worked well. At the beginning the participants were not so sure about the effectiveness of the format, but it turned out to be a good experience. The interviewee reacted positively on the format and expressed the feeling that they had achieved a better understanding of e-learning and developed a lot of ideas.

To be able to conduct an Analysis Framework Approach, the interviewer needs to be well prepared. An introduction on paper, a hands on session or acting as a participating observant, is not an adequate-enough grounding. One needs to be an e-learning expert who is familiar with e-learning 'good' practices and the e-learning

market, someone who is knowledgeable about the client and can adept the Analysis Framework Approach interview items to the client context.

There was a division of roles. The consultant worked closely together with the project leader and the idea was to prepare and train the project leader to perform as an consultant, to be able to do the Analysis Framework Approach by himself.

Another format was used for reporting and the clients were satisfied with the adapted format. The project leader was, for strategic reasons, reluctant to come forward with recommendations on the basis of the Analysis Framework Approach. The effect was that the reports, each unit had its own report, were too-much restricted to 'telling the story' of the past, instead of focusing on what would be next. The reports were not directly used for the follow up, but were considered helpful as a reference in the decision-making process on the choice of pilot-project themes.

From the consultant's point of view the objectives were met. The primary client, the project leader, was satisfied. The units were less fulfilled because they expected clear-cut recommendations which would have made it easier for them to proceed. The project leader though valued the decision making process with the units as part of the implementation strategy. A follow up of the participation of the consultant in the project is foreseen.

The Analysis Framework Approach was doable, although the reduction in consultancy time impacted the outcome negatively. The consultant prefers to finish the Analysis Framework Approach with a clear-cut outline for the next step to ease the transition to the next phase and to try to assure a continuation of the advisory work.

The Analysis Framework Approach was used for a 'zero assessment'. During the conduction of the analysis, the aspiration emerged of being able to use the analysis repeatedly, at different phases of the project. The main question was: what are the requirements to be able to make the next step? If the Analysis Framework Approach can be used to decide on the requirements, then this instrument can be of great help during all the phases of an e-learning implementation.

Although there was no preference for using the business-model category as a main issue during the analysis, most participants implicitly and explicitly talked about the added value without being able to describe this value in clear terms. The consultant could increase his value for the project by supporting the business-model issue in ROI-terms as this still is a field to be discovered by educationalists, but important where e-learning is at stake.

D. Synthesis

D1 Conducting the Analysis Framework Approach

There was a mixed use. Three Analysis Framework Approaches were conducted by the consultant in collaboration with the project leader, and three by the project leader independently. The Analysis Framework Approach was well received and functioned well, but missed out on the need for the zero-analysis regarding the willingness of the participants to support the e-learning development. Therefore the analysis was combined with the Tichy matrix to become the 'monitor e-learning'. As a consequence, the Analysis Framework Approach procedure was adapted. The effect was that there was a less-solid outcome in the form of plans for the follow up. But, as the project leader stated, being reluctant to come forward with clear recommendations was also a conscious move as part of the implementation strategy to increase the involvement of the units.

There was an emerging need for the business-model aspects and the wish to re-apply the analysis in the different phases to secure the readiness of the organization and participants to move to the next phase of development and implementation.

D2 Conclusions concerning the portability and the changes to be made in the Analysis Framework Approach (RQ 7 & 8).

Concerning the portability:

- The Analysis Framework Approach was used in combination with another instrument. It kept its analytical performance, but lost some of its value because of the enlarged scope of the e-learning monitor.
- The analysis was used in close collaboration between the consultant and the project leader and independently by the project leader.
- It was used for the different units at the college, which means different educational contexts and different levels of development.
- There was a clear wish to use the analysis over and over again to ascertain the requirements needed, before moving on to the next phase.

Changes to be made:

- The need for assessment of the 'attitude to e-learning' issue should be taken care of. Previous experiences with innovation were the main source for this need.
- The Analysis Framework Approach represents a sequential and formatted approach. This does not necessarily coincide with the intention, the policy or innovation strategy of the client. The consultant needs to adapt and be able to

adept the Analysis Framework Approach to the client's context, without losing the 'added value' of the approach. Therefore there should be a short guideline to help the consultant to decide about the changes to be made in the Analysis Framework Approach, without losing too much of its accuracy and usefulness.

- A consultant needs to be an expert to make these changes and adapt the analysis to the client's context. The expert preparation of the consultant can not be done incidentally and is beyond the scope of the analysis. An option, which would fit within the scope of this analysis, would be a short description of the knowledge and skills such an expert needs to have.
- There is a growing concern about the financials when it comes to e-learning. This means that the business-model category should be extended to fulfill this need.
- There was a strong desire to use the Analysis Framework Approach repeatedly in the different phases of the implementation process. The argument was, that the evaluation of existing projects only gives the information on what has been done in the project and that is not enough. You also need information on how the project relates to the overall implementation process and strategy. The analysis would be a good tool to conduct this cyclical investigation.

5.3 Cross-Case Analysis

The next step in this empirical research is to take a closer look at the outcome of the case-study analyses by comparing the results and see what the critical issues are in relation to the portability and the improvement of the analysis. This next step consists of a cross-case analysis, which is the explanation-building process for the analysis of multiple cases. A uniform framework is used for the presentation of the data from the individual cases. In our research, this framework is called the cross-case analysis schedule. This schedule includes the same information items as the case study, but the information is restricted to the most important issues, written down in a concise word table format (see the Tables 29 and 30). This format is needed to be able to conduct this deduction process and develop an overview of the important issues, so the findings of the different cases can be compared and discussed. The investigator uses this information, which is based on empirical data, to develop arguments on the portability and the changes to be made to Version 0 for the improvement of the Analysis Framework Approach. The structure of the schedule is based on the information items of the case study report outline. An overview of these items is shown in the first column of the schedule. Subsequently, the information on the different case studies can be found in the other columns. There are in total six different cases. Each of these cases is described and used in the cross-case analysis (see Section 5.5.1)

Table 29 Cross-case analysis schedule, Cases # 1 - 3

Cases # 1 - 3	# 1 Steel industry: metal strip production unit	# 2 Steel industry: metal packaging production unit	# 3 Steel industry: corporate training organization
A. Context			
1. Company	Steel sector	Steel sector	Steel sector
2. Main activity (profile)	Metal strip production in a new, high-tech production plant with 200 employees.	Metal packaging. Products: tin material for cans, and others. International unit with 1100 employees in the Netherlands.	Corporate training organization, responsible for the introductory and basic training of trainees and newcomers. Focus of the analysis is the basic course on environmental issues.
3. Consultant	Learning consultant & consultant-investigator	Learning consultant and consultant-investigator.	The consultant-investigator
4. Available resources	Online & paperware; Analysis Framework Approach report, training info, interviewer questionnaire, participative observation, taped interviews	Online & paperware; Analysis Framework Approach report, training info, interviewer questionnaire, participative observation, taped interviews	Online & paperware; Analysis Framework Approach report, training info, interviewer questionnaire, participative observation, taped interview
5. Organizational level	HR, training organization & program	HRD, training organization, program and course.	Training organization, program and course.
6. Management level	Tactical & operational	Operational level, with some tactical issues	Tactical level
7. E-learning development	Starters level	Starters level	Starters level
8. Stages of awareness	Information & initial personal skills level	Information & initial personal skills level	Information level
B. Procedure			
1. Sites and contacts	One of several production units on a site in the Netherlands. Senior engineer trainer and HR manager	This unit is part of an international BU for packaging metal applications. Contact person was the human resources officer, also involved in training .	Corporate training center for the Netherlands. Main contact was the manager of the department for general training.
2. Data, time, effort	Sept – Oct 2001; 50 hrs; organization of the meetings took more time than expected	Sept – Oct 2001; 80 hours. The time spent on Analysis Framework Approach procedure & discussion with stakeholders on pilot projects.	Oct – Nov 2001; 40 hours. The time spent on the intake, execution of the analysis, the reporting, and initial discussion on the pilot.
3. Preparation of the visit	Initiative by the corporate training	Initiative by the production unit, but	The department took the initiative, but the funding

Cases # 1 - 3	# 1 Steel industry: metal strip production unit	# 2 Steel industry: metal packaging production unit	# 3 Steel industry: corporate training organization
	center. 2 intake meetings, 2 participants from other units, HR manager in the final phase	funded by the corporate training center. 2 intake meetings, selection of items in relation to solution of training problems.	came from the corporate training center. There were two preparatory meetings and an analysis of existing, related training offerings.
C. Case-study observations and experiences			
1. The rational	<p>Lack of organizational structure for introductory training of new comers and temporary workers.</p> <p>Key terms: Limited availability of information; lack of a teaching model; no admin for the learning process.</p> <p>E-learning: Flexibility in the organization of training and direct workplace related learning.</p>	<p>Because of the continuous process of change and innovation, a different approach for learning is needed, including a transparent reporting system. Integral approach (training business column) decisive for the use of the Analysis Framework Approach.</p> <p>Key terms: Train timely and adequately, it should be a continuous process, and easily accessible.</p> <p>E-learning: Use of ICT is considered key. Recent experiences with digital solutions were not successful.</p>	<p>The need for more flexibility to cope with the increasing training demand; the need for tailor-made solutions; lack of teachers and the wish to serve third-party clients. The focus was on the basic course on environmental issues.</p> <p>Key terms: Efficiency in course development; improvement of content handling and reuse; better testing possibilities; increased quality by standardization; new business model.</p> <p>E-learning: ICT use is considered crucial to be able to deal with the key needs. The Analysis Framework Approach was considered a tool for analysis, also providing some insight on the expected return on investment.</p>
2. Observations	E-learning is good for: availability of company information; admin of learning activities; overview of progress and results and makes learning more	The report contained an analysis and the outline of two pilots. The analysis supplied insight in the usefulness of e-learning to solve training problems and the features of a pilot	The analysis was conducted in the context of the environmental-issues course. The analysis was a good help to get an overview of the relevant issues. There was special attention for the

Cases # 1 - 3	# 1 Steel industry: metal strip production unit	# 2 Steel industry: metal packaging production unit	# 3 Steel industry: corporate training organization
	transparent	project.: As a follow up, one pilot project was developed and implemented.	renewal of the business model. The final report was used extensively to discuss e-learning with the staff of the department and other stakeholders. The analysis was the start for the development of the course on environmental issues.
3. Experiences	Not available.	This was the second experiment. The selection of stakeholders was too small. A broader group would have improved the level of information and decision making for the follow up. Contact person as forerunner who did not seem to connect well with other stakeholders. E-learning and training expertises were needed to guide the dialogue. In some instances it appeared to be difficult to put the question in the right context to increase the level of understanding.	This was the third experiment in the steel industry. Not in a production unit, but in the corporate training center. The basic procedure was used. Mostly management issues were discussed. Involvement from more stakeholders would have been helpful for later discussion. Strategic and political issues though are not at all times suited for a broader discussion. Increasing awareness on the usability of e-learning in relation to organizational flexibility.
D. Synthesis			
I. Conducting the approach	It was the first experiment. It helped to clarify the existing training problems. Following the outline was difficult, because of the 'associative way of thinking and reacting'. 'We relate everything to the production'. The consultant was not well-enough prepared for this situation. The involvement of stakeholders was not optimal.	The consultant needs to have a certain level of expertise, especially in a situation where experienced training persons are interviewed. The 'dialogue' is the main operating feature of the Analysis Framework Approach and for this the consultant should be very much aware of the 'information level' of the interviewed. Training has traditionally been a strong element in	The difference with the two earlier analyses was the focus on the strategic level. The analysis helped to position e-learning relative to other training and learning offerings. This strategic information was very helpful for the development of an outline for the pilot, in collaboration with a broader group of stakeholders.

Cases # 1 - 3	# 1 Steel industry: metal strip production unit	# 2 Steel industry: metal packaging production unit	# 3 Steel industry: corporate training organization
		<p>the unit and there was extensive experience with digital training material. The analysis was not optimal, because: the number of participants was small, the focus was limited, information level of the interviewed was hard to grasp.</p>	
<p>2. Relevance for the research questions</p>	<p>Portability:</p> <ul style="list-style-type: none"> ○ First experiment ○ Systematic approach well received ○ Final report used as reference, both by the unit and training organization <p>Changes to be made</p> <ul style="list-style-type: none"> ○ Add questions about 'learning culture' ○ Assure participation of stake holders with a management position, if this is decisive in the decisionmaking process. ○ Make interview items more operational (further development of sub categorization and related questions). ○ Stay close to the categories ○ ROI: what is the added value? This issue keeps coming back. Extend the category business model. 	<p>Portability:</p> <ul style="list-style-type: none"> ○ The analytical value of the analysis depends on the quality of the interview. Preparation is an important element. Context is a dominant issue. ○ Pilot ideas were discussed and two were chosen as the most viable. ○ Good guidance was given by the problem orientation of the pilot. <p>Changes to be made</p> <ul style="list-style-type: none"> ○ Improve the 'Analysis Framework Approach user guide' with information on: 'ability' of the organization to mobilize the right people and resources for the analysis. ○ With such a new development the information-level issue should be dealt with more extensively. ○ Questions and items should be stated more operationally. Should function as a guideline not as a set of questions. 	<p>Portability:</p> <ul style="list-style-type: none"> ○ Limiting the analysis to the strategic or tactical management level is helpful in situations where e-learning has not yet a track record. ○ The value of involvement of stakeholders depends on the goals of the prime client. ○ The outcome of the analysis on this strategic level could in an adapted format also be used at other levels. This is another view on the portability issue. <p>Changes to be made:</p> <ul style="list-style-type: none"> ○ Important to determine beforehand what management level is the primary level. Focusing helps to avoid misunderstanding and wrong expectations. ○ The consultant should be very conscious of the 'transition' of the outcome of the analysis to other levels.

Table 30 Cross-case analysis schedule, Cases # 4-6

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
A. Context			
1. Company	Steel sector	Steel sector	Training sector
2. Main activity (profile)	Product staining subdivision of the Hot strip Mill, one of the most important production units of the company. The subdivision started early 2001. At the time of the analysis, there were 40 employees with a lot of newcomers and temporary workers. The production and working processes were slowly reaching stability.	The color coating unit is responsible for the finishing of steel products. The products are used in construction, automotive and domestic appliance sectors. It is an international unit with 500 employees on the site in the Netherlands.	It is a large college with 50 educational centers, 1800 staff members and over 20.000 students from age 16 onwards. There are 7 business units' offerings a large number of courses in the vocational (workforce) areas at different levels. The unit of adult education has about 4.000 students.
3. Consultant	Two learning consultants. The investigator had a remote role.	Learning consultant and consultant-investigator.	A learning consultant in close collaboration with the project leader e-learning. The investigator was not involved.
4. Available resources	Online & paperware; Analysis Framework Approach report, training info, interviewer questionnaire, taped interviews	Online & paperware; Analysis Framework Approach report, training info during intake, interviewer questionnaire, participative observation, taped interviews.	Online & paperware; 6 Analysis Framework Approach reports, training info, interviewer questionnaire, a few sessions were taped.
5. Organizational level	Training organization, program, course and information and knowledge management.	HRD, training organization, organization, program and others: information management.	Each business unit participated in the analysis. The representatives were active on the levels: organization, program and course level.
6. Management level	Tactical & operational	Tactical level	The initiative was taken by the central organization. This means that the project leader clearly was working on a strategic level and the business units more on a

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
			tactical level during the conduction of the Analysis Framework Approach. The follow was 65very much operational.
7. E-learning development	Starters level	Starters level	In general on the starters level, although some units and some people had previous experience with e- learning.
8. Stages of awareness	Information level	Information & initial personal skills level	Except for the forerunners, the majority was on the level of initial personal skills.
B. Procedure			
1. Sites and contacts	The subdivision of a production unit, responsible for their task -related training. Main contacts: employee responsible for training and information management. The analysis took place with the presence of participants from the strip production hall, where e-learning was already implemented.	The unit is part of an international Business Unit for color coating of steel products. The main contact was with the training developer and the training coordinator. In addition there was one participant from the hot strip mill, where e- learning was already implemented.	In total there were 50 sites, but the contact was only with 15 to 20 representatives of the business units and not with particular sites. The main contact person was the project leader e-learning.
2. Data, time, effort	Nov - Dec 2001; 60 hrs; organization of the meetings took more time than expected. Difficulty was the dual agenda: training needs and related information management. The total Analysis Framework Approach procedure was conducted, including the discussion on the pilots.	Jan – Feb 2002; 60 hours. Time spend on Analysis Framework Approach procedure & initial discussion on the follow up.	April – June 2002; 30 hours. The project leader did most of the work. Together with the consultant an approach was developed which would fit objectives of the e- learning project.
3. Preparation of the visit	Initiative by the subdivision after consultation with the hot strip mill division and with support of the	Initiative by the production unit, but funded by the corporate training center. There were 2 intake meetings.	The college had decided on an e-learning project and the analysis would be used for the initial analysis. The action was prepared by the

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
	corporate training center. Several intake meetings, 2 additional participants from another division.	Two items appeared to be of prime interest: the organization of the training and the content development and maintenance.	consultant in close collaboration with the project leader.
C. Case-study observations and experiences			
I. The rational	<p>The organizational structure for training is not adequate to support newcomers and experienced workers.</p> <p>Key terms: New sub-division with unstable production processes; machine and process-related information is lacking; no means to handle this; no educational model; working schedule makes traditional classroom training impossible.</p> <p>E-learning: Support development, administration and maintenance of information material (learning content); more flexibility in time and place; better plan, structure and register learning activities; training more measurable and transparent.</p>	<p>The management was well aware of the difficulties with training and content, but there was not yet a viable solution at hand.</p> <p>Key terms: 'Father – son' model of knowledge transfer and training is outdated; more flexibility in the training model due to the speed of changes; tools for easy and quick content development; administrative tools, reporting utility on training achievements and results; connections with SAP.</p> <p>E-learning: Allows for more flexibility; might offer an electronic alternative for the 'father – son' method; lower the threshold for content development by different people; tracking progress and results for the individual learner and the organization.</p>	<p>The educational model is predominantly linear and therefore not flexible enough.</p> <p>Key terms: Reduction of the number of students; increased heterogeneity; more part-time students; changing needs of employers; the need for more variety in educational models.</p> <p>E-learning: E-learning is considered a good alternative to make learning more flexible; offer more tailor-made learning solutions; increase the quality; improve the image and attractiveness of the college.</p> <p>To achieve these goals an e-learning project was started. The Analysis Framework Approach was used in phase I: preparation of the pilot phase (April – December 2002).</p>

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
2. Observations	<p>It took time to clarify the goals and responsibilities for training and information management. There was a broad group of participants. There was an interim and final report, including suggestions for a pilot. The report functioned as a first analysis of the training situation, not just an analysis in relation to e-learning. The information issue was crucial to develop any e-learning. Anyhow, the conclusion was that e-learning would help to structure training, make it flexible and would help to solve the content-development dilemma.</p>	<p>The approach taken was rather technical and content oriented. E-learning was perceived as very promising. The initial pilot ideas were: pre tests; development of a first-aid kit format for quickly emerging training problems of small and more-extensive courses. The emphasis in the analysis shifted more and more to the content development issue. It was decided to copy the e-learning model used by the hot strip mill. Main component of the content was video. This was good-quality material, but lacked the didactical and organizational framework and therefore lost a great deal of its potential.</p>	<p>A college wide e-learning project was developed. It was decided to start with a 'zero-analysis' of the state of affairs. The Analysis Framework Approach was seen a good instrument, but considered less accurate pertaining to the willingness of the participants to contribute and support this development. Therefore the analysis was mixed with the matrix model of Tichy, a diagnostic model for the inventory and analysis of factors for organizational change. This combination was called 'the monitor e-learning'. In total 6 monitoring sessions took place. One of the thresholds mentioned was: how to define e-learning and how to discriminate between e-learning and other activities?</p>
3. Experiences	<p>It was the fourth experiment, conducted by two learning consultants. The investigator was not directly involved. The general procedure was followed. The report was useful to structure the discussion and the decision-making process of how to proceed. Participants seem to be better able to judge the possibilities of e-learning. Clearly though, without a</p>	<p>This was the fifth experiment. The group of interviewees was not representative enough as it became clear during the analysis. The analysis helped to clarify some organizational, process and technical e-learning issues, but failed to clarify that a holistic approach is needed to make it work. The consultants assessed themselves not being very successful in inviting</p>	<p>Important issue in the preparation was the procedure for conducting the monitor. The project leader conducted 3 monitors by himself. So the first three were 'learning' events. The analysis was used in an adapted format: combination with Tichy, change in the sequence of categories and adaptation of interview items. The interviewees were positive on the format and</p>

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
	<p>good system for content development, e-learning would not be very useful.</p>	<p>the right people, recognizing the political interest and clarify the imbalance between the problems mentioned and the persuaded solutions. The focus was too narrow, which limited the usability of the analysis. Despite this the client was satisfied, the report helped to decide about how to proceed. There was no follow up for the consultants.</p>	<p>felt that they had achieved a better understanding of e-learning. One needs to be an e-learning expert to be able to conduct the analysis and be knowledgeable about the client. The consultant prepared the project leader for conducting the analysis. The project leader was reluctant to come forward with firm recommendations on the basis of the Analysis Framework Approach. So the reports were a bit more like 'telling the story' of the past, instead of focusing on what would be next. This was a strategic decision to stimulate commitment by the different units. The objectives were met, the analysis provided the framework for the 'zero assessment'. The main issue was: what are the requirements to be able to make the next step?' There was no preference for using the business model category, but each participants showed interest in the 'added value' of e-learning.</p>
D. Synthesis			
<p>I. Conducting the approach</p>	<p>There was a strong focus on the production process with no time left for training and information management. E-learning was considered a problem solver to speed up the training process and</p>	<p>The Analysis Framework Approach provided a good analysis of the existing problems, but the discussion on the solutions focused too much on the content issue. Therefore the usability of the analysis</p>	<p>The monitor was well received and functioned well, but missed out on the measurement of the willingness of the participants to contribute to the development. The Analysis Framework Approach procedure was</p>

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
	<p>information development. Therefore the scope was enlarged. As a consequence more time was needed to decide what to do. The consultants were invited to support the pilot development.</p>	<p>was limited. Important feature of the analysis is to avoid fragmented analysis to make sure that the relevance of the suggested solutions is as high as possible. Narrowing the focus to content development, limits the usability of the analysis. The conclusion can be that narrowing the bandwidth affects the usability of the analysis negatively.</p>	<p>part of the analysis carried out. There was mixed use, both by the project leader and the consultant. An emerging need was shown for aspects of new business models and the wish to re-apply the analysis in the different phases of e-learning development.</p>
<p>2. Relevance for the research questions</p>	<p>Two issues: the missing structure of training activities and the lack of content.</p> <p>Portability:</p> <ul style="list-style-type: none"> ○ Before the case the analysis had been used in a rather stable training situation (enough structure and content). This was lacking in this case ○ As a consequence the focus was enlarged, including information-management issues. ○ The danger is that the analysis might become less usable, because the problem-orientation is extended to other areas. ○ The suggestion could be to perform multiple analyses or have more than one interview with different stakeholders. ○ This is a 'bandwidth' 	<p>Portability:</p> <ul style="list-style-type: none"> ○ Important notion is that the Analysis Framework Approach needs to have a certain bandwidth for optimal use. ○ A too-broad or too-narrow scope causes a fragmented analysis and effects the usability. ○ For the time being the 'educational business column' as presented in the categories of the quick scan phase, is considered to provide the structure for the optimal bandwidth. ○ Portable, yes, but in any event one should be aware of the needed competencies to conduct the analysis. This is true for the interviewer and for the 	<p>Portability:</p> <ul style="list-style-type: none"> ○ The analysis was used in combination with another instrument. It kept its analytical performance, but lost some of its value concerning the choice of solutions. ○ It was used by different people in the course of one project and in collaboration with different business units. ○ Re-use of the analysis was an issue because of the need to 'measure' the progress and results of the different projects relative to the overall e-learning objectives and to prepare for the next step. ○ Re-use includes the inventory of requirements needed to be able to make the next step, often described as the readiness of an organization to start or proceed with a development.

Cases # 4- 6	# 4 Steel industry: product staining subdivision	# 5 Steel industry: color coating unit	# 6 Training sector: regional college for vocational and adult education
	<p>issue of the analysis.</p> <p>Changes to be made:</p> <ul style="list-style-type: none"> ○ Add information on the bandwidth issue to the user guide. ○ Emphasize the problem orientation and the learning context-related nature of the analysis. ○ There is a preference for the involvement of primary stakeholders. Be cautious about mingling with other participants, because it might cloud the discussion and outcome. 	<p>interviewee.</p> <p>Changes to be made</p> <ul style="list-style-type: none"> ○ Add information on the scope issue to the guide. ○ The intake should be more focused in elements like organization and politics. ○ Add to the skills list of the consultant the element of 'bandwidth'. So an imbalance in problems mentioned and suggested solutions can be avoided. 	<p>Changes to be made:</p> <ul style="list-style-type: none"> ○ The need for assessment of the 'attitude to e-learning'. ○ The sequence in the Analysis Framework Approach format has its purpose. Changing the sequence might cause changes in the outcome. The consultant needs to be able to adept to the client's context. ○ There is a growing concern about financials. The business model should be extended for that. ○ There is a need to relate the results of a project to the overall implementation process. The analysis could be a good tool to conduct the cyclical analysis, but needs to be adapted for this purpose.

The synthesis of the results of the cross-case analysis can be found in Section 5.5.

5.4 The Expert Meetings

There were two kinds of situations during this first cycle of experiences with the Analysis Framework Approach, in which empirical information was gathered. First was the execution of the approach by a learning consultant in a company or organization. This resource has been discussed extensively in the previous section. The second sources of information are the expert meetings. There were two different sessions, one e-learning seminar to test the approach on the feasibility and acceptability, and two sessions to test the content validity of the Analysis Framework Approach. The expert meetings are discussed in this section. The results of the Expert Meeting 1 are presented in Section 5.4.1. those of the Expert Meeting 2 are presented in Section 5.4.2.

5.4.1 Expert Meeting 1: E-learning seminar for the business sector

An e-learning seminar was organized in September 2002 with a representative group of training managers and consultants from the business sector to investigate if the Analysis Framework Approach was feasible and acceptable. There were 15 people from different sectors: an airline, a steel company, a training organization, several consultancy firms and a telecommunications company. The group was asked to react on the 'Analysis Framework Approach'. This process was organized with the help of group decision software (GDS²). The test session started with the introduction of the Analysis Framework Approach, a short explanation of the goal and the procedure of the test session and the use of the software. The goal was to have each participant key in the factors which they considered success factors, and secondly key in the inhibiting factors for each of the categories of the educational business column, part of the quick scan sub-phase of the Analysis Framework Approach (see Figure 32, Section 3.4). This would allow the investigator to get an overview of what this target group of potential clients considered to be important.

² To support the information exchange and decision making process during these expert meetings, Group Decision Software (GDS) has been used. GDS-enabled meetings generally work with laptops linked in a local area network with a master laptop. The guidance is given by a technical support person, using this master laptop, and a facilitator responsible for the process. An agenda appears on the screen and ideas are keyed in anonymously and the assembled views and data can be analyzed on the spot. The data can be (re-)organized into categories and voted upon and can be looked at in an overview in the form of a chart or table. The technology helps to reduce the discussion and decision making time during the meeting. The quality of the meeting depends on the preparation, the facilitator's skills and the contribution of the participants. Therefore the structure and the desired output of the meeting should be considered beforehand.

The educational business column consists of the categories: organization, process, content, infrastructure and business model. The steps in the procedure were: short discussion on Category 1, then type in the three success factors you consider most important: When everybody is done the outcome is looked at, related factors are combined and, when necessary explained and the result is a list of factors: The final step is to vote for the factors one considers as most important. Each participant had five points to allocate. The factor which received the highest number of points was ranked Number 1, the second highest was ranked Number 2, and so on. This procedure was repeated for the success and inhibiting factors for each of the categories. In Table 31 an overview is given of the first five success and inhibiting factors selected as the most important for each of the categories.

Table 31 Overview of success and inhibiting factors for e-learning

<p>1. Organization</p> <p>Success factors</p> <ul style="list-style-type: none"> ○ Acceptance of the e-learning solution by the user group ○ Management vision on learning ○ Management support ○ Customer satisfaction ○ Level of integration of the training organization in the company <p>Inhibiting factors</p> <ul style="list-style-type: none"> ○ Training is already problematic ○ There is no training manager ○ Time and money, what is the added value for the organization? ○ Consequences for the training organization, the changing roles. ○ Underestimation of the technical complexity
<p>2. Process</p> <p>Success factors</p> <ul style="list-style-type: none"> ○ Connect to the existing learning style and start the change from there ○ Time and budget ○ Starting phase low key, integrated in daily ICT practice ○ Support communication and feedback ○ Acceptance by the target group <p>Inhibiting factors</p> <ul style="list-style-type: none"> ○ Lack of experience of the trainer and of the student ○ Motivation for computer use ○ Acceptance by the trainer ○ Knowledge and skills level of the trainer ○ Does not connect to the learning needs
<p>3. Content</p> <p>Success factors</p> <ul style="list-style-type: none"> ○ Client satisfaction ○ Good preparation ○ Good results

Table 31 continues ...

Table 31, continued.

<ul style="list-style-type: none"> ○ Generic and specific content development ○ Attractive learning materials (video, pictures, text, sound) <p>Inhibiting factors</p> <ul style="list-style-type: none"> ○ Copying paperware content to the new context ○ Too complicated and too theoretical to digest from a computer screen ○ Not taking account of the learning style of the learner ○ Client dissatisfaction ○ Connection with daily practice
<p>4. Infrastructure</p> <p>Success factors</p> <ul style="list-style-type: none"> ○ Good running network and IT support ○ Computer requirements for the client (low threshold) ○ Starting from an installed base ○ Internet access at all times and all places ○ Good facilities (PC, classroom, access from home) <p>Inhibiting factors</p> <ul style="list-style-type: none"> ○ Communication costs for the client ○ Availability of hardware and software ○ Bad access to the e-learning environment ○ Level of computer use within the organisation and the configuration of the pc network ○ Home learning not facilitated
<p>5. Business model</p> <p>Success factors</p> <ul style="list-style-type: none"> ○ More effective and more efficient than the existing training offerings ○ Costs for content development ○ Savings ○ Better view on development costs ○ Realistic business case <p>Inhibiting factors</p> <ul style="list-style-type: none"> ○ Too high development costs and time ○ Upfront investment much higher than in the traditional situation ○ No clarification of new responsibilities ○ Unexpected expenses for maintenance and licenses ○ Legal rights concerning content

At the end of the session the participants were asked to give their opinion on the Analysis Framework Approach in relation to the feasibility and the acceptability of the analysis. The majority of the participants considered the analysis feasible, because:

- HR-managers are already familiar with the e-HRM phenomenon
- You need to do an analysis anyway
- It should especially work well on the strategic level
- It is a lean kind of activity, but you might have to do some preparatory work to catch management attention
- Management is not always willing to outsource the analytics. A business case on the Analysis Framework Approach then would help.

This overview of factors and opinions was taken into account in the development of Version I of the Analysis Framework Approach as one of the sources of empirical information.

5.4.2 Expert Meeting 2: The content validity test

The second kind of meeting was on the content validity of the categories in the educational business column and took place in November 2002. The Content Validity test is a two-step analysis carried out by a group of experts (Levy & Lemeshow, 1999; Hodgins, 2002). 'These experts determine that the instrument's individual elements are *content valid* and that the entire instruments is *content valid*' (Hodgins, 2002, p.1). The rule is that there must be a minimum of three experts, although more participants are equally acceptable. The ideal number of participants to check the level of *chance agreement* is five. The experts decide about the validity of the individual elements of an instrument and the validity of the entire instrument. This decision-making process is executed using specific instructions for the experts. The experts should be familiar with the procedure and the objectives. In the case of the Analysis Framework Approach, the experts are asked to judge the validity of each of the interview categories and the underlying questions. The most common instrument for this judgment is a four-point scale, in which the score of 1 indicates that this question is irrelevant and 4 indicate a highly-relevant item. In this case only the items with a score of 3 or 4 are considered relevant. The rest will be left out or should be revised. Also, the experts are expected to indicate what is missing.

In total twelve people were invited for the content validity test. They were all experts in the field of education and training within the CINOP organization, by which the investigator was employed at the time this activity took place. Six people were involved in an e-learning team focusing on e-learning in the business world. The other six were experts in adjoining fields, like competency development, learning at the workplace and related topics.

Before coming to the meeting the participants received a short description of the CES Model and the Analysis Framework Approach. The test session started with an introduction on the goal of the meeting and the procedures. GDS software was used in the expert meeting to structure the discussion and profit from the possibilities to derive the median of the scores and the variance and produce a meeting report with an overview of all the scores. A four point scale was used for the qualification of the interview questions: 1= not relevant, 2 = little relevance, 3= relevant, 4 = very relevant.

After the introduction, the test persons were asked to score each of the interview questions per category, using the four-point scale. The scoring was done per category and at the start of each cycle; the category was introduced with a short explanation. In addition the test persons were asked to add their comments on the questions per

category. Finally the test persons were asked to give their opinion on three issues: the feasibility of the analysis, the acceptability of the analysis for the client, and suggestions for improvement. In Table 32 an original example in Dutch is shown from the test scores of the GDS-report. Each question was rated by the test persons. The table is arranged so that the questions considered most relevant are at the top, including the variability which is a measure of the consensus among the participants in their scores.

Table 32 Example of test scores as presented by the GDR Software

Session I: Content Validity Test: category Organization		
# Item	Average Rating	Variability
1. Verantwoordelijke op managementniveau	3.8	26%
2. Relatie HRD beleid en opleiden	3.8	26%
3. Organisatie van het leren	3.8	26%
4. Integratie bedrijfsdoelstellingen en opleidingsplannen	3.6	32%
5. Opleidingsvraag (procedures voor inschrijving en deelname)	3.6	32%
6. Organisatie van het leren (centraal en decentraal)	3.4	53%
7. Planning rond trainingsbehoeften	3.4	32%
8. Standaarden voor cursusontwikkeling/evaluatie (ISO-), etc.	3.4	32%
9. Gespecialiseerde training?	3.2	49%
10. Budgettering (kengetallen bekend, etc.)	3.2	49%
11. Financieel management (bijhouden budgetten, kosten)	3.2	49%
12. Hoe is kennisuitwisseling georganiseerd?	3.0	42%
13. Logistieke organisatie (toewijzing lokalen, docenten, e.a.)	3.0	42%
14. Besluitvorming over trainingsbehoeften (proces en criteria)	2.8	49%
15. Individuele keuze mogelijk?	2.8	49%
16. Relatie leren – inschaling	2.8	26%

At the rating of each of the questions per category, the question with a score lower than three was left out and considered irrelevant, unless the investigator decided otherwise based on the relevance of a particular item from a theoretical or practical perspective.

The two groups of experts each produced their scoring list. These scores were taken together and subsequently divided by two to produce the final score. The two groups differ in their rating and their comments. The e-learning experts have a lower variability in their scores and are therefore much more homogeneous in their rating than the other experts. Virtually all the experts used the opportunity to comment on the interview questions and did suggestions for improvement. These reactions were a valuable add on to the scores, including the opinions given on the feasibility and acceptability of the analysis by the client.

When looking at the outcome of the expert meeting, there are a few interesting observations:

- The ratings of the two groups differ in all categories.
- The e-learning group delivers a rather homogeneous score compared to the other group, which clearly shows individual differences in their interpretation and opinion.
- Of the first ten items in each of the categories, there are at least four or five that received a high score by both groups. The exception is the category business model. The scores differ more and the reason might be that this category is less developed than the others and the discrimination between the different interview items is less outspoken.

The reactions on the interview questions and additional remarks being made are summarized per category (see Table 33). The considerations, which are taken into account for the development of Version I, are summarized at the end of this section.

Table 33 Reactions on the interview questions per category

<p>I. Organization</p> <p>Interview questions</p> <ul style="list-style-type: none"> ○ Shows overlap with the category Business model ○ The model seems to focus on the objectives of the organization instead of the learning needs of employees; this influences the question of the effectiveness of learning and training. ○ The analysis should focus on multiple (management) levels ○ The perspective of the analysis seems to be restricted to formal training. Is informal training relevant as well? ○ HRD policy and training are not the two sides of a coin. ○ What is the definition? Is it about learning, training, learning at the workplace, knowledge management? ○ The interview questions seem to focus on e-learning? What is the advantage? <p>General remarks</p> <ul style="list-style-type: none"> ○ On what market is company active? ○ Are the course offerings internal or external directed? ○ What is the learning and knowledge culture of the company and how do the informal decision making process work? ○ Do not focus on training and education as the problem solution. ○ Explain the context before asking questions and be clear about what is happening with the results. ○ Explain the procedure of the analysis, so it becomes easier to emphasize issues. ○ The overlay in four steps (existing situation, desired situation, thresholds and solutions) is not acknowledged in the interview questions.
<p>2. Process</p> <p>Interview questions</p> <ul style="list-style-type: none"> ○ What kind of analysis is this? For transfer or for results? ○ Focus on the business need instead of the training need. ○ Put the emphasis on the competencies of the trainer. All the rest less important.

Table 33 continues ...

Table 33, continued.

<ul style="list-style-type: none"> ○ What kind of learning activities and learning offerings? <p>General remarks</p> <ul style="list-style-type: none"> ○ Is it about a training need or a training problem? ○ Try to increase discrimination between the questions and the topics (sub categories). ○ What about assessment and previous required skills procedures? ○ Use the introduction of the categories and sub-categories as entry and the questions as reminder. ○ Ask the students why they do the training and what their motivation is. <p>It seems like the analysis is a mix of items on a strategic and an operational level. What will be the emphasis in the final report?</p>
<p>3. Content</p> <p>Interview questions</p> <ul style="list-style-type: none"> ○ Essential question is on what level you are operating. Group level, factory or corporate level? ○ The importance of content for the learning process should be taken into account, also in the other categories. ○ Buy, lease, outsource: these considerations should be part of the strategy. <p>General remarks</p> <ul style="list-style-type: none"> ○ Appreciations of the target group for the existing content. ○ What methods and procedures are for knowledge storage? ○ The average usage cycle time of content? ○ Target-group related questions: learning style, assignments, type of offerings, interaction. ○ Legal rights and content, worthwhile asking for to avoid disappointment. ○ Is there a work flow for content development? ○ Who is responsible for the correctness, quality and authenticity of the content? ○ What educational philosophy is used in the Analysis Framework Approach? ○ Develop different lists, one for the business analysis, one for learning, and one more specific for e-learning. ○ Do not focus too much on the redesign of existing courses. Consider other possibilities for knowledge transfer and knowledge sharing like cooperative learning, interactive databases, access to other knowledge sources.
<p>4. Infrastructure</p> <p>Interview questions</p> <ul style="list-style-type: none"> ○ No comments <p>General remarks</p> <ul style="list-style-type: none"> ○ Willingness to invest in the infrastructure. ○ Focus on general services. ○ How is the existing infrastructure being appreciated? ○ What are the procedures for changes in the infrastructure? ○ Tools for content development ought to be in the category for content. ○ What are the weak spots in the existing infrastructure? ○ Use the explanation to clarify the goals and the structure of the analysis and use the interview questions as reference
<p>5. Business model</p> <p>Interview questions</p> <ul style="list-style-type: none"> ○ ROI considerations are not details, but essential issues. ○ Explain what the business model is, to make sure that the questions belong here. ○ Timing is not just important in relation to financial considerations.

Table 33 continues ...

Table 33, continued.

General remarks

- Organizational issues should be dealt with at the start, except the business objectives and the learning issue.
- The majority of the questions in this category are not relevant, or have been dealt with earlier.
- The Analysis Framework Approach seems to be a tool for measurement. Can it also be used as an instrument for increasing awareness and policy development and did you take this in account in the validation exercise?
- What is ROI in traditional training?
- Return on investment is related to the reduction of the number of errors on the work floor and not to the amount of time spent on training.

At the end of the test session, the test persons added some additional, general observations considered to be relevant for the development of Version 1 of the analysis. In their opinion the Categories 1, 2 and 3 seem to be more relevant than 4 and 5. In general the overview was considered helpful to supply the client with the idea that this is a very comprehensive analysis. The conductor of the analysis will need to acquire experience with the selection of the most relevant interview questions for which previous experiences can play an important role. The bandwidth of the analysis supports the idea that something will come out, especially when the interviewer critically values the acquired information. In particular the broad view on training and learning in the context of the company is positive. The analysis becomes more useful when the structure is improved, like a better separation of the main issues and details and the consideration of decisive elements in the analysis process. It takes time to identify on which decision-making level you need to have stake holders at the table to obtain a reliable view of the business situation. It is advisable to focus at the start of the analysis on more-general questions and then zoom in on more specific, e-learning related questions. This will add to the transparency of the Analysis Framework Approach.

An important question was the usability of the analysis in the corporate environment. One issue is the need for the right competencies of the interviewer and the interviewee to be able to conduct the analysis. Another issue is the level of satisfaction of the client. Does it supply the company with the right amount of information and ideas to make the next step, or, for example, does it help to develop a corporate learning strategy? How much time is needed? Are the right people involved? Is the company willing to supply useful information? The experiences with the Analysis Framework Approach show that on the average it takes 40 hours from the intake to the presentation of the final report. The entire procedure could be conducted in two weeks' time, but in practice the time schedule of the people involved will dictate the duration of the exercise.

In general the Analysis Framework Approach is regarded as an acceptable solution by most of the participants. The following issues are considered to be essential. It is important to know if the consultants and the interviewees want to work with the

analysis. Do they use other reliable and validated approaches or are there alternatives which they consider better? For the client it is important to know what can be expected and if the time invested is acceptable as well as the expenses. The analysis would be acceptable if the final report contains a summary with the highlights, conclusions and recommendations. It is expected that the final report will meet the expectations, but the users should be capable of using it. Speed and reliable results are essential; therefore structure should be added to the analysis. The client is looking for a solution, but be aware of the fact that this does not necessarily mean e-learning. So the scope should be broadened.

5.5 Final Analysis

All experiences with the Analysis Framework Approach are being used for the final analysis. These include the case studies and the expert meetings. The case studies have been reported upon using the case-study method as developed by Yin (2003). Subsequently the main outcome of these cases is shown in the cross-case analysis (see Table 34) presented in Section 5.5.1. The same approach has been used for the expert meetings. The data from these meetings are analyzed and the summary findings are presented in Section 5.5.2. The outcome of the final analysis is presented in Section 5.5.3 on the conclusions and recommendations which includes a SWOT analysis to set priorities in the selection of improvement actions.

5.5.1 The cross-case analysis

The cross case analysis schedule is the basis for the cross case analysis, which is an explanation building process for the evaluation of multiple cases. In total there were six cases developed using Version 0 of the Analysis Framework Approach. A summary of the results of the cross-case analysis can be found in Table 34.

Table 34 Summary results of the cross-case analysis, Cases # 1 - 6

Cases # 1 - 6	
Context	
1. Company	Five cases were conducted at a corporation in the steel sector and one case in the educational sector. The steel production units involved were very different, but all part of the same steel corporation. One of the five cases was about the corporate training center of this steel company. The case in the educational sector was a compilation of six cases from six different business units, but brought together in one overall case study. There were only two different organizations involved in this cycle of case studies and therefore these studies do not confirm the usability of the analysis in different companies.
2. Main activity (profile)	There were three very different steel production units involved, and one subdivision, ranging from 40 to 1100 employees. One case was conducted in the corporate training center, focusing on a particular course. The training institution

Chapter 5: First experiences with the Analysis Framework Approach

	is a large college with over 20.000 student and 1.800 staff. Business units offer a great number of courses in vocational training areas, at different levels.
3. Consultant	In three instances the analysis was conducted by a combination of a learning consultant and the consultant-investigator. One analysis was done just by the consultant-investigator himself and two analyses were conducted without direct involvement of the investigator. In case # 6 the learning consultant worked closely together with the project leader, who conducted three of the six analyses himself. So there was a clear mix of different people using the Analysis Framework Approach.
4. Available resources	In all cases there was online general information & paperware; the Analysis Framework Approach report, specific training info, the interviewer questionnaire for the inventory of experiences and in some cases the interviews were recorded. In most cases the investigator was a participant observer. In two cases the investigator was not directly involved and had to rely on the reports and the information received via the questionnaires. Additional information was acquired from the reviews of the case study reports by the learning consultants.
5. Organizational level	In most cases: the HR, the organizational and the program level were involved. In two cases knowledge management was involved as well. One can conclude that different organizational levels were involved.
6. Management level	Most were on the tactical and operational level, with one on the strategic level. Clearly the Analysis Framework Approach has operated on different levels, but more experience is needed.
7. E-learning development	All were starters, with the exception of Case # 6, where there was a mixed level of forerunners and starters. From an institutional perspective the college was on the starters' level of e-learning development.
8. Stages of awareness	Almost all were in the information stage or on the initial personal skills level. The exceptions were the forerunners in Case # 6, who had some level of routine, but on an individual basis and not really affecting the general level of awareness.
Procedure	
A. Sites and contacts	All the production units of the steel company are on one location in the Netherlands, although most of them belonged to an international business unit with a chain of sites in different countries. The training college is located in the center of the country with 50 different locations in the region. The range of contacts was in most cases restricted to the human resources and training level. Some were on tactical management level and one on the strategic level.
B. Data, time, effort	The Analysis Framework Approach took place in the period from September 2001 through June 2002. The time investment reached from a minimum of 30 hours to approximately 80 hours, largely depending on the situation, the number of stakeholders involved, and the bandwidth of the analysis. The effort was directly related to the emergence of the training problem, the stakeholder's interest and the context in which the analysis took place, for example. Like in one case were the unit was newly established and the production and working processes were not yet stabilized, causing all kinds of thresholds to proceed with the e-learning activity.
C. Preparation of the visit	In the case of the steel industry, most analyses were conducted on the initiative of the corporate training center. In some instances the initiative was brought

	about by one of the units which was already using e-learning. Others were initiated by the consultant.
Case-study observations and experiences	
1. The rational	<p>Reasons why e-learning is considered:</p> <ul style="list-style-type: none"> ○ There is a continuous process of change and innovation. The traditional linear classroom model lacks flexibility to keep pace with these developments and does not fit the actual working schedules. ○ The transition from training to learning as the dominant way to prepare and support employees in their job. ○ Increased heterogeneity of the workforce/students ○ The lack of organizational structure for introductory training of newcomers and temporary workers. ○ Training has become a continuous process and should be timely, adequately, easily accessible and increasingly aligned with the business goals. ○ The need for tailor-made solutions. ○ The need to improve and shorten the cycle time for content development. ○ The need to improve content handling and reuse. ○ The need for better reporting facilities for the organization and administration of the learning process. <p>The expectations people have of e-learning:</p> <ul style="list-style-type: none"> ○ ICT is considered the key for new developments. ○ A digital alternative for the 'father – son paradigm' of training and knowledge transfer. ○ Flexibility in the organization of training (time, place, access) and direct workplace related learning. ○ Better possibilities to plan, structure, register learning and track progress and results of (individual) learning activities. ○ Possibilities to make training more transparent and more measurable (business case, business model, return on investment). ○ An increase in quality, image and attractiveness.
2. Observations	<p>The procedure and products of the analysis:</p> <ul style="list-style-type: none"> ○ Supplied insight in the usefulness of e-learning. ○ Was a good help to get an overview of the relevant issues to discuss, when considering e-learning as an alternative. ○ The final report gave structure for the discussion with other stakeholders in the organization and supported the decision making process of how to proceed. ○ A too-narrow or a too-broad focus affects the outcome of the analysis. In one case the focus was mainly on content development and in the other case the scope was extended to information management. ○ The analysis lacks interview items on the readiness or willingness of the participants to support the innovation. ○ The context analysis needs to be improved because this can limit the outcome of the analysis. Being more-knowledgeable about the background of the trainer and the training situation is helpful for the interview process.

Table 34 continues ...

Table 34, continued.

<p>3. Experiences of the consultant</p>	<ul style="list-style-type: none"> ○ The report was useful to structure the discussion and decision-making process of how to proceed. ○ Participants have a better understanding of e-learning and are better able to judge the usefulness of e-learning. ○ Sometimes difficult to select the right people or the right stakeholders. ○ The bandwidth of the analysis is an important feature in the problem-oriented approach, in which the dialogue plays a central role. ○ A narrow or too-broad scope might cause imbalance between the problems mentioned and the persuaded solutions. ○ It seems like the Analysis Framework Approach can be adapted and combined with other approaches. There is one experience in Case # 6 with the Tichy matrix on factors for organizational change. ○ This combination will affect the outcome but does not necessarily mean that the analysis becomes less useful. ○ The dialogue is an important feature of the Analysis Framework Approach interview approach. This technique though requires interview skills and a good preparation. ○ Sometimes a analysis needs to be restricted to a certain management level. For example when strategic or tactical issues and politics play a role. ○ There was no preference for using the business model category more extensively, but each participant showed interest in the 'added value' of e-learning.
<p>D. Synthesis</p>	
<p>1. Conducting the approach</p>	<ul style="list-style-type: none"> ○ A certain level of expertise is needed to be able to conduct the analysis in different situations, with different interviewees. ○ This notion is connected to the fact that the 'dialogue' is the main operating feature of the Analysis Framework Approach, which requires interview skills and a good preparation. ○ Long involvement with training in a certain business context might cause a 'strong associative way of thinking and reacting'. This makes it difficult to follow the main line in the Analysis Framework Approach interview. ○ The Analysis Framework Approach missed out on the measurement of willingness of participants to contribute to the development. ○ On a strategic level the analysis can help to position e-learning relative to the other training and learning offerings. ○ An emerging need for new business model aspects and the wish to re-apply the analysis in different phases of the e-learning development.
<p>2. Relevance for the research questions</p>	<p>Portability:</p> <ul style="list-style-type: none"> ○ The Analysis Framework Approach supplies a systematic approach which appears useful in different situations (different people, organizational level, management level, level of e-learning development). ○ The analytical value depends on the quality of the interview. Preparation and context are dominant issues. In addition the analysis demands certain competencies both from the consultant and the client. ○ The problem orientation gives guidance for the follow up.

Table 34 continues ...

Table 34, continued.

	<ul style="list-style-type: none"> ○ Limiting the first analysis to the strategic and/or tactical level can be helpful in situations where e-learning has not yet a track record. ○ The outcome of the analysis on the strategic level could in adapted format also be used on other levels. This is another portability issue: the question is not about the usability of the analysis on different levels, but about the usability of the outcome of the analysis on different levels. This seemed to work well in the case of the corporate training center. ○ E-learning is seen as a problem solver to speed up training development. The analysis functioned well in an unstable training situation with a lack of structure and content. As a consequence the focus was broadened with additional information management issues. The analysis might become less accurate. ○ A suggestion is to conduct in such a situation multiple analyses or have separate interviews with different stakeholders in the context of one analysis. ○ The analysis needs a certain bandwidth for optimal use. A too-broad or too-narrow scope causes a fragmented analysis and affects the usability. ○ For the time being the 'educational business column' is considered to provide the structure for the optimal bandwidth. ○ The analysis seems to be usable in combination with another instrument, like in one of the cases with the Tichy matrix. ○ Re-use of the analysis is an issue. There is a need to 'measure' the result of pilot projects relative to the larger context of e-learning development. There is also a need to re-use the analysis in a cyclical manner to assess the readiness in relation to the requirements for the next step. <p>Changes to be made:</p> <ul style="list-style-type: none"> ○ Develop a user's guide to outline the Analysis Framework Approach procedure, clarify the objectives, emphasize the problem orientation, and give some guidance for the adaptation of the analysis to a particular context. ○ Add information to the guide on the bandwidth. ○ Add questions on 'learning culture'. ○ Make interview items more operational (short one-sided questions) to be used more as a guideline than as a set of questions. ○ Emphasize the preference for the involvement of primary stakeholders. ○ There is a need for assessment of the 'attitude to e-learning' of the client population. ○ The sequence in the analysis has its purpose. Changing it might cause changes in the outcome. The consultant though should be able to adapt to the client's context. ○ Questions on the financials keep coming back, so add more profile to the category business column.
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5.5.2 Outcome of the expert meetings

There were two kinds of expert meetings, one with a representative group of training managers and consultants from the business sector, and one with a group of educational and e-learning experts. The focus of the business expert meeting was to confront this group with the Analysis Framework Approach to get their opinion about the procedure, the ‘interview categories’ and on the feasibility and the acceptability of the Analysis Framework Approach. A full description of this meeting is presented in Section 5.4.1. A summary of the results can be found in Table 35. This summary is organized according to the categories used in the Analysis Framework Approach.

Table 35 Summary results of the expert meeting with the business sector

1. Organization
<ul style="list-style-type: none"> ○ Define the need for management vision and support. ○ Establish the right level of acceptance by the stake holders and certainly by the end user. ○ Do not underestimate the consequences and technical complexity of e-learning implementation.
2. Process
<ul style="list-style-type: none"> ○ Establish a low enough participation threshold to assure the connection and communication with the target group. ○ Reassure the trainer’s expectations, motivation and skills.
3. Content
<ul style="list-style-type: none"> ○ Use attractive learning materials to reach client satisfaction. ○ Adapt the content to the learner, the medium and daily practice.
4. Infrastructure
<ul style="list-style-type: none"> ○ Establish a well functioning network and IT support. ○ Focus in the client requirements and all time Internet access.
5. Business model
<ul style="list-style-type: none"> ○ Be more effective, efficient and for acceptable costs. ○ Develop a realistic business case.
6. Feasibility
<ul style="list-style-type: none"> ○ An analysis is needed anyway and HR are used to e-HR. ○ Work on the strategic level. ○ It’s a lean approach, but you still need to catch management attention. ○ Reduce insecurity concerning the financials by developing a realistic business case.
7. Acceptability
<ul style="list-style-type: none"> ○ € 5000, - (about 40 hrs) for a regular Analysis Framework Approach seems to be acceptable, but depends on the usefulness of the outcome for the follow up. The connection to the next step is important.

The second expert meeting was with educational and e-learning experts. There were two sessions, one with the educational and one with the e-learning experts. A full

description of these meetings is presented in Section 5.4.2. A summary of the results can be found in Table 36.

Table 36 Summary results of the expert meeting with educational and e-learning experts

1. Organization
<ul style="list-style-type: none"> ○ Avoid too much overlap, for example with the category business model ○ Focus on multiple management levels. ○ Define the domain to avoid confusion. What is the definition? Is it about learning, training, informal learning, workplace learning, knowledge management? ○ Do not focus too much only on e-learning or on education and training as the problem solution.
2. Process
<ul style="list-style-type: none"> ○ Pay attention to the items: business needs, trainer competencies, learning activities and learning offerings ○ Assess existing and previous acquired skills.
3. Content
<ul style="list-style-type: none"> ○ Keep an eye on the level of operation: group level, factory or corporate level. ○ Review regularly the considerations for buying, leasing and outsourcing content. ○ Appreciate the existing content with a.o the learning style, assignments, type of offerings, interaction. ○ Reconsider the average production and usage cycle time. ○ Take care of legal rights issues, quality responsibility, correctness and authenticity.
4. Infrastructure
<ul style="list-style-type: none"> ○ Asses the strong and weak points in the IT structure and services. ○ Appreciate the existing infrastructure and the procedures for change. ○ Require assurance for the willingness to invest.
5. Business model
<ul style="list-style-type: none"> ○ Pay attention to ROI, also in relation to traditional training. ○ Make sure what ROI is important in the business context.
6. Feasibility
<ul style="list-style-type: none"> ○ Better structure the Analysis Framework Approach and therefore take into account the decision making issues. ○ Start with a more general approach and then zoom in on the specific e-learning issues.
7. Acceptability
<ul style="list-style-type: none"> ○ Add a summary, highlights, conclusions and recommendations. ○ Assess the competency of the users to achieve results with the Analysis Framework Approach. ○ Focus in the organization on speed and results.
8. General remarks
<ul style="list-style-type: none"> ○ Explain the context and the procedure to improve the flow. ○ Increase the discrimination between the categories, sub-categories and questions. ○ The Analysis Framework Approach seems to be a tool for measurement. Can you also use it as an instrument to increase awareness and policy development? ○ The categories 1 to 3 seem more relevant than 4 and 5. ○ The holistic approach and the broad scope communicate completeness, which builds confidence at the clients side, especially when feedback is built in.

Table 36 continues ...

Table 36, continued.

- Identify the stakeholders on the different organizational levels to achieve a representative image of the organization.
- Structure the conclusions, the thresholds and solutions relative to the problems. The client is looking for a solution and that does not necessarily have to be e-learning. The scope should be broader than e-learning to better serve the client.
- Find ways to collect and introduce good experiences as a continuous flow of improvement.

5.5.3 Conclusions and recommendations

The sections on the case-study analysis and the expert meetings provide us with a whole array of empirical information on the use and the examination of the Analysis Framework Approach. To avoid too much of a repetition of what has been said and to be able to concentrate on the most important factors, we have chosen to add focus by using a SWOT analysis (see Table 37). SWOT is an abbreviation of the terms Strength, Weakness, Opportunities and Threats. The goal of the analysis is to identify critical strategic factors and then to (Morrison, 2004, p. 118):

- Build on core strengths
- Eliminate undermining weaknesses
- Take quick advantage of significant opportunities
- Circumnavigate or mitigate threats

This analysis should help to critically focus on the most important issues concerning the portability and the changes to be made to the Analysis Framework Approach to develop Version I.

Table 37 SWOT Analysis on the outcome of the experiments

A. Strengths	<ol style="list-style-type: none"> 1. The holistic approach communicates completeness, which increases the confidence clients develop concerning the results. 2. The bandwidth, the problem-orientation approach and the dialogue, are important features of the Analysis Framework Approach for the analysis of the usability of e-learning within the training and learning context of the client. 3. The procedure and products of the analysis supply insight and a better understanding of the opportunities of e-learning. 4. The final report gives structure to the decision-making process for the stakeholders on how to proceed with e-learning. 5. The lean and speedy analysis approach seems attractive. 6. The analysis can be used by different people, on different organizational levels, different management levels and different levels of e-learning awareness and development (this notion needs to be supported by additional experiences).
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Table 37 continues ...

Table 37, continued.

	<p>7. The analysis can be combined with other analysis tools. The narrowing or broadening of the bandwidth, when combined with other approaches, should be an ongoing concern.</p>
<p>B. Weaknesses</p>	<ol style="list-style-type: none"> 1. Defining e-learning is difficult to do, because it is hard to distinguish between e-learning and other training and learning activities, between e-learning and learning, training, informal learning, workplace learning, information management. 2. The client is looking for a solution, which not necessarily is e-learning. 3. The analysis needs more structure (main issues and items) and the items should be phrased much more operationally. 4. The interview categories need on each level more discrimination. 5. The business-model category does not meet the analytical requirements. 6. The analysis lacks interview items on the readiness or willingness of the stakeholders to support e-learning development. 7. It is difficult to assess the information level of the stakeholders. 8. Not staying with the right bandwidth of the analysis (educational business column with the interview categories) might cause imbalance between the problems mentioned and the persuaded solutions. 9. Too much adaptation of the analysis might cause a decrease in the usability.
<p>C. Opportunities</p>	<ol style="list-style-type: none"> 1. The Analysis Framework Approach is a tool for measurement, but shows also to be instrumental to increase awareness and policy development. 2. The conclusions of the analysis need to be structured in line with the thresholds and solutions, relative to the training and learning needs and problems. 3. Interview items should be added on the 'stakeholders' attitude to e-learning. 4. A more accurate intake allows for a better view on the learning and training context of the organization and the competencies of the stakeholders (interviewees). 5. The user's guide can help to better inform about the procedure and avoid the weaknesses and threats. 6. Multiple analyses or multiple interviews are a way to deal with a too narrow focus of the stakeholders. 7. The analysis can repeatedly be used in different phases of e-learning development to evaluate the projects relative to the overall objectives of the e-learning initiative. 8. The analysis can be adapted to assess the readiness of an organization to move to a next phase of e-learning development. 9. A realistic business case can function as supporting evidence for the added value e-learning might provide.
<p>D. Threats</p>	<ol style="list-style-type: none"> 1. Considering e-learning as a multiple problem solver will lead to disappointment. 2. A too narrow or too broad focus on one of the categories affects the outcome negatively. 3. A satisfactory context and stakeholder analysis is often not feasible. Information might be missing about the lack of willingness or commitment. 4. It is not at all easy to reach and select competent consultants and stakeholders. 5. Financials become increasingly important, but reliable information are difficult to gather and hard to use as evidence.

The SWOT analysis gives an overview of the issues, which should be taken into account in our further discussion on the portability (RQ 7) and the improvement of the Analysis Framework Approach (RQ 8). But, what were the considerations and decisions taken in relation to these issues? Let us first take a look at the SWOT analysis from the perspective of portability and improvement, and then decide about the changes to be made for the development of Version I of the framework. Reading through this breakdown, one should keep in mind that the starting point of the analysis is the consultant. The portability and the improvement are related to the usability of the Analysis Framework Approach by the consultant.

A. Strengths

When looking at the strengths (see Table 37) of the Analysis Framework Approach in relation to the portability, it is obvious that the format supports the use of the analysis by different people, on different organizational levels, different management levels and different levels of e-learning awareness and development (RQ 7). Although the diversity in settings in this first cycle of case studies was restricted to the steel industry and vocational education, the variety in usage of the Analysis Framework Approach was adequate to develop an opinion about the portability. In general it is the holistic approach (A1), the stepwise procedure (A3), and the lean and speedy analysis (A5) which ease the use of the analysis in different situations. Very helpful here is the problem orientation (A2), so the discussion with the client is not just about e-learning in general, but focuses on the needs of the company and the intention to solve the problems. Using dialogue (A2) as the medium for communication lowers the threshold for participation of the client. The format of the Analysis Framework Approach (A4) report is very helpful as a reference for further development. In some instances this report is used as evidence and source for presenting project ideas and outlines to decision makers.

An interesting issue evolved during the conduction of the analysis. Obviously the procedure, including the interview, the reading and discussion on the outcome, supplied the clients with a better insight and a better understanding of the opportunities of e-learning (A3) in their own context. This learning process is an important component of the Analysis Framework Approach procedure, but could endanger the process at large due to the differences in information level between the participants. Therefore it is important to make sure that the primary stakeholders join the project right from the beginning, to achieve consensus in an early stage and to avoid in the follow up, too much of a diversity among the stakeholders in the decision-making process. A factor which adds value to the portability is the notion that the analysis can be combined with other tools (A7), although there is a need to be cautious in changing the bandwidth of the analysis. A too-broad or a too-narrow scope might negatively affect the results of the analysis.

Recommendations:

To strengthen the portability and foster improvement of the analysis:

- The strong elements mentioned in the SWOT analysis very well support the purpose of the analysis and should be strengthened when possible.
- This means that the existing format and ingredients of the Analysis Framework Approach, as mentioned in the strong component SWOT analysis, should be maintained.
- This can be done by developing a user's guide, emphasizing these elements.

B. Weaknesses

An important notion is the need to define the object of investigation. In other words: 'What is e-learning?' (B1 & B2). Are we talking about learning, training, informal learning, workplace learning, etc.? This question is dealt with in Chapter 1 of this study on the context of e-learning. The outcome was that there are a great number of definitions for e-learning, but that each definition shows the so-called ownership principle, indicating that all definitions of e-learning will largely depend on the intention and the context of the creator. For that reason it is advisable to develop some sort of opinion on the meaning of e-learning in the context of the client and use that as the main frame of reference for further discussion. The importance of defining the term also has a strategic value. The context-related definition will make it easier to distinguish between e-learning and other training and learning activities, which certainly is helpful in an initial development phase, but might become less important later on. This strategic notion is also helpful to realize that in most cases the client is looking for a solution and this does not necessarily need to be e-learning (B5). The expectation is that the fast-increasing use of technology in education and training on all levels of the business column will change the distinction being made between 'e-learning' and 'not e-learning', into an artifact. This would also mean that in the near future the Analysis Framework Approach will be faced with the question of broadening the scope (B9 & B10) or not. In any event the bandwidth issue, not too broad and not too small to avoid imbalance between the needs and the persuaded solutions, is something to take care of to secure that portability stays a viable option.

For the improvement of the analysis, it is evident that the interview categories need more structure (B3 & B4), which can be achieved by adding discriminating sub-categories to distinguish more clearly between main issues and details. The category Business model will need to be strengthened (B6) by adding interview items, which focus on questions of return on investment, not just in financial terms, but in terms of added value.

The analysis lacks appropriate interview items on the readiness or willingness of stakeholders to support e-learning development (B7 & B8). This is a sensitive problem

and has something to do with the format of the analysis in which interaction in the form of a dialogue is an important vehicle for the analysis process. People react differently, depending on the context of the interview. Factors which play a role are: familiarity with the subject, is it a group interview or not, and the tendency to show 'politically correct behavior'. So it seems that the solution for the collection of information on the readiness and information level of stakeholders will be found beyond the business-column categories. One option is the use of an additional questionnaire.

Recommendations:

To strengthen the portability:

- The suggested user's guide should contain information on 'defining e-learning' and problem orientation. The focus on e-learning needs to be strengthened and operational quality in different situations needs to be added.
- Bandwidth certainly is a portability issue, because the effectiveness of the analysis in different situations relies partly on the appropriate bandwidth of the analysis. Emphasize this in the users' guide.

To improve the Analysis Framework Approach:

- Strengthen the focus on the client context by emphasizing the problem orientation and the company definition of e-learning. Add information on this to the user's guide.
- Add structure to the Analysis Framework Approach interview by, when possible, introducing additional sub-categories and items to better distinguish between the different topics. And phrase the items in a more-operational way.
- Review the category 'business model' and extend the return on investment issues.
- Develop a questionnaire to assess the readiness and information level of the stakeholders.

C. Opportunities

The Analysis Framework Approach procedure is an analysis process, but at the same time it appears to be a learning process for the client and in particular for the stakeholders (C1). The consequence is that primary stakeholders should be involved from the beginning to avoid discrepancy in the information level. At the same time one cannot avoid that other people will be involved in other phases of e-learning development and one of the opportunities is to use the Analysis Framework Approach report as an important frame of reference for newcomers and the others, who will get

involved at a later time. This report though should be written with this purpose in mind (C2). To improve the quality of the report, it is important for the consultant to get to know the stakeholders well before the interview takes place (C3 & C4). The attitude questionnaire, one of the recommendations in the section on weaknesses, could be very helpful to raise the level of information on the client.

Again the bandwidth issue has been raised. One opportunity to deal with this issue is to apply multiple interviews or even multiple analyses to assure that the holistic approach has the necessary bandwidth, given a certain context (C6).

One promising opportunity is the wish to re-apply the analysis in different phases of e-learning development. Not just at the start of a project, but also later on, when the evaluation of progress and results in relation to the overall e-learning initiative becomes increasingly important (C7). This also applies to the different phases in the development and in particular to assess the requirements for making a sound transition from one phase to the other (C8). The business issue (C9) is raised frequently in all cases and in the discussion with the educational and e-learning experts. Return on investment (ROI) has been a non issue in the educational sector for a long period of time. Since the emergence of e-learning, ROI has attracted lots of attention. The available theories and instruments do not yet supply us with the ultimate answer to this question. The need though is there, to get more of a grip on the added value in financial and non-financial terms. So the category 'business model' should be extended with ROI related interview items.

Recommendations:

To strengthen the portability:

- The attitude questionnaire can help to get to know the stakeholders better beforehand and be better prepared for the interview
- Valuing the learning process for the client and the consultant in the conduction of the analysis, will help to apply the analysis in different situations.
- The Analysis Framework Approach report could be used as an important frame of reference for further development in the discussion with other and new participants, getting involved in e-learning development at a later time.
- Add these items to the user guide.

To improve the Analysis Framework Approach:

- The bandwidth issue needs to be dealt with. The application of multiple interviews or even multiple Analysis Framework Approaches to avoid a too-narrow or too-broad approach seems feasible within the framework of this research.

- The suggestion to re-apply the analysis for evaluation and assessment in the following phases is another research activity, which will not be part of this study, because the context variables differ from the analysis situation that the analysis so far has been used for.
- Add ROI-related interview items to the Business model category.

D. Threats

A real threat is an inadequate level of expectation. Considering e-learning as the ultimate problem solver is not a good way to create a realistic approach (D1). This realism should be present at all times and must be an important consideration of the consultant versus the client. This realism should also be present in situations in which a too-narrow or too-broad focus might lead to an imbalance in the suggested solutions relative to the existing problems (D2). Sometimes a situation is not favorable for conducting an Analysis Framework Approach. These conditions might be: inadequate information, a too narrow scope, lack of willingness or commitment, incompetent stakeholders, isolated stakeholders in a forerunner position, major changes in the company or a worsening economic situation (D3, D4). Therefore it is advisable to pay attention to these conditions during the intake and decide upon a go or not go, after discussing the issues with the client.

Financials are becoming increasingly important, but within the framework of the Analysis Framework Approach, this demand cannot be solved (D5). Being more conscious about it and explicitly paying attention to it is feasible within the framework of the Analysis Framework Approach, but that is all.

Recommendations:

To strengthen the portability:

- It is important to assess the level of expectation. This could be done by adding some questions to the attitude questionnaire and discussing the issue during the intake. The analysis though is not developed to convince people to start using e-learning, so this situation should be avoided when possible.
- The analysis seems to work fine in different situations, when the bandwidth is kept attune. This concept should be looked at under all circumstances.

To improve the Analysis Framework Approach:

- Be conservative in the estimation of the results, which might be achievable with the help of e-learning, especially in a situation in which it is unclear how e-learning is perceived by important decision makers.

- Add interview items on the financial issue to the business model category, but again be clear about the limited possibilities of this exercise to develop a clear overview of the return on investment. It might help to focus on the requirements to come up with detailed information, because this will show what is needed to define the ROI of a project.

5.6 Actions for the Improvement of the Analysis Framework Approach

The final analysis has brought about a compilation of conclusions and recommendations concerning the portability and the improvement of the Analysis Framework Approach (the Analysis Framework Approach). The information will be used to develop Version I of the Analysis Framework Approach. In Section 5.6.1 - 5.6.4 we will describe the selected measures and products on the basis of the recommendations which will lead to the desired improvement.

5.6.1 Action I: Add structure to the analysis

The general opinion was that the interview part of the analysis needed more structure, so the consultant is better able to distinguish between the categories, the sub categories and the items. The different categories though are supposed to be complementary, which means that a certain overlap cannot be avoided but should be more distinguishable, so it is clear for the consultant that when an item shows up in more than one category it has been positioned there on purpose and should be considered in this particular context.

The suggested improvements:





- Add context to the different categories and sub categories.
- Introduce, when possible, additional sub categories and interview items to better distinguish between the different topics.
- Review the category 'business model' and extend the return on investment issues. Focus on what is needed to become more knowledgeable about the added value and financials.

Version 0 of the Analysis Framework Approach consists of a short introduction to the approach with information on: the stepwise procedure, the problem orientation, the flow in the Analysis Framework Approach, the interview-overlay of 'existing situation – desired situation – thresholds – solutions'. The consultant should keep this overlay in mind, while going through the categories and interview items. Next is an explanation of the goal of the report, a report outline, showing a list of topics which ideally are part of the report; and a goal statement of what to achieve with the Analysis Framework Approach. The goals are:

- Clarify the demands and problems of the training and learning situation.
- Clarify what contribution e-learning can make to solve these demands and problems.
- What are these solutions and why?
- What are the main features of the business case?
- Supply insight in the possibilities and limitations of an e-learning pilot project.

See Appendix C for a complete copy of Version 0 of the interview items for the quick scan phase of the Analysis Framework Approach. Table 38 shows the category 'process' as a selected example of the interview schedule used by the consultants in the first cycle of case studies.

Table 38 Version 0: Category 'Process' as a selected example of the interview schedule

2. Process	a Training needs	<ul style="list-style-type: none"> ○ Analysis of the training need (quantity, goal and targetgroup) ○ Evaluation 	
	b Training model 	<ul style="list-style-type: none"> ○ Analyses existing training offerings (organisation, administration, maintenance) ○ Kind of instructiontie ○ Activities ○ Testing ○ Certification ○ Mentoring, coaching 	<ul style="list-style-type: none"> ○ ICT role in the training model 
	c Teaching and learning activities	<ul style="list-style-type: none"> ○ What specific activities? 	
	d Trainers and instructors	<ul style="list-style-type: none"> ○ Job profile ○ Competencies ○ Assessment ○ Local instructors? ○ Specialists? ○ Training and knowledge level ○ Teaching experience ○ Digital skills 	
	e Students	<ul style="list-style-type: none"> ○ Job profile (training and knowledge level) ○ Competencies ○ Assessment ○ Learning experience ○ Digital skills 	<ul style="list-style-type: none"> ○ Supply chain with vendors and clients

The suggested improvements were: Add context to the different categories and sub categories and introduce additional sub categories and interview items to better distinguish between the different topics. Table 39 shows the same category as Table

38, but now in the upgraded Version I, in which context is introduced by adding relevant information on the background of the category and the sub categories. At the same time additional sub categories and items are introduced, when possible, for the purpose of a better discrimination between the different sub categories and items. A full Version I can be found in Appendix D.

Table 39 Version I: Category 'Process' as a selected example of the interview schedule

<p>2. Process</p> <p>Category</p> <p>Sub category</p>	<p>The actual learning, teaching, training and knowledge sharing process is your main point of reference. Do not focus, at the start of an e-learning development process, on niche or isolated training needs or problems.</p> <p>Context for the category</p>
<p>Training needs An important success factor for e-learning is the sense of emergency for the 'business, training or learning problem' for which e-learning is supposed to be (part of) the solution.</p> <p>Context for the sub category</p>	<p>9. What is the relationship with the primary business process? 10. How do you analyze the companies' needs in relation to training needs or problems (what kind, how big, goals, target group and other stake holders, time, planning)? 11. Do you evaluate the final results (relation of training needs – chosen solution final outcome)</p> <p>Phrase the items more operationally</p>
<p>Training model Assessing the current use of ICT is a helpful exercise to explore the possibilities for e-learning. So what is the importance of ICT use in the current training and learning programme and what experiences (positive and negative) do they have?</p>	<p>12. What training models do you use in the existing program? 13. What kind of learning offerings do you have (classroom, open learning centre, workplace learning, i.e.)? 14. What are the coaching models you are using (mentoring, etc.)? 15. What is the role of testing? In what way do you test and do you use testing for other than assessment purposes? 16. What is the role of certification and how is it organized (internal, external)? 17. Do you have some success stories and which success factors were decisive?</p>
<p>Teaching and learning activities The role of ICT use in the actual teaching and learning process. Starting point for e-learning activities.</p>	<p>18. What pedagogical models are most common in the teaching and learning process? 19. Could you give some examples of ICT use? 20. What is the general perception of the added value of ICT?</p>

Table 39 continues ...

Table 39, continued.

<p>Trainers and instructors Important question is if the current group of teachers and trainers are able to support and execute an innovation (like e-learning) or to stop such a development? What would be the (structural) success factors and inhibiting factors for this target group?</p>	<p>21. What is the competency profile of the teachers, trainers and other people with a training responsibility? 22. What is the general teaching and learning experience of the teachers/trainers? 23. What training and knowledge level? 24. Are the teacher/trainer roles competency based? 25. What is the level of digital skills? 26. With what categories of teachers and trainers do you work with (dedicated, experts, internal, external, i.e.) 27. What is the appreciation of the 'teachers and trainers' work in the eyes of the teacher?</p> <div style="border: 1px solid black; padding: 5px; text-align: center; background-color: #e0e0e0;"> <p>Add items to better distinguish</p> </div>
<p>Students (target group) The student's attitude should favor change and be positive about the use of ICT. It is important to be familiar with the (structural) success factors and the inhibiting factors.</p>	<p>28. What is the general learning experience? 29. What is the knowledge level? 30. Are the students working roles competency based? 31. What is the level of digital skills? 32. What students do you serve internally? 33. Do you also serve external students (suppliers, clients or others)? 34. What is the appreciation of the training and learning offerings? 35. What is the appreciation of the 'trainers/teachers work'?</p>

A final recommendation in this action was the upgrade of the category 'business model' with more focus on the added value factors and financials. In Version 0 of the analysis, this category was called 'Business case', with a sub category business model. The idea behind was that the development of a preliminary business case would help the decision-making process. In practice this was not feasible, because so early on in a project it was possible to indicate what kind of expenses or revenues one could expect but not what the exact numbers would be. It was decided that the emphasis in this category should be more on the business model as a more generic approach than on the business case which would always be linked with a particular initiative. So if we compare Version 0 with Version 1 on this category, there is an obvious difference as can be seen in the overview in Table 40.

Table 40 Business category in Version 0 versus Version 1

Version 0: Category Business Case	Version 1: Category Business Model
<p>Sub categories:</p> <ol style="list-style-type: none"> 1. Learning strategy With emphasis on the relation with the primary business goals, learning needs, integration of work and learning. 2. Strategic reasons for investment Abstract level of technical, organisational, demographical developments, changing regulations and competition. 3. Cost and benefits Focusing on the business problem, e-learning solution and the expected benefits (numbers). 4. Difference between the old and new business model What are the cost drivers and the benefits in the new, e-learning situation, with the focus on knowledge development and distribution, added value for stakeholders, collaboration with third parties? 	<p>Sub categories:</p> <ol style="list-style-type: none"> 1. The existing business model: Analysis of the features of the existing model in relation to the urgency of learning, cost drivers, revenues, SWOP of the existing model. 2. Motives for the 'learning strategy': Is there a strategy and what the motives are: business goals, technical and organisational developments, changing expectations of the employees. 3. An 'e-learning' business model: This is an attempt to picture the consequences, when e-learning is applied? 4. Piloting e-learning: This sub category is new and is in fact a preview of what the next step would be. An important aspect is the choice of the most urgent problem and the expected benefits.

5.6.2 Action 2: Develop a user's guide for the consultant

There is no reason to adjust the existing Analysis Framework Approach procedure. This format and the ingredients should be maintained. In the second cycle of case studies we will again look at the empirical evidence to see if this strategy should be altered. It is evident though that at this time, some of the issues require additional information as a reminder for the consultant.

The suggested improvements are:

- Support the existing procedure by emphasizing the importance of the problem-oriented, step-wise and holistic approach.
- Add information on 'defining e-learning'
- Value the learning process for the client and the consultant in conducting the analysis, which will help to apply the analysis in different situations.
- Clarify the role of the Analysis Framework Approach report as a product of the analysis and an important frame of reference for further development.

Version 0 of the Analysis Framework Approach was supplied with an introductory chapter on the main issues of the Analysis Framework Approach. This introduction was a reminder for the consultant, but was not meant to be a full introduction to the subject. The items which were covered in this introductory chapter were:

- Introduction to the main goals of the Analysis Framework Approach
- The problem oriented approach
- The step wise approach and flow in the Analysis Framework Approach.
- Outline of the final report
- Objectives of the analysis to deliver in the final report.

For Version I this guide was extended with the suggested improvements in mind. In preparation of the second cycle of case studies, in which consultants and students would participate, it was decided to develop two guides, one for the student and one for the consultant. The reason was that the student would use the Analysis Framework Approach in the course of a final project as part of a Master of Science Program on technology applications in training, and the consultant would use the analysis in the course of his or her daily work in relation with clients and colleagues. For the consultant the Analysis Framework Approach was part of an innovation strategy to improve e-learning consultancy. This innovation was supported by other discussions and documents. The main difference between the two guides is that the student guide contains more context on the issue of e-learning strategy. The guide was used as background information for a lecture on the Analysis Framework Approach both for the Technology Application in Education and Science masters program at the University of Twente and an elective course for master students on 'E-learning in Corporations' at the Delft University of Technology. We will discuss the two guides here, but limit this discussion to the outline of the content. A complete version of the students' users guide can be found in Appendix B and the consultant guide can be found in Appendix A.

The student user guide was entitled 'Corporate E-learning strategy: The Analysis Framework Approach: analysis tool of the CES model'. This guide was developed to supply the student with the necessary information on the context and on the procedure to be followed in conducting the Analysis Framework Approach. Chapter 1 was on e-learning strategy and deals with the questions: why e-learning and why a strategy? This is followed by the discussion on the 'building blocks' for a strategy, focusing on 'a new way of thinking about learning' and the need for an analysis to make sure that the strategy is connected to the needs and possibilities of the company. Chapter 2 is about the Corporate E-learning Strategy model (CES model), which is the overall structure for implementing e-learning. The model is explained to provide an overview and enable the student to position the Analysis Framework Approach as part of the starting phase in this model. Chapter 3 then describes the Analysis Framework Approach as a tool for analysis, with an overview of the different steps, guidelines for the intake, the interview and reporting. The guide concludes with a list of recommended resources. The interview items, in this case Version I, were not

included in the guide, but were separately supplied to the students during the preparation for conducting the Analysis Framework Approach in a company.

The user guide for the consultant lacks the e-learning strategy discussion and focuses solely on the procedure. There is a short introduction on the CES model, the Analysis Framework Approach procedure, the problem orientation and the goals of the analysis. This is followed by guidelines for the different phases, like intake, interview and reporting. The guide contains the list of interview categories, with the sub categories and the interview items. The full guide is only available in Dutch (see Appendix A).

5.6.3 Action 3: Develop an attitude questionnaire for the client

The need to get to know the client better, is essential for the preparation of the interview, the report and the follow up. In some instances one is not able to speak to all participants beforehand. A questionnaire might be helpful in this case, also because it should be of assistance to get a general idea about the attitude and the differences between the participants.

- The questionnaire should help to judge the attitude of the stakeholders.
- It should help to judge the level of expectation.
- It should help to evaluate the information level of the stakeholders.
- And it should help the consultant to be better prepared for the interview or the Analysis Framework Approach phase.

The questionnaire should be a short, easy to handle list of questions. It is not a strict measure of the state of affairs, but merely a tool to collect additional information. The questionnaire should be used right at the beginning of the Analysis Framework Approach and at the end. A complete version can be found in Appendix G.

Table 41 shows Page 1 of the questionnaire. Next to some general information, the questions focus directly on the value estimation of the respondent. It starts with the question about how valuable e-learning might be for the existing training and learning practice. The next question is about the motives of the respondent for using e-learning. The motives used are selected from several lists of 'most important motives' (Boulton, 2001; Campaign for Learning, 2000; Clark, 2003; Rebensburg, Busch, & Rautenstrauch, 2002) and leaves space to add one's very own motive. The answers are qualified on a five-point scale ranging from 'not at all' to 'very important' and 'don't know'. This allows for a numerical comparison between the pre- and post test. The other main questions are: what benefits do you expect from e-learning, what barriers could limit your usage of e-learning, what disadvantages could limit your usage of e-learning? In the post test, there is an additional question asking for the opinion of the respondent on the usability of the analysis.

Table 41 First page of the Attitude to E-learning questionnaire.

Post test of the attitude to e-learning

Name _____
 Position _____
 Company _____

A The use of e-learning in your organization

A01 Do you think it's valuable to add e-learning to the existing training and learning offerings?

- 1 Not at all.
- 2 Little value
- 3 Valuable
- 4 Very Valuable
- 5 I don't know / No opinion

Please comment on why it will or will not be valuable for you:

A02 What benefits do you expect from e-learning?

Please, take a close look at each expected benefit and give your opinion on the importance of each element.

Expected benefits	Not important at all	Not important	Important	Very important	Don't know
A Reduces costs	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
B Learning opportunities anytime, anywhere	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
C Provides just-in-time, just-enough learning	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
D Allows for self-paced learning	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
F Allows for online communication among participants	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
G Allows for more (online) communication with trainers and experts	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

5.6.4 Actions not viable in the course of this research.

There are two issues which were given a lot of attention by the consultants and clients. In the first place the discussion about the bandwidth and secondly the competencies needed to conduct the Analysis Framework Approach successfully. These are discussed here.

The effectiveness of the analysis in different situations relies partly on the appropriate bandwidth of the analysis. Therefore there is a need to stay close to the original 'educational business column interview categories', which are (a) organization, (b) process, (c) content, (d) infrastructure, and (e) business model. This part of the bandwidth is taken care of in Action I by the suggestion to develop a user's guide. The other part of the bandwidth discussion is about the wish to apply multiple interviews or even multiple-analysis framework approaches to avoid a too-narrow or too-broad approach, and the suggestion to re-apply the analysis for evaluation and assessment in the subsequent phases of e-learning development. Although we consider this an interesting extension of the use of the analysis, it can be seen as another research activity which will not be part of this study. The analysis has initially been developed for a particular context, and broadening the scope would mean a change in the research framework which is not feasible in the context of this study.

The second issue is about the competencies of the participants. It is true that looking at the procedure the Analysis Framework Approach is built on, there are very different activities both for the consultant as well as for the client. The better the participants are able to execute these activities, the better the results will be. In other words, the consultant needs to be able to guide the process, conduct a productive interview, report on the interview and assist in the follow up, while keeping a position as the consultant who wants to continue after this first phase of e-learning development. The client would have to choose the right stakeholders, people who are familiar with the subject who are willing to support the innovation and have the competencies to make it a success. Although in the course of this study we have been looking for the competencies needed to accomplish this e-learning development, this issue will not be part of this study, because it would need an additional cycle of research to verify if the inventory of competencies can be considered valid. This goes beyond the scope of this study.

5.7 Summary

This chapter focused on the practical experiences with Version 0 of the Analysis Framework Approach. There were two kinds of activities: the first was conducting the Analysis Framework Approach by learning consultants in companies or organisations. These experiences were documented in the form of case studies and evaluated using a cross-case analysis. The second activity was the meetings held with different experts to test the approach and check the content validity of the analysis framework. The outcome of these experiences was reviewed in a final analysis. This breakdown was

then valued using a SWOT analysis to distinguish between the urgency of improvements to be made to the analysis framework. Subsequently three improvement actions were selected, which should lead to an enhanced Version I of the approach. Action 1 was on the improvement of the structure of the approach. Action 2 was about the need and development of an users guide and action 3 was about the development of an 'attitude to e-learning' questionnaire. These actions were carried out to constitute the improved Version I of the Analysis Framework Approach. Next to these three improvement issues, the final SWOT analysis showed two other important elements which were not taken into further account. These were: bandwidth and competencies. Both were left out of the redesign because they would interfere too much with the overall research outline. There is no doubt though that these issues should be considered in the recommendations for further research in chapter 8.

The following chapter, Chapter 6, is about the experiences with Version I of the Analysis Framework Approach. This is the second cycle of empirical use of the approach, using the same analysis procedure as in this chapter.

6 The Second Cycle of Case Studies

This chapter focuses on the second cycle of case studies, conducted with Version 1 of the Analysis Framework Approach. The experiences with Version 0 of the approach, as described in Chapter 5, have led to the development of Version 1. The procedures in this second cycle of collecting, describing and analysing the data are exactly the same as for the first cycle of experiences in Chapter 5. The overall goal of this practical research is to improve the Analysis Framework Approach and to collect empirical evidence for the verification of the portability of the approach. The term portability is defined in Research Questions 7 and 8 as the usability of the approach by different people, in different organisations, on different organisational levels and in different stages of e-learning development.

As with the first cycle of case studies, all cases are situated in real-life situations and are executed in line with the demands of the client. The client is a company or an organisation. The cases in this cycle were conducted by professional learning consultants or Master's degree students from the University of Twente and the Delft University of Technology. The procedures for the second cycle are the same as for the first cycle, which means that the cases are described in case-study reports. These reports are then analysed and the results are collected in a cross-case analysis schedule.

The case-study method is presented in Section 6.1 followed by a description of two case studies in Section 6.2. The cross-case analysis is shown in Section 6.3 and the chapter ends with a summary in Section 6.4.

6.1 The Case-Study Method

The cases we are dealing with in this chapter are built on the experiences with Version 1 of the Analysis Framework Approach. In total there are eight cases executed by consultants, the consultant investigator and Masters' students from the University of Twente and the Delft University of Technology. The findings from these cases will help to improve the analysis framework and eventually lead to develop Version 2. Version 2 will not be included in this dissertation.

The case study actually is the end station of a research cycle. It starts with an intake, then the quick-scan analysis phase where the interviews take place and the final report is delivered. This report, together with the experiences of the consultant, the experiences of the client and the observations of the investigator, are the resources used to produce the case-study report. Subsequently these concept reports have been reviewed by the consultants who were involved in the analysis and the outcomes have been used to write the final case study reports. These reports are used to carry out the cross-case analysis and the outcome is tested in a SWOT analysis to select the

most important issues for the development of Version 2 of the Analysis Framework Approach.

In total eight new case studies were developed with Version 1 of the Analysis Framework Approach. These cases are described in line with the case-study protocol to develop the case-study reports. An overview of the case studies is shown in table 42. Each study is based on an analysis by the learning-consultant, in most cases a senior consultant with e-learning expertise, Masters' students and, or the investigator. Cases 7 to 10 and 12 and 13, are based on an official assignment of the company or organization. The others were done by students, having no financial agreement. Two cases were conducted in the steel industry, two in the health sector, one in the glass industry, two in the service sector and one in the food industry.

In table 42, Column 1 gives the case number, Column 2 shows the time period in which the analysis took place, Column 3 is about the main activity of the company or organization, next is the Version of the analysis framework which has been used, and the last columns show who was involved: a consultant, a student, the investigator or a combination.

Table 42 Overview of case studies using Version 1 of the Analysis Framework Approach

#	Period	Company / organization	Version	Consultant	Student	Investigator
7	Oct 2002 – Mar 2003	Steel industry: technical support unit of a hot strip mill	I	X		X
8	Jan – Feb 2003	Health care: training institute for company doctors	I	X		
9	Mar – Apr 2003	Steel industry: logistics and transport	I	X		X
10	Feb – Jun 2003	Glass industry: glass manufacturing	I		X	X
11	Mar – Jun 2003	Service organisation: call centre	I		X	
12	Sep 2003 – Jan 2004	Service organization: centre for standardization	I	X		X
13	Jan – Apr 2004	Health care: hospital for special diseases	I	X		
14	Feb – Aug 2004	Food industry: producer of refined oils and fats	I		X	X

We have selected two representative case studies for presentation in the next section. These are # 8 and # 14. Case # 8 took place in the health-care sector and case # 14 in

the food sector. A complete overview of this second cycle of case-study reports can be found in Appendix H.

6.2 The Case Studies

The first case study presented is on health care and shown in Section 6.2.1. The second case study is on the food sector and is shown in Section 6.2.2.

6.2.1 Case # 8 Health care: Training institute for company doctors

The results are organized according to the categories of the case-study protocol.

A. The context of the case study

A1 Company or organization

This institute is responsible for the additional training of professionals working in the field of social security and for post academic training, policy support and research for public health organizations and social medical science.

A2 Main activity of the company/organization (profile)

The institute is about to reorganize the training plan to integrate three existing post academic programs for company doctors. The intention is to offer at least 25% of the new program by means of e-learning. The program takes four years of about one day a week and the student must be working in the field. The training focuses on information transfer and knowledge creation. The institute has 100 employees.

A3 Consultant, student, investigator

The analysis was conducted by a senior learning consultant from CINOP. The investigator only had a remote role in the activity.

Table 43 shows an overview of factual information of the case.

Table 43 Presentation of factual information on case study # 8

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis-framework report	X	A full report discussed and accepted by the stakeholders.
c. Specific information on learning and training	X	General information given during the intake of the analysis.
d. Outline e-learning pilot	X	The outline of the first pilot and suggestions for additional pilots were part of the analysis report.

Table 43 continues ...

Table 43, continued.

e. User's guide	X	Was available for the consultant – interviewer.
f. Questionnaire: 'Attitude to e-learning' (client)		Was available, but not used.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The senior consultant has completed the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Consultant-investigator)		
j. Taped interviews		
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM		
c. Training organization	X	It is a training organization working on its new training strategy.
d. Training program		
e. Training course		
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	Focusing on plans of how to achieve the transfer of part of the training program to e-learning modules.
c. Operational	X	The pilot was aimed on the construction of an e-learning module.
A7 e-learning development phase	Present	Additional information
a. Start	X	Initial phase of innovation by means of e-learning.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level		
c. Initial personal skills	X	Innovation of the training process by using e-learning.
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data-collection procedure

B1 Sites and contact persons

- The institute has one central location, but supplies training in several different places in the country.
- Contact person: among the group of stake holders was the project leader/program coordinator, a team coordinator and a program project leader.

B2 Data-collection plan

- January – February 2003
- Time investment for the consultant was about 70 hours
- There were several preparatory intake meetings. This was helpful for the formation of a project group on e-learning strategy. There were two interviews with two different groups of interviewees.

B3 Preparation of the visit

The institute differed from the corporate environment in the sense that it was an independent training institute. The analysis had to be adapted to this other setting. All interview items focusing on corporate and business issues were reviewed, changed or left out.

C. Case-study observations and experiences

C1 Rational for the use of the Analysis Framework Approach

There were several reasons for looking at e-learning as a possible alternative:

- Travel time. Students had to attend classes in addition to their working hours.
- The added value of classroom sessions was limited compared to self study by means of a course handout.
- The course material needed a regular update, a central administration and easy access for students.
- Communication and information exchange among students can be improved and increased by means of ICT (communities of practise).

C2 Observations in conducting the Analysis Framework Approach

The normal procedure of the analysis was used, involving preparatory meetings, the interview, the reporting and a discussion about the follow up.

The result of the analysis was that e-learning was expected to help:

- Increase information exchange and collaboration among the students.
- Increase the added value of classroom sessions.
- Increase the level at which students prepare for classroom sessions, so individual differences in knowledge levels would be reduced.
- Improve the accessibility of students and teachers to the course materials. Absent students then still have access to the correct version of the material and this service lowers distribution costs.
- The cycle time for content development sometimes is too long. E-learning can help to support the workflow-procedures.
- Student profiles help to select and deliver the right information to the right person and in time.

In the long term e-learning might be helpful to add efficiency to skills training and to ease the implementation and operation of the personal development plan in relation with competence development. Also external collaboration and educational partnerships for content development and maintenance could be considered.

The pilot outline was further developed into a project plan and executed in close collaboration between the consultants.

C3 Experiences of the consultant using the analysis framework

This was the first time the consultant used the analysis. Preparation was done with the help of the guide and two group sessions at CINOP for the learning consultants. The investigator had a remote role. There were several preparatory meetings to establish a mutual understanding of the goal and procedure of the analysis. A project group e-learning strategy was established. There was a representative selection of stakeholders. Management was involved, but from a distance.

The analysis functioned well, but for the interview not all items applied to this independent training institute. Questions were omitted, adapted or replaced. Some questions did not fit in the context and for example, the questions on knowledge management were replaced. The systematic approach worked well, as well as the dialogue. The interview took quite some time because some of the issues were new for the participants. The interview especially helped to create a broader look at e-learning than just the pilot.

It is advisable to use the context of the organization to position e-learning. This and the wish to assess the institute's ability to use e-learning can be difficult, because of the short period in which one is expected to get an overview of the organization. Sufficient knowledge of the organization, the recognition of different interests, politics and positions, remain difficult to judge.

There was one report and unfortunately not an immediate follow up. The client appeared to be very much satisfied with the analysis process and the reporting. It helped to raise awareness about the usability of e-learning in the organization.

D. Synthesis

D1 Conduction of the Analysis Framework Approach

The analysis functioned well and the client was satisfied. It gave structure to the analysis process and supplied the organization with a report which was used to continue thinking about the possibilities of e-learning and how to make the next step. Apparently it took some time for the organization to make up its mind, but the consultant stayed involved in the development process.

The analysis seemed flexible enough to adept to the context of this training institute. The focus of the analysis is on the corporate sector. To make the analysis more flexible, this scope should be broadened.

In the starting phase, the consultant will be rather unfamiliar with the organization and using the context of the organization to explain the possibilities of e-learning will remain difficult.

D2 Conclusions concerning the portability and the changes to be made in the Analysis Framework Approach (RQ 7 & 8).

Concerning the portability:

- The preparation of the consultant was based on the short guide and the information received during two group sessions on the analysis. The consultant confirmed that participating in a real-life session is the better way to prepare to conduct the analysis. The investigator had a remote role.
- The analysis showed enough flexibility for the use in a different, not-corporate organization. The emphasis on corporate issues could be reduced, but this should not lead to another, but a broader focus.
- The comparison of the changes made to adept the analysis to a particular situation could help to develop several 'context-bound' analyses, with a certain focus on for example corporate, smaller companies, training organizations.
- Within the course of one project, it is possible that different groups are interviewed. The analysis allows for this shifting focus, relying on the assumption that adding up all the information would still supply the consultant with a complete picture of the situation.
- If the results are to be used in a follow up, by other people in other situations, then it is advisable to add a paragraph in the report on the context of the

analysis, to achieve mutual understanding of the reasoning behind the innovation.

Changes to be made:

- The adaptation process should be looked at more carefully.
- The strategy of 'quickly getting to know the organization' should be extended.
- A paragraph on the 'reasoning' of the organization for the innovation should be added to the outline of the final report.

6.2.2 Case # 14 Food industry: Producer of refined oils and fats

The results are organized according to the categories of the case-study protocol.

A. The context of the case study

A1 Company or organization

The company produces and supplies refined oils and fats to the European food- and feed industries as well as to technical applications. The products are distinguished into commodities and specialties. There is a strong focus on the quality aspect and product safety. Also the environmental issues are a focal point in the operation. The plant in the Netherlands is part of a world wide operating company with a strong representation in Asia.

A2 Main activity of the company/organization (profile)

The organization operates in a very competitive market and is very much process and result oriented. There is a shared responsibility for the performance of the organization and therefore training and learning is considered crucial for the empowerment of the employees. All employees should be well trained and fit for their jobs, while making maximum use of each others' skills and competencies. Care for safety, quality, environment and working conditions are regarded as everybody's business. The care for employees is reflected in a balanced social policy. The company employs 200 people, with a majority working on a middle-vocational level.

A3 Consultant, student, investigator

The analysis was conducted by a group of three part-time Masters' students participating in an elective course on 'e-learning in corporations' at the Delft University of Technology. They had a strong background in vocational education and training and worked as consultants at a vocational training institute in the western part of the country. The investigator was coach of this group of students and supported the conduction of the analysis.

Table 44 shows an overview of factual information on the case study.

Table 44 Presentation of factual information on case study # 14

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information and paperware.
b. Analysis framework report	X	Developed by the students, using an adapted format for reporting.
c. Specific information on learning and training	X	The existing organizational and training approach.
d. Outline e-learning pilot	X	Several suggestions were made and discussed with the client.
e. User's guide	X	The student user's guide.
f. Questionnaire: 'Attitude to e-learning' (client)	X	Used by almost all stakeholders. Five group levels were chosen as the most representative clusters of stakeholders.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	All three students filled out the questionnaire.
h. Observation (Investigator)	X	The investigator was involved in the preparation, was present at one interview session and at the presentation of the final report for the main stakeholders.
i. Participative observation (Consultant-investigator)		
j. Taped interviews	X	The interviews were recorded and the information was used for analysis and reporting.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM	X	The need to collect information and reactions and discuss e-learning on the different levels to reach the main groups of stakeholders (operating on the organizational levels b, c and d).
c. Training organization	X	
d. Training program	X	
e. Training course		
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic	X	Depending on the group of stakeholders, the analysis focused mainly on the strategic and tactical level.
b. Tactical	X	
c. Operational		

Table 44 continues ...

Table 44, continued.

A7 e-learning development phase	Present	Additional information
a. Start	X	The organization is bound to decide on e-learning, using the analysis.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level		
c. Initial personal skills	X	The awareness of the need to find other ways to solve the training needs was there. There was an upcoming awareness, fueled by the analysis activities, that e-learning might help to solve the problems.
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data-collection procedure

B1 Sites and contact persons

The company is located in the western part of the country. The main contact persons were the human resource manager and the supply chain operations manager. One of the students was involved in training activities in the company prior to the analysis. This connection was an important incentive for the company to allow these students to conduct the analysis. There was no formal contract, as the project proposal was part of the e-learning course for the students.

B2 Data-collection plan

- Period: March 2004 – August 2004.
- Time spent was about 170 hours.

The preparation of the analysis was done in close collaboration with the main contact persons. The line of activities was extensively discussed and included the decision to interview at least five levels of stakeholders to be able to develop a good insight into the readiness of the company to start using e-learning.

B3 Preparation of the visit

There was one official and several unofficial preparatory meetings with the contact persons for an introduction of e-learning and to make sure that the analysis was set up in line with their expectations. The analysis format was adjusted to the context of the company and five groups of stakeholders were selected and subsequently interviewed.

These were: management, middle management, IT employees, trainers and operators. These groups were selected because they were involved in the current activities concerning the training policy, training requirements, delivery of the training or as a participant. Each group included at least three people. Each interview session started with a short introduction of the main features of e-learning. This presentation was adapted to the information level of the stakeholders.

C. Case-study observations and experiences

C1 Rational for the use of the Analysis Framework Approach

Since training and learning were considered important issues, the desire to find other and new solutions for the current training needs was present. The opportunity to perform an analysis to see whether e-learning could make a difference was therefore welcomed.

The main thresholds to improve training and learning were considered to be:

- Difficulties in organising courses and training.
- The coaching and tracing and tracking of students.
- The storage, maintenance and retrieval of critical information for production purposes.

It is believed that e-learning can help to solve these problems, especially because training and learning can become more flexible and the digital storage of information offers new opportunities to access information when needed and from all locations.

C2 Observations in conducting the Analysis Framework Approach

There were several preparatory meetings, five interview sessions, information exchange on the interim report and a session on the final report. During the final session, several suggestions for a follow up were discussed with the groups of stakeholders. Also at this time the stakeholders filled in the 'post attitude to e-learning questionnaire'. Students completed the 'analysis questionnaire' at a later moment in time.

The students have used the analysis, but in an adapted format. It was decided to reduce the number of categories and only use the interview items which fitted into three main categories: (a) training level, (b) schooling and (c) knowledge. An important reason for this shift was the preference given by the contact persons, the limited available time for the interviews, and the wish to move as close as possible to the organization's context. This meant a major change in the format. The overlay in the analysis: existing situation – desired situation – thresholds and solutions, was used in the interviews. From there though, things were different. The focus was on these

three categories, which in the context of the analysis are considered to be sub categories. The outcome of the interviews was described as an ideal picture of learning in the company. This picture was converted into a number of success factors. On the basis of this ideal picture, three types of solutions were suggested:

- Hire a training coordinator.
- Outsource all training and learning activities
- Apply e-learning.

These solutions were rated using a multi-criteria analysis. The basis for this analysis was the success factor which had been given a certain weight in relation to their economic priority. The outcome shows that e-learning is the preferred solution and in line with the analysis information, three activities were seen as most favourable:

- The development of an online information and knowledge base.
- A website with an overview of course offerings and online courses.
- Training and learning using e-learning.

These activities can be considered complementary, but do not necessarily need to be developed at the same time.

C3 Experiences of the consultant using the analysis framework

Three part-time Masters' students having a strong background in vocational education and training executed the analysis. The analysis procedure was followed with some changes in the interview categories and the way the analysis was conducted to come to the final results. There was a good representative group of stakeholders, combined into five different groups of about three employees each, ranging from the operator level to the management level. In almost all cases the interviewees were very cooperative and eager to contribute to the analysis. The IT group was reluctant, indicating that they had already an overload of work. To prepare for the analysis, one needs at least a hands-on session, but joining as a participative observer in a real-life session is a better way. The students took different roles: active interviewer, observer, note taker. The fact that one of the students was involved with the organization already for some time made it easier to position e-learning relative to the needs of the company. Concerning the tasks of the interviewer, the students qualified themselves as sufficient and good. The reports were firstly presented to the HR manager to assure that the message was in line with the expectations of the client. The reports were well received. In general the conclusion was that the analysis procedure helped the client to further develop its opinions about the possibilities of e-learning.

At some point the interview items had to be explained and in some instances the students felt that the analysis might not be an easy way for everyone to share their

thoughts about e-learning. The students found that the analysis procedure was followed, also in the reporting. In fact there was an divergence in the way the analysis was conducted and the way the report was structured. Important though was that the client felt comfortable with the results. Although a decision has not been taken yet, it looks like there will be a follow up.

When looking at the 'attitude to e-learning questionnaire', the students concluded that apparently there is a solid support for e-learning in the organization on all levels. Comparing the pre test with the post test, is helpful to see what has changed in the attitudes or opinions of the respondents during the analysis procedure. In the pre test, 26% considered e-learning of little value, 47% thought it is valuable and 27% saw it as very valuable. In the post test 25% think it is valuable and 75% find e-learning very valuable. Apparently the opinion on the value of e-learning for training and learning in the company was rated higher after the analysis than before. The comments given in the post test focus more on individual training programs and information-management issues (maintain knowledge, save knowledge), than just on the flexibility topic. Interesting enough, the post test shows that the range of opinions of the respondents about e-learning has less variation than in the pre test and the 'don't know' column was little used which indicates a reduction in uncertainty. All respondents believe that the analysis was a good tool for analysis. 100% are satisfied with the analysis procedure and 71% are satisfied with the results and would recommend the analysis to others.

D. Synthesis

DI Conducting the Analysis Framework Approach

The analysis, conducted by the three students, went well. The client was satisfied and most likely there will be a follow up for the students as consultant of the vocational training college.

The reduction in the number of categories, and the focus on particular sub categories as the items (a) training level, (b) schooling and (c) knowledge, decreased the bandwidth of the analysis. As a consequence the analysis was not as thorough as it could have been. One issue which the investigator qualifies as a missed opportunity was the financial aspect. The organization was willing to provide numbers for the past few years, but in the hectic processes of interviews and reporting, this issue was forgotten. An interesting aspect about the different approach is that the sub categories were taken as a starting point, using the main categories as sub categories. So instead of the flow: category 'process' and then the sub category 'training level', the students switched: they took the sub category 'training level' as their entry level and then went through the main categories, looking at 'organisation for the training level', 'processes and the training level', e.g. subsequently the 'ideal training and learning situation was

described' which was used as the basis for the development of the success factors. These factors then were used in a multi-criteria analysis, to rate each of the proposed solutions. This was an invalidated approach, since there was no validation of the factors, or of their ratings or of the proposed solutions. Such a validation though would have exceeded the level of this analysis exercise.

The different approach seemed to fit the priorities of the organization. The danger is that the analysis gets entangled in the existing structure and situation and new and other possibilities are not considered.

One other issue should be looked at carefully. Almost all stakeholders showed a 'solid support' for e-learning in the belief that this would help to solve problems. The management of expectations is important in any project, but especially in a situation where e-learning tends to be seen as the ultimate solution.

D2 Conclusions concerning the portability and the changes to be made in the Analysis Framework Approach (RQ 7 & 8).

Concerning the portability:

- Changing the procedure, and in this case also the bandwidth, does effect the character of the analysis and has consequences for the outcome. It does not necessarily effect the level of satisfaction of the client. One should be aware of this, as has been pointed out before in Cases # 4 and # 6.
- It seems that training organizations like to add or change things in the analysis approach, based on previous experiences. As in Case # 6, the analysis categories were adapted and another analysis approach, the multi-criteria analysis, was added.
- Trying to zoom in on the organizations' context is a good thing to do. One should be cautious though, not to get too much entangled in the existing structure and situation. It might negatively effect the process of looking for and applying other and new solutions.
- The 'attitude to e-learning questionnaire' shows that the analysis procedure seems to help the client in reducing uncertainty and building consensus about the usability of e-learning in their environment. This questionnaire should become an integral part of the analysis and consequently be upgraded using the experiences.

Changes to be made:

- Add information on the bandwidth issue using the experiences in this case study.

- Add evaluation of the ‘attitude to e-learning questionnaire’ to the analysis procedure for the consultant.

6.3 Cross-Case Analysis Schedule

The next step in this empirical research is to take a closer look at the outcomes of the case study analysis by comparing the results and see what the critical issues are in relation to the four dimensions of the portability and the improvement of the analysis. This next step consists of a cross-case analysis, which is the explanation building process for the analysis of multiple cases. A cross-case analysis schedule (see Tables 45 - 47) is used for the presentation of the data from the individual cases.

This analysis is concluded with a summary statement in Chapter 7 on conclusions and recommendations.

The structure of the schedule is based on the information items of the case-study report outline. An overview of these items is shown in the first column of the schedule. Subsequently, the information on the different case studies can be found in the other columns. There are in total eight different cases. Each of the cases is described and used in the cross-case analysis. Table 45 shows the case studies # 7-9. In Table 46 are presented the case studies # 10 – 12 and in Table 47 the cases # 13 – 14.

Table 45 Cross-case analysis schedule, Cases # 7 - 9

Cases # 7-9	# 7 Steel industry: metal strip production unit	# 8 Health care: training institute for company doctors	# 9 Steel industry: service unit logistics and transport
A. Context			
1. Company	Steel sector	Health care training and research	Steel sector
2. Main activity (profile)	Technical team in a Metal strip production unit.	The institute is responsible for the additional training of professionals and policy support and research.	This unit is responsible for the storage and internal and external transport of the companies' products.
3. Consultant	Learning consultant & consultant-investigator	Senior learning consultant	A senior learning consultant and the consultant-investigator
4. Available resources	Online & paperware; analysis report, training info, interviewer questionnaire, participative observation, taped interviews	Online & paperware; analysis report, training info, interviewer questionnaire	Online & paperware; analysis report, training info, interviewer questionnaire, questionnaire on the attitude to e-learning, participative observation, taped interview

Chapter 6: The Second Cycle of Case Studies

Cases # 7-9	# 7 Steel industry: metal strip production unit	# 8 Health care: training institute for company doctors	# 9 Steel industry: service unit logistics and transport
5. Organizational level	Training organization & program	Training organization	Training program and course.
6. Management level	Tactical & training course	Tactical level with operational considerations	Tactical level with the focus on the effectiveness of the training organization and the improvement of the training.
7. E-learning development	Starters level	Starters level	Starters level
8. Stages of awareness	Information & initial personal skills level	Initial personal skills level	Information level
B. Procedure			
1. Sites and contacts	One of several production units on a site in the Netherlands. The manager of the technical team and the vice manager of the training center.	There is one central location. Contact persons: project leader/program coordinator, team coordinator and a program project leader.	The L&T unit is located at the main site of the company in the Netherlands. The main contact was the training officer, assisted by a trainee.
2. Data, time, effort	Oct – 2002 – March 2003; 70 hrs; organization and decision making took more time than expected	Jan – Feb 2003; 70 hrs, with several preparatory meetings. One goal was to establish a project group on e-learning strategy.	March – April 2003; 70 hours. The normal procedure of the analysis could be followed.
3. Preparation of the visit	Initiative by the technical team and the corporate training center. Several intake meetings.	The analysis had to be adapted to the setting of this independent training institute. Items focusing on corporate and business issues were reviewed, changed and/or replaced.	The information on several other analyses from this company was helpful in the preparation and the positioning of L&T in the company context. The intake meeting was used to get a hold on the items L&T considered as most important.
C. Case study observations and experiences			
1. The rationale	How to train in a timely and adequately manner?	Reasons for considering e-learning.	The time factor was considered crucial to keep the training in line with the companies'

Cases # 7-9	# 7 Steel industry: metal strip production unit	# 8 Health care: training institute for company doctors	# 9 Steel industry: service unit logistics and transport
	<p>The traditional apprenticeship training model does not function any more. So there is a need for a new and flexible training model.</p> <p>Key terms: Increased mobility, early retirement, fast changing production machinery, cycle time of information, attitude (alertness).</p> <p>E-learning: e-learning is believed to help solving these problems, especially where it can add flexibility to the training and learning process.</p>	<p>Key terms: Travel time; increase the added value of classroom sessions, timely course material update, communication and exchange between students.</p> <p>E-learning: A new training program is being developed and it is expected that 25% of the training can be conducted by e-learning.</p>	<p>processes. It is impossible to attain this goal under the existing circumstances.</p> <p>Key terms: Training and learning are strategic; means to achieve business goals. Training and learning should support chain management.</p> <p>E-learning: Flexibility, update and upgrade existing content, easy access to learning, Emphasis on safety and well being.</p>
2. Observations	<p>E-learning is good for: lowering the threshold for timely content development by different people, for maintenance, upgrading and access. Management commitment in time, money and effort is needed to make it a success. Communication a requirement for implementation.</p>	<p>Result of the analysis was that e-learning is expected to:</p> <ul style="list-style-type: none"> - Increase the information exchange and collaboration among students - Increase the added value of classroom sessions - Improve the accessibility of course materials - Help to reduce the cycle time for material development - Student profiles help to supply adequate information at the right time. - In the long term e-learning might help to add efficiency to skills training. 	<p>E-learning offers good opportunities:</p> <ul style="list-style-type: none"> - To support innovation and improvement - To support improvement in the development, maintenance of content - To support easy access - To plan training and learning activities - To report on progress and results - To facilitate (self) tests and exams - A special presentation was prepared for a management introduction of the issue.

Cases # 7-9	# 7 Steel industry: metal strip production unit	# 8 Health care: training institute for company doctors	# 9 Steel industry: service unit logistics and transport
3. Experiences	<p>There was a difference in interest between the two stakeholder groups; therefore the discussion took more time than expected. A complicating factor was the link with information management. The discussion on what is 'content' was important. A broader group of representatives would have been useful for the transition to the pilot phase.</p>	<p>This was the first time the consultant used the analysis. In preparation there were a few meetings on the procedure and the adaptation of the analysis for this target group. The investigator had a remote role.</p> <p>The interview time was longer than expected because some issues were new for the participants. The analysis helped to create a broader look at e-learning than just the pilot. It remains difficult to position e-learning in the context of an organization when the knowledge on the different interests, politics and positions is not or only sparsely available for the consultant.</p> <p>Although it took some time to decide, there was a follow up.</p>	<p>There was no representative selection of stakeholders. This was acceptable as long as the conversation was on tactical issues, but on the course level we missed the input of the end user. The consultant found that the division in sub categories did not work well, because of the 'associative way of thinking', context related, of the training officer. The analysis facilitated this process, but it was difficult for the consultant to keep track of what had not yet been discussed. It was relatively easy to position e-learning relative to the needs of the company.</p> <p>There was a follow up, but the consultant was not involved.</p>
D. Synthesis			
1. Conducting the approach	<p>Mainly operating on a tactical level and therefore the representation was too shallow to be well prepared for the transition to Phase 2, the pilot phase.</p>	<p>This again was a different sector and organization than the previous ones. The client was satisfied with the procedure and the results. The analysis seems to be adaptable to the particular situation. To broaden the usability, one might want to be less-specifically focused on the company context</p>	<p>The analysis focuses on the tactical level, but there was a lack of stakeholders on the end-user side to bring the analysis a bit further in the pilot outline. It helped to position e-learning in the context of the organization. The analysis was qualified as successful; the client was</p>

Cases # 7-9	# 7 Steel industry: metal strip production unit	# 8 Health care: training institute for company doctors	# 9 Steel industry: service unit logistics and transport
		or develop different versions for different sectors.	satisfied by the results and would recommend the analysis to others.
2. Relevance for the research questions	<p>Portability:</p> <ul style="list-style-type: none"> a. Organizational levels <ul style="list-style-type: none"> - Stakeholder involvement is an important issue for the transition from one to another phase. - Facilitate participation from different stakeholders of different organizational levels if collaboration is crucial. d. Stages of e-learning development <ul style="list-style-type: none"> - Look at the usability of the final report for other stakeholders and for other phases. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Give guidelines for the 're-use' of parts of the analysis for widening stakeholders involvement. - Improve and extend the report outline to increase the usability for other stakeholders in other phases of development. 	<p>Portability:</p> <ul style="list-style-type: none"> a. Different organizations <ul style="list-style-type: none"> - The approach showed flexibility and could be used in this organization, which differed from the previous ones, with some minor changes. - This might lead to the development of context- or sector-bound analyses. b. Organizational levels <ul style="list-style-type: none"> - The flexibility is also present in the option to interview different groups with a shifting focus. c. Different people <ul style="list-style-type: none"> - The preparation for the consultant was sufficient, but participating in a real-life session seems to be a better way to prepare. d. Stages of development <ul style="list-style-type: none"> - Add information on the context of the analysis to achieve a better understanding of the rational and increase commitment. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Look more closely at the adaptation process of the interview categories and items. - Extend the strategy to quickly getting to know the organization. 	<p>Portability:</p> <ul style="list-style-type: none"> b. Organizational levels <ul style="list-style-type: none"> - A first analysis seems to focus on tactical issues. This focus might limit the possibilities to get a good overview of what is going on in the organization. c. Different people <ul style="list-style-type: none"> - The preparations for the consultant to conduct the analysis need to be looked at. A guide is not sufficient. - A competency matrix would help to clarify what skills and knowledge is needed to conduct the analysis in a satisfactory manner. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Add guidelines to the users guide for situations in which the outline is hard to follow.

Cases # 7-9	# 7 Steel industry: metal strip production unit	# 8 Health care: training institute for company doctors	# 9 Steel industry: service unit logistics and transport
		- Increase the attention for the 'the rational' for innovation in the report (outline).	

Table 46 Cross-case analysis schedule, Cases # 10- 12

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
A. Context			
1. Company	International glassware producing company with three plants in the Netherlands.	A call-center provider, offering a wide range of integrated custom solutions from help desk to technical assistance and live web chat. It is a world-wide enterprise with one site in the Netherlands.	The organization coordinates the development of standards and regulations for many kinds of activities, like the building and IT sector.
2. Main activity (profile)	Important business segments are bottles and food jars. The reduction of the number of employees per factory was the incentive to integrate competencies and skills levels of the employees as part of the business strategy.	The location offers services using state-of-the-art technology, covering 12 languages, 16 countries and 13 projects from different clients. The most-important business goal is quality of service. Business and training goals are highly integrated, because agents in the call centre represent the client company.	The organization promotes the use of standards and offers training. The analysis was conducted in the business unit responsible for training and events.
3. Consultant	Two groups of Masters' students from the University of Twente and the Delft University of Technology, coached by their mentors.	A group of three Masters' students from the University of Twente. This was their second analysis. The first has been described in case # 10. The group was coached by their mentor	A senior learning consultant and the consultant-investigator.

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
		and remotely supported by the investigator.	
4. Available resources	Online and paperware; analysis report; training info; user's guide; interviewer questionnaire; participative observation; attitude questionnaire; taped interviews	Online and paperware; analysis report; training info; user's guide; interviewer questionnaire; attitude questionnaire; taped interviews and a master thesis on the topic.	Online and paperware; analysis report; training info; interviewer questionnaire; questionnaire on the attitude to e-learning; participative observation; taped interview.
5. Organizational level	Company learning strategy, training organization & program	Company learning strategy level.	Training organization level.
6. Management level	Tactical level	Tactical level with operational considerations	On the strategic level for the added value of e-learning and on the tactical level for the renewal of the organizational model.
7. E-learning development	Starters and pilot development phase	Starters level with no experience	Starters level
8. Stages of awareness	Level of routine use of some aspects, extended level and contributor's level. The training coordinator was obviously a forerunner, which was not the case with other stakeholders.	Awareness was available, but not so much in relation with the companies own business goals.	The majority of the stakeholder were on the information level.
B. Procedure			
1. Sites and contacts	The company has three sites in the Netherlands, which all participated in the e-learning activities. The main contact persons were the head of training and a training coach.	There is one location in the eastern part of the country. The main contact persons were manager of project management & training, a soft-skill trainer, the European director of ICT and an interim call-center manager.	The main location is in the western part of the country. The main contact persons were: the Business Unit coordinator of courses and events and the Business Unit manager.

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
2. Data, time, effort	February – June 2004; organization of the analysis had to be arranged in line with the respective study time and programs of the students. For the Twente students, this analysis was an exercise in preparation of a next analysis. For the Delft students this was the only analysis they conducted.	March – June 2003; it was difficult to distinguish the analysis hours from the time spent on the Masters' thesis.	September 2003 – January 2004; 50 hrs, but since the project was extended beyond the planning period, the time investment was higher than expected. The regular analysis procedure could be followed.
3. Preparation of the visit	There were preparatory meetings with the students to discuss the analysis and prepare the interview. In between there were several meetings to discuss the findings and prepare for the next step. Part of the preparation was a guided tour at one of the locations.	There were preparatory meetings with the students to discuss the analysis, the intake session with the group of stakeholders. They did not use prior information on the company in their preparation. There was a guided tour on the company's premises.	There were two preparatory visits to plan the analysis process, select the stakeholders and fine-tune the analysis for the context of this client.
C. Case study observations and experiences			
1. The rational	<p>The situation was different from previous cases. E-learning development was well underway and therefore the analysis focused on the analysis of the state of affairs. The rationale was that the head of training wanted to verify if he was on the right track.</p> <p>Key terms: Connect training and learning to business goals; innovation needed; e-learning a vehicle for</p>	<p>The performance of the agents determines the quality of the service. So a lot depends on the 'interaction with the call-center client's customer'.</p> <p>Reasons for considering e-learning.</p> <p>Key terms: The need for timely knowledge updates; agents need to decide on a individual basis when and what to learn; the</p>	<p>The organization wanted to get a good idea of the possibilities of e-learning and the analysis was considered a through and systematic approach.</p> <p>Key terms: linadequate flexibility in the organisation of courses, possibilities for tailor-made solutions were restricted, course</p>

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
	<p>improvement.</p> <p>E-learning: More-structured and professional training by redesigning the training and learning process; allows for more focus on the function profile of the workers, for monitoring progress and results, timely and accurate content update, allows for training and learning on the job</p>	<p>need to systematically measure the training impact.</p> <p>E-learning: There is a general notion that the company is ready for an innovation as e-learning; the motivation of the agents is high; agents are expected to be better when they can make their own individual choices.</p>	<p>material was too theoretical and not suitable for self study, the effectiveness of the courses was considered to be moderate, the production cycle time for courses was too long, and actual offerings served only a minority of the target group.</p> <p>E-learning: More flexibility in time and place, diversification of the course offerings, better integration into daily practice, application of active learning processes, decrease of development time</p>
2. Observations	<p>From the analysis it could be concluded that the company was on the right track. The main supporting factors were:</p> <ul style="list-style-type: none"> - The cultural shift (towards a company-wide e-learning), committed mentality - Embedded learning strategy (learning goals linked to business goals) - Organizational impact (awareness of organizational changes) - Infrastructure readiness (is it truly enabling e-learning?). 	<p>The normal analysis procedure could be followed. The process was supported by the mentor. The outcome of the analysis was:</p> <ul style="list-style-type: none"> - E-learning was highly recommended. - The best solution seemed to be a blended-learning situation. - The organizational environment is mature enough to make a start with e-learning. 	<p>The analysis was conducted using the regular procedure, with some changes in relation to the context of the organization.</p> <p>There were three interview meetings with different stakeholder groups. Each meeting started with a short introduction of e-learning to create an appropriate level of expectations. It was not easy to organize</p>

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
	<p>Some aspects needed more attention: return on investment issue, not dealt with adequately; outsourcing of e-learning activities; collaboration with educational services, the need to develop a basis of shared interest with providers and vendors to achieve additional benefits from the e-learning strategy.</p>		<p>these meeting, due to a major reorganization of the organization taking place at the same time. The final report was discussed with the main group of stakeholders.</p> <p>Several suggestions for the follow up were presented, like a course on safety, and an introductory course for new employees and participants of the commission boards. A didactical upgrading for the teachers was accepted.</p>
3. Experiences	<p>Although the entire analysis went well the level of information of the students could not meet the level of the client if more stakeholders would had participated, this forerunner situation would have been less obvious. The client was very cooperative. Interview items were sometimes difficult to interpret and questions were not always clearly stated.</p> <p>The client was satisfied about the final report and seriously considered the recommendations. This led to a follow up on the topic of return on investment.</p>	<p>The students did not consider the stakeholder group representative enough. The end user group, the agents, was missing. A stakeholder group should be better analyzed in order to enhance the validity and reliability of the information.</p> <p>Some interview items and questions were not clearly stated and caused confusion. The students qualified themselves as sufficiently prepared, but more training and experience would help to better conduct the analysis. they thought it</p>	<p>Unfortunately there was no opportunity to interview the end user. Although the time span in which the analysis took place was quite long, the client was satisfied with the results. Because of the reorganization, e-learning obvious was not a priority and there was no follow up.</p> <p>The attitude to e-learning questionnaire was used by almost all participants. The pre test showed seventeen 'do not know', the</p>

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
		<p>was a very good experience to be out in the field.</p> <p>The attitude to e-learning questionnaire showed a high level of expectation and all respondents see e-learning as very beneficial for their work. They would recommend the analysis, but were not completely satisfied with the results.</p>	<p>post test responses showed only two. The respondents felt more confident in what they thought about e-learning, than before the analysis.</p>
D. Synthesis			
1. Conducting the approach	<p>This case study differed from the previous ones in two ways: the analysis was executed by relatively inexperienced students, and this was not an upfront analysis but a state-of-affairs development check. The main question was: 'Are we doing the right thing'? The students were not as well informed as the client and some questions were lacking for this specific situation. However the outcome was seen as rewarding.</p>	<p>The investigator's observation was that the students had not sufficient operational knowledge of the subject, were in need of interview skills and lacked experience in working with a tool like the analysis. Each of the students took one or two categories to focus on, but this led to a fragmentation of the analysis and they therefore missed out on the translation of the findings into a concrete outline for a pilot.</p>	<p>The analysis went well, but it took some time, due to other priorities. The outcome was not surprising but to the point and considered realistic.</p>
2. Relevance for the research questions	<p>Portability:</p> <p>b. Organizational levels:</p> <ul style="list-style-type: none"> - Stakeholder involvement was not optimal and might have effected the outcome. <p>c. Different people:</p> <ul style="list-style-type: none"> - Although the student 	<p>Portability:</p> <p>a. Different organizations:</p> <ul style="list-style-type: none"> - The approach seems to work well, but the inexperience of the interviewers hampered the results. 	<p>Portability:</p> <p>a. Different organizations:</p> <ul style="list-style-type: none"> - The first time the approach was used in this organizational context and it

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
	<p>groups were inexperienced and less knowledgeable about e-learning than the client, the approach worked out well.</p> <ul style="list-style-type: none"> - The interpretation of the interview items was not at all times easy. Understandable because of the different background and level of expertise. - Would be interesting to see, whether e-learning experts outside of CINOP would react the same way. <p>d. Stages of e-learning development:</p> <ul style="list-style-type: none"> - Using the approach as an 'evaluator' of the actual situation instead of an upfront analysis. - It can be expected that the need for an upfront analysis will decrease in the near future, when most companies will have started using e-learning. The need for an ongoing analysis, related to the different development phases, will increase. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Take a close look at the interview items and questions from the perspective of misinterpretation. - Consider the possibilities of the 	<p>b. Organizational levels:</p> <ul style="list-style-type: none"> - Involvement of different stakeholders is important to increase the reliability of the collected information. <p>c. Different people:</p> <ul style="list-style-type: none"> - It is rather difficult for inexperienced students to conduct a analysis in a real life and commercial environment, looking for real solutions. - The interpretation of the interview items and questions was not easy at all times. - There was a difficulty in handling the 'overlay of existing situation – desired situation – thresholds – solutions' in the interview items. <p>Changes to be made:</p> <ul style="list-style-type: none"> - The interview items and questions should be looked at again to see whether change is needed or the context should be more clearly stated. - Add the 'pilot outline', which is now a sub category of the 'Business model' category, as a sixth category to support the 'context driven solution for a training or learning need of 	<p>worked out well.</p> <p>b. Organizational levels:</p> <ul style="list-style-type: none"> - The division into three different stakeholder groups worked out well and contributed to the multitude of information. <p>d. Stages of development:</p> <ul style="list-style-type: none"> - Going through the approach is a learning process, which helps to build consensus on the clients' side. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Add to the user's guide a remark on the 'capacity for change' and the 'readiness for e-learning'. The analysis will be less effective when at the same other major changes are taking place.

Cases # 10-12	# 10 Production industry: glassware company	# 11 Service industry: a call center	# 12 Service industry: organization for the development of standards
	analysis as an analysis tool for ongoing evaluation purposes.	the company itself.	

Table 47 Cross-case analysis schedule, Cases # 13- 14

Cases # 13 -14	# 13 Health care: organization for special diseases	# 14 Food industry: producer of refined oils and fats
A. Context		
1. Company	The organization combines a clinic and a research center. There is special treatment center to improve remediation and all major areas of research are covered.	The company produces and supplies refined oils and fats to the European food and feed industries and is part of a worldwide operating company with a strong representation in Asia.
2. Main activity (profile)	The analysis was conducted in the department for radiotherapy with the focus on the paramedic group of laboratory employees. This group should increase their availability for different tasks. The organization employs 1200 people.	The company is very much process and result oriented, due to a very competitive market. There is a shared responsibility for the performance of the organisation. Training and learning therefore are considered crucial for the empowerment of the employees. Care for safety, quality, environment and working conditions are regarded as everybody's business. The company has 200 employees.
3. Consultant	Two senior learning consultants. The investigator had no role in this.	The analysis was conducted by a group of three part-time Masters' students from the Delft University of Technology as part of their elective course on 'e-learning in corporations'. They had a strong background in vocational training and education and worked as consultants for a vocational-training college. The investigator was mentor and coach of this group.
4. Available resources	Online and paperware; analysis report; training info; user's guide; interviewer questionnaire;	Online and paperware; analysis report; training info; user's guide; interviewer questionnaire; observation by the investigator; attitude questionnaire; taped interviews and essays on the experiences on the analysis process.

Chapter 6: The Second Cycle of Case Studies

Cases # 13 -14	# 13 Health care: organization for special diseases	# 14 Food industry: producer of refined oils and fats
5. Organizational level	On the HR level, the level of the training organization and the training program.	On the HR level the need to collect information and reactions from the different stakeholder levels, to be able to discuss e-learning on the organization and program level.
6. Management level	On the strategic level to see whether the outcome of the analysis would extrapolation of e-learning possibilities. On the tactical level the question focused on how to achieve the changes.	The analysis was operated mainly on the strategic and tactical level.
7. E-learning development	At the start of e-learning development.	Starters level with no experience.
8. Stages of awareness	Initial personal skills level. Aware of the possibilities, trying to solve the problems and become familiar with the consequences.	Level c (initial personal skills). The awareness that e-learning might help to solve problems was present. The question though was how?
B. Procedure		
1. Sites and contacts	The main contact persons were: head of the training department, the head of the radiotherapy cluster of the paramedical group and the head of the IT unit.	There is one site in the Netherlands in the western part of the country. The main contact persons were: the HR manager and the supply-chain operations manager. The fact that one of the students had been working for the company prior to this research was very helpful.
2. Data, time, effort	January – April 2004; time spent about 40 hours. The installation of the e-learning project group eased the organization process for conducting the analysis.	March 2004 – August 2004; time spent was 170 hours of which part was spent on related assignments for the elective course.
3. Preparation of the visit	There was one preparatory meeting. It was decided to install an e-learning project group. Also this meeting helped to learn about the context and the limitations of the existing training and learning program.	There were preparatory meetings, official and unofficial, with the students and the client. The line of activities was extensively discussed and it was decided to interview multiple levels of stakeholders to develop a good insight into the readiness of the company to use e-learning. The analysis format was adjusted to the context of the company. Five levels of stakeholders were selected: management, middle management, IT-employees, trainers and operators.

Cases # 13 -14	# 13 Health care: organization for special diseases	# 14 Food industry: producer of refined oils and fats
C. Case study observations and experiences		
1. The rationale	<p>The difference with most other cases was that this organization is not a company working for profit, but an internal training organization. The organization was eager to get a good idea about the possibilities of e-learning and the consequences.</p> <p>Key terms: Flexibility and employability of employees in the radiology department, lack of basic knowledge, availability of simulators and mentors, performance control, staying up to date.</p> <p>E-learning: Training and learning must become more flexible and more personal. This is not feasible with the existing training organization. Less time and place related learning and training is believed to bring the needed flexibility.</p>	<p>The main reason for considering e-learning was the desire to find other and new solutions for the current training needs. The possibility to perform an analysis to verify what the opportunities were was welcomed.</p> <p>Key terms: Difficult to organize the training; need to coach, track and trace students; production-relevant information storage, maintenance and retrieval need to be upgraded.</p> <p>E-learning: There is a general notion that e-learning will help to deliver training and learning in a more-flexible way and that digital information offers new opportunities for timely access and at any location.</p>
2. Observations	<p>The normal analysis procedure could be followed with some adaptation of the interview items. The final report contained also a pilot outline which was discussed.</p> <p>From the analysis it can be concluded that e-learning could contribute as follows:</p> <ul style="list-style-type: none"> - Supply entry-level tests, so students know better what to expect and what is needed. - Offer upfront course material, so students can prepare and extend their knowledge beforehand. - Make the training situation more transparent by having access to information on progress and results. - Offer additional exercises. 	<p>The basic procedure could be followed.</p> <p>The students used the analysis in an adapted format. The numbers of categories were reduced and only the interview items which fitted into three main categories: (a) training level, (b) schooling and (c) knowledge, were used. This shift was a reaction to the preference of the client, the limited available time and the wish to work in a context related way. This meant that the analysis focused on these three categories, which in the context of the analysis were considered sub categories. The outcome of the interviews was described as an ideal picture of learning in the company. This picture was converted into a number of success factors. On the</p>

Cases # 13 -14	# 13 Health care: organization for special diseases	# 14 Food industry: producer of refined oils and fats
	<p>When looking at the usability for the organization at large:</p> <ul style="list-style-type: none"> - Use a case approach. - Exchange of experiences and questions. - Offer tests for the actual level of knowledge. - Offer administrative functionalities for progress and study results. <p>Suggestions for the follow up: Entry-level tests, learning content and assignments.</p>	<p>basis of this ideal picture, three types of solutions were suggested:</p> <ul style="list-style-type: none"> - Hire a training coordinator. - Outsource all training and learning activities - Apply e-learning. <p>These solutions were rated using a multi-criteria analysis. The bases for this analysis were the success factors which had been given a certain weight in relation to their economic priority. The outcome shows that e-learning is the preferred solution and three activities were seen as most favourable:</p> <ul style="list-style-type: none"> - The development of an online information and knowledge base. - A website with an overview of course offerings and online courses. - Training and learning using e-learning.
<p>3. Experiences</p>	<p>The analysis went well and some clear and usable conclusions and recommendations were produced. The stakeholders' representation was well balanced and contributed to the success of the analysis. The categories were mostly used as guidelines and questions were rephrased in the context of the organization. The analysis helped to increase the awareness of the client on the possibilities of e-learning. It was possible to position e-learning relative to the needs of the target group, not so much to the organization at large. The organization employs 1200 people and consists of a large number of different units.</p> <p>The consultants assessed themselves as 'sufficient to good' concerning their interview skills.</p> <p>The client was satisfied with the outcome, but eager to know more about costs and the time involved in developing a pilot.</p>	<p>The analysis was executed by the three part-time Master's students having strong backgrounds in vocational education and training. The procedure was followed with some changes in the interview categories and the way the analysis was conducted to come to the final results. There was a representative group of stakeholders, combined into five different groups of about three employees each ranging from the operator level to the management level. The students took different roles: active interviewer, observer, note taker. The reports were well received. The conclusion was that the analysis procedure helped the client to further develop its opinion about the possibilities of e-learning.</p> <p>The students felt that the analysis might not be an easy way for everyone to share their thoughts about e-learning. There was an obvious divergence in the way the analysis was</p>

Cases # 13 -14	# 13 Health care: organization for special diseases	# 14 Food industry: producer of refined oils and fats
		<p>conducted and the report was structured. The client felt comfortable with the results and it looks like there will be a follow up.</p> <p>The 'attitude to e-learning questionnaire' showed a solid support for e-learning on all levels. The value of e-learning for training and learning in the company is rated higher after the analysis than before. Interesting is the decrease in 'don't knows', which indicates a reduction in uncertainty. All respondents believed that the analysis was a good tool for analysis. 100% were satisfied with the analysis procedure and 71% were satisfied with the results and would recommend the analysis to others.</p>
D. Synthesis		
<p>1. Conducting the approach</p>	<p>This case study differed from most previous ones because of the nature of the organization an internal training service of a not-for-profit organization.</p> <p>The analysis went well, the client was satisfied. It took some time though before action was taken for the follow up, but when it happened the consultants were again involved. The interview items needed to be adapted and were mainly used as guide, also because of the dominance of the main problems and issues of the client.</p>	<p>The reduction in the number of categories and the focus on the sub categories (a) training level, (b) schooling and (c) knowledge, decreased the bandwidth of the analysis. As a consequence the analysis was not as thorough as it could have been. One issue, which the investigator qualifies as a missed opportunity, was the financial aspect. Data were made available, but not used.</p> <p>From the analysis the ideal learning environment was perceived and the solutions were rated against the success factors in a multi criteria analysis. This was a non validated approach, because no validation of the factors took place, nor of their rating nor of the proposed solutions. This validation would have exceeded the level of this analysis exercise.</p> <p>The danger of getting entangled in the existing structure and situation increases when narrowing the bandwidth of the analysis.</p>

Cases # 13 -14	# 13 Health care: organization for special diseases	# 14 Food industry: producer of refined oils and fats
<p>2. Relevance for the research questions</p>	<p>Portability:</p> <p>a. Different organizations:</p> <ul style="list-style-type: none"> - The approach worked well in again a new context. - It would be helpful to have a broad collection of adapted interview items for specific businesses and organizations, especially when the items have shown to be useful. <p>c. Different people:</p> <ul style="list-style-type: none"> - The interview items predominantly have a function as guide and reminder certainly in a non-business environment. - One needs to change and replace items to make the analysis fully operational in other environments. - Some guidance is needed to apply this change process. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Add careful considerations to the user's guide for the adaptation process of the interview items to better support the interview process in the context of the client. 	<p>Portability:</p> <p>a. Different organizations</p> <ul style="list-style-type: none"> - The approach worked well in yet another setting, in which a training organization conducted the approach in a production facility. <p>b. Organizational levels:</p> <ul style="list-style-type: none"> - Zooming in on the companies' context is a good thing to do, but one should not get too much entangled in the existing structure and situation. It might effect the process negatively of looking for and applying other and new solutions. <p>c. Different people:</p> <ul style="list-style-type: none"> - Training organizations like to add or change things in the analysis approach, based on previous experiences. <p>d. Stages in e-learning development:</p> <ul style="list-style-type: none"> - The 'attitude to e-learning questionnaire' is helpful in reducing uncertainty and building consensus. - Changing the procedure, and in this case also the bandwidth, effects the character of the approach and has consequences for the outcome, as has been pointed out before in the Cases # 4 and # 6. <p>Changes to be made:</p> <ul style="list-style-type: none"> - Add information on the bandwidth issue using the experiences in this case study. - Add evaluation of the 'attitude to e-learning questionnaire' to the analysis procedure for the consultant.

The synthesis of the findings of this cross-case analysis is presented in the next chapter in Section 7.1.

6.4 Summary

The focus in this chapter was on the practical experiences with Version I of the Analysis Framework Approach. This second cycle of case studies consisted of cases from different organisations, like the steel industry, the health-care sector, the service industry, the glass-production industry and the food sector. The cases were conducted by different consultants and students, on different organisational levels and at different stages of e-learning development. The outcome of these experiences was documented in case-study reports and reviewed in a cross-case analysis.

This analytical reduction process will continue in Chapter 7 containing the final conclusions and recommendations. The outcome of the cross-case analysis will be summarized and then valued using a SWOT analysis to make a distinction in the urgency of improvements to be made to the Analysis Framework Approach.

It is evident that the empirical evidence supports the notion that the Analysis Framework Approach can be used by different people, although a certain level of expertise and consultancy skills is needed. The approach can be used in different organisations. The evidence is less strong concerning the use of the approach on different organisational levels and at different stages of e-learning development.

7 Conclusions on Version 2 and Recommendations

This chapter is about the main conclusions and recommendations concerning Version I of the Analysis Framework Approach. The main objective of this research is to develop and implement such an approach to support the learning consultant in the management process of e-learning development. The conclusions are the end result of a deduction process which began with the analysis of the meaning of e-learning, the theory on educational change and on innovation and the experiences we have had with ICT since the introduction of the first educational telecommunication tools. It was on the basis of this analysis that a set of building blocks was established as the main frame reference for the development of Version 0 of the Analysis Framework Approach. Version 0 was tested, evaluated and recommendations were made for the improvement of the approach. Version I was the improved Version which was tested in practice in the same way as Version 0. The empirical data were documented as case studies and the most relevant issues were brought together for a cross-case analysis in Chapter 6. In this chapter we will present a summary of results of the cross-case analysis (see Section 7.1). Subsequently a SWOT analysis is applied on these results to be able to select the most important actions for a new version of the Analysis Framework Approach, leading to the final recommendations for the portability and the improvement of the approach covering RQ 7 and 8 (see Section 7.2). The portability of the approach is defined as the usability of the analysis framework in four dimensions: (1) in different business and organizations, (2) on different organizational levels, (3) by different people and in (4) different stages of e-learning development. The recommendations are clustered in line with these four dimensions, including the suggestions for improvement (see Section 7.3). The chapter ends with a summary presented in Section 7.4.

7.1 Summary Results of the Cross-Case Analysis

The cross-case analysis schedule is the basis for the cross case analysis, which is an explanation building process for the evaluation of multiple cases. In total there were eight cases developed using Version I of the Analysis Framework Approach. A summary of the results of the cross-case analysis can be found in Table 48. The structure of this overview is identical with the original case-study report protocol, which has been used as the main document structure and also for the cross-case analysis. An overview of the case-study reports from the second cycle of case studies can be found in Appendix H. The summary results are the selected raw data outcome of the cross case analysis. Parts A and B of the summary supply factual information, Part C provides an overview of the observations and experiences of the learning consultant conducting the Analysis Framework Approach and Part D is the summary

of the reflections from the investigator per case study on the analysis process and the outcomes.

Table 48 Summary results of the cross case analysis, Cases # 7 - 14

A. Context	
1. Company	The analysis covers a combination of cases from the steel industry, the production and food industry, the service industry and the health-care sector. The variance is larger than for the first cycle of case studies and meets the demand to test the Analysis Framework Approach in different companies and different sectors.
2. Main activity (profile)	In most industries, the task-related training is the responsibility of the training coordinator. In some sectors, like in health care, training and learning is of a primary concern or a prime task, involving staff members.
3. Consultant	The approaches were conducted by senior learning consultants, groups of Masters' students and the investigator operating as participative observer, observer or mentor and coach of the students. One group Masters' students was coached by their own mentor. So, different people used the Analysis Framework Approach in different situations, with, as we will see, different results.
4. Available resources	In most cases all the expected resources were available, including the 'attitude to e-learning questionnaire'. This questionnaire was added as a result of the analysis of the first cycle of case studies. In addition, students supplied their master theses and reflective essays, which complemented the existing information in Cases # 10, 11 and 14.
5. Organizational level	Most analyses were conducted on the level of the training organization and the training program. In Case # 10 these were combined with the strategy level and in Cases # 13 and 14 with the HR level. Case # 11 on the call center focused solely on the strategy level. Case # 9 combined the program and course level. This shows that the Analysis Framework Approach was used on different organizational levels.
6. Management level	All the prime participants operated on the tactical level, with Cases # 12, 13 and 14 adding strategic issues. In the Cases # 8 and 11 there were operational considerations. The dominance of the tactical level has to do with the fact that for most organizations this was a first analysis on e-learning. People functioning on a tactical level have the tasks, the possibilities and the funds to decide about such an activity and remain the prime stakeholders in this first phase. This is confirmed by the listing of the main contact persons in B1. There is no doubt that in the following phases of e-learning development within the organization, other levels will be present as well. However, the emphasis on the tactical level is dominant.
7. E-learning development	All cases were conducted on the starter's development level, with the exception of Case # 10, where e-learning was well underway and the analysis had the character of a process evaluation. So there was only one case operating on a different level of development.

Table 48 continues ...

Table 48, continued.

8. Stages of awareness	Almost all organizations and their people were on the information and the initial personal skills level, with the exception of Case # 10. The main contact person in this case could be seen as a forerunner, acting on the level of routine use, the extended level and the contributor's level.
B. Procedure	
1. Sites and contacts	<p>All cases were conducted in the Netherlands in international organizations, except for the health sector and one service organization. Involved as primary contacts were:</p> <ul style="list-style-type: none"> - Team manager - Vice manager of a training center - Project leader/program coordinator - Team coordinator and program project leader - Training officer - Head of training - Training coach - Manager of project management - Training and soft-skill trainer - European director of ICT - Interim call center manager - Business unit coordinator - Business unit manager - Head of the training department - Head of a paramedical group and head of the IT unit - HR manager - Supply-chain operations manager. <p>These were primary contacts and stakeholders participating in the different cases in the analysis approach. The group of interviewees was much larger and mostly included people from all levels.</p>
2. Data, time, effort	<p>The intention to conduct the approach in two to four weeks' time. In reality it took longer or even much longer. In Case # 12 it took six months due to a major internal reorganization. In general an analysis required about 40 – 70 hrs. The cases conducted by students took more time, because of the need for extra preparation and discussion and the mix with related assignments.</p>
3. Preparation of the visit	<p>At all times online or otherwise available information was used to prepare for a first meeting. In case there was a contract, there was a previous meeting to agree on the conditions.</p> <p>In all cases there were preparatory meetings or, as it is called in the CES Model, intake sessions with the main contact persons to achieve an agreement on the procedure of the approach and to collect information on the context. In some cases this led to changes in the approach. In Case # 8 for example, the organization was not a business but an independent training institute, so items had to be adapted or replaced in preparation of the interview.</p>

Table 48 continues ...

Table 48, continued.

C. Case-study observations and experiences	
1. The rationale	<p>This is an overview of the observations and experiences from the consultants who conducted the analysis.</p> <p>The main reasons for the companies and organizations to conduct an analysis were:</p> <ul style="list-style-type: none"> - The need to get a good idea about the possibilities of e-learning and the consequences. - The need for training and learning in a timely and adequate manner. Case # 10 differed in the sense that e-learning was well underway in this project, but the head of training wanted to verify if he was on the right track. <p>The expectations' the companies and organizations have of e-learning:</p> <ul style="list-style-type: none"> - More-flexible and more-personal training and learning - Help to deal with increased mobility - Help to deal with early retirement - Reduced cycle time of information - Reduced cycle time of content production - Better connection of training and learning to the business goals - Timely and accurate knowledge updates - Individual training and learning options - Better measurement of progress, results and impact - More emphasis of information storage, maintenance and retrieval. <p>In general e-learning is expected to add flexibility to the training and learning process and support ongoing innovation.</p>
2. Observations	<p>The procedure and products of the approach:</p> <ul style="list-style-type: none"> - The Analysis Framework Approach could be conducted in all cases. - In general (minor) adaptation of the analysis was needed in relation to the specific context of the different organizations. - In some cases this meant changes in the interview items (Case # 8, 12, 13 and 14) or in the procedures (Cases # 10, 11, 13 and 14). <p>Part of the analysis approach is to look for solutions of current problems and to see what role e-learning can play. According to the respondents e-learning seems to offer opportunities for:</p> <ul style="list-style-type: none"> - Timely content development and maintenance by different people. - Reduction of the cycle time for content development and updating. - Improvement of the development and the maintenance of content. - Better options for access, information retrieval and information exchange. - More flexibility in the planning and ways of conducting training and learning activities. <ul style="list-style-type: none"> - Increase in the added value of classroom sessions.

Table 48 continues ...

Table 48, continued.

	<ul style="list-style-type: none"> - Entry-level tests and individual profiles for timely and adequate information and planning of learning activities. - Improvement of the organization for individual tests and exams. - Use of reporting facilities on progress, results and impact to increase the transparency of the training situation. - Outsourcing of training and learning, facilitated by e-learning. - Testing the readiness for e-learning. - Spend more attention and have more possibilities for the return on investment issue. - Using e-learning for a broader innovation of the human capital factor, than just training and learning. - Strengthening the 'learning strategy' of the organization by means of e-learning. <p>E-learning was well underway in Case # 10 and this resulted in an opportunity listing, which differed from the previous one:</p> <ul style="list-style-type: none"> - The return-on-investment issue was part of the evaluation process to support decision making. - Collaboration with educational services, like a vocational-training college was established. - The need for partnerships and shared interest with providers and vendors, to achieve additional benefits as part of the e-learning strategy was identified
3. Experiences of the consultant	<ul style="list-style-type: none"> - The approach could be conducted in all cases with minor changes if needed. - Obviously it was difficult to judge in an early stage if the right people were at the table and what to do to change it if they were not. In some instances, like in Case # 10, 11 and 12, it was felt that especially end users were missing as stakeholders. In other cases (# 13 and 14), a balanced representation of stakeholders contributed to the outcome. - It remained difficult to position e-learning relative to the needs of the company, when information on the 'social fabric' was only sparsely available and when it was a large organization. - The approach functioned as a work method for the consultant, but sometimes it was difficult to follow the dotted line. The focus of the interviewees on their own situation sometimes led to a very 'associative way of thinking', which made it difficult to think out of the box and discuss other and new solutions (see case # 9). - Case # 10, it was an internal reorganization which hampered conducting the approach within an acceptable period of time. - The differences of the level of information among the stakeholders played a role. Therefore, when needed, meetings started with a short introduction on e-learning. - In Case # 10 it happened that the interviewee was better informed than the students executing the approach. - In all cases people were eager to become familiar with the added value of e-learning in their situation and with the consequences, also from a 'return on investment' perspective (Case # 10 & 13).

Table 48 continues ...

Table 48, continued.

	<ul style="list-style-type: none"> - A complicating factor is the tendency of the client to link the Analysis Framework Approach with other, related fields, like information and knowledge management. This is logical, but might direct the attention away from the prime issue, which is e-learning. <p>The wish to deal with the 'readiness of stakeholders' to support e-learning development was translated into an 'attitude to e-learning questionnaire', as one of the changes made to Version 0 of the Analysis Framework Approach. This questionnaire was used in Version 1, but not in all cases. The outcome of the questionnaire showed that stakeholders see e-learning as beneficial for their work and have high expectations. This demonstrates the readiness of stakeholders to support e-learning development. A vast majority of the stakeholders qualified the approach as a good tool for analysis. They were very satisfied with the procedure, with the results and would recommend the approach to others.</p>
D. Synthesis	
<p>1. Conducting the approach</p>	<p>This is a summary of the reflections from the investigator per case study on the analysis process and the outcome:</p> <ul style="list-style-type: none"> - Conducting the approach mainly took place on a tactical level. This had the disadvantage that other stakeholders might not be heard. This would hamper the preparation for a pilot phase (Case # 7 and 9). - The approach was originally developed for the corporate environment, but could with some adaptation also be used in other sectors and organizations (see Cases # 8, 11, 12, 13 and 14). The different experiences and adaptations could be stored for later use in similar cases. - The approach is not suited for relatively inexperienced students. They might not have the right information level, the interview skills and might miss the experience to work with a tool like the quick-scan approach, which is demanding from a procedural point of view. - In all cases, the students qualified the work as a good field experience. - A reduction of the interview categories and items or changing the procedure might lead to a fragmentation of the analysis and, like in Case # 11, prevent the translation of the findings into a concrete outline for a pilot. - In general, changing the 'bandwidth' of the approach might limit the usability and lead to a fragmented analysis or confinement in the existing structure and situation. The term 'bandwidth' comprises all the elements of 'the educational business column'. - In general the outcome of the approach is considered to be to the point and realistic.
<p>2. Relevance for the research questions</p>	<p>The analysis of the portability of the approach (RQ 7) is based on the usability in four dimensions, which are:</p> <ol style="list-style-type: none"> a. In different organizations b. On different organizational levels c. By different people d. In different stages of e-learning development

Table 48 continues ...

Table 48, continued.

<p>The dimensions are used to structure the summary results for a better analysis. What follows is an overview of the relevance of the dimensions in the different cases, based on the number of issues mentioned in relation to the dimensions. In addition there is a short description of the issues per dimension.</p>				
Dimensions	a. Different organisations	b. Different organizational levels	c. Different people	d. Different stages of e-learning development
Case # 7		++		+
Case # 8	++	+	+	+
Case # 9		+	++	
Case # 10		+	+++	++
Case # 11	+	+	+++	
Case # 12	+	+		+
Case # 13	++		+++	
Case # 14	+	++	+	++

+ = number of times this aspect was mentioned

Portability (RQ 7):

a. In different organizations:

- The Analysis Framework Approach showed flexibility and could be used in different organizations with some minor changes. Guidance is needed though to apply this change process correctly.
- A collection of adapted interview items for specific businesses and organizations might be helpful, when the items have shown to be useful.

b. On different organizational levels:

- A first analysis seems to focus on tactical issues, which might limit the overview of what is going on in the organization.
- Stakeholder involvement from different organizational levels is an important criterion for the reliability of the analysis and for the transition from one to another e-learning development phase.
- Increasing the usability of the final report for other and new stakeholders might help to better deal with the stakeholder issue. Additional items for the final report could be: more background information on the training needs and the demographic situation, more about the rationale for considering e-learning, the consequences and the alignment with business goals.
- Zooming in on the company's context is a good thing to do, but it might lead to entanglement in the existing structure and situation which will negatively affect the innovation process.

c. By different people:

- Participation of the consultant in a real-life session is a good way to prepare this person for conducting the approach.
- The interview items in the analysis approach have a function as guide and reminder and should be treated like that.

Table 48 continues ...

Table 48, continued.

	<ul style="list-style-type: none"> - The interpretation of these interview items was not at all times easy for the interviewer and for the interviewee. - The possible use of the approach by different people showed some limitations. In general a competency matrix might help to clarify what skills and knowledge are needed to conduct the approach in a successful manner. - The consultant needs to be able to adapt the framework to the clients' context to assure that the approach will be fully operational. Some guidance is needed for this change process. <p>d. Different stages of e-learning development:</p> <ul style="list-style-type: none"> - The usability of the final report should be improved to better support for other development phases and other stakeholders. - Information should be added on the context of the analysis to achieve a better understanding of the rationale for the conduction of the analysis and to increase commitment. - In one case (# 10) the approach was used as an 'evaluator' of the existing e-learning situation instead of the common 'upfront analysis'. It can be expected that the need for an ongoing analysis will increase when most companies have started to use e-learning. - The 'attitude to e-learning questionnaire' is helpful in reducing uncertainty and building consensus. - Changing the procedure, and in this case also the bandwidth, does effect the character of the approach and has consequences for the outcome, as has been pointed out before in the Cases # 4 and # 6. <p>Changes to be made (RQ 8):</p> <ul style="list-style-type: none"> - Give guidelines to increase the usability of the final report and for the 're-use' of parts of the report for other and new stakeholders in other phases of e-learning development. - Develop guidelines for the adaptation of the categories and interview items for other and new sectors and organizations. - Consider the possibilities of the approach as an analysis tool for ongoing evaluation purposes. - Add the 'pilot outline', now a sub category in the business category, as a separate category to support 'the context driven solution for training or learning need of the company'. - Add to the user's guide information on the need to judge the 'capacity for change' and the 'readiness for e-learning'. When organizations are heavily involved in other change processes then e-learning might not come at the right time. <p>Add information on the bandwidth issue to the user's guide concerning the danger of 'confinement with the existing structure and situation'.</p>
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This overview of summary results is the main source for the reflection in the next sections on the factors which are most important for the improvement of the Analysis Framework Approach.

In particular the use of the questionnaire on the attitude to e-learning (see Appendix G) showed that the participants became better informed about the possibilities and consequences of e-learning during the course of the analysis process. From the perspective of the consultant the analysis procedure is an efficient way to become familiar with the client. For the client this procedure is a learning process to become familiar with the possibilities of e-learning in the context of the organization and it helps the client to reduce uncertainty and build consensus. It is worth mentioning this dimension, not as an add on to the other dimensions, but as an opportunity to consider in the management process of e-learning development.

7.2 The SWOT Analysis

The cross-case analysis schedule (Tables 45 - 47) and the summary of findings (Table 48), provide us with an overview of empirical information on the use and the examination of the Analysis Framework Approach in eight different businesses and organizations. For this second cycle of case studies we have been using Version I of the approach. Version I is the improved Version of Version 0. The improvements were the result of the analysis of the first cycle of case studies described in Chapter 5. In this chapter we have followed the same analysis procedure as in Chapter 5, which means that in this section on conclusions and recommendations, we will zoom in on the most important issues using a SWOT analysis (see Table 49) to isolate the factors which can contribute to the improvement of the Analysis Framework Approach in the context of this study.

Table 49 SWOT analysis on the outcome of the cases # 7 - 14

<p>A. Strengths</p>	<ol style="list-style-type: none"> 1. The variance in this second cycle of cases made it possible to test the analysis framework in different companies and different sectors. The approach needed adaptation and the consultant needed the skills to do that, but it was doable and led in most cases to a new assignment for the consultant. 2. The approach was used by different people in different situations, but with different results. The students were less successful than the consultants, lacking knowledge and interview experience. 3. The approach produced many different resources, including the 'e-learning attitude questionnaire', which appeared to be a very helpful tool to assess the readiness of individual stakeholders to support e-learning innovation. 4. The different resources could be used to improve the preparation for an analysis approach in a particular situation. The resources need to be customized to improve the options for storing operational information and the access. 5. In all cases the primary contact persons also participated in the approach. The number of interviewees in general was larger then in the Cases 1-6, including people from other levels of the organizations.
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Table 49 continues ...

Table 49, continued.

	<ol style="list-style-type: none"> 6. A dominant reasoning for conducting the Analysis Framework Approach is the wish of the organization to get a good idea about the possibilities of e-learning and about the consequences. 7. The framework approach procedure helps to learn about e-learning, to reduce uncertainty and to increase consensus about the possibilities of e-learning in relation to the context of the organization.
<p>B. Weaknesses</p>	<ol style="list-style-type: none"> 1. The requirements for conducting the approach are demanding. It involves expert knowledge, research and interview skills, reporting and presenting skills and change management experience. 2. All but one case was at the beginner's level of development with e-learning. The variance therefore was not sufficient enough to verify if the Analysis Framework Approach can be used at different levels of development. 3. Most cases are positioned in the early stages of awareness. So again, we can not conclude that the approach will work well on higher-level stages, although it worked well in the one case (# 10) involving a forerunner. 4. The analysis was originally developed for the business sector. In practice this meant that for the use in other sectors the analysis needed more adaptation. The consultant needs the skills to be able to do that. 5. The approach does not provide procedures and tools to improve the selection and involvement of the main stakeholders. 6. Equally difficult is the positioning of e-learning relative to the needs of the company or organization especially when the company is large and information on the 'social fabric' is only sparsely available. 7. The intention was to conduct the approach in two to four weeks' time. In reality it took much longer in most cases, because of other priorities of the client. The danger is that the project and innovation might loose momentum and supporters.
<p>C. Opportunities</p>	<ol style="list-style-type: none"> 1. Training and learning are increasingly becoming business critical, raising management involvement. Subsequently the need for the training and learning sector to systematically evaluate and measure results is becoming essential. 2. The Analysis Framework Approach can be used in different sectors, but the portability could be increased by an adequate reporting system for the experiences with the approach in different situations, stimulating the learning and improvement process. 3. Scanning the readiness of stakeholders to support the e-learning development is a powerful activity and should be looked at to see whether the 'tool' can be extended. 4. The final report of the analysis can become more useful when the scope is extended to the use of the report by other and new stakeholders in other phases of development. 5. Most companies and organizations involved in the analysis were in the start phase of e-learning development. It can be expected that in the near future the need for analysis in other phases or for an ongoing analysis will increase because of the continuous development of e-learning in businesses and organizations.

Table 49 continues ...

Table 49, continued.

D. Threats	<ol style="list-style-type: none"> 1. A complicating factor is the link with knowledge management or other adjacent areas. This connection is a very logical and important one, but can be confusing and is in most instances not part of the expertise or responsibility of the employees in the training field. It could endanger the analysis process and the follow up. This is an evolving development which cannot at all times be avoided in the near future. 2. In most cases the contact persons and most stakeholders function on the tactical level. This can hamper the reliability of the analysis and hamper the transition from the start to the pilot phase because of the lack of stakeholders on the strategic and operational level. 3. The use of the approach by different people showed to be limited. The approach is not suited for relatively inexperienced students, but also consultants should take a close look at the needed competencies before using the approach. 4. Changing the bandwidth, causing an increase or a reduction of categories and interview items, can lead to a fragmented analysis which is hard to use for the development of a coherent pilot phase or leads to confinement in the existing structure and situation of the company or organization.
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The SWOT analysis gives an overview of the issues which should be taken into account in our further discussion on the portability (RQ 7) and the improvement of the Analysis Framework Approach (RQ 8). What were the considerations and decisions taken in relation to these issues? Let us first take a look at the SWOT analysis from the perspective of portability and improvement, and then decide about the changes to be made for the development of Version 2 of the framework. Reading through this breakdown, one should keep in mind that the starting point of the analysis is the consultant. The portability and the improvement are related to the usability of the Analysis Framework Approach by the person, doing consultancy work for a business or organization.

A. Strengths

When looking at the strengths (see Table 48) of the Analysis Framework Approach in relation to portability and improvement, it becomes clear that the demand of being able to use the approach in different companies and different sectors can be answered positively (A1). The consultant needs the skills to adapt the approach to a different organizational context. The research shows that inexperienced students were less successful in doing so than the consultants and that the students were weak in other skills like interviewing and reporting (A2). The e-learning attitude questionnaire showed itself to be helpful and should be looked at more closely to see whether this tool can be extended to better question the total group of interviewees beyond the dominance of the primary contact persons (A3 & 4).

The adaptation of the approach will be a continuing process, not only because of the differences between companies but also because e-learning initiatives will move

from the start to other phases and activities. One way to ease the portability is to document the achievements in such a way that this information can be used to prepare for an analysis in similar companies or organizations (A5).

Different from the first cycle of cases is the outspoken rationale for conducting the Analysis Framework Approach. Almost all companies and organizations want to get to know the possibilities of e-learning and the consequences. It seems that the approach is very helpful in this process because the Analysis Framework Approach procedure helps participants to learn about e-learning, to reduce uncertainty and to increase consensus. In this way, the decision-making process is supported on the basis of arguments directly related to the context of the company or organization itself (A6 & 7).

Considerations:

To strengthen the portability and foster improvement of the approach:

- The portability is supported by the adaptability of the approach to other contexts. This adaptation process can be improved by adding information to the user's guide and by the documentation of experiences in a reusable format.
- The attitude to e-learning questionnaire is a useful tool and should be looked at more closely to improve the information gathering process on the personal readiness for e-learning, beyond the group of prime stakeholders.
- The 'learning-process element' of the approach should be used to better prepare for the next phases. Participants who missed out on this process should receive more guidance. The final report can be of help when the scope is extended for this purpose.

B. Weaknesses

When looking at the weaknesses (see Table 48) of the Analysis Framework Approach in relation to the portability and improvement, it is the high demand on skills, which makes the approach less portable for the use by different people (B1). So the possibilities for multiple usage are restricted. We assume that consulting organizations which are familiar with the 'competency matrix' for the approach are capable of selecting the right persons. In relation with this issue, is the adaptation process of the approach, which still has a focus on business issues more than anything else. A reporting system could help to store experiences for use in different, but similar cases (B2).

Most cases are positioned in the early stages of awareness about e-learning (B3). We expect this to change, because e-learning will continue to develop. It can not yet be confirmed that the approach will be equally usable, since there was only one case

on a higher level. Again the usability will depend for a great deal on the possibilities to adapt the approach without leaving the holistic approach and the basic structure (B4).

At the start of an approach, it is not easy to get an overview of the 'social fabric' of the company or organization. To be able to judge the reliability of the information for e-learning activities, it is important to know whether one is sitting with the right people at the right table. The positioning of e-learning relative to the needs of the company will depend on this information (B5 & 6). It is important to strengthen this part of the analysis process to improve the outcomes and to judge whether the innovation capacity of the organization is viable for e-learning development.

Time is in any innovation a critical issue (B7). For the Analysis Framework Approach, it is necessary to move quickly in trying to keep the momentum and supporters in place. An analysis is nothing but a start up for the consultant. It helps to develop a group of supporters who most likely will be the better informed group of participants and at that time the prime stakeholders, but there is no guaranty that this group will be able to continue without further commitment of management. One cannot avoid situations in which other activities will dominate, but it is advisable to keep the time span as short as possible. Also from a consultant's point of view, an analysis is a short event which should lead to a next phase in which participation is more profitable in terms of time and people.

Considerations:

To strengthen the portability and foster improvement of the approach:

- The adaptation process of the approach will play an increasingly important role and should be integrated in the work process of the Analysis Framework Approach to foster portability.
- The notion of adaptation is part of the bandwidth discussion, which was one of the prime concerns in the analysis of Version 0 of the approach. The conclusion was that changing the bandwidth, to the extent that the training business column is effected, will cause fragmentation in the analysis and should be avoided at all times.
- The analysis of the 'social fabric' should be strengthened. The attitude to e-learning questionnaire is a good example, but this approach can be expanded.
- The time span for the analysis approach should be kept short to ease the transition to the pilot phase, which is for the consultant a much more-stable construct from a business point of view.

C. Opportunities

Training and learning are increasingly considered business critical. This is a wonderful opportunity for the training world, but at the same threatening, because managers not

at all times believe that the existing training department will be capable of doing the job. Van Adelsberg and Trolley qualify this as 'T&D professionals and business executives are often out of sync' (1999, p. 11). 'Measurement is the issue that clearly separates training from business and therefore training needs to develop a measurement crusade, to overcome this divide' (C1) (Van Adelsberg & Trolley, 1999, p. 13). Strengthening the business-model approach in the analysis framework, as part of the training and learning business column, is therefore critical. An adequate reporting system to store the details of the adaptation process and the experiences can become a valuable support mechanism for the portability of the approach for senior, but also for new and less-experienced consultants (C2).

The final report is meant to summarize the outcome and pre-consider the follow up by outlining a pilot. The report could become more valuable when the content is written with the purpose of becoming a support tool for the next phase with other people, new to the process. One can think of a much more-context related document, expanding on the rationale, the added value and the possible consequences of the innovation (C3 & 4). In line with this consideration, it can be expected that in the near future the need for an ongoing analysis will increase because of the rapid development of e-learning in the business world (C5).

Considerations:

To strengthen the portability and foster improvement of the approach:

- Strengthen the business model approach in the analysis framework as part of the training and learning business column, with the emphasis on evaluation and measurement.
- Reconsider the goal of the final report. It should become much more a supporting document for further development to ease the incorporation for other and new participants into the innovation in a different phase of development.
- Prepare for the reorientation of the Analysis Framework Approach, from a mainly upfront analysis to a tool for ongoing analysis in all the phases of the development process.

D. Threats

The link of e-learning with information and knowledge management is evident, but can be a complicating factor at the start of e-learning development. The reason is that, in general, other than training people are responsible for these fields. Therefore the link should be carefully considered to avoid confusion and misinterpretation of the analysis outcome (D1). Sometimes it is inevitable, but the fact that in most cases the main stakeholders can be found on the tactical level is a threat. A lack of stakeholders on

the strategic and operational level can influence the reliability of the collected information and endanger the continuity like the transition from one to the other phase (D2&3). The use of the approach by different people has its limitations, as was shown by the achievements of the students. Since the analysis is the first activity in a hopefully longer relationship with the client, it is advisable to screen the competencies of the consultant before becoming operational (D4). The change of bandwidth, like the reduction of the number of categories, the reduction of the number of interview items, a change in the procedure, the introduction of additional topics other than e-learning items, will influence the results. The analysis can therefore become fragmented and limited, which in turn can lead to confinement in the existing structure and situation (D5&6).

Considerations:

To strengthen the portability and foster improvement:

- Too many linkages with other, related fields of interest like information management will disrupt the quality of the analysis phase. The isolation of learning issues is important for the reliability of the analysis.
- In an analysis phase one might not be able to avoid a one-sided representation of the stakeholders. This is not a good basis for the development of a reliable analysis, which should prepare for the next phases.
- The bandwidth issue is evident, but is not yet defined in such a way that the boundaries are clearly specified. Additional information on this should be included in the user's guide.

7.3 Recommendations for the Improvement of the Analysis Framework Approach

The final analysis has brought about a compilation of conclusions and recommendations concerning the portability and the improvement of the Analysis Framework Approach. The information will be used to select the actions which seem to be most effective when it comes to the improvement of the approach. We will not in the course of this research develop a new version of the Analysis Framework Approach. In this section we will describe the selected measures and products on the basis of the recommendations which should lead to the desired improvement in the future. Again, to structure the action plan, we have used the four dimensions of portability, which are the usability criteria of the approach in this study. These dimensions are: (1) usable in different organizations, (2) on different organizational levels, (3) by different people, and (4) in different stages of e-learning development. These are addressed in the Sections 7.3.1 – 7.3.4.

7.3.1 Dimension 1: Usable in different organisations

Action 1: Add guidelines for the adaptation of the approach to other contexts.

This is a repeating issue, because it is evident that for an adequate analysis it is necessary to adapt the approach to the context of the company or organization. In most cases this concerns only minor changes, but in the event the approach needs to be limited, broadened or used repeatedly with different stakeholders, it is of crucial importance to stay within the bandwidth of the Analysis Framework Approach. At the moment this bandwidth is determined by the 'educational business column', which in practice supplies the consultant with enough flexibility to adapt the approach. In the future, the dissimilarity of the projects will increase and adaptation will become quite common to optimize the analysis. Therefore there is a need for supporting guidelines for the experienced and the new consultant to avoid fragmentation of the analysis and, in the case of narrowing the approach, the possibility of confinement to the existing structure and situation.

The suggested improvements:

- Add guidelines to the user's guide on the adaptation process. They should help the consultant to adapt the approach in a consequent manner, staying within the boundaries of the Analysis Framework Approach.

7.3.2 Dimension 2: Usable in different organizational levels

Action 2: Improve the analysis of the 'social fabric'.

Most stakeholders involved in the upfront analysis function on the tactical management level. The disadvantage of this limited representation of stakeholders is that it might effect the reliability of the collected information. Consequently, also the transition from the start phase to the pilot phase, involving a majority of people working on an operational level will not be the best possible. It is difficult in an analysis phase to extend the number of stakeholders. Basically this means that it will be difficult in the beginning to position e-learning relative to the needs of the company, when the information on the 'social fabric' is only sparsely available.

One of the suggestions for improvement of Version 0 was the use of an 'attitude to e-learning questionnaire'. This questionnaire helped very much to collect information on the personal attitudes of people concerning the e-learning innovation. An extension of this questionnaire covering issues on the 'social fabric' could ease the way to deal with the limited possibilities in an early phase.

The suggested improvement:

- Extend the ‘attitude to e-learning questionnaire’ to cover ‘social fabric’ issues, relevant for the reliability of collected information and the preparation of the pilot phase.

7.3.3 Dimension 3: Usable by different people

Action 3: Develop a competency matrix for the consultant

It was noticeable that someone who wants to conduct the approach needs certain skills. The user’s guide helps the consultant to become familiar with the procedure of the analysis, but does not supply the consultant with interview, reporting and other general consultancy skills. So apart from the expected e-learning expertise, the consultant should be aware of the range of competencies needed to judge whether he or she is capable of conducting the approach. This will especially be important for management and new consultants. Also, in the future it is expected that there will be at least three different Analysis Framework Approaches, covering the three development phases from the corporate e-learning strategy model (the CES Model). It can be expected that the needed competencies might vary between the different phases.

The suggested improvement:

- Develop a first competency matrix for the existing Analysis Framework Approach and be prepared to extend this matrix for the two additional Analysis Framework Approaches.

Action 4: Develop a systematic approach for the collection of knowledge and experiences.

The consultants collect a lot of information and experiences while conducting the approach. Especially the information on how to adept the approach in particular situations is helpful for other and new consultants. It saves time and opens up the opportunity to improve the quality of the analysis and the work flow. The collected information would also be a rich source for the improvement of the Analysis Framework Approach in general. Therefore it is suggested to develop a systematic approach for the collection, the storage and retrieval of practical information. The starting point of this exercise would be the ‘users’ profile’. How and when would a consultant use the information and what is expected added value? The case-study protocol could be looked at to see whether such a format would do the job.

The suggested improvement:

- Develop a format for the collection of information and experiences of the consultant conducting the Analysis Framework Approach. The case study protocol could be a starting point. Important is to make the storage and retrieval of these sources as easy as possible.

7.3.4 Dimension 4: Usable in different stages of e-learning development

Action 5: Improve the usability of the final report.

The final report is the end station of the upfront analysis. It contains a description of the possibilities of e-learning for the company or organization and an outline for a pilot. To ease the transition to the next phase and support the integration of upcoming stakeholders and new participants, the report outline should be extended with information on the rationale for the decision to consider e-learning as a possible solution, the expected added value and the consequences of the implementation of such an innovation. People who participated in the Analysis Framework Approach procedure have learnt about e-learning, about the possibilities for the organization and developed consensus about which way to go. Newcomers need support to reach a workable level of information to deal with the prime stakeholders. An extended report can help to achieve this and serve as a frame of reference for further development.

The suggested improvement:

- Extend the final report with information on the rationale for e-learning, the added value and the consequences so it can function as a reference for the existing stakeholders and participants and as a source of information for new stakeholders and participants.

Action 6: The transition of the analysis framework to an approach for ongoing analysis.

It can be expected that the need for an upfront analysis will decrease because of the continuing development of e-learning in companies and organizations. So the emphasis in the Analysis Framework Approach needs to be changed in favor of an analysis which allows for an ongoing study of e-learning in the different phases of development. This is especially true for the strategic level, but with the notion that on the tactical and operational level there will be newcomers and starters all the time. In the case of the vocational training college (see Case # 6), there was a call for the evaluation of the state of affairs relative to the overall strategy. In addition there was a need for the

analysis of the actual situation of individual projects concerning the requirements for a successful next step.

Following this discussion it seems advisable to add, on the basis of the existing framework, two other approaches one for the pilot phase, and one for the integration phase. The Corporate E-learning Strategy Model (CES Model) contains three phases: a starting phase, a pilot phase and an integration phase. This would mean that the Analysis Framework Approach would consist of three different approaches, one for each phase but with the possibilities of adaptation of each of the approaches to the context of the company or organization, within the boundaries of the different phases. Together, these approaches would cover the total route of development of e-learning as an integral tool for analysis.

One of the consequences is that the category Business Model needs to be strengthened because the return-on-investment issue will play a more-prominent role in the pilot and integration phase and beyond than in the starting phase.

The suggested improvements:

- Develop on the basis of the existing analysis framework, two other approaches, one for the pilot phase and one for the integration phase. Together with the existing approach, they will constitute a complete Analysis Framework Approach for all phases in the development of e-learning.
- Strengthen the business-model category to support the return-on-investment issue in the analysis.

The participants going through the Analysis Framework Approach experienced the procedure as a learning process, due to the interviews, reports and discussions. And as could be noticed in several instance, this learning process largely reduced the level of uncertainty of the stakeholders concerning their beliefs in the usefulness of e-learning. We could consider this experience a new dimension, because it is a powerful way to deal with the 'readiness of stakeholders' in support of e-learning development.

7.4 Summary

The summary results of the cross-case analysis gave an overview of the most-important issues. Special attention was given to the coverage of RQ 7 and 8 on the portability of the approach and the changes for improvement. The next step was to zoom in using a SWOT analysis to identify the critical strategic factors. It is important to remember that the usability of the Analysis Framework Approach is about the usefulness of the approach for the daily practice of the learning consultant. The SWOT analysis provided us with an overview of the strengths, weaknesses, opportunities and threats of Version I of the Analysis Framework Approach. Each category in turn

Chapter 7: Conclusions and recommendations

delivered recommendations which were turned into a final set of recommendations divided over the four dimensions of criteria for the portability.

Chapter 8 is used for a reflection on the results and experiences during the research and some recommendations are made for further research in this field.

8 Discussion and Further Research

This chapter is used for a reflection on the results and experiences of the research activities. In Section 8.1 we will look back on the research process and reflect on the state of affairs with e-learning in Section 8.2. Upcoming issues are discussed in Section 8.3 and in Section 8.4 recommendations for further research are presented.

8.1 Looking Back

The process of looking back and reflecting on what has been done starts in Section 8.1.1 with a presentation of the experiences from the field. A reflection on the outcome of the research is presented in Section 8.1.2 followed by a reflective review of the research questions in Section 8.1.3.

8.1.1 Experiences from the field

This study focused on the dilemma of ‘how to improve the management process of e-learning development in the corporate environment?’ The motivation for this problem statement was based on the notion that although e-learning was very promising, a systematic approach for e-learning development in organisations seemed to be lacking. The results of e-learning activities were in many instances a source of confusion and disappointment. E-learning however is an innovation of a complex nature, because it affects the training and learning processes, the content, the infrastructure, and the learning economics and it represents a large-scale organizational change. In addition, for e-learning to become a success in the corporate environment, it requires integration with the company’s learning strategy, the business organization and the IT structure. In most cases, as described in this study, people were not aware of this complexity or not able to deal with it. This has been an issue from the beginning of ICT use in education and training and obviously we have great difficulty to master this situation satisfactorily. I have had similar experiences as a learning consultant, and therefore developed an interest in finding ways to use or develop a work method to better structure e-learning development. This observation was confirmed by research showing that the lack of research-based approaches and analysis instruments to cope with this complexity is a reason for the indecisive results. (Garrison & Anderson, 2003). So it was decided to focus on the development and implementation of an analytical work method, including procedures and tools, to support the management process of e-learning development. The central issue in this method was the analytical approach and the notion that e-learning should be looked at and used with the right level of expectation in mind. The Analysis Framework Approach, as the work method was called, is the first phase of a larger framework, the Corporate E-learning Strategy Model (CES Model). The two other phases in this CES model were not incorporated in this research.

The Analysis Framework Approach was primarily developed to support the learning consultant to better manage the process in close collaboration with the client. This rather practical approach had to do with the daily reality in the business world and led to the decision to test the approach only under real-life conditions. So each case was an assignment with a contract and the obligation to produce the deliverables in time and in line with the quality demands of the client. This resulted in a good level of commitment from both sides, but of course decreased the extent of control the investigator had over the research situation and the planning.

Was the research doable? Yes it was. The consultants I worked with in this research were interested, also because the clients valued the use of the approach as a thorough and reliable work method. Thresholds in the way of conducting the approach were mostly related to a lack of interest for learning by management, difficulties in arranging meetings with different stakeholders, getting to know the right stakeholders and slow decision making. Most activities went well considering the fact that these were real life conditions. What worked very well was the problem orientation in the analysis and the fact that the approach ended with an outline for a pilot, selected on the basis of the urgency of the training or learning problem. Obviously this made more sense than an abstract discussion on e-learning. An emerging issue was the alignment of training and learning with the business goals. This was not seen as an overall urgent matter, but the question on 'the return on e-learning' was pressing and therefore the need for clearly stated business cases will increase.

Special attention should be given to the role of the learning consultant and the supporting role of e-learning specialists and administrative support. The Analysis Framework Approach is an adaptable work method, but this will only work for skilled consultants. They need to have the ability to ask good questions and interpret the answers, to be a good listener who can not be trapped by preconceptions, consultants who are adaptive and flexible and able to encounter unexpected and new situations, who has a firm grasp of e-learning and unbiased by preconceived notions (Yin, 2003, p. 59). The consultant though relies heavily on the back office support by a multi disciplinary team of colleagues for additional expertise and administrative support.

During the course of the research there was a tendency to regard the Analysis Framework Approach as a 'quality system'. This is not a bad idea, because this would fit the widespread business policies concerning quality and it would connect to such developments as the 'ISO quality requirements' as there are for course development. In any event, quality is an ongoing concern to keep the approach on the right level. A regular check and update is needed to match the rapidly changing context of e-learning development.

What did we learn?

- The step-wise approach requires alertness, which might be difficult to handle if not organized well.
- The use of tools like checklists, help to standardize part of the procedures for development and make it easier for experienced consultants to do their work more efficiently, to replace a colleague and to support newcomers.
- A strategy helps to develop a common approach in the organization and for conducting the consultancy activities. It will ease the workflow and participants will be better able to anticipate and prepare for upcoming activities in the different phases of the project.
- Almost inevitable in a novice innovation like e-learning is the lack of a common language. Consensus about the terminology used supports an effective communication.
- A systematic approach allows for a systematic feedback and the use of the input for improvement of the process.
- To really profit from such an approach, it is necessary to have a policy in place in the organisation that adopts such an Analysis Framework Approach as the way to go.

8.1.2 Outcomes of the research

From a research perspective, there were some additional criteria to test the viability of the approach. There were four criteria: Is the approach usable in (1) different organisations, can it be used on (2) different organisational levels, by (3) different people and in (4) different stages of e-learning development. The outcome of the research showed that the Analysis Framework Approach can be used in different organisations. It can be used on different organisational levels, although more evidence is needed. It can be used by different people, but with a certain level of expertise and consultancy skills. The evidence is less strong for the use of the approach in different stages of e-learning development, because almost all companies and organisations involved in the research were starters. From this outcome it can be concluded that the analysis framework is a viable approach, but more information is needed on the usability on different organisational levels and in different stages of development.

For the use in different organizations, the approach needed to be adaptable to the context of a particular organisation to optimise the analysis. What we have seen is that adaptation takes place all the time, but the procedures and the bandwidth of the analysis are left in tact. The adaptation process relies for a great deal on the performance of the consultant, which is a delicate concern. The suggestion for improvement was (Action 1) to add guidelines for the consultant, especially for situations in which the approach is applied in a new and different organisation, when it must be limited, broadened or used repeatedly with different stakeholders. We have

defined this adaptation process as the bandwidth issue. In this study we have taken the 'educational business column' as the optimal bandwidth, and as long as the approach follows this pattern the quality is assured from that point of view. The educational business column is used as a metaphor and should be understood as the organizational framework, which is generally put in place in a company as the training organization to analyze the needs and develop and deliver training and learning to the workforce.

The divergence between the different cases was relatively low, because almost all organisations were in a starter's phase. In a few years from now, the situation per organisation will differ substantially. The speed and direction of development will differ and also the scale and not to forget the type of learning management. It would be interesting to see how such a development would affect the usability of the 'bandwidth' as a securing mechanism for the quality of the analysis. Our conclusion at the moment is that supporting guidelines for both the experienced and new consultant, will help to conduct the adaptation process for a given context. It can be expected that these guidelines will have to be adjusted frequently, not only because different and other organizations will start using e-learning, but also because e-learning is moving into different stages of development.

All but one organization were e-learning starters and as a consequence the consultant operated predominantly on the tactical management level. For the quality of the analysis it is important to acquire a broad enough view of the organization, also since the end user plays such a decisive role in the success of e-learning. Therefore the recommendation (Action 2) was to improve the analysis of the 'social fabric' by extending the available 'attitude to e-learning questionnaire' so other stakeholders can at least be assessed on their views, wishes and beliefs. Other disciplines certainly can contribute to the achievement of this improvement. It is expected that moving from one to the other stages of e-learning development will foster the involvement of other levels.

The approach worked well with different (senior) learning consultants, but not with the Masters' students. They lacked the expertise and experience to really perform well. The Analysis Framework Approach is a working method with procedures and supporting tools. So, apart from the expected e-learning expertise, it requires a certain level of interview, reporting and other general consultancy skills, to be able to handle the approach adequately. To make sure that this is understood it was suggested (Action 3) to develop a competency matrix, to be used by the consultant for verification or by the manager as a quality check.

The Analysis Framework Approach was developed with the intention to improve the management of e-learning development. An important ingredient for such an improvement is the continuous renewal of the approach to stay in line with the developmental life cycle of e-learning. The consultant can play an important role in this renewal process, but should be facilitated to do so. Therefore it was suggested (Action 4) to develop a systematic approach for the collection of knowledge and experiences.

This would not only help to keep the approach up to date, but also to improve the quality of the work flow. The starting point for such an exercise would be the 'users' profile', to increase the likelihood that this mechanism will work for the consultant.

Unfortunately there was only one case study positioned on a pilot and integration level. All the others were at the starter's level. This meant that there was a lack of empirical evidence for the usability of the Analysis Framework Approach in different stages of e-learning development. The suggestion made to improve the usability of the approach was (Action 5) to upgrade the final report, adding sections on: the rationale for e-learning, the added value and the consequences for the organization or parts of the organization. The usability of the report will increase when it can function as an important reference tool for existing and prospective stakeholders, different functional groups, with different expertise and priorities. Action 5 is directly related with the following suggestion (Action 6) on the transition of the analysis framework into an approach for ongoing analysis. This was especially stated in relation to the need for evaluation of the achievements relative to the overall learning strategy of the company or organization. An ongoing analysis would mean the development of two additional analysis frameworks, one for the pilot phase and one for the integration phase, the final phase in the Corporate E-learning Strategy Model. One of the consequences would be to expand the analysis with a 'return on e-learning' issue, which played only a minor role in the first two versions of the Analysis Framework Approach.

8.1.3 The research questions revisited

We started with the problem statement to set the boundaries for this research, which was about the question of how to improve the management process of e-learning development in the corporate environment. The Corporate E-learning Strategy Model (CES Model) was chosen as the overall framework, but the research was limited to the further development of the first, starting phase in this model. To be able to support this development, a thorough analysis was needed to cope with the complexity of e-learning development. As a result the research objective for this research was described as: 'The development and implementation of an Analysis Framework Approach for corporate e-learning'. It was believed that the improvement of the management process missed out on an adequate method for analysis. It should not be a straightforward evaluation procedure, but an approach with built-in flexibility. How this Analysis Framework Approach has been developed and used is extensively described in this study.

The flow of the research was guided by a series of research questions, which we want to look at again to see whether our vision has changed.

RQ 1: 'What is e-learning?'

The goal was to clarify the context for this study to acquire a good insight in the nature and meaning of e-learning, before moving on to more practical issues. The

conclusion was that e-learning is a multi-faceted phenomenon which derives meaning from the context in which it operates. In that sense our definition of e-learning, which we adopted as point of reference for this study, was of no value. The term was useful to distinguish learning from e-learning for the sake of organizational and budgetary concerns. The expectation is that e-learning will loose the 'e' very quickly so we can return to what it is all about, and that is learning.

RQ 2: 'What do we know about innovation in general and educational change in particular?'

Research has not been overwhelming, because of the poor tradition in education and training of the analysis for the cycle of process improvement. Scholars agree that there is still a lot to do about research-based approaches and analysis instruments. This is a reason why e-learning does not in all cases meets the expectations, or, maybe we do not know well enough what to expect. This research should be placed in this line of thought: develop a work method that incorporates expectation management.

RQ 3: 'What are the characteristics and what roles will content and technology play as important success factors in the development of e-learning in the years to come?'

Content and technology are considered to be important pillars for the development of e-learning. The technology is often qualified as essential, but not decisive. Content firstly has been named 'king' in relation to e-learning, but lost some of it's glamour to the 'context' queen, as the rising star. Maybe instructional designers should shift their focus to context development, instead of outlining "Google-able" content. I have not spent much time on technology and content in this study, but I did conclude that the dominance of the big commercial players in the market, offering LMS, LCMS, and other learning technology, as well as the big content suppliers, have had a negative influence on the development of e-learning as an educational innovation. The dominance caused a technology and content push with products and services which were tailored to the publishing-house paradigm and not to the needs of individual customers. On the contrary, the motivation for the training and learning demands in companies was very much focused on flexibility, adaptable and tailor-made solutions and not so much on 'off the shelf everything'. According to the latest developments, the big players on technology and content are loosing ground and therefore loosing interest in the e-learning market, which I consider an improvement.

RQ 4: 'What have we learnt from the implementation of ICT and in particular communication technology in education and training?'

What we have seen is that the same obstacles show up all the time. It is about enthusiastic people working hard to improve their teaching and training methods, using technology whenever feasible, available and manageable, but without this

structural development and dissemination process in mind. We have learnt a lot in the last couple of years much more than in the ten years before, but we are not yet on the level of research and expertise that is needed to support the transfer of e-learning from a more-or-less isolated activity to a fully integrated part of the training and learning offerings on a broad scale.

RQ 5: 'What are the building blocks for the Analysis Framework Approach?'

The outcome of RQ 2, 3 and 4 supplied input for the construction of the Analysis Framework Approach. The input is converted into so-called building blocks. These blocks however have a limited shelf life, because the quality of the Analysis Framework Approach depends largely on the alignment of the approach with the fast-changing learning environment. The business, the changing needs and the decreased cycle time of development, press the need for a quality assurance of the Analysis Framework Approach over time. And on this point, the educational and research world, and the business world could work together. We as researchers can help to feed the building-block discussion and update these, so the consultant can be certain that these blocks represent an up-to-date, suitable and reliable frame of reference. A feedback mechanism should be in place to secure the contribution in this upgrading process with information from the field.

RQ 6: 'How is this framework being developed and what are the main features?'

The development process was based on a consequent deduction process of information from different resources. This process ended with a listing of success factors for e-learning development and these were translated into operational categories, the building blocks. The categories, like organization and content, were used to develop the work flow, including procedures and tools, for the Analysis Framework Approach. Updating of the approach is an issue and therefore it becomes equally important to standardize this deduction process to become more suitable for the working environment of the consultant. Version 0 of the approach was developed on the basis of the building blocks and tested. Version 1 was developed using the outcomes of Version 0. The approach basically is a working method for the analysis process, with procedures and tools. It is not a blueprint, but a framework, so flexibility is guaranteed. This implies though that the consultant needs to have the competencies to be able to work with this instrument for analysis.

RQ 7: What is the portability of the Analysis Framework Approach when used by different people, in different organizations, on different management levels and in different stages of development?

A considerable amount of time was spent on conducting the analysis in practice and reworking the experiences into case studies for further analysis. This research question played a dominant role in the qualification of the research as viable, because

certainly in this action research approach, the proof of the pudding was in the eating. I do believe we collected sufficient evidence to prove that the pudding was worth the effort. Most recently I received the news that consultants are increasingly using the approach with good results, meaning acquiring new assignments and the continuation of current assignments by the client. Portability though has other dimensions to it beyond the four criteria mentioned in this research question. What I have noticed was that going through the Analysis Framework Approach procedure helped immensely to increase the knowledge level of the stakeholders and reduce uncertainty, which was especially helpful in the decision-making process. Another element is the dimension of time. The approach needs to stay in line with new developments, experiences and new insights to fulfill the qualification as a practical and reliable instrument. One way is to add the time dimension as a requirement for the usability and portability of the approach.

RQ 8: ‘What modifications should be applied in the development of the Analysis Framework Approach, based on the experiences with Version I?’

An outcome of the case-study analysis was six actions for the improvement of the Analysis Framework Approach. These actions have been discussed in an earlier section of this chapter, but what is the line that connects them? The focus is on the people and not so much on the procedures. The recommendations are about guidelines for the consultant to improve the adaptation process, to broaden the stakeholders’ analysis, to widen the scope of the analysis to an approach for ongoing analysis in all the phases of the CES Model. As a consequence, the analysis approach would become the dominant management method for the development and implementation of e-learning. This is in my eyes an attractive challenge.

8.2 The State of Affairs with E-learning

In a period of four years, e-learning has been over-hyped, de-hyped and is under-hyped now. This development seems to be a common practice in the business process innovation cycle, but is rather new for the education and training world. Nevertheless we know now that technology has found its way in education and training, causing a shift from training to learning as the dominant mode of delivery. We also know that e-learning is a different matter compared to what we were used to. E-learning is an educational innovation based on the use of technology and in particular communication technology. This innovation is of a complex nature and in most cases people are not aware of this complexity or not able to deal with it, so decision making is becoming an important issue because of the investments to be made. E-learning is not yet everybody’s case and there still is much criticism about the usefulness. It is, like most innovations in education and training, not a product with a limited shelf life or an event, but an ongoing process that will have no end. There is no doubt though

that, like with e-business and other e-activities, e-learning will become mainstream, so achieving results are no longer optional.

8.3 Upcoming Issues

There are topics, which should be added to the domain of the Analysis Framework Approach, because these are of increasing importance for the innovation of training and learning.

Formal and informal learning

This research was mainly focused on teaching and learning activities which are in general qualified as formal learning. The increasing affinity of e-learning with information and knowledge management shows a tendency towards other forms than formal learning. Recent research by Cross (2004) showed that there is more time and money spent on formal learning than on informal learning, although we know that most learning is informal. It is noticeable that in practice e-learning tends to open up opportunities for informal learning using online content which had been developed for formal e-learning. In addition, the use of e-learning in formal learning has added flexibility to the teaching and learning process offering opportunities for informal learning behaviour. So what can be seen is that under the influence of e-learning, formal learning is becoming more informal and informal learning is becoming more formal. By using learning technology, informal learning behaviour gets a touch of formality, because progress and results can be stored and looked at. From that point of view it can be said that informal learning offers far greater e-learning opportunities than the formal setting will ever be able to provide. Hence, I wonder why informal learning plays such an inferior role in our schools.

Return on e-learning

The increasing attention for learning in the business environment originated to a certain extent from the e-learning hype. As a result learning moved up on the priority list and in some businesses learning even achieved the status of being business critical. In general, measurement is the issue that clearly separates training from business. In order to stay in the rank order, the training community needs to develop a 'measurement crusade' to be able to fulfil the requirements for being and staying business critical. Currently the business model is one of the core categories in the Analysis Framework Approach. I believe that in a work method in which analysis plays such an important role, the 'return on e-learning' should get a more prominent role in the approach.

8.4 Recommendations for Further Research

Basically there are two items, which I consider to be particularly interesting for further exploration. Item 1 would be the support and guidance of the learning consultant,

including organisational issues as back office resources and tools, the competencies and performance of the consultant and the quality assurance. Item 2 would be to widen the scope of the Analysis Framework Approach into an approach for ongoing analysis in all the phases of the CES Model. I have a preference for the second item, because one of the conclusions of the research was that the Analysis Framework Approach could develop as a method for the management of e-learning development with the analysis approach as a guiding principle in a dynamic environment. Another element which I consider of crucial importance is the assurance of the usability of the Analysis Framework Approach over time. E-learning is part of a dynamic world, so staying in line with new developments and insights is a prerequisite for the usability. These considerations lead to the following recommendations for further research:

- The development of two additional approaches: one for the pilot phase and one for the integration phase of the CES Model, to compose a comprehensive work method. This should be complemented with research on the smoothening of the transition from one to the other phase.
- The improvement of the (upfront) analysis of the stakeholders as the human and decisive factor for success.
- The further exploration and operationalisation of the bandwidth issue to optimize the focus on e-learning. As we have seen: too broad or too narrow leads to a fragmented analysis or confinement with the existing situation.
- The improvement of the 'return on e-learning' element. This should include the question of how to support informal learning, as part of the strategy is that any means are allowed as long as the employee learns what he needs, as efficiently as possible.
- The development of a method for the collection and storage of knowledge and experiences of the consultants for the continuous improvement of the approach.
- The collaboration between the consultant and the researcher for the updating of the building blocks as the dynamic frame of reference for e-learning, including the conversion for practical use of the new insights and experiences into the Analysis Framework Approach.
- This research should bring about an improved, up-to-date and comprehensive analysis approach for businesses and organizations to better manage e-learning development. The collaboration of businesses, consultants and researchers should allow for a continuous development and quality control of the Analysis Framework Approach.

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Summary

Introduction and problem statement

E-learning is an innovation which has not yet settled in the training and learning world. It is a multi-faceted phenomenon with a complexity that is different from any other learning innovation. It is this complexity we are dealing with and the problem account of this study was on the dilemma of 'how to improve the management process of e-learning development in the corporate environment?' There is a myriad of 'solutions' one could think of, but to be able to select the focal point of this study an analysis was made to define the importance of e-learning for education and training and to see what the theory on educational change and innovation could contribute to the focusing process. The outcome of this review was that e-learning is a different matter compared to what we are used to in corporate training. E-learning is an educational innovation based on the use of technology and in particular communication technology. This innovation is of a complex nature, because it affects the training and learning processes, the content, the infrastructure, the learning economics and represents a large-scale organizational change. In most cases people are not aware of this complexity or not able to deal with it, so decision making is becoming an important issue because of the investments to be made. There is no doubt though that, like with e-business and other e-activities, e-learning will become main-stream, and so achieving results are no longer optional. The lack of research-based approaches and analysis instruments to cope with this complexity is one of the reasons why the development suffers from an incomplete and fragmented set of activities. These considerations led to the decision to develop and implement an Analysis Framework Approach as a work method to reduce complexity by systematically analysing the e-learning context. The main goal of the approach was to support the learning consultant, as the prime user, in the management process of e-learning development. So the objective of the study was: 'The development and implementation of an Analysis Framework Approach for corporate e-learning'.

The e-learning context

E-learning is in essence a technology-driven development, currently influencing the way the innovation of learning is approached. In practice e-learning is a multi-faceted phenomenon which is hard to grasp in a straightforward definition or description. Nevertheless in the context of this study we defined e-learning as 'the process of learning and teaching in which the connections among the participants and with the resources are supported throughout by means of communication technology.'

A first thing to do was to discover the meaning of e-learning in the context of training and learning and how this might evolve. The first research question (RQ 1) was: 'What is e-learning?' The technology bias of e-learning is an important issue, but not decisive when it comes to learning. Also e-learning is not a stand-alone

Summary

development, but is firmly related to the new economy with e-business and e-commerce as important exponents. As a consequence it can be concluded that e-learning is here to stay and the likelihood that sooner or later everybody will experience e-learning is therefore far greater than expected. As such, e-learning is very promising, but we are still about to discover the value for education and training. It is evident that we need a balanced view on the meaning of e-learning for education and training. We are not yet that far, as long as the growth of e-learning is being described as explosive, unprecedented, and above all, disruptive.

The rationale for the research

Swift changes in the business organisation, the processes and the technology have created an increasing demand for more and different training and learning, which can not be dealt with by the traditional organisation. E-learning seemed to offer unlimited possibilities to solve this problem. There were high expectations, but at first e-learning was over-hyped, then de-hyped and seems to be under-hyped now. An increasing number of organisations though have had their first experiences and are alerted about less-successful stories, implementation pains and successes. To realize the full potential, a solid learning strategy is needed, before getting caught up in the whirlwind of e-learning technology.

The general opinion is that e-learning has found its place in the business sector and will be of increasing importance in the years to come. It is expected that e-learning will become a business critical issue for companies and will develop as an important instrument for human resource development. From the analysis of the theory on educational innovation and experiences with ICT in education and training (RQ 2, 3 and 4), it became clear that there is a lack of appropriate instruments to verify if e-learning is a good alternative instructional strategy compared to the existing learning solutions. The goal for this research therefore was to develop an analysis approach that would support the decision-making process and help to manage e-learning development.

The Analysis Framework Approach: a management tool

Based on the findings of the research, it was decided to develop an Analysis Framework Approach as a work method for the management of e-learning development. The approach consists of several different steps with complementary activities and is part of a comprehensive strategy model for corporate e-learning called the Corporate E-learning Strategy Model (the CES Model). The Analysis Framework Approach is Phase I in this three-phase model and the focus of this research.

Research question (RQ 5) was: 'What are the building blocks for the Analysis Framework Approach?' The building blocks were the success factors for e-learning, as an outcome of the deductive analysis process of the e-learning context and the theory on educational innovation and innovation in general. The next question (RQ 6) was:

'How is this framework being developed and what are the main features?' The building blocks were used to develop the Analysis Framework Approach, using a set of operational categories to structure the development and the use of the approach. These categories are qualified as the Educational Business Column, because they are interlinked and complement each other and together they cover all the components which are crucial for the development and success of e-learning.

Collecting empirical evidence

The action-research approach was used as the most appropriate research strategy. Part of the strategy was to use the case-study method for the collection and analysis of data. Notable for action research is that it proceeds through several spirals of planning, acting, observing and reflecting. The case-study method is especially valuable in situations where the researcher has little or no control over the events. The cases were conducted under real-life conditions, which increased the reliability of the outcome but at the same time raised the external influences on the research.

The research design consisted of the data-collection protocol, the outline for reporting, the cross case analysis schedule and a final SWOT analysis to set priorities for change and improvement of the approach. The research was conducted from the perspective of the professional learning consultant who has to operate in real-life situations. The main characteristics of the action-research approach were: cyclic, participative, qualitative and reflective.

The goal of the Analysis Framework Approach was to support the management process of e-learning development in the corporate environment. An important element of the approach is the portability (RQ 7) and the decision-making process of how to increase the usability (RQ 8) of the process. The principles for data collection were: multiple sources of evidence, a case study database and a chain of evidence, which is the linkage of the questions asked, the data collected and the conclusions drawn. The analysis strategy is based on a cross-case analysis, followed by a set of conclusions and recommendations. The SWOT analysis was used to prioritize actions for further development in relation to RQ 7 and RQ 8.

The data were collected in two consecutive cycles of case studies. The first release of the work method, Version 0 of the approach, was used in the first cycle. Version I, the improved version, was used in the second cycle.

Experiences

The Analysis Framework Approach in the first cycle of case studies was conducted by different learning consultants in a company or organisation. These were real-life situations in which the consultant worked in line with the demands of the client on the basis of a contract. Most cases were conducted in the process industry and one in a regional college for vocational training. The experiences were documented in case-study reports, using a special format which was subsequently also used in the cross-

Summary

case analysis. A second situation in which information was gathered were the meetings held with different experts, to test the approach and check the content validity of the analysis framework. The overall goal of this practical research was to improve the Analysis Framework Approach and to collect empirical evidence for the verification of the portability of the approach. The term portability is defined as the usability of the approach by different people, in different organisations, on different organisational levels and in different stages of e-learning development (RQ 7). These are important criteria for a work method to be used by the learning consultant for different clients. The outcome of this analysis was tested against a SWOT analysis to be able to prioritize the actions needed to develop the improved Version 1 of the approach (RQ 8). Subsequently three improvement actions were selected.

Action 1 was the improvement of the structure of the approach. Action 2 was about the need and development of a users guide and action 3 was the development of an 'attitude to e-learning' questionnaire. These actions were carried out to constitute the improved Version 1 of the Analysis Framework Approach. The SWOT analysis showed two other important elements, which were not taken into account in Version 1. These were: bandwidth and competencies. Both were left out because they would interfere too much with the overall research outline, but should be taken into account in the recommendations for further research.

The experiences with Version 0 of the approach have led to the development of Version 1. The procedures in this second cycle of collecting, describing and analysing the data were exactly the same as for the first cycle of case studies. The overall goal was to improve the Analysis Framework Approach and collect empirical evidence for the verification of the portability of the approach. As with the first cycle of case studies, all cases were positioned in real-life situations and were executed in line with the demands of the client. The cases were conducted by learning consultants or by Masters' students from the University of Twente and the Delft University of Technology and took place in different organisations, like the steel industry, the health care sector, the service industry, the glass-production industry and the food sector. All but one organisation was in the starter's phase of e-learning development. The outcome of these experiences were documented in case study reports and reviewed in a cross case analysis. This breakdown was then valued using a SWOT analysis. Subsequently six improvement actions were selected, which should lead to an enhanced version of the approach. Unlike the improvement actions with Version 0, the actions mentioned in the analysis of Version 1 will, according to the research outline, not be executed but used for the development of a strategy for further research.

Conclusions and recommendations

The conclusion is that the empirical data support the view that the Analysis Framework Approach can be used in very different organisations. The evidence is less

strong for the use of the approach on different organisational levels. In most cases the organisation was on a starter's level of e-learning development with prime stakeholders operating mainly on the tactical management level. The approach can be used by different people, although a certain level of expertise and consultancy skills was needed. The analysis appeared to be flexible enough for adaptation by the consultant to the clients' context. Evidence for the use of the approach in different stages of development is not strong enough. As has been indicated, most organisations were still in the starting phase, but the expectation is that the need for context-related analysis while the e-learning activities are moving into the pilot and integration phase increase rapidly.

The recommendations focus on the human aspect of the approach. The suggested actions are on the expansion of guidelines for the adaptation of the analysis framework to different contexts, improvement of the analysis of the 'social fabric' of the business or organisation, a competency matrix for the consultant and a systematic approach for the collection and knowledge and experiences, improvement of the usability of the final report and last but not least the suggestion to develop the Analysis Framework Approach into an approach for ongoing analysis.

Discussion and further research value

The experiences show that the approach was doable and considered valuable both by the consultant and the client. In most cases the analysis approach was followed by another assignment. Conducting the approach is not always easy. It requires alertness, interview and reporting skills, the ability to work systematically in line with procedures, the ability to handle tools and a certain level of expertise in the field of e-learning. Equally important is the notion that the approach needs a regular and timely update to stay in line with the dynamics of e-learning development.

In the discussion we noted two items which we would like to add to the domain of the Analysis Framework Approach: 'formal and informal learning' and 'return on e-learning', a metaphor of 'return on investment'. Combining e-learning with informal learning seems a very natural relationship and should be explored further. The expectation is that the return on investment of e-learning in informal learning processes could be of greater importance than with formal learning. E-learning seems to push learning onto the level of becoming business critical. This will require 'return on e-learning' accountability, which is rather new for the training and learning world.

Finally there were some recommendations which were considered important items for further research: the development of approaches for the two following phases in the CES Model, the pilot and the integration phase; an improvement of the analysis of the stakeholder factor; the bandwidth issue of the approach as an important quality item; the element of 'return on e-learning'; and the options for collaboration of the consultants with researchers to secure the updating process of the Analysis Framework Approach to stay in line with the (e-)learning dynamics.

Summary

Samenvatting

Inleiding en probleemstelling

E-learning is een innovatie die nog niet is ingeburgerd in de wereld van opleiden en leren. Het is een veelzijdig verschijnsel van een complexiteit, die anders is dan elke andere innovatie op het gebied van leren. Deze complexiteit is het onderwerp van studie in dit onderzoek met als probleemstelling de vraag: 'Hoe kan het management proces van e-learning ontwikkeling in de corporate omgeving worden verbeterd? Er zijn vele mogelijke oplossingen te bedenken, maar om een goede keuze te kunnen maken werd een analyse uitgevoerd om vast te stellen wat het belang was van e-learning voor onderwijs en leren en wat de theorie zegt over innovatie in het onderwijs en innovatie in het algemeen. De conclusie was dat e-learning echt iets anders is dan wat men in bedrijven en organisaties gewend is. Het is een innovatie met parallelle ontwikkelingen in de rest van de samenleving, die is gebaseerd op het gebruik van technologie en in het bijzonder communicatie technologie. Deze innovatie heeft een complex karakter, omdat het niet alleen effect heeft op de training en leerprocessen, maar ook op de content, de infrastructuur, de financiën en het feit dat een grootschalige organisatorische verandering nodig is. In de meeste gevallen is men zich hiervan niet bewust of niet in staat om ermee om te gaan en dit betekent dat het besluitvormingsproces extra belangrijk wordt, omdat er investeringen moeten worden gedaan. Er is echter geen twijfel mogelijk dat e-learning, net als e-business en andere e-activiteiten, een belangrijke rol gaat spelen en het behalen van resultaten is daarom een noodzaak. Het gebrek aan onderzoeksbenaderingen en analyse-instrumenten om met deze complexiteit om te gaan, is een van de redenen waarom e-learning ontwikkeling last heeft van een onvolledige en vaak fragmentarische aanpak. Deze afwegingen hebben geleid tot het besluit om een werkmethode te ontwikkelen waarmee op systematische wijze de e-learning context kan worden geanalyseerd om daarmee de complexiteit te reduceren. Het oogmerk was om de consultant, als de primaire gebruiker van deze werkmethode, te ondersteunen bij het managen van e-learning ontwikkeling en daarmee werd het doel van de studie: 'De ontwikkeling en implementatie van een analysekader benadering (Analysis Framework Approach) voor corporate e-learning'.

De e-learning context

E-learning is een door technologie gedreven ontwikkeling, die op dit moment voor een belangrijk deel bepaalt hoe de onderwijsinnovatie eruit ziet. E-learning is een veelzijdig verschijnsel, dat moeilijk in een definitie of omschrijving te vangen is, waardoor regelmatig misverstanden ontstaan. Om dat te voorkomen werd voor de context van deze studie de volgende definitie gebruikt: 'E-learning is het leer- en doceerproces

waarin de verbindingen tussen de deelnemers en met de bronnen voortdurend ondersteund worden door communicatie technologie'.

De eerste onderzoeksvraag (Research Question 1) was: 'Wat is e-learning?'. Dit om vast te stellen welke betekenis e-learning heeft in de context van opleiden en leren en hoe zich dit verder zal gaan ontwikkelen. Techniek speelt een belangrijke rol bij e-learning, maar is niet doorslaggevend als het gaat om de innovatie van leeractiviteiten. E-learning is geen op zichzelf staande ontwikkeling, maar verbonden met de opkomst van de nieuwe economie met e-business en e-commerce als belangrijke exponenten. De conclusie is dat e-learning niet meer weg te denken is en dat de kans groot is dat iedereen op de korte of langere termijn met dit verschijnsel te maken krijgt. Wat dit betreft is e-learning veelbelovend, hoewel we nog bezig zijn om de werkelijke waarde voor opleiden en leren te ontdekken. Het is duidelijk dat we een uitgebalanceerde kijk op de betekenis van e-learning nodig hebben om die waarde te kunnen bepalen. Wat dit betreft zijn we nog niet zover, zolang de groei van e-learning wordt beschreven als explosief, nieuw en verstorend.

De rationale voor het onderzoek.

Snelle veranderingen in de bedrijfsorganisatie, de bedrijfsprocessen en de technologie zorgden voor een toenemende vraag naar meer en andere mogelijkheden voor trainen en leren, iets waartoe vele bestaande opleidingsorganisaties niet meer in staat waren. E-learning lijkt onbeperkte mogelijkheden te bieden om dit probleem op te lossen. Er waren hoge verwachtingen en dit leidde ertoe dat e-learning werd 'over-hyped', toen 'de-hyped' en nu 'under-hyped' is. Een toenemend aantal organisaties heeft de eerste ervaringen gehad met e-learning en kent de verhalen over implementatie problemen, magere resultaten en successen. Om ten volle te kunnen profiteren van e-learning is een solide leerstrategie nodig om te voorkomen dat men op sleeptouw wordt genomen door de e-learning technologie.

De algemene mening is dat e-learning langzamerhand haar plek vindt in de bedrijvensector en in de komende jaren in betekenis toe zal nemen. De verwachting is dat e-learning een kritisch issue wordt voor bedrijven en zich zal ontwikkelen tot een belangrijk instrument voor human resource ontwikkeling. De analyse van onderwijskundige en algemene innovatietheorieën en de ervaringen met ICT in onderwijs en training (RQ 2, 3 en 4) laten zien dat er een gebrek is aan een adequaat instrumentarium om na te gaan of e-learning een goede, alternatieve opleidingsstrategie biedt in vergelijking met de bestaande oplossingen. Het doel van dit onderzoek was om een analysebenadering te ontwikkelen, die zowel het besluitvormingsproces als het managen van de e-learningontwikkeling zou ondersteunen.

De ‘analysekader benadering’: een management tool

Op basis van de onderzoeksresultaten werd besloten om een benadering te kiezen met als uitgangspunt een raamwerk voor analyse. Deze analysekader benadering bestaat uit verschillende stappen van complementaire activiteiten en is onderdeel van een bredere strategie voor corporate e-learning onder de naam: ‘Corporate E-learning Strategy Model, de CES Model’. Dit model bestaat uit drie fasen. Het analysekader heeft betrekking op fase I van dit model en vormt de kern van het onderzoek.

Onderzoeksvraag vijf (RQ 5) was: ‘Wat zijn de bouwstenen voor deze analyseraamwerk benadering?’ Als bouwstenen werden de succesfactoren voor e-learning gebruikt, die het resultaat waren van een deductief analyse proces van de e-learning context en de theorie over onderwijskundige innovatie en innovatie in het algemeen. De volgende onderzoeksvraag (RQ 6) was; ‘Hoe is dit raamwerk ontwikkeld en wat zijn de belangrijkste kenmerken?’. De bouwstenen werden benutten om het analysekader te ontwikkelen, waarbij gebruik werd gemaakt van een aantal operationele categorieën om zowel de ontwikkeling als het gebruik van de benadering te structureren. Deze categorieën werden gekwalificeerd als zijnde de bedrijfskolom opleidingen. De categorieën zijn aan elkaar gerelateerd en vullen elkaar aan en dekken alle componenten af die cruciaal zijn voor de ontwikkeling en het succes van e-learning.

Verzamelen van empirische bewijsmateriaal

Als methode werd gekozen voor actieonderzoek, als de meest toepasselijke onderzoeksstrategie. Onderdeel van die strategie was het gebruik van een casestudie methode voor het verzamelen en analyseren van gegevens. Kenmerkend voor actieonderzoek is het cyclische proces van planning, actie, observatie en reflectie. De casestudie methode is vooral waardevol in situaties waarin de onderzoeker weinig of geen controle heeft over de onderzoekssituatie. De cases werden uitgevoerd in de dagelijkse praktijk. Aan de ene kant neemt daardoor het werkelijkheidsgehalte toe. Aan de andere kant is er een grotere invloed van externe factoren op het onderzoek.

Het onderzoeksontwerp bestond uit een protocol voor gegevensverzameling, een rapportage format, een crosscase analyse schema met op het einde een sterktezwakte analyse (SWOT) om prioriteiten te kunnen stellen ten aanzien van de verandering en verbetering van de analyse benadering. Het onderzoek werd uitgevoerd vanuit het perspectief van een professionele leerconsultant, die in de dagelijkse praktijk werkzaam is bij bedrijven en organisaties. De belangrijkste karakteristieken van actieonderzoek zijn: cyclisch, participatief, kwalitatief and reflectief.

Doel van de analysekader benadering was het ondersteunen van het management proces van e-learning ontwikkeling in de corporate omgeving. Een belangrijk element in de benadering is de overdraagbaarheid (RQ 7) en de besluitvorming over de verbetering van de bruikbaarheid (RQ 8). De uitgangspunten bij de

gegevensverzameling waren: meerdere bronnen van bewijsmateriaal, een casestudie gegevensbank en een keten van bewijsmateriaal. Die keten gaat over de relatie tussen de vragen die worden gesteld, de verzamelde gegevens en de conclusies. De analysestrategie is gebaseerd op een crosscase analyse, gevolgd door een verzameling van conclusies en aanbevelingen. Een sterktezwakte analyse werd gebruikt om de belangrijkste acties te selecteren in relatie tot de genoemde overdraagbaarheid en bruikbaarheid, de onderzoeksvragen zeven en acht.

De gegevensverzameling vond plaats in twee opeenvolgende rondes van case studies. Versie 0 van het analysekader werd gebruikt in ronde 1. Versie 1 werd gebruikt in ronde 2.

Ervaringen

De analysekader benadering werd in de eerste ronde van de case studies door verschillende leerconsultants uitgevoerd. De analyses vonden plaats in de dagelijkse praktijk van een bedrijf op basis van een commercieel contract dat de consultant had gesloten met de betreffende organisatie. De meeste cases werden uitgevoerd in de procesindustrie en één in een regionaal opleidingscentrum. De ervaringen werden vastgelegd in casestudie rapporten, waarbij gebruik werd gemaakt van een speciaal format, dat ook werd toegepast in de crosscase analyse. Een tweede situatie waarin informatie werd verzameld waren bijeenkomsten met verschillende experts om de benadering te toetsen en een controle uit te voeren op de validiteit van de inhoud van het analysekader. Het belangrijkste doel van dit praktijkgericht onderzoek was om het analysekader te verbeteren en empirische gegevens te verzamelen voor de controle op de bruikbaarheid van de benadering. De term overdraagbaarheid wordt gedefinieerd als de bruikbaarheid van de benadering door verschillende mensen, in verschillende organisaties, op verschillende organisatorische niveaus en in verschillende stadia van e-learning ontwikkeling (RQ 7). Dit zijn belangrijke criteria, omdat de consultant de benadering bij verschillende klanten gaat gebruiken. De uitkomsten werden aan een sterktezwakte analyse onderworpen om de belangrijkste verbeteringsacties te kunnen selecteren voor de ontwikkeling van versie 1 van het analysekader (RQ 8). Er werden drie acties uitgekozen.

Actie 1 was de verbetering van de structuur van het analysekader. Actie 2 was de ontwikkeling van een gebruikershandleiding en actie 3 de ontwikkeling van een 'vragenlijst naar de mening van deelnemers over e-learning'. Deze acties werden uitgevoerd de ontwikkeling van versie 1 van het analysekader. Bij de sterktezwakte analyse kwamen nog twee andere elementen als belangrijk naar voren en deze waren: bandbreedte en competenties. Beide werden niet in de verbeteringacties betrokken, omdat ze teveel af zouden wijken van de oorspronkelijke onderzoeksopzet, maar werden opgenomen bij de aanbevelingen voor verder onderzoek.

De ervaringen met versie 0 van het analysesysteem hebben geleid tot de ontwikkeling van de verbeterde versie 1. De procedures in de tweede ronde van het

verzamelen, beschrijven en analyseren van de gegevens waren precies dezelfde als in de eerste ronde van casestudies. Het belangrijkste doel was de verbetering van het analysekader en het verzamelen van empirisch bewijsmateriaal voor de controle op de bruikbaarheid van deze benadering. Evenals in de eerste ronde van case studies vonden alle cases plaats in de dagelijkse bedrijfspraktijk en werden de analyses uitgevoerd op basis van de afspraken met de opdrachtgever. De cases werden uitgevoerd door leerconsulenten en door master studenten van de Universiteit van Twente en de Technisch Universiteit Delft. Ze werden uitgevoerd in verschillende bedrijven en organisaties, zoals de staalindustrie, de voedingssector, de gezondheidssector, de service sector en de glasindustrie. Alle organisaties op één na waren in de beginfase van e-learning ontwikkeling. De ervaringen werden gedocumenteerd in casestudy rapporten en verder onderzocht middels een crosscase analyse. De resultaten hiervan werden vervolgens via een sterktezwakte analyse beoordeeld op hun relevantie. Vervolgens werden er zes verbeteringsacties geselecteerd, die moeten leiden tot een verbeterde versie van het analysekader. In overeenstemming met de onderzoeksopzet werden deze acties echter niet uitgevoerd, maar gebruikt als onderdeel van de strategie voor verder onderzoek.

Conclusies en aanbevelingen

De verzamelde gegevens bevestigen dat de analysekader benadering gebruikt kan worden in verschillende organisaties. Het bewijs is minder sterk voor het gebruik van de benadering op verschillende organisatorische niveaus. De meeste bedrijven en organisaties waren in een startfase en in die fase heeft de consultant vooral te maken met een groep primaire stakeholders, die vooral opereren op het niveau van het tactisch management. De benadering kan worden gebruikt door verschillende mensen, hoewel een bepaald expertiseniveau en consultancy vaardigheden vereist zijn. Het analysekader is voldoende flexibel om door de consultant te worden aangepast aan de context van de klant. Het bewijs voor gebruik van de benadering in verschillende stadia van ontwikkeling is niet voldoende. Zoals aangegeven bevonden de meeste organisaties zich in een beginfase. De verwachting is echter dat de behoefte aan een context gebonden analyse snel toe zal nemen naarmate e-learning zich verder ontwikkelt in de pilot- en integratiefasen van implementatie.

De aanbevelingen richtten zich vooral op de organisatorische kant van het analysekader. De voorgestelde veranderingen gaan over de uitbreiding van de aanwijzingen om de benadering aan te passen aan de verschillende bedrijfscontexten; de verbetering van de analyse van het ' sociale netwerk ' in een organisatie; de ontwikkeling van een competentie matrix voor de consultant; een systematische benadering voor de verzameling van kennis en ervaringen en verbetering in het gebruik van de analysekader rapportages. Een niet onbelangrijke suggestie is om de analysekader benadering te ontwikkelen tot een benadering voor doorgaande analyse. Dus niet beperkt tot de beginfase, maar in alle fasen van ontwikkeling.

Discussie en verder onderzoek

De ervaringen laten zien dat de analysekader benadering uitvoerbaar was en door de consultant en klant als waardevol werden ervaren. Dit betekende dat in de meeste gevallen de analyse leidde tot een vervolgopdracht. De uitvoering van de analyse benadering was niet altijd even makkelijk. Het vereist een zekere alertheid, interview en verslagleggingvaardigheden, men moet in staat zijn om systematisch te werken conform bepaalde procedures en het vereist een bepaald expertiseniveau op het terrein van e-learning. Eveneens van belang is de notie dat de benadering een regelmatige en tijdige vernieuwing vereist om de dynamische ontwikkelingen in e-learning bij te kunnen houden.

In de discussie werden twee items genoemd die toegevoegd zouden moeten worden aan het analysekader en dat zijn: 'formeel en informeel leren' en 'return on e-learning'. De combinatie van e-learning met informeel leren lijkt een natuurlijk gegeven en moet verder worden onderzocht. Daarnaast is de verwachting dat de return on investment van e-learning in de informele leerprocessen van groter belang zal zijn dan in de formele. E-learning lijkt het belang van leren binnen bedrijven en organisaties te versterken en leidt tot verwachtingen en investeringen, die een grotere mate van financiële verantwoording vereist en dat is een relatief nieuw verschijnsel in de opleidingswereld.

Tot slot worden aanbevelingen gedaan voor verder onderzoek: de voorbereiding van de analyse benadering voor gebruik in andere fasen van e-learning ontwikkeling; een verbetering in de analyse van de stakeholder factor; verdere uitwerking van de bandbreedte van het analysekader als belangrijke kwaliteitsnorm; de 'return on e-learning' en de samenwerking tussen onderzoekers en de consultant om de broodnodige actualisering van het analysekader zeker te stellen, gezien de dynamiek van e-learning ontwikkeling.

Appendix A: Analysis Framework Approach Version I: Consultants' Users Guide.

This guide is only available in Dutch and can be obtained from the author by sending an email to: "p.devries@tbm.tudelft.nl".

Appendix B: Analysis Framework Approach Version I: Student Users Guide.

E-learning strategy An analysis framework approach

STUDENT GUIDE

E-learning strategy

Welcome in the world of e-learning and strategy. E-learning seems to be high on the agenda of almost everyone who is involved in education and training. In practise a lot of people talk about it, but have never done it. No wonder, because e-learning is an innovation which takes time, money, energy and a vision on learning and change.

This lecture is about the need for an e-learning strategy to make sure that e-learning can become a success.

'If you don't know where you are going, any road will do'

The White Rabbit, in 'Alice in Wonderland' (Lewis Carrol)

Why e-learning?

Swift changes in the business organization, the business processes and the technology have created an increasing demand of training and learning. To be able to meet these demands, the supply of training needs to be more focused on the functions and competencies of the employees in relation with the business processes. Therefore there is a need for more tailor made learning solutions, which also fit the increased heterogeneity of the workforce.

The traditional, classroom oriented training lacks the necessary flexibility and sometimes even shows to be contra productive in the process of just-in-time and just-enough learning. Therefore corporations are looking for useful alternatives and consider e-learning to be helpful in developing learning solutions that fit the current needs for more flexibility.

Why a strategy?

There are several reasons. E-learning is not the ultimate tool for all training demands and problems, but can help to find solutions which where not in reach in the pre-internet time. It is essential though to 'position' e-learning in a correct way, because the success depends greatly on the right 'mix' with other training and learning offerings, like classroom sessions, open learning, computer based training, seminars, etc.

Appendix B

The purpose of a strategy therefore is:

'To plan and guide e-learning into a good position relative to existing training offerings'
(De Vries, 2002)

Another reason is the complexity of the development and implementation process of e-learning. From the perspective of a supplier of e-learning consultancy, there are two sides of the coin, an external one and an internal one.

Consider the following and complete each argument with an example you are familiar with.

The need for a strategy:	Give an example
External reasons	
Different way of thinking about learning.	Learning is a continuous process and does not stop at the classroom door or when you close your book..
1. Redesign of the teaching and learning environment
2. Change of teacher and student skills	
3. Different actors	
4. Content	
5. Technology	
6. E-learning market	
7. Experiment	
8. Change of business models	

Consider the following and complete each argument with one explanatory remark!

The need for a strategy:	Please explain.
Internal reasons	
1. Step wise approach	
2. Use of check lists	
3. Using tools for 'each' step	
4. Common approach	
5. Shared vocabulary	
6. Shared workflow in the organisation	
7. A system for feedback and improvement	

Building blocks for a strategy

The reasoning why companies in general embrace corporate e-learning is because it is considered a very promising alternative. It can help acquire more flexibility to handle the increased need for training and learning, which can not be supplied by the traditional classroom model. At the same time e-learning is not something that falls from the sky or will grow over night. The building blocks can be sensed in the following considerations.

A new way of thinking about learning

The organizational model for teaching and learning, based on the linear design principle of training programs and content like books, video's and most computer based training, need to be reconsidered. The classroom setting and the old didactical paradigm of interaction between trainer-student-content can not supply the needed flexibility.

Redesign of the teaching and learning environment

The perceived value of e-learning can only come to an acceptable level, when the old structures are reconsidered. This does not mean that the 'classroom is out'. The inflexibility of a fixed time and place is out, as long as the added value of c-learning (classroom learning) does not compete with the advantages of e-learning.

A more personal set of teaching and learning capabilities

To be able to profit from the improved access to teaching activities and learning solutions, the teacher and the learner will regularly change places, use different resources, act in different groups, use different forms of interaction, have a different perspective on the value of the teaching and learning activities.

Different and new actors, different content and different technology

The traditional didactical triangle is treaded in for a situation in which each of the participants, being a teacher, coach, moderator, learner, expert, resource for content, discussion group, working and learning place, change positions all the time. Because of this, the learning setting becomes more fluid and therefore more flexible. Content is no longer stored in just a book or a folder, but can be at all places, change all the time, be manipulated by the trainer as well as the student. Content, like the interaction between the participants, becomes fluid, gains value along the way and is owned by many. Internet technology plays a prominent role, but is at the same time a tool widely used in every day life. In addition learning technologies integrate more than ever with other supporting systems not developed for learning in the first place.

Appendix B

An open mind for experiments

There is no blue print for the optimal e-learning situation, so most of the activities have an experimental character. This requires a different approach, causing uncertainty and a claim for flexibility of the stakeholders.

A view on the 'e-learning market'

A rapidly developing market, which is still very immature. The training world is confronted with a whole group of newcomers and new products from knowledge capture tools to learning and content management systems. The lack of clearly defined e-learning strategies and the relative slow pace in the development is testing the elasticity of the prospective market.

A sense for new business models

This used to be a very fixed model with predictable costs and income. The situation is changing due to the increasing flexibility in the organization of training and learning. In practice this means that it is not clear when, how long and how many *students participate at a certain point of time. Will the classroom be used and what is the amount of content being chargeable.*

The awareness that e-learning is not a product, but a process.

Looking at these building blocks for the framework of analysis, there is one important element which should be added. E-learning can not be considered a product, but is part of the innovation in training and learning which is taken place, aiming at a more flexible learning and teaching environment, which better fits the needs of the company and their employees.

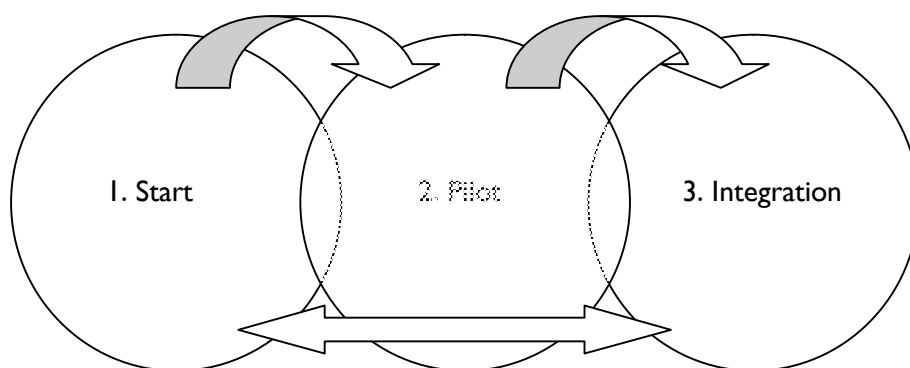
With the building blocks in mind we can turn to the 'three step approach' and focus on the actual tool for analysis in the next section.

The analysis

No strategy without an analysis. All the building block elements are touched upon when e-learning is at stake. This means that any analysis, which does not consider these building blocks, is doomed to fail. The building blocks are the starting point for the development of the strategy and the tools for analysis to be used to develop a set of relevant factors and get knowledgeable about the actors. This analysis framework is built on three basic steps, which are worked out in the CES Model for Corporate E-learning Strategy. This stepwise approach represents on a general level the three sets of factors and actors that can be distinguished as being different categories in the process of change from a mainly classroom based teaching and learning activity to a more flexible situation in which network technology plays an important role.

The CES model (Corporate E-learning Strategy)

This model supports the development and implementation of e-learning aiming at acceptable results in the short term and a future proof strategy for long term development. It is a stepwise, problem oriented approach, starting with small actions and progressively finding the way to extend e-learning to all the corporate learning activities.



The 3 phases of the CES model

Phase 1: Start

- Getting familiar with e-learning for all (early) participants
- Quick scan of existing training problems to see if e-learning offers a solution
- Selection of the e-learning technology like Learning Management Systems and other development tools
- Prepare for phase 2.

Phase 2: Pilot

- Solve the training problem
- Acquire knowledge and experience with e-learning
- Improve the strategy
- Prepare for phase 3.

Phase 3: Integration

- Establish the right service level for company wide e-learning developments
- Integration with the companies learning strategy
- Optimise the interconnection with business goals and business processes

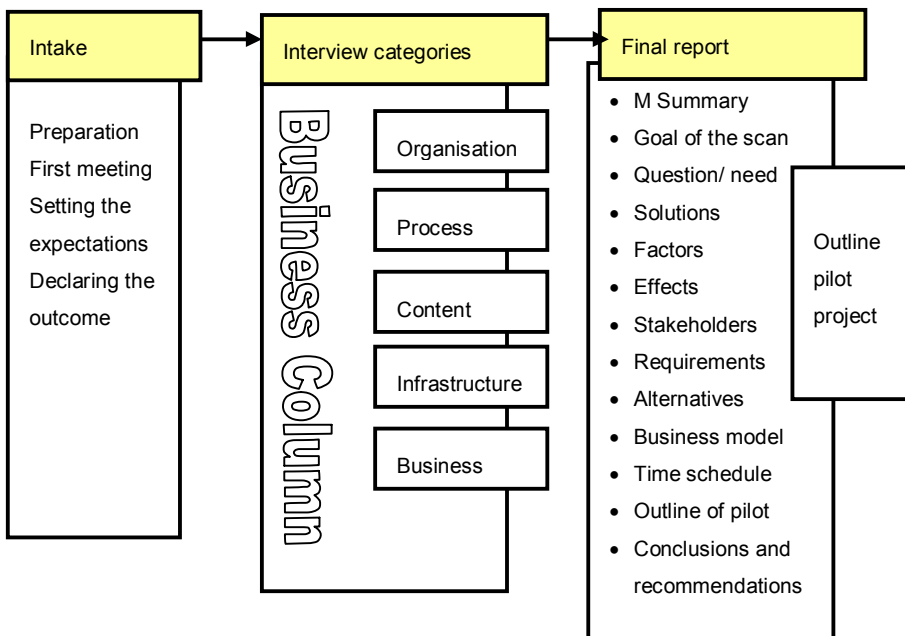
The Quick Scan: a tool for analysis

Part of phase I of the CES Model is the Quick Scan corporate e-learning. This scan is a tool for analysis of the training/learning needs of a company to be able to decide in an early stage whether e-learning is the appropriate choice.

The scan is built on the analysis of the *business column* 'training and learning' which contains the following categories:

1. corporate organizational capability
2. instructional processes
3. content
4. infrastructure
5. business model

This analysis can help significantly to make the right decision. The quick scan though is not just an inventory of options, but also a tool to familiarize your client with the benefits of e-learning, to supply him or her with the right arguments for the internal discussion and prepare for further collaboration. It also helps to get to know your client better and get a good overview of the opportunities in the company for your consultancy work.



Overview of the different steps in the Quick Scan

Guidelines for using the Quick Scan

Intake

Preparation

You will need to get familiar with the company before contacting any person. Try to get to know as much as possible beforehand, this will ease your entry. Use the internet for a first overview and focus on the information concerning HRD and training and learning. Most companies offer a year report and additional public information. This will also help you to decide which people you need to have your interview with or to pose the right questions when preparing the interview with your contact person.

Contacting the company

Try to arrange a meeting and be specific with whom you would like to talk to. This is an intake meeting to see if both you and the company representatives can agree on the goals and the procedure of the Quick Scan. If possible set the agenda during this intake meeting for the total meetings. Next to the intake (1 hour), there is the 'interview' (2-3 hours) and the presentation of the final report (2 hours).

The interview

Procedure and focus

The quick scan is built on a semi structured interview with a selection of people (stake holders) involved in the training and learning process.

- The interview items (see the overview below) are your guideline for the interview, leaving enough room to skip or add items when necessary.
- It is advisable to tape the conversation, helpful when working on the outcome.
- Use the same format as the interview to present your results.
- Discuss the outcome with your client to make sure that the results are qualified as appropriate.
- Rework the outcome of this conversation in the final report with the interview items as an appendix.

The interview format

- Start the interview with the following introduction:
- The goal of the scan
- The procedure
- The outcome
- Make sure people agree with your plan.

The guiding principle in the interview is to bring the ‘pain’ to the surface and start this collaborative thinking process about a solution, which could be e-learning. So the overlay in the interview is:

1. What is the existing situation?
2. What is the desired situation?
3. What are the thresholds?
4. What is an appropriate solution?

Use the following format to write down the interview results in line with the ‘interview categories’.

Categorie Organisation	Existing situation	Desired situation	Thresholds	Solution
Sub-category Management	Due to production pressure there is no time left to send people away for training	Need for a more flexible organisation of training	Learning at different times and places....	24/7 offerings for learning close to the workplace....

The final report

Focus of the report

- The analysis of the training question or problem
- The description of the benefits of e-learning in this situation
- The outline for a pilot project
- The usability of the report as a reference and a first guideline for the next step

Outline of the report

The final report can be considered a piece of evidence to indicate that the analysis has been a thorough process to support decision making on the use of e-learning. Most likely it will be used by your client to make his point and persuade managers. So make sure it reads well and looks good, because this might be your ‘business card’ to enter a long term relationship. Consider changes when the company is using a different format for these kinds of reports.

The final report should at least contain the following items:

Final report outline	Your comments
1. Management summary	
2. Introduction on the purpose of the scan and the people involved	
3. The training and learning question or need	
4. The solutions	
5. The enabling and inhibiting factors	
6. The effect on the existing situation	
7. The stakeholders	
8. The requirements	
9. The alternatives	
10. The business model	
<ul style="list-style-type: none"> • The time schedule 	
11. The outline of a pilot project	
12. Conclusions and recommendations	

Recommended resources

ASTD e-learning glossary

www.learningcircuits.org/glossary.html

Boulton, P. (2001). *Reasons for Implementing e-Learning*. Monash University

Campaign for Learning. (2000). *Attitudes to e-learning: a national survey 2000*. London

Cedefop. The European Centre for the Development of Vocational Training..

www.trainingvillage.org

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Collis, B. and Moonen, J. (2001). *Flexible Learning in a digital world, experiences and expectations*, Kogan Page, London, ISBN 0 7494 3371 x

Deloitte research (2001). *From e-Learning to Enterprise Learning*, becoming a strategic organization, www.dc.com/research

De Vries, P. (1999) White Paper. *TeleLearn: Costing Issues in Flexible and Distance Learning*. Proceedings of the Flish Conference 1999. Sheffield, UK.

De Vries, P. (2002). *Geruisloos leren in de Walshal*. HRD-magazine, dec 2002, nr 12, pp. 40 – 43.

Financial Times, special report, Spring 2002. 'Understanding e-learning: the learning curve'.

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Oprins, E., De Vries, P. (2001). *E-learning on the job in the Steel Industry*. Proceedings of the Ed-Media conference 2001 in Tampere, Finland.

Rosenberg, M.J. (2001). *E-learning: Strategies for Delivering Knowledge in the Digital Age*. MacGraw-Hill

Rossett, A. (Ed.) (2002). *The ASTD E-learning Handbook*. MacGraw-Hill. ISBN0-07-138796-X

Urdan, T.A. and Weggen, C.C. (2000). *Corporate e-Learning: Exploring a New Frontier*. WR Hambrecht & Co.

Völkl, C. & Castelein, F. (2002). E-learning in the Old world: A Reflection on the European E-learning Situation. In: Rossett, A. (Ed.) (2002). *The ASTD E-learning Handbook*. MacGraw-Hill. Pp. 64-77.

Appendix C: Analysis Framework Approach Version 0: Interview Items for the Quick Scan Sub- phase.

Quick Scan Sub-phase: Overview Interview Items Version 0

<u>1. Organisation</u>	a. Management	<ul style="list-style-type: none"> • Stakeholder on management level • Organization of Learning activities (central en de-central) • Decision making concerning the training needs (criteria) • Planning of training needs • Options for individual choice • Standards for course development and evaluation • Alignment of the training goals with the business objectives • Specialized training • Information and knowledge exchange on training and learning • Integration of training and learning with salary • Budget details (numbers, i.e.) 	
	b. Administration	<ul style="list-style-type: none"> • Organization of learning • Training needs • Logistics • Financial management 	
<u>2. Process</u>	a. Training needs	<ul style="list-style-type: none"> • Analysis of the training need (quantity, goal and target group) • Evaluation 	
	b. Training model	<ul style="list-style-type: none"> • Analysis existing training offerings (organization, administration, maintenance) • Kind of instruction • Learning activities • Testing • Certification • Mentoring, coaching 	<ul style="list-style-type: none"> • ICT role in the training model

	c	Teaching and learning activities	<ul style="list-style-type: none"> • What specific activities? 	
	d	Trainers, teachers and instructors	<ul style="list-style-type: none"> • Job profile • Competencies • Assessment • Local instructors? • Specialists? • Training and knowledge level • Teaching experience • Digital skills 	
	e	Students	<ul style="list-style-type: none"> • Job profile (training and knowledge level) • Competencies • Assessment • Learning experience • Digital skills 	<ul style="list-style-type: none"> • Suppliers • Clients • Training value chain
3. Content	a.	Existing and available content	<ul style="list-style-type: none"> • Usability and quality • Technical analysis for conversion • Developers? • Standards (development, testing, deliverance, i.e.) 	
	b.	The role of core competencies	<ul style="list-style-type: none"> • Group, unit and corporate level 	
	c.	Development and support	<ul style="list-style-type: none"> • Who develops and who supports? • Standards and regulations • Outsourcing • Acquisition 	
	d.	Administration and maintenance	<ul style="list-style-type: none"> • By whom and how? 	
	e.	Content re-use	<ul style="list-style-type: none"> • What content ? • Distribution 	<ul style="list-style-type: none"> • Re-use to enhance the return on investment
	f.	Content value	<ul style="list-style-type: none"> • Company specific value 	
	g.	Third party	<ul style="list-style-type: none"> • Acquisition, lease, exchange • For-profit exchange 	

	h. Knowledge management	<ul style="list-style-type: none"> • In what form? • The importance for learning? • Local or general available • Integration with learning management? 	
<hr/>			
4. Infrastructure	a. Network	<ul style="list-style-type: none"> • Capacity of the infrastructure • Capacity of the internet- and/or intranet connection 	
	b. Hard- and software	<ul style="list-style-type: none"> • Facilities in the work place • Facilities elsewhere in the organisation and at home 	
	c. System maintenance	<ul style="list-style-type: none"> • What kind of specialism • Who is responsible? • Security aspects 	
	d. E-learning tools	<ul style="list-style-type: none"> • What tools and why? 	
	e. Administration and maintenance	<ul style="list-style-type: none"> • Who is responsible? • Organizational setting 	
	f. Buildings, classrooms and other facilities	<ul style="list-style-type: none"> • What facilities? • Special facilities? 	
<hr/>			
5. Business case	a. Learning strategy (short and long term)	<ul style="list-style-type: none"> • Alignment of learning with the business objectives (short and long term) • Learning needs (strategic tactical, operational) • Integration of work and learning • Certification (obligatory) • Business value of content • Re-use of content • Current training and learning programm • Rational for e-learning development 	
	b. Strategic considerations for investment	<ul style="list-style-type: none"> • Quick technical and organizational developments • Internationalization • Demographic developments • Knowledge inflation • Changing regulations (environment, safety, health) 	<ul style="list-style-type: none"> • Critical success factors • Inhibiting factors

- Expectations of workers
 - SWOT- analysis
 - Competition (how do they train and learn?)
-

Costs and revenues

- Business problem
 - E-learning solution
 - Revenues (what revenues and what are the expectations)
 - Cost drivers
 - Revenues
 - Expenditure for the existing training (administrative, organizational and operational)
 - Measuring results?
 - Advantages of more flexibility (cost reduction, quality increase, multiple usability. i.e.)
-

**Appendix D: Analysis Framework Approach
Version 1: Interview items for the Quick Scan
Phase.**

Interview items for the Quick Scan Phase

Company

Main activity:

Location:

Date:

Motive:

Interviewed persons

Name:

Position:

Connection with training and/or e-learning:

Interviewer

Name:

Position:

Motive:

Other details

<p>I. Organisation</p>	<p>This category aims at the development of a general picture of the company and the companies policy on training and learning. An important item for the development of e-learning is the ability of the company to cope with organisational change. Therefore the organisational level is an important success factor.</p>
<p>Management CEO's and managers play a decisive role in innovation. You should get a clear picture of the companies strategy when dealing with innovation in training and learning.</p>	<ol style="list-style-type: none"> 1. What is the importance of 'training and learning' in the company? 2. What is the appreciation of the training and learning offerings on management level? 3. Who is responsible on the management level (line management)? 4. Could you give an overview of the training responsibilities throughout the company and the matching organisational model (central-decentral, etc.)? 5. Are business goals and training goals integrated? 6. Could you describe the training or learning culture? 7. What kind of courses or learning facilities do you offer (internal, external, etc.)? 8. What is the relation between the HRM and HRD policy and training and learning? 9. How is, in general, the exchange of knowledge organised? Are there alternatives in relation to training and learning? 10. Is there a clear picture of the budgets and expenses of training, learning and knowledge exchange? 11. What is your decision making process about training needs (criteria)? 12. Can students make individual choices (choice of courses, participation, time, etc)?
<p>Administration Flexibility for the user is supposed to be one of the strongholds of e-learning. This requires though a well organized back office.</p>	<ol style="list-style-type: none"> 13. How do you plan for training needs? 14. What kind of procedures do you have for the enrolment and participation of students? 15. How is the financial management for training and learning organised? 16. Who is responsibility for the logistical organisation (classrooms, teachers, equipment, etc.)? 17. Is ICT a tool in the management and administrative process?

2. Process	<p>The actual learning, teaching, training and knowledge sharing process is your main point of reference. Do not focus, at the start of an e-learning development process, on niche or isolated training needs or problems.</p>
Training needs An important success factor for e-learning is the sense of emergency for the 'business, training or learning problem' for which e-learning is supposed to be (part of) the solution..	<ol style="list-style-type: none"> 1. What is the relationship with the primary business process? 2. How do you analyse the companies needs in relation to training needs or problems (what kind, how big, goals, target group and other stake holders, time, planning)? 3. Do you evaluate the final results (relation of training needs – chosen solution final outcome)
Training model Assessing the current use of ICT is a helpful exercise to explore the possibilities for e-learning. So what is the importance of ICT use in the current training and learning programme and what experiences (positive and negative) do they have?	<ol style="list-style-type: none"> 4. What training models do you use in the existing programme? 5. What kind of learning offerings do you have (classroom, open learning centre, workplace learning, a.o.)? 6. What are the coaching models you are using (mentoring, etc.)? 7. What is the role of testing? In what way do you test and do you use testing for other than assessment purposes? 8. What is the role of certification and how is it organised (internal, external)? 9. Do you have some success stories and which success factors were decisive?
Teaching and learning activities The role of ICT use in the actual teaching and learning process. Starting point for e-learning activities.	<ol style="list-style-type: none"> 10. What pedagogical models are most common in the teaching and learning process? 11. Could you give some examples of ICT use? 12. What is the general perception of the added value of ICT?
Trainers and instructors Important question is if the current group of teachers and trainers are able to support and execute an innovation (like e-learning) or to stop such a development? What would be the (structural) success factors and inhibiting factors for this target group?	<ol style="list-style-type: none"> 13. What is the competency profile of the teachers, trainers and other people with a training responsibility? 14. What is the general teaching and learning experience of the teachers/trainers? 15. What training and knowledge level? 16. Are the teacher/trainer roles competency based? 17. What is the level of digital skills? 18. With what categories of teachers and trainers do you work with (dedicated, experts, internal, external, etc.) 19. What is the appreciation of the 'teachers and trainers' work in the eyes of the teacher?

Appendix D

Students (target group)

The student's attitude should favour change and be positive about the use of ICT. It is important to be familiar with the (structural) success factors and the inhibiting factors.

20. What is the general learning experience?
 21. What is the knowledge level?
 22. Are the students working roles competency based?
 23. What is the level of digital skills?
 24. What students do you serve internally?
 25. Do you also serve external students (suppliers, clients or others)?
 26. What is the appreciation of the training and learning offerings?
 27. What is the appreciation of the 'trainers/teachers work'?
-

3. Content	Content for learning related purposes is not anymore what it used to be. Good content though, including the development process, storage and maintenance, is crucial for the success of e-learning and so is knowledge creation. Try to get a picture of these processes.
Available content Make an inventory of the most important resources, the use of ICT and the kind of applications (CBT, databases, performance support, CRM, e.a.). What works well or not and why?	<ol style="list-style-type: none"> 1. What kind of content (lesson materials, company process information, workplace instructions, etc.)? 2. User experiences (satisfaction level, general and ICT related)? 3. What are the success and what are the inhibiting factors? 4. What are the main thresholds (production, availability, quality, maintenance, development, update)? 5. The tenability of the content (expiring date)?
Content production factors Figure out what the most dominant content production factor is. Is it workplace bound, is it the HRD or something else?	<ol style="list-style-type: none"> 6. What is the prime motive for content production? 7. On what level? (Work team level, production unit, corporate level?) 8. What workflow do you use? 9. Do you use certain standards or formats for course and/or content development (ISO-), etc.? 10. Is it home made, out sourced, third party? 11. Which categories of resources do you use (experts, workplace instructions, user manuals, end user input, ...) 12. What tools do you use (for example X-help, a.o.) 13. Who is responsible?
New and updated content (development and support) It is good to know what procedures are used.	<ol style="list-style-type: none"> 14. Decision making process on 15. (Development, administration and maintenance) 16. What is the budget or how is the budget being determined? 17. What is the procedure of content update? 18. What is the procedure of acquiring new content?
Re-use of content Re-use could become an important added value factor (easier to organise with e-learning).	<ol style="list-style-type: none"> 19. Is there a re-use policy? 20. What content (generic, process oriented, learning related)? 21. Is copy right an issue?
Clients Most likely the target group has already been analysed several	<ol style="list-style-type: none"> 22. Which are the target groups? 23. How do you deal with the characteristics of your target group in relation to content?

Appendix D

times. Use this knowledge and relate it to the specific 'demands' for e-learning.

Knowledge management, Business communication, a.o.

Are KM, Business communication or other knowledge creation processes related to 'learning'?

The integration of e-learning with these processes is an upcoming phenomenon, which emphasizes the need for a good positioning of e-learning.

24. What is the rate of participation in training?
 25. What is the rate of participation in informal knowledge exchange?
 26. Do the students take responsibility for their own learning?

 27. What is your KM, Business communication policy?
 28. What is the relation with training and learning?
 29. What methodology and procedures do you use for knowledge creation, storage and access?
-

4. Infrastructure	E-learning can not function without technology. E-learning though will in most cases have a low priority in the companies 'technology policy'. How do people experience the quality of the it-services (infrastructure) and is there a willingness to invest?
e-Learning technology If the company is already using a LMS or other e-l technologies, then focus on the characteristics of the existing system.	<ol style="list-style-type: none"> 1. Do you use any e-learning technology? 2. If, so, could you describe the technology and how it is used to date? 3. What works well and what does not? 4. How do you develop and maintain this technology? 5. How did you select the technology (procedures?) 6. Are you satisfied (success and inhibiting factors)? 7. What are you plans for future development?
Tools What tools are used for learning related purposes and what are the experiences?	<ol style="list-style-type: none"> 8. Do you use any instructional and/or learning tools? 9. Why do you use these tools? 10. What are your experiences (good, bad)? 11. Plans for the future?
Network Do they use internet and what is their user policy?	<ol style="list-style-type: none"> 12. Do you have an intranet and/or internet? 13. Do you use it for training and learning related purposes and in what way? 14. What is your opinion about the quality? 15. What are the access facilities? 16. Plans for the future?
Hard- en software The availability of the pc, the basic configuration and the development policy.	<ol style="list-style-type: none"> 17. Computer use at the workplace or close to the workplace? 18. Do you have additional facilities, like at home? 19. Do you have learning related facilities?
IT-services A good connection with the it-unit is crucial.	<ol style="list-style-type: none"> 20. Do you connect with the it-people? 21. How much do you depend on them? 22. Is there a helpdesk? 23. Are you satisfied with their services? 24. Any security aspects?

Appendix D

Development, administration and maintenance

It is good to know the kind of responsibilities and how this affects the overall use and innovation capacity.

Buildings, classrooms and other facilities.

E-learning can reduce the necessity to invest in 'property', which could be a powerful *success factor*.

25. Who is responsible for what?
26. How does this work out in practice?

27. What kind of facilities do you have or do you have access to (internal, external, availability)?
28. Are these used well?
29. Are the 'users' satisfied?

Business model (return on investment)

With e-learning, it is not only the organisation, the process, the content or the infrastructure which changes. Also the return on investment or better, the added value question is different. Therefore it is important to rethink the business model. Try to get a grip on the actual situation and look for added value factors (financial, time, flexibility, contribution to business processes, a.o.) which might contribute to the success of e-learning if taken into account.

The existing business model

Analyse the features of the existing model in trying to get a grip on the actual situation.

1. What is the urgency of learning ?
2. What is the general appreciation of the existing training and learning offerings?
3. What are the cost drivers?
4. Where do the revenues come from and how are they qualified (financial, time-to-market, subsidies, production, etc.)?
5. Is there a recognition and reward program to encourage and support 'learning'?
6. Do you take into account the costs for 'inefficient or no training'?
7. Who are the stakeholders?
8. Are there any partnerships?
9. Is there for-profit learning exchange?
10. What are the major thresholds in the existing model (SWAP-analysis)?
11. Who decides in the end about the 'business model'?

Motives for the 'learning strategy'	<p>12. Is there a 'learning' strategy and if so, how does it look like?</p> <p>13. Is your existing strategy appropriate?</p> <p>14. What are the motives? Or what would be the motives?</p> <ul style="list-style-type: none"> • Training/learning and business goals? • Integration of work and learning? • The supply and demand mechanism: complete, incomplete, appropriate, timely? • The fast emerging technical and organisational developments? • Knowledge inflation, transfer, development of knowledge, perception of knowledge? • The changing expectations of the employees? • Demographic developments (older generation of workers still needed, hardly any new influx, etc.)? • Change in regulations (safety, environmental issues, etc.)? • Internationalisation? • The competition, how do they treat 'learning'? <p>15. What about the availability and qualifications of the personnel in relation to a 'learning strategy'?</p>
An 'e-learning' business model	<p>16. How extensive would the e-learning offering be (additional support, additional course, single program, redesign of the course offerings, company wide, etc.)?</p> <p>17. What factors will be used to compare the costs for e-learning with the existing situation?</p> <p>18. What advantages and disadvantages are expected?</p> <p>19. What are the costs when training and learning opportunities are not available?</p> <p>20. Which revenues are expected from the e-learning application?</p>
Piloting e-learning	<p>21. What training problem or question is likely to profit from an e-learning approach?</p> <p>22. What is the urgency of the problem?</p> <p>23. Is this urgency shared by all the stake holders?</p> <p>24. Are quick wins feasible?</p> <p>25. In what way could this pilot project show the benefits of e-learning?</p> <p>26. What are the alternatives to compare e-learning with?</p> <p>27. Could this project function as a catalyst for further development?</p> <p>28. What would be your time schedule?</p> <p>29. What would be the first step?</p>

Appendix E: Analysis Framework Approach Version I: Questionnaire on the Use of the Approach.

Evaluating the use of the Quick Scan

July 2003
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Introduction

The Quick Scan is a tool for analysis of the training/learning needs of a company to be able to decide in an early stage whether e-learning is an appropriate choice. This evaluation is meant to gather information about the experiences of the consultants who used the Quick Scan. The outcome of the survey will be used to improve the Scan and the procedures.

So, please take your time to fill out this questionnaire and do not hesitate to make additional remarks you consider as valuable for this evaluation.

Thank you in advance.

Pieter de Vries

Consultant / Interviewer(s)

Name	Name	Name
Organization	Organization	Organization
Position	Position	Position

People interviewed

Company	Company	Company
Name	Name	Name
Position	Position	Position

Interview dates

- Intake
 - Interview
-

- Interim report
 - Final report
-

I. Quick scan procedure

a. Intake meeting

	yes	no
• Did you have an intake meeting?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you use company information to prepare for the intake?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you use the 'attitude questionnaire on e-learning'?	<input type="checkbox"/>	<input type="checkbox"/>
• Did your client agree with the interview procedure?	<input type="checkbox"/>	<input type="checkbox"/>

What other activities you think are necessary to prepare for intake?

.....
.....

Was the intake helpful to prepare for the interview? Please clarify.

.....
.....

b. Position and role of the people interviewed

	yes	no
• Did you talk to a representative selection of stake holders?	<input type="checkbox"/>	<input type="checkbox"/>
• Would you work with the same people if there is a follow up after the Quick Scan?	<input type="checkbox"/>	<input type="checkbox"/>

What was this representative selection?

.....

Which other people would you have liked to interview?

.....

c. For which organisational level did you use the scan?

- Company strategy
- Human Resource Management or Human Resource Development
- Training organisation
- Training programme
- Training courses
- Customer training
- Other

Please clarify:

--

d. Did the client have any previous experience with e-learning?

- None
- Little
- Quite some
- A lot

Please clarify:

--

e. If you would qualify your client according to the following sequence of innovation concerns, in what stage would the company be?

Stage	Type of Concern	Action toward the Innovation	
1. Unawareness	None	Total inaction	<input type="checkbox"/>
2. Information level	'Should I know something about this?'	Casual interest in obtaining some information	<input type="checkbox"/>
3. Initial personal skills level	'How does this work? Will I be able to figure it out and handle it?'	Wants to have the chance to try it out and have enough skills to do so	<input type="checkbox"/>
4. Level of routine use of some aspect of the innovation	'Is there a manageable way that I can come to regularly use this innovation so that some need of mine is met?'	Has found a use for the innovation and a handy way to execute that use, so that it becomes routine.	<input type="checkbox"/>
5. Extended impact level	'Are there other aspects of my educational practice that could benefit from a broader use of this innovation?'	Begins to change aspects of professional routine to incorporate more of the innovation's potential	<input type="checkbox"/>
6. Contributor's level	'How can I work together with others to exploit the value of this innovation?'	Becomes involved in collaborative activities associated with the innovation	<input type="checkbox"/>
7. Leadership level	'How might education al practice be changed through exploiting this innovation? How should the innovation itself be altered?'	Develops a leadership role, after reflection, contributes to the evolution of the innovation itself.	<input type="checkbox"/>

CBAM, stages of awareness model

Please clarify:

2. Interview: the format

a. Did you manage to execute the interview in line with the format?

	yes	no
• Did the division in categories work well?	<input type="checkbox"/>	<input type="checkbox"/>
• Did the division in sub categories work well?	<input type="checkbox"/>	<input type="checkbox"/>
• Was the explanation per category clear enough?	<input type="checkbox"/>	<input type="checkbox"/>
• Were the questions clearly stated?	<input type="checkbox"/>	<input type="checkbox"/>

Please clarify:

3. Interview: the dialogue

2. It is a semi structured interview to allow for dialogue.

	yes	no
• Could you follow the main line of the structure of the interview?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you prepare by selecting the most relevant questions in relation to the context of this client?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you adept or add questions in relation to the client's context?	<input type="checkbox"/>	<input type="checkbox"/>
• Could you 'connect' the questions and answers?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you touch on all the subjects?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you tape the conversation and use the recording to develop the reports?	<input type="checkbox"/>	<input type="checkbox"/>

Appendix E

Please clarify:

b. Other remarkable reactions and/or questions of the interviewed?

4. Interview: the interviewed

a. The interview should help increase awareness of the possibilities of e-learning.

	yes	no
• Was your client willing to participate in the dialogue?	<input type="checkbox"/>	<input type="checkbox"/>
• Was your client able to answer the questions?	<input type="checkbox"/>	<input type="checkbox"/>
• Was your support needed to clarify e-learning specific questions?	<input type="checkbox"/>	<input type="checkbox"/>
• Did your client show confidence in the outcome of the interview?	<input type="checkbox"/>	<input type="checkbox"/>
• Did the interview help to familiarize your client with e-learning?	<input type="checkbox"/>	<input type="checkbox"/>

Please clarify:

5. Interview: interviewers

a. Roles of the interviewers.

yes

no

- Did you use a particular division of roles?

What was this division and how did it work out?

c. Ability to position e-learning relative to the needs of the company?

yes

no

- Were you able to explain the benefits of e-learning?
- Were you able to use the client's context for clarification?
- Did you get a good overview of the companies ability to use e-learning?

Please clarify:

--

c. When looking back, how would you assess yourself on the next items?

Tasks of the interviewer	Ability				
	Not	Poor	Sufficient	Good	Don't know

a Inviting the right people	1	2	3	4	5
b Sufficient knowledge of the company	1	2	3	4	5
c Introduction of the objectives, the structure and the outcome of the scan	1	2	3	4	5
d To ask questions and continue asking	1	2	3	4	5
f To recognize different interests, politics and positions	1	2	3	4	5
g To summaries the main issues	1	2	3	4	5
h To distinct between problems and solutions	1	2	3	4	5
j To write the report and formulate the conclusions	1	2	3	4	5
k Present the results to the client	1	2	3	4	5

Please clarify:

6. Reporting (interim and final report)
--

a. The interim report

	yes	no
• Did you use the suggested format?	<input type="checkbox"/>	<input type="checkbox"/>
• Were you satisfied with the interim report?	<input type="checkbox"/>	<input type="checkbox"/>
• Was your client satisfied?	<input type="checkbox"/>	<input type="checkbox"/>

To whom did you present the interim report?

.....

What was the main reaction?

.....

b. The final report

	yes	no
• Did you use the suggested format?	<input type="checkbox"/>	<input type="checkbox"/>
• Were you satisfied with the final report?	<input type="checkbox"/>	<input type="checkbox"/>
• Did you get a positive reaction on the outcome?	<input type="checkbox"/>	<input type="checkbox"/>
• Is your client going to use the final report for promoting e-learning?	<input type="checkbox"/>	<input type="checkbox"/>

To whom did you present the final report?

.....

What was the main reaction?

.....

7. Met your objectives?

a. The format of the interview is a dialogue (semi structured interview), which allows for knowledge exchange and a common point of reference for further development of e-learning.

yes

no

- Did you reach this goal?

Please clarify:

b. Customer satisfaction

yes

no

- Is your client satisfied?
- Was there a follow up (new assignment)?

c. How much time did you spent on the

hours

- intake
- interview
- preparation of the interim report
- discussion of the interim report
- deliverance of the final report
- discussion, correction and acceptance of the final report

d. Is the Quick Scan concept acceptable for the client ?

	yes	no
• The time and effort for bringing the right people together?	<input type="checkbox"/>	<input type="checkbox"/>
• Is the scan not too complicated for the target audience (the interviewed)?	<input type="checkbox"/>	<input type="checkbox"/>
• Is the outcome in line with the expectations of your client?	<input type="checkbox"/>	<input type="checkbox"/>
• Do the results support the client for the internal follow up?	<input type="checkbox"/>	<input type="checkbox"/>
• The amount of time the client needs to spent to go through the scan?	<input type="checkbox"/>	<input type="checkbox"/>
• The expenses for the Quick Scan?	<input type="checkbox"/>	<input type="checkbox"/>

Please clarify:

e. Is the Quick Scan concept doable?

	yes	no
• Getting together the right mix of stake holders?	<input type="checkbox"/>	<input type="checkbox"/>
• Having the right knowledge and skills available as an interviewer?	<input type="checkbox"/>	<input type="checkbox"/>
• Having the right knowledge and skills available at the client site?	<input type="checkbox"/>	<input type="checkbox"/>
• The willingness to present confidential information (company) for analysis?	<input type="checkbox"/>	<input type="checkbox"/>
• The amount of time available?	<input type="checkbox"/>	<input type="checkbox"/>

f. The pre and post 'attitude to e-learning questionnaire'.

	yes	no
• Did you use these questionnaires?	<input type="checkbox"/>	<input type="checkbox"/>

What is most remarkable about the outcome?

.....
.....

What is the main difference in the outcome of the pre and post test?

.....
.....

What can you conclude of this?

.....
.....

P.S.

Please add a copy of the pre and post test made by your client(s).

Appendix F: Analysis Framework Approach Version 0: Overview of the first Cycle of Case Studies.

The first Cycle of Case Studies

This is the complete collection of case study reports conducted with version 0 of the analysis framework approach. The findings are discussed and analyzed in chapter 5.

Overview of Case Studies using Version 0 of the Analysis Framework Approach

#	Period	Company or organization	Version	Consultant	Student	Investigator
1	Sep -Oct 2001	Steel industry: metal strip production	0	X		X
2	Oct -Nov 2001	Steel industry: metal packaging	0	X		X
3	Oct -Nov 2001	Steel industry: training organization	0			X
4	Nov - Dec 2001	Steel industry: product staining	0	x		
5	Jan -Feb 2002	Steel industry: product coating	0	x		X
6	Apr -June 2002	Training institution: regional college for vocational and adult education	0	x		

The case studies

Case # 1 Steel industry: metal strip production unit

A. The context of the case study

A1 Company or organization

This case study is about one of the production units of a steel producing company. The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing

employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The production unit involved in this case study is the new Direct Sheet Plant in the Netherlands. This unit is based on new technology, which enables the steps between casting and rolling the steel to be integrated. It makes it possible to deliver a high-quality product whilst shortening the throughput time. Also this new technology will lead to a reduced environmental impact, because it is no longer necessary to transport and heat the slabs, thus cutting the energy consumption per tons of steel. The construction of the plant started in the spring of 1998, and trial production started at the end of 1999.

The initiative to carry out an analysis framework approach e-learning was taken by the central training organization of the company, which also funded the activity. On the site of the company in the Netherlands, there are two business units, consisting of several different production units. The training center wanted to use the analysis to gather information about the state of affairs on e-learning and offer the different units the opportunity to think about e-learning as an alternative for solving training problems. The initiative followed the request of several units, which were already experimenting with e-learning, but wanted the training center to support them on issues which most likely could be solved more easily on a central level, than by each unit individually. One can think of the purchase of a learning management system, testing software, the collection of experiences and making this available on the web site, and others. It is these initiatives, which lead to the execution of in total seven analyses framework approaches in the business units and different plants of the steel company.

A3 Consultant, student, investigator

Involved were: two external senior consultants; the vice-manager of the company's training center and two training coordinators from other plants. The manager and coordinators participated with the aim to get to know and learn from the conduction of the analysis framework approach. The investigator was one of the senior consultants and participated as consultant.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information and paperware.
b. Analysis framework report	X	The senior consultants, using the given format for reporting, developed the report.

c.	Specific information on learning and training	X	The main organizational and training model. And for example the quarterly bulletin of the training center.
d.	Outline e-learning pilot	X	Short outline was developed and discussed.
e.	User's guide	0	
f.	Questionnaire: 'Attitude to e-learning' (client)	0	
g.	Questionnaire: 'Evaluating the use of the Analysis framework approach' (interviewer)	X	The senior consultant, not being the investigator, answered the questionnaire.
h.	Observation (Investigator)		
i.	Participative observation (Consultant-investigator)	X	The investigator was actively involved in the conduction of the analysis framework approach.
j.	Taped interviews		
	A5 Organizational level	Present	Additional information
k.	Company learning strategy		
l.	HRD & HRM	X	The HRM manager of the plant.
m.	Training organization	X	Senior engineer trainer
n.	Training program	X	Senior engineer trainer
o.	Training course		
p.	Customer training		
q.	Other ...		
	A6 Management level	Present	Additional information
a.	Strategic		
b.	Tactical	X	
c.	Operational	X	
	A7 e-learning development phase	Present	Additional information
a.	Start	X	Some efforts though, have been made to use spreadsheets and existing SAP applications, to improve the management of the training and learning processes.
b.	Pilot		
c.	Integration		

A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware	x	
b. Information level	x	The stage of awareness of the main contact person, being the senior engineer trainer, was on the 'information' and 'initial personal skills level'. The other participant of this production unit was the HR-manager and this person was on the level of 'unawareness'.
c. Initial personal skills	x	
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data collection procedure

B1 Names of sites and contact persons

Sites: The plant is one of several production units on a site in the Netherlands.

Contact persons: senior engineer trainer and HR manager

B2 Data collection plan

- September – October 2001
- Time investment for the consultants was 50 hours
- The organization of the different dates and times for the analysis framework approach was not easy due to the participation of several people from other parts of the business.

B3 Preparation of the visit

There were two intake meetings to clarify the organization and scope of the analysis framework approach. The initiative for the analysis was taken by the central training organization, which also supplied the funding.

A consultant and the consultant/investigator, who were accompanied by three people from the company, conducted the analysis. These were the vice-manager of the central training organization and two training coordinators from other production

units. The HR-manager of the plant entered the discussion at the time the decision making process started about the follow up.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

The plant is a three years old high tech organisation. The technical information is available, but the integrated description of the entire production process and the related working tasks, is missing. A major problematic issue within this context is the lack of an organisational structure for a quick and efficient introductory training of new comers and temporary workers. Important factors are:

- The limited availability and access of company information
- The lack of a teaching model to guide students efficiently trough the learning program
- The lack of an integrated system for the planning, administration and reporting of the 'learning processes'.

These factors also cause the limited possibilities for experienced workers to keep up or extend their main tasks.

The organisation has a high level of automation, which means that the use of computers and digital information in the working processes is daily practice. It is expected that the threshold for using e-learning, the fusion of technology and learning, is low. There have been several trials to use ICT for training purposes, but these were too fragmented to be able to achieve satisfying results. It is believed that e-learning, and especially the e-learning technologies, can provide the organisation with the possibilities for more flexibility in the organisation of training and direct workplace related learning.

C2 Observations in the conduction of the analysis framework approach

The decision to execute an analysis was related to the support given by the corporate training center and the believe of the senior engineer trainer, that e-learning could be of a great help. The analysis framework approach was executed and reported. The final report was issued after a thorough discussion with the participants. Subsequently a proposal was developed for the next step, the pilot phase. The proposal was not awarded.

The outcome of the analysis framework approach was:

E-learning is considered a good alternative for:

- The support of the development, administration and maintenance of company information.
- The planning, structuring and registration of 'learning activities'.
- The planning of training and learning related to the main tasks.
- The transparency of the learning process concerning progress and results.

C3 Experiences of the consultant using the analysis framework

N.A.

D. Synthesis

D1 Conduction of the analysis framework approach

The approach helped to clarify the existing training problems and the limited possibilities for the supply of up to date and relevant information for new comers and the current working population. The main source of information on the present affairs was the training coordinator, a well-informed person, very much involved with the situation at this new plant. Unfortunately the HR-manager became involved at a later time, which influenced the decision making process negatively. Earlier involvement would have helped the manager to understand the 'mystique of e-learning' and the added value. Now her main frame of reference were previous experiences with Cdrom based training solutions, which have not been successful. It was remarkable that the arguments the manager used for not starting an e-learning project, were the same as the analysis framework approach showed to be the success factors for e-learning in the given context. There was no follow up despite an additional proposal.

This was the first experiment with the analysis framework approach. The procedure was followed and turned out to be a usable format. The categories and interview items showed to be adequate, but during the interview it was difficult to follow the outline, because of the very 'associative way of thinking and reacting' of the interviewed. Important reason was the dominancy of the 'production process', as the most important frame of reference, as stated by the interviewed, when asked for his first reaction on the analysis framework approach. 'We relate everything to the

production'. As an interviewer the investigator was not well enough informed about the specific situation of this unit. The high tech plant was a major investment, which did not yet meet the production objectives. This put a lot of pressure on the employees, especially because only the best were invited to work in this unit. Therefore the working context, and in particular the working culture, was an important issue.

The involvement of different participants, also from other business units, will have influenced the outcome, but it is unclear if this was positive or negative. Surely the stakeholder issue was present in the analysis framework approach. The HR-manager appeared to be an important factor in the decision making process, but was not assigned as such at the start of the analysis. The senior engineer trainer announced that he was about to retire in one years time. Although he was very positive about the possibilities of e-learning, he added that realistically he would not be able to really push the development. It took a while before the replacement was organised and together with the negative advice of the HR-manager, the e-learning development was set on hold.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

This was the first experiment with the analysis framework approach. The consultant/investigator was leading in the interview. In this stage of development, there was not yet a comparison possible with other analyses. The systematic approach, as explained during the intake and repeated prior to the interview, was appreciated. The final report was well received and later on used as a reference.

Both the corporate training center and the production unit are interested in the analysis for related, but different purposes. A portability issue, which should be looked at again after all the analyses have been conducted.

Changes to be made:

- In the intake the companies 'learning culture' should receive more attention to better understand the context in which the interview is taking place.
- This analysis framework approach was a case of multi-interest. Both the production unit and the central training organization wanted to know more about the possibilities of e-learning and see what match could be made. This item will be looked at in the other analyses, which took place in the same company, but at different production units.
- Trying to stay close to the categories and interview items, it showed that the items should be phrased as 'operational' as possible.

- Also it seems like a further development of the sub categorization might work well to support the 'categorical approach'.
- Like indicated, the production process is the dominant drive for all other activities. Consequently the return on investment question was brought up repeatedly. Not in the first place as a financial issue, but as the 'added value question'. This would imply an extension of the category business model.

Case # 2 Steel industry: steel packaging unit

A. The context of the case study

A1 Company or organization

This case study is about one of the production units of a steel producing company. The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The metal packaging production unit is a supplier of light gauge steel for packaging and non-packaging applications. This production facility is part of a business unit with other production plants abroad. As a result there is an international orientation. Important issue is the collaboration with customers in partnerships to help streamline business chains and focus on providing innovative solutions. The unit in the Netherlands has 1100 employees.

The initiative to carry out an analysis framework approach e-learning was taken by the central training organization of the company, which also funded the activity. On the site of the company in the Netherlands, there are two business units, consisting of several different production units. The training center wanted to use the analysis to gather information about the state of affairs on e-learning and offer the different units the opportunity to think about e-learning as an alternative for solving training problems. The initiative followed the request of several units, which were already experimenting with e-learning, but wanted the training center to support them on issues which most likely could be solved more easily on a central level, than by each unit individually. One can think of the purchase of a learning management system, testing software, the collection of experiences and making this available on the web

site, and others. It is this initiative, which leads to the execution of in total seven analyses in the business units and different plants of the steel company.

A3 Consultant, student, investigator

A learning consultant and the consultant-investigator executed the analysis framework approach.

A4 Resources	Available	Additional information
a. Information on the organization	X	Online information
b. Analysis framework report	X	Report is available following the original outline.
c. Specific information on learning and training	X	Overview of training activities.
d. Outline e-learning pilot	X	In preparation of two pilots.
e. User's guide		
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the approach' (interviewer)	X	Both the consultant and the project leader have been interviewed by means of the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Consultant-Investigator)	X	Actively involved in the conduction of the analysis framework approach.
j. Taped interviews	X	The interview session was taped.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM	X	
c. Training organization	X	Training organization of the production plant
d. Training program	X	Current program
e. Training course	X	Outline for Pilot project
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	
c. Operational	X	The emphasis was on the operational level, with some tactical implementation issues.

A7 e-learning development phase	Present	Additional information
a. Start	X	Although the production unit had extensive experience in the use and development of learning programs on cdrom, the e-learning development was still premature and therefore on the 'starter' level.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level	X	Most participants were on the information level, with the human resources officer on the level of initial personal skills
c. Initial personal skills	X	
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

The production unit is part of an international business unit focusing on packaging and non-packaging applications. The main contact person was the Human Resources Officer, with a leading position in the training department of the production unit. The analysis framework approach produced the outline for two pilot projects. Involved in the initial development phase of the pilots were representatives with a direct responsibility for training and the manufacturing manager of the packaging, warehousing and distribution sector, where one of the pilots was going to take place.

B2 Data collection plan

- The analysis framework approach took place from September – October 2001 and was the second experiment in a row of experiments in the steel industry.
- The times spend for the total procedure was 80 hours. This included the preparation, the intake, the execution of the analysis, the reporting, and the initial discussion on the pilot projects with the stakeholders, and finally the presentation of the results.

- The main contact person acted as an active partner in motivating the participants for the pilot projects. This positive attitude was of crucial importance for the outcome of the analysis framework approach.

B3 Preparation of the visit

The corporate training centre initiated the organisation of the analysis framework approach. The centre wanted to obtain more information about the state of affairs in the unit considering the use of ICT, the contribution e-learning could make to solve the emerging training problems and the role the centre was expected to play in this development. The unit itself wanted to analyse their training situation more thoroughly to see where and how e-learning could help to improve the training organisation and services. These considerations led to the decision to select some of the interview items, as items, which should be discussed under all circumstances.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

Apart from the motivation of the corporate training centre to conduct the analyses, the focus here is on the arguments of the production unit. This unit is faced with a continuous process of change and innovation, and feels the need to prepare the employees for dealing with these changes. An important issue is the change in tasks and the need to improve and extend the facilities to train the workforce timely and adequately. Therefore training and learning should become a continuous process with the possibilities to store relevant information and experiences at any time and at any place. This and other business information should be made easily accessible. There is a need for a transparent reporting system on the progress and achievements of the learner, so the employee and the supervisor can keep track of what is going on. Experiments with systematic training methods, the use of instructional technology and the development of in house instructional materials, were less successful than expected, and one of the reasons is the investment in time and money. The same thing could happen to e-learning development, so a thorough analysis is required to make sure what contribution e-learning could make in solving the training problems.

The use of communication technologies is considered a key for the solution of the training problem. The unit has experiences in the use and the development of digital learning materials for cdrom, and although the results were not spectacular, one expects e-learning to help out with both content and organisational issues. The fact that the analysis framework approach uses an integral approach, meaning that all the elements of the business, training and learning are taken into account, was decisive in the decision to conduct the analysis.

C2 Observations in the conduction of the analysis framework approach

The analysis was conducted after two intake sessions. There was an interim and a final report on the analysis framework approach, including the outline for two pilot projects. The report also contained an analysis of one of the pilots, which was planned to take place in the distribution sector of the unit. This analysis was later on used to develop the pilot and appeared to be very helpful to get an overview of all the issues at hand to make the pilot project work.

The analysis framework approach procedure and report appeared to supply insight and information on the contribution e-learning could make to solve the training problems. It led to the development of two pilots, one on the routing of products in the distribution centre and one on reporting issues like registration and progress reports for the training organisation.

C3 Experiences of the consultant using the analysis framework

It was the second experiment. A consultant and the consultant-investigator executed the analysis. The corporate training center took the initiative for this analysis framework approach and was as participant observer involved in the conduction of the analysis. The selection was too small to be representative. It did not seem to change the outcome of the analysis, but involvement of a broader group of participants would have improved the level of information and the decision-making process for the follow up. The broader group should comprise for example the HR manager and a representative collection of middle management. Linked with the issue is the notion that when, like in this case, a forerunner is to promote the innovation, the connection with the other potential supporters needs to be taken care of.

The questions need to be operational and allow for a 'selection' of the most important issues in the eyes of the interviewed. The interviewer will not at all times be able to anticipate the situation fully, when inside information is hard to regain. It was difficult to figure out if the analysis framework approach led to an improvement of the level of understanding, although the proposals for the pilots showed a knowledgeable consideration of e-learning. In the situation at hand, where the interviewed is an experienced training person, the interviewer needs to be an e-learning expert to guide the dialogue, which is an important aspect of the analysis. The fact that there was only one informant involved in the analysis process, made it difficult to get a clear view on the ins and outs of the training activities. Later on in the development of the outline and the preliminary pilots projects, more people got involved.

The reports were produced and there was a follow up with two pilot projects. The primary client, the human resources officer from the production unit, and the corporate training center, were satisfied with the procedure of the analysis as well as

the results. In some instances it seems to be difficult to bridge the gap between the question, the understanding of the question by the interviewed and the understanding of the answer by the interviewers. The main reason for this seems to be the information gap of the interviewer concerning the training culture and organization.

The analysis framework approach was doable, but the need for additional information on the context in which one is operating, is a point of concern.

D. Synthesis

D1 Conduction of the analysis framework approach

The corporate training center took the initiative for this analysis and was present as participant observant. The analysis served two goals: the training center needed information about the state of affairs on e-learning and the unit wanted to know how to use e-learning to solve their training problems. Although the unit had extensive experience in the use and development of learning programs on cdrom, the e-learning development was still premature and therefore on the 'starter' level. There was one main contact person. Even though this person was very motivated, the involvement of a broader group of participants would have improved the level of information and the decision-making process for the follow up.

The interviewed was an experienced training person, with over twenty years of training involvement. The interviewer needs to be an e-learning expert to be able to conduct such an interview in an acceptable way. Guiding the dialogue is a main operating feature of the analysis framework approach.

The outcome of the analysis was influenced by the fact that the interviewers felt that they had an information gap regarding the training culture and organization. Training has traditionally been a strong element in this corporation. The analysis framework approach though was successful and there were two pilot developed as a follow up.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

The analysis was used for a second time in the steel corporation, but for another production unit. This meant a different type of organization and a different training and learning context. Participants were the consultants, a representative from the corporate training center and the human resources officer from the production unit.

Concerning the portability:

- The analytical value of the analysis depends for a great deal on the quality of the interview, for which the preparation of the interviewed and the interviewer is an important element. Being better informed about the context of the training situation and the position and background of the people

interviewed, support the portability and indeed the flexibility to use the analysis in different situations.

- Two pilots were chosen, being the most urgent. A lot of other pilot ideas were discussed. The selected pilots were on: the routing of products in the distribution centre and the other one on reporting issues, like registration and progress reports for the training organisation. Obviously the outcome of the analysis framework approach allowed for different kind of pilots and not one sort of solution.

Changes to be made:

- The intake should be carefully prepared to be able to have a representative group of people taking part in the conduction of the analysis. It is not just about the state of affairs, but also about the 'ability' of the organization to mobilize the right people and resources. This should be emphasized in the 'analysis user guide'.
- How to deal with and help a forerunner? The analysis should have a focus on the motivation and resources issue and the means for a sustainable development.
- For operational purposes the questions/interview items should be better stated. More operational in this case means that the items should serve as a guideline and not as a set of questions, which should successively be dealt with.

Case # 3 Steel industry: corporate training organization

A. The context of the case study

A1 Company or organization

This case study was conducted in the corporate training organization of a steel producing company. The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The corporate training center is responsible for the introductory and basic training of trainees and newcomers. In addition it is the main supplier for general training

courses, like on safety and health issues, and the center supports the task related training in the different production units. Approximately 100 people are employed by this unit. A lot of work is being outsourced and other people, mostly specialists, are hired from other units on a regular basis. The unit is more and more developing into an intermediate service for training activities.

The training center has taken the initiative to explore the possibilities of e-learning. The initiative followed the request of several units, which were already experimenting with digital content and e-learning, but wanted the training center to support them on issues which most likely could be solved more easily on a central level, than by each unit individually. The goal of the center is to conduct such analysis to get a better picture of the state of affairs on e-learning and develop ideas about the kind of support to be given to the different units. For the units the analyses can contribute to the awareness on the possibilities of e-learning, which should motivate the training staff to further engage in this development.

The analysis framework approach was conducted in the department for general training, like health and safety, language training and basic courses on metallurgy. The focus was on the basic course on environmental issues.

A3 Consultant, student, investigator

The consultant-investigator executed the analysis, with as a counterpart the manager of the department.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report	X	Report is available following the original outline.
c. Specific information on learning and training	X	Overview of training activities. Yearbook of trainings offerings.
d. Outline e-learning pilot	X	Was developed, discussed with internal stake holders and finally used as the overall design plan for the production of the course.
e. User's guide		
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the analysis' (interviewer)	X	Both the consultant and the project leader have been interviewed by means of the questionnaire.
h. Observation (Investigator)		
i. Participative observation	X	In the role of consultant-investigator.

(Investigator-consultant)			
j. Taped interviews	X		The interview session was taped.
A5 Organizational level	Present		Additional information
a. Company learning strategy			
b. HRD & HRM			
c. Training organization	X		Context was the training organization of the production plant
d. Training program	X		Current program
e. Training course	X		Focus was on the ins and outs of the course on environmental issues.
f. Customer training			
g. Other ...			
A6 Management level	Present		Additional information
a. Strategic			
b. Tactical	X		Important issue was the exploration of the possibilities of e-learning for the corporate training center, focusing on an existing training need.
c. Operational			
A7 e-learning development phase	Present		Additional information
a. Start	X		The training center had extensive experience in the use and development of learning programs on cdrom, the e-learning development was still premature and therefore on the 'starter' level.
b. Pilot			
c. Integration			
A8 Stages of awareness (CBAM model)	Present		Additional information
a. Unaware			
b. Information level	X		The participants were on the information level, but very much focusing on the management perspective.
c. Initial personal skills			
d. Level of routine use of some aspects			
e. Extended impact level			
f. Contributor's level			
g. Leadership level			

B. The data collection procedure

B1 Sites and contact persons

The corporate training center serves the corporation in the Netherlands. The analysis framework approach was executed by the consultant-investigator. The manager of the department for general training was the only person to be interviewed.

B2 Data collection plan

The analysis framework approach took place from October – November 2001 and was the third one in a row of experiments in the steel industry. This time it was not a production unit, but the corporate training center. The character of the analysis differed from the others in the sense that not the production, but the training process was dominant in the way of thinking about training. The time, spend for the total procedure was approximately 40 hours. This included the preparation, the intake, the execution of the analysis, the reporting, and the initial discussion on the pilot project.

B3 Preparation of the visit

This analysis framework approach was part of the initiative by the corporate training centre. The centre wanted to obtain more information about the state of affairs in general and in this case also about the situation in their own organisation. The focus was on finding out how e-learning could be used, and not if it should be used. Version 0 of the analysis framework approach was applied, without any changes.

C. Case study observations and experiences

C1 Rational for the use of the analysis framework approach

Apart from the motivation of the corporate training centre to conduct analyses, the focus here is on the arguments of the department for 'general training' and in particular for the basic course on environmental issues, to consider e-learning as an alternative to the traditional way of teaching and learning.

The issues the centre was facing can be summarized as follows:

- The need for more flexibility to be able to cope with the increasing training demand.
- The demand for tailor made learning solutions
- The lack of qualified teachers.
- The wish to serve 'third party' clients from outside the company.
- The need for more efficiency in course development
- The wish to improve the organisation of the storage, the administration, the update and reuse of content.
- The need to increase the possibilities for testing and online registration.

Appendix F

- The need to increase the quality by means of standardisation of content, didactics and testing, combined with the development of criteria for learning goals.
- The wish to develop a business model for collaboration with third party clients.

It is believed that e-learning is a key for helping to solve these problems and needs. The department has a long time experience with the use and the development of digital learning materials for cdrom, with acceptable results. The corporate training centre has worked on developing an ICT policy, but was not successful. It might have been too early. The framework approach was considered a tool for analysis, which would deliver the information and, more over, the evidence, that investing in e-learning would prove to be worthwhile.

C2 Observations in the conduction of the analysis framework approach

The analysis was conducted after two intake sessions. There was an interim and a final report, including the outline for one pilot project. The report was used as a reference for the development of an e-learning pilot and showed to be helpful to get an overview of all the issues at hand to make the pilot work. Special attention was given to the development of another business model. The traditional model was: buy or develop a course and then rent out seats. The new model should allow for more flexibility in the collaboration with third parties, to share, to outsource and to use risk-sharing models for the development and conduction of generic and tailor made learning solutions.

The analysis procedure and report helped to develop more insight and information on the different possibilities of e-learning to assist in solving the problems and needs the department was confronted with. The report was used extensively to discuss e-learning with the staff of the department and other stakeholders, like environmentalists from the corporate research centre. Involved in the discussion and further development were a learning consultant and the consultant-investigator. The analysis framework approach procedure finally led to the development of a basic course on environmental issues, which was, in the end, produced and maintained by a third party.

C3 Experiences of the consultant using the analysis framework

It was the third experiment related to the initiative taken by the corporate training center. The analysis was conducted by the consultant-investigator with the manager of the department for general courses as the interviewee. The normal analysis framework approach procedure was used.

The main structure of the interview was followed and while proceeding, like with the discussion on the interim report, it became noticeable that the interviewee developed a better understanding of e-learning possibilities and limitations. There was no special preparation needed, apart from the notion that management issues were discussed mostly, relative to the positioning of e-learning to the needs of the department.

Unfortunately it was not possible to involve more 'stake holders' right from the beginning. It would have been helpful for the discussion to engage more operational people, especially for the development of the pilot outline. On the other hand, a lot of what was said and talked about was very strategic and even political. So the awareness level was not so much about e-learning practice, but about e-learning as a management approach to increase organizational flexibility. Again the difficulty arose of trying to get a clear picture of the context in which the interviewee was working and on which his thinking was based.

The interim report was discussed. The final report appeared to be very useful, especially in the discussion with other stakeholders, to position e-learning as an instrument to solve existing needs and problems and not as a means to replace trainers. The client was satisfied with the outcome and the usability of the report. The analysis framework approach was acceptable and doable. In any event the cost for consultancy was paid by the center and not by the department.

D. Synthesis

D1 Conduction of the analysis framework approach

This case study differed from the previous ones in the sense that this was not a production unit, but a 'training department' of the central training center and the interview and discussion focused on what can be called the 'strategic level'. Although the aspiration was to engage more people, especially those involved on an operational level, it turned out useful to firstly establish a view on the tactical role of e-learning, before moving on. In this way the analysis framework approach helped to position e-learning relative to other training and learning offerings. The next step was to further develop the outline for the pilot and for this the analysis framework approach report proved to be very useful. In short, the awareness level was not so much about e-learning practice, but about e-learning as a managerial attempt to increase organizational flexibility. This was later on very well understood by the broader community of 'operational' stake holders of the course on environmental issues.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

The analysis framework approach was used in the corporate training center of the steel company on a tactical level. This meant a different type of organization, a

different organizational level and a different training and learning context compared to the case studies one and two. Participants were the consultant-investigator and the manager of the department of the center, responsible for general courses.

Concerning the portability:

- To operate smoothly, it is important to focus on a particular level to avoid conflict of interest. The client was very much interested in the positioning of e-learning and not yet so much in operational issues. Later on the 'tactical' analysis framework approach appeared to be very useful to support the discussion on the operational level about how to proceed with the pilot outline.
- The value of the involvement of stakeholders should be judged by the goals the prime client has with the analysis. In some instances this might mean that a limited group of people should be asked to participate.
- It seems that the outcome of an analysis framework approach on one organizational level can be used on other levels for different purposes. This can be qualified as another way of looking at portability.

Changes to be made:

- During the intake one should better clarify the 'level' on which the analysis will operate and try to avoid too much conflict of interest concerning the usefulness of the outcome. This element should be emphasized in the 'guide'.
- The consultant should be very conscience about the transition of the outcome to other organizational levels. The usefulness will depend on the 'translation' to these levels to foster commitment.

Case # 4 Steel industry: product staining subdivision

A. The context of the case study

AI Company or organization

This case study was conducted in the recently established product staining subdivision of the hot strip mill production unit of a steel company. The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The staining subdivision started early 2001 and is responsible for the finishing of steel products from the main section where metal strips are produced. Most production and working processes are reaching stability, some are still in development. The subdivision itself is responsible for the process and task related training of the employees. At the time the analysis framework approach was conducted, there were approximately 40 employees working in this subdivision.

The corporate training center has taken the initiative to explore the possibilities of e-learning by using the analysis framework approach. This initiative followed the request of several units, which were already experimenting with digital content and e-learning, but wanted the training center to support them on issues which most likely could be solved more easily on a central level, than by each unit individually. The main division of the hot strip mill is using e-learning since 1999 and has moderately promoted their approach in other divisions, including the staining subdivision. Due to the start up phase, the subdivision is confronted with major training and information problems, and wants to see if e-learning can help.

A3 Consultant, student, investigator

The analysis framework approach was executed by two learning consultants and a mixed group of stake holders from the subdivisions, including the people responsible for training.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report (Analysis framework approach report)	X	Report is available following the original outline.
c. Specific information on learning and training	X	Overview of task related training activities.
d. Outline e-learning pilot	X	General outline for an e-learning pilot
e. User's guide		
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the Analysis framework approach' (interviewer)	X	One consultant has been interviewed by means of the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Investigator-consultant)		

j. Taped Analysis framework approach interviews	X	The interview session was recorded.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM		
c. Training organization	X	Training organization of the subdivision
d. Training program	X	Task related training
e. Training course	X	Organization and execution of the training.
f. Customer training		
g. Other ...	X	Information and knowledge management
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	Focus was as on the tactical and operational level. Important issues were: the exploration of the possibilities of e-learning for task related training needs and problems, and the associated call for information management.
c. Operational	X	
A7 e-learning development phase	Present	Additional information
a. Start	X	The subdivision had some experience with computer based training, but very little with e-learning. So it was a 'starter' situation.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level	X	Virtually all participants were on the information level, trying to move up quickly to the initial personal skills level. Participants wanted to try 'it' out, develop the necessary skills and make sure that some needs were met.
c. Initial personal skills		
d. Level of routine use of some aspects		

-
- e. Extended impact level
 - f. Contributor's level
 - g. Leadership level
-

B. The data collection procedure

B1 Sites and contact persons

The analysis framework approach was executed by two learning-consultants. The investigator was not directly involved. The member of staff responsible for training was the main contact person, but the analysis took place with a broader group of stake holders, including employees from the strip production hall, where e-learning was already partly implemented.

B2 Data collection plan

The analysis framework approach took place in November – December 2001. It was the fourth one in a row of experiments in the steel industry. This time it was a subdivision of a production unit, where e-learning had been introduced two years prior to this interview, but not in all the divisions. The complexity in this analysis was the wish of the client to find a solution for particular training needs and a solution for the related management of information. The consultants spent about 60 hours, including the preparation, the intake, the execution of the analysis framework approach, the reporting, and the initial discussion on the follow up.

B3 Preparation of the visit

There was a preparatory meeting of the learning-consultants conducting the analysis framework approach, and the investigator. The analysis framework approach was funded by the corporate training centre in their wish to obtain more information about the state of affairs in general and in this case also about the situation in the subdivision. The exchange of information between the major division in the hot strip mill, which applied already e-learning, and the subdivision brought about the motivation for carrying out the analysis framework approach. Representatives of the division took part in the analysis framework approach. They helped out in the preparation phase together with the member of staff responsible for training of the subdivision. Version 0 of the analysis was applied.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

The focus of the analysis framework approach was on the task related training in the subdivision. The rational for the use of the analysis framework approach (working title: analysis framework approach e-learning) was the compilation of thresholds for the effective organisation of the training. The training problem can be described as follows:

Appendix F

- The organisational structure is inadequate for the support of newcomers and experienced employees in the task related training.
- The subdivision is quite new and still in development, so training is a necessity
- Machine and process related information is lacking
- There are no means to update the information or process related documentation
- There is no educational model available to effectively help the student to do the training
- It is very hard to organise classroom sessions due to the working schedule

Within the context of the existing training structure, it is considered impossible to solve these problems. It is believed though that e-learning can help to:

- Support the development, administration and maintenance of information material
- Achieve much more flexibility in training activities by making these less time and place dependent
- Better plan, structure and register the learning activities.
- Training better measurable and more transparent.
- Decrease the availability and access of up to date information material, considered an important success factor.

C2 Observations in the conduction of the analysis framework approach

The analysis framework approach was conducted by two learning consultants after several intake sessions with changing participants. Due to the fact that the subdivision was a recent start up, it took some time to clarify the goals and responsibilities in relation to the training activities and the information management. The participants from the company were from the subdivision and from other divisions in the production unit. Reason for this broad group was that others wanted to learn from the way this analysis was conducted and to see whether the outcome could be of help for their own situation.

There was an interim and a final report on the analysis framework approach, including a general outline for a pilot project. The report was not only used as an analysis for e-learning activities, but was also seen as a first analysis of the actual training situation. Special attention was given to the fact that without accurate descriptions of working processes and related information, it would be difficult to develop e-learning or any formal training. So the need to look for ways to combine the training and information development and in some instances content development was an important issue. In some cases, there was no documentation available about production processes, because these processes did not work well yet.

The conclusion from the analysis framework approach was that e-learning could be of great help to add structure and flexibility to the training and help to solve some of the problems with content development. It should be understood that content in this case was considered to be the full range of describing the production and working processes, development of work place instructions, organising the technical documentation, store, update and make it accessible and usable for work related activities and training purposes.

C3 Experiences of the consultant using the analysis framework

It was the fourth experiment and the analysis was conducted by two learning consultants in collaboration with a mixed group of interviewees of which it was not at all times clear which position or role they would play in further activities. The investigator was not directly involved. The general procedure of the analysis framework approach was followed. In the subdivision there was little or no experience with e-learning. Some participants, from the main division, were already involved in e-learning. So the interview group stage of awareness moved in between the information level and the level of routine use of some aspects of the innovation. The focus though was clearly on the situation in the subdivision.

The interim report was discussed. The final report appeared to be very useful for the decision making process about how to proceed in this situation. Although the outcome was well received, it took some time before the next step was taken and a first pilot could start. In general the analysis framework approach provided the participants with an analysis, which helped them to better judge the possibilities of e-learning. At the same time it became clear that without a good system for content development, information management or even knowledge management, e-learning could only play a marginal role. Therefore it was not easy to position e-learning relative to the other needs, without developing a clear policy and supplying additional budget for information and knowledge management issues.

D. Synthesis

D1 Conduction of the analysis framework approach

Due to the overall focus on the production process in this start up phase of the subdivision, training and information management did not get the attention needed and became problematic. E-learning was considered a problem solving approach, which could help to speed up the process and, at the same time, secure the development of a viable and flexible training situation. Different people from different divisions participated. As a consequence the subdivision people tended to be less outspoken, than was the case in other sessions. The attitude in general is that each division should solve their own problems, and this seemed to apply also in this case.

This was the first analysis of the training situation in the subdivision and the analysis evolved into an analysis of all the elements which effect or are related to

Appendix F

training. So the scope was enlarged, but the analysis still helped to decide what to do, although the incubation took quite some time. The analysis report though helped to clarify the problems and showed what kinds of solutions were feasible. In that way it supported the discussion and the decision making process. In the end the consultants were invited to assist the subdivision in their first pilot.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

The analysis framework approach was used in a subdivision of a production unit where e-learning was already applied in the major division. The subdivision was quite new, so processes were not optimal yet. Two issues arose: the (missing) structure of training activities and the lack of content (business document, work instructions, etc.). Solving the problem would mean solving both issues.

Concerning the portability:

- Up till now the analysis was used in a rather stable training environment, with a firm training infrastructure in place and sufficient content to work with. This was lacking in this case and therefore the focus of the analysis framework approach was enlarged during the discussion into a problem solving approach for learning and content-information management. It worked, but the danger is that the suggested solutions lack focus and therefore become less usable.
- It is advisable to reduce the scope when the problem appears to be bigger than for what the analysis framework approach was developed. Focusing is important to be able to stay with the problem orientation nature of the analysis framework approach. To avoid too holistic approaches, one should decide to perform multiple analyses to make sure that the suggested problem solving strategies will work within their given context.
- Of course it would be interesting to see what the bandwidth is of the analysis framework approach, before becoming dysfunctional.

Changes to be made:

- Add information to the guide on this scope issue. The analysis framework approach is problem oriented within a certain context. When this context exceeds the bandwidth, it is advisable to conduct multiple analysis framework approaches, each having a different focus. Or, have several interviews with different people and then try to integrate the results into one report with still a clear, but multi-level focus.
- The stakeholders issue has also something to do with the scope. One should focus on the involvement of primary stakeholders to start with and not mingle

too much with other people and interests, unless this is done with a certain goal in mind. This goal then should be considered an issue.

Case # 5 Steel industry: color coating unit

A. The context of the case study

A1 Company or organization

This case study was conducted in the production unit responsible for the coating of steel products. The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The coated product production unit takes care of the finishing of steel products from other production units. The unit supplies organic coated pre-finished steels on cold reduced or metallic coated substrates, depending on their use, backed up with services such as engineering solutions, supply chain management and end product development. These products are used in construction, the automotive and the domestic appliance sectors. The unit has several other production divisions in Europe. Each division is responsible for the process and task related training of their employees. The number of employees on the site in the Netherlands is 500.

The corporate training center, functioning on a central level and not responsible for task related training, has taken the initiative to explore the possibilities of e-learning by using the analysis framework approach. This initiative followed the request of several units, including the unit for coated products, which were already experimenting with digital content and e-learning, but wanted the training center to support them on issues which most likely could be solved more easily on a central level, than by each unit individually.

A3 Consultant, student, investigator

The analysis framework approach was executed by two learning consultants, the training coordinator and human resources officer, and two training coordinators from other units, who were interested in e-learning and curious about the conduction of the analysis framework approach.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report (Analysis framework approach report)	X	Report is available following the original outline.
c. Specific information on learning and training	X	Information collected during intake.
d. Outline e-learning pilot	X	General outline for an e-learning pilot
e. User's guide		
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the Analysis framework approach' (interviewer)	X	The consultants have filled out the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Investigator-consultant)	X	The consultant was directly involved in the execution of the analysis framework approach.
j. Taped Analysis framework approach interviews	X	The interview session was recorded.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM	X	Newcomers and people leaving taking their knowledge with them
c. Training organization	X	Training organization of the unit
d. Training program	X	Introductory and task related training
e. Training course		
f. Customer training		
g. Other ...	X	Information management
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	The focus was on the tactical level. Important issues were: the exploration of the possibilities of e-learning for introductory training for new comers and task related training needs and problems. This included the associated call for information management and

		content development, including the need to distract and store expert knowledge from retiring employees.
c. Operational		
A7 e-learning development phase	Present	Additional information
a. Start	X	The unit had some experience with computer based training and the development of digital, visual material like video, but none with e-learning. So it was a 'starter' situation.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level	X	The participants were on the information and initial personal skills level, trying to move up quickly, learn from the experiences of others and develop a situation suitable for the context of their production unit.
c. Initial personal skills	X	
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

The analysis framework approach was executed by a learning-consultant and the consultant-investigator. Involved were the training coordinator and the training developer and one other training coordinator from the hot strip mill unit, who was involved in e-learning since 1999 and was consulted by the coated products unit regularly.

B2 Data collection plan

The analysis framework approach took place in January – February 2002. It was the fifth analysis in a row of experiments in the steel industry. The unit was very much aware of the training problems, but had not found a viable solution yet. The consultants spent about 60 hours, including the preparation, the intake, the execution

of the analysis framework approach, the reporting, and the initial discussion on the follow up.

B3 Preparation of the visit

The analysis framework approach procedure started with two intake sessions, before planning the interview. Two issues were of prime interest: the organisation of the training and the content development and maintenance. The corporate training centre funded the analysis. Version 0 of the analysis was applied.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

The focus of the analysis framework approach was on the introductory and task related training and on the learning content. The rational for the use of the analysis framework approach was:

- The awareness of the management of the difficulties with training and content.
- The awareness of the fact that there was not yet a viable solution at hand to solve the problems.

The key challenges were:

- Increased mobility of the employees, which made the 'master-student apprenticeship' model of training not applicable anymore.
- The need for more flexibility in the educational model. The speed of technical and organisational changes, newcomers with different backgrounds; storage, maintenance and retrieval of relevant information and content.
- The need for tools for easy and quick content development
- The need for easy administration and maintenance of content by specialists on the work floor.
- The need for reporting on training achievements and results, to be used for guidance and quality control in connection with the company wide SAP-HR application.

The arguments for the investigation of e-learning as possible problem solving alternative were:

- E-learning allows for more flexibility in the training organisation. It does not replace the 'master-student' model, but might help to build an 'electronic' alternative.
- It could lower the threshold for content development and maintenance by different people.
- It can help to keep track of the progress and the results for the individual learner as well as for organisation.

- Using e-learning with the possibilities to store training information, should lower the threshold for a direct connection of task related training with the central administrative system.
- There was a strong emphasis on the technological possibilities e-learning offers, and not so much on the need to improve educational quality.

C2 Observations in the conduction of the analysis framework approach

The analysis framework approach was conducted by a learning consultant and the consultant –investigator. Three people on the client side were involved: the training coordinator, the training developer and a training coordinator from another unit. There were two intake sessions, an interim report and a final report. Also there was an outline developed for pilot projects. E-learning seems to supply the unit with lots of opportunities for solving the problems mentioned. Initial pilot ideas were: pre tests and the development of a first aid kit format for quickly emerging training problems of small and more extensive courses.

The emphasis in the analysis framework approach shifted from a more general analysis to the analysis of the focus of the training developer, which was content development. Although this was a definite important issue, it was only one part of the problem. The human resources officer was recently appointed in the job and lacked the information and overview to outbalance the preference of the coordinator. Unfortunately there was no other stakeholder involved. After the analysis framework approach it was decided to copy the e-learning model that has been developed by the hot strip mill unit. This model has been in operation since the start in 1999 and still worked well in the context of the hot strip mill. The focus on content development though left out the needed reflection on organisational and didactical issues to make sure that this model would also function well in the coated product context. The main component of the content was video. It was good quality material, but lacked the didactical framework and therefore lost a great deal of its potential.

The conclusion from the analysis framework approach can be that it provided a good analysis of the existing problems. The discussion about the possibilities e-learning could provide was too much focused on the content issue and therefore the usability of the analysis was moderate when it came to the organisational and the learning processes. The client interview group surely was not representative enough to have an outbalanced discussion. The follow up was, from the consultant point of view, shallow. No additional assignments were received.

C3 Experiences of the consultant using the analysis framework

This was the fifth experiment. The analysis was conducted by a learning-consultant and the consultant-investigator. The group of interviewees was not representative enough,

but this became clear only during the analysis. Information on how the training was organized was lacking. Although the main line in the interview could be followed, the emphasis shifted repeatedly to the topic of content development. The interview certainly helped to clarify some organizational, process and technical e-learning issues, but was less successful in transferring the notion that a holistic approach was needed to ascertain the usability of the analysis. Holistic should be understood as an analysis in which all interview categories are taken into account to verify what the success factors are in this particular context and what should be done to make e-learning work.

The consultants did not assess themselves to be very successful on the task of inviting the right people, of recognizing the political interests and to clarify the imbalance between the problems mentioned and the persuaded solutions.

The problem which arose was that with such a narrow scope, it became difficult to assure that e-learning would be able to develop to the level of support needed for the innovation. So the focus here was not too broad, but too narrow. A too broad focus conveys the same limitations for the usability of the analysis.

The interim report was discussed. The final report was in the eyes of the consultant less useful than could be expected, but helped the decision making process of how to proceed in this situation. It was decided to copy the e-learning model developed in the hot strip mill plant, but there was no analysis to see if adaptation of the model was needed to fit the context of the coated product unit. The client showed to be satisfied with the results. The consultants concluded that the objectives were not met. It seems like the analysis only had a minor influence on the policy direction of the training developer, because the solutions suggested, were not taken into account in the follow up.

D. Synthesis

DI Conduction of the analysis framework approach

The conclusion from the analysis framework approach can be that it provided a good analysis of the existing problems, but the discussion about the possibilities e-learning could provide was too much focused on the content issue and therefore the usability of the analysis was moderate when it came to the organisational and the learning processes.

The analysis was less successful in transferring the notion that a holistic approach was needed to make e-learning work. Holistic means, taking into account all categories of the educational business column, which comprises: organization, process, content, and technology and business model. The analysis needs a certain bandwidth to avoid a fragmented examination and to make sure that the relevance of the suggested solutions is as high as possible. The conclusion can be that just like a too broad focus, a narrow focus also limits the usability of the analysis.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

An important issue was the imbalance between the analysis of the training problems and the solutions. There was a clear preference for one solution and this focus limited the usefulness of the analysis. In other words, the analysis is a problem oriented, but holistic approach, using the existing training and learning context to decide about the positioning of e-learning as a solution provider. In that way a selection can be made of possible applications of e-learning, using the holistic approach and the available context. The bandwidth is needed to be able to make a balanced choice.

Concerning the portability:

- The original bandwidth of the analysis framework approach, which can be recognized in the 'educational business column', appears to be functional in the sense that this approach avoids a fragmented analysis to be able to subsequently supply an outbalanced advice.
- In this case study it became clear that a too narrow focus will lead to an one-sided analysis, limiting the usability of the analysis.
- For the time being the 'educational business column' is considered the bandwidth the consultant should work with.
- It seems that the consultant needs to be a skilled interviewer to be able to deal with these situations.
- The same notion can be applied for the client. Participants do not necessarily have the skills to fully participate in the conduction of the analysis framework approach.

Changes to be made:

- Add information to the guide on this scope issue. The analysis framework approach needs to operate within a certain bandwidth to keep the usability on an acceptable level.
- The intake should allow for more insight in the organization, the politics and the agenda's. The prime stakeholder is the first to consult, but should never be considered the only source of information, unless politics are involved. From a consultancy perspective though, it is hard to push the client unless the quality argument can be used.
- The consultants did not assess themselves as very successful. More stakeholders should have been involved, the politics should have been noticed earlier and the imbalance between the problems mentioned and the persuaded solutions should have been made more prominent. These qualifications should be added to the skills list of the learning consultant.

- The consultant should be aware of the fact that not all participants from the client side will be able to or are not in the position to fully respond to the demands of the analysis framework approach.

Case # 6 Training sector: regional college for vocational and adult education

A. The context of the case study

A1 Company or organization

This organization is a large college for vocational and adult education in the Netherlands, serving a particular geographical region. The abbreviation for the type of college in Dutch is: ROC (Regionaal Opleidings Centrum).

A2 Main activity of the company/organization (profile)

The organization consists of 50 educational centers with 1800 staff members, serving over 20.000 students from 16 onwards. The college has 7 business units offering different kinds of courses and a central administrative apparatus, including an educational development unit and a central division for student support. The college offers a large number of courses in the vocational (workforce) areas at different levels (there are 4 levels) and as full- and part-time courses and apprenticeship. The area's covered are: engineering, economics, care, health and tourism. The unit of adult education has about 4.000 students, offering courses in basic adult education (numeracy, literacy); Dutch as a foreign language; general secondary adult education; training for the unemployed.

A3 Consultant, student, investigator

A senior consultant from Cinop has executed the analysis framework approach in close collaboration with the project leader e-learning at this ROC. The intention was to prepare the project leader to use the analysis framework approach independently. In total six analyses framework approaches were carried out. Three analyses were done by the consultant and the project leader together. The remaining three were done by the project leader, who wrote all the reports with the help of the help of the consultant. The investigator had a remote, reflective role.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report (Analysis framework approach report)	X	There were six reports, from six different units, using different outlines. The original outline was changed to fit the context better.

c.	Specific information on learning and training	X	The main teaching model
d.	Outline e-learning pilot	X	Development of unit project plans, using the outcome of the analysis.
e.	User's guide		
f.	Questionnaire: 'Attitude to e-learning' (client)		
g.	Questionnaire: 'Evaluating the use of the Analysis framework approach' (interviewer)	X	Both the consultant and the project leader have been interviewed by means of the questionnaire.
h.	Observation (Investigator)	X	Both the consultant and the project leader have been asked to give their opinion about the concept case study report. The outcome of these discussions is used in this final report.
i.	Participative observation (Investigator-consultant)		
j.	Taped Analysis framework approach interviews	X	A few sessions were recorded.
A5 Organizational level		Present	Additional information
a.	Company learning strategy	X	Background was an organization wide e-learning initiative. Progress and results ought to be reported to the management team.
b.	HRD & HRM		
c.	Training organization	X	Each unit can be considered an independent organization.
d.	Training program	X	Each unit organizes different training programs within their main area.
e.	Training course	X	Focus was on operational pilots in particular subject area's or organizational setting (part time, coaching, i. e.)
f.	Customer training		
g.	Other ...		
A6 Management level		Present	Additional information
a.	Strategic		
b.	Tactical	X	Although there was a direct connection with the management board, the execution of the e-learning activities was delegated to the internal project leader. He operated mainly on the tactical level with most of his co-project workers functioning on the operational

		level.
c. Operational	X	
A7 e-learning development phase	Present	Additional information
a. Start	X	The majority of the participants can be qualified as starters, although there were variations between the different people and units. At large the college is in the first, starting phase of e-learning implementation, while working on defining the pilot phase.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level		
c. Initial personal skills	X	A majority of the participants are on the level of Initial personal skills. This is the level on which there is a desire to try out the possibilities of an innovation.
d. Level of routine use of some aspects	X	There is a small number of people, who are on the level of routine use of some aspects of the innovation and can be qualified as the 'for runners'.
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data collection procedure

B1 Names of sites and contact persons

- 50 sites in the center of the country
- contact person: project leader for the overall e-learning project

B2 Data collection plan

- April – June 2002
- Time investment for the consultant was 30 hours
- The project leader did most time consuming activities, like the selection of the participants. Part of the effort was to prepare the project leader on how to conduct the analysis framework approach.

B3 Preparation of the visit

The consultant was familiar with the organisation and has worked together with the project leader for several years in different settings. The preparation of the analysis framework approach was done in the form of a discussion on the objectives, how the

sessions would be organised and the division in tasks between the consultant and the project leader. Financial resources for the external consultant were restricted and lead to a reduction of consultancy time and involvement.

C. Case study observations and experiences

C1 Rational for the use of the analysis framework approach

The actual organizational and educational model is predominantly linear and not flexible enough to deal with the changes taking place. The reduction of the number of students, the increased heterogeneity of the student population, the increase in part time students and the quickly changing needs of regional companies, being the main job supplier for students, press for more flexibility in the organization and the use of other, and more diverse educational models. E-learning is expected to help out on these issues and the analysis framework approach should support the discussion and facilitate the analysis on the state of affairs. The analysis was considered a guide for the interviews and a help for making implicit thoughts more explicit, like: perspectives on e-learning, expectations of the added value and results.

The college has some experience in the field of e-learning and consider it a good alternative to make education more flexible, offer more tailor made learning solutions, become more effective, increase quality and improve the image and attractiveness of the college. To achieve these goals, the college has started an e-learning project, which includes three phases:

Phase 1: Preparation of the pilot phase (April 2002 – December 2002)

Phase 2: Pilot period (January 2003 – July 2004)

Phase 3: Implementation-/enlargement till July 2005

The analysis framework approach was used in phase I in preparation for the unit project plan for the pilot period.

C2 Observations in the conduction of the analysis framework approach

The decision was made to start a college wide e-learning project. The next step was to settle on the procedures for phase I. The college decided to do a analysis framework approach for a 'zero-analysis' of the state of affairs. In other words: where are we with e-learning development? The analysis framework approach was considered a good instrument to deal with the status of the different units concerning e-learning, but less accurate pertaining the willingness of the participants to contribute and support this development. The analysis framework approach did not contain specific enough interview items on this issue and therefore it was decided to combine the analysis framework approach with the matrix model of Tichy, which is a diagnostic model for the inventory and analysis of success factors and inhibiting factors for organizational change. The combination was called the 'Monitor e-learning' and was described as the analysis instrument for phase I of the e-learning project.

The analysis framework approach contains interview categories, which normally are used in a fixed sequence. The project group decided to change the sequence and start with the category 'content', instead of 'organization'. Looking at the outcome of the 'monitor e-learning', it seems that this change of sequence caused a greater focus on primary process issues than expected, causing some imbalance.

The outcome of the monitor e-learning was:

- A strong emphasis on organizational flexibility and tailor made learning offerings as a prime concern.
- E-learning should help to manage this diversity.
- Coaching can be upgraded, not only for the traditional internships.
- Put forward flexible (content and speed) learning offerings for other and new target groups.

Thresholds:

- How to define e-learning? How to discriminate between e-learning and other activities?
- The discussion seems to focus on a mixture of wishes and goals, which are only partially guided by clear business objectives.
- The financials need clarification and need to become more transparent.
- There is a lack of e-learning skills. How to prepare the teacher and how to integrate these skills in the process.
- E-learning content is only sparsely available, how to proceed?
- Dependence on good functioning IT support.

Each unit developed an e-learning implementation plan on the basis of the outcome of the 'monitor e-learning'. According to a recent monitoring report (Matthijsse, 2004), quite some progress is being made with the conduction of the original pilot projects, in line with the planning.

C3 Experiences of the consultant using the analysis framework

There was an intake meeting with the project leader, who took care of the selection of participants from the different units. A meeting was organized with these e-learning representatives to discuss the procedures of the monitor e-learning, on which all agreed. Additional information on the organization was used in preparation. The representative selection of people was also the group to work with after the analysis framework approach. The consultant did not have the opportunity to talk to the responsible manager to verify what support to expect on the highest level in the organization.

Version 0 of the analysis framework approach was used in an adapted format. The sequence of categories was changed and interview items were adapted, replaced or added, depending on the goal, the target group and wishes of the project leader.

The analysis framework approach is a semi-structured interview to allow for dialogue. This worked well. At the beginning the participants were not so sure about the effectiveness of the format, but it turned out to be a good experience. The interviewed reacted positively on the format and expressed the feeling that they had achieved a better understanding of e-learning and developed a lot of ideas.

To be able to conduct a analysis framework approach, the interviewer needs to be well prepared. An introduction on paper, hands on session or acting as a participating observant, is not an adequate enough grounding. One needs to be an e-learning expert, who is familiar with e-learning 'good' practices and the e-learning market. Someone who is knowledgeable about the client and can adept the analysis framework approach interview items to the client context.

There was a division of roles. The consultant worked closely together with the project leader and the idea was to prepare and train the project leader to perform as an consultant, to be able to do the analysis framework approach by himself.

Another format was used for reporting, clients though were satisfied. The project leader was, for strategic reasons, reluctant to come forward with recommendations on the basis of the analysis framework approach. The effect was that the reports, each unit had its own report, were too much restricted to 'telling the story' of the past, instead of focusing on what would be next. The reports were not directly used for the follow up, but were considered helpful as a reference in the decision making process on the choice of pilot project themes.

From the consultant's point of view the objectives were met. The primary client, the project leader, was satisfied. The units were less fulfilled, because they expected clear-cut recommendations, which would have made it easier for them to proceed. The project leader though valued the decision making process with the units as part of the implementation strategy. A follow up of the participation of the consultant in the project is foreseen.

The analysis framework approach was doable, although the reduction in consultancy time impacted the outcome negatively. The consultant prefers to finish the analysis framework approach with a clear-cut outline for the next step to ease the transition to the next phase and to try to assure a continuation of the advisory work.

The analysis framework approach was used for a 'zero assessment'. During the conduction of the analysis, the aspiration emerged of being able to use the analysis repeatedly, at different phases of the project. Main question was: what are the

requirements to be able to make the next step? If the analysis framework approach can be used to decide on the requirements, then this instrument can be of great help during all the phases of an e-learning implementation.

Although there was no preference for using the business model category as a main issue during the analysis, most participants implicitly and explicitly talked about the added value, without being able to describe this value in clear terms. The consultant could increase his value for the project by supporting the business model issue in ROI-terms. Still a field to be discovered by educationalists, but becoming a hot issue where e-learning is at stake.

D. Synthesis

D1 Conduction of the analysis framework approach

There was a mixed use. Three analysis framework approaches were conducted by the consultant in collaboration with the project leader, and three by the project leader independently. The analysis framework approach was well received and functioned well, but missed out on the need for the zero-analysis regarding the willingness of the participants to support the e-learning development. Therefore the analysis was combined with the Tichy matrix to become the 'monitor e-learning'. As a consequence, the analysis framework approach procedure was adapted. The effect was that there was a less solid outcome in the form of plans for the follow up. But, as the project leader stated, being reluctant to come forward with clear recommendations was also a conscious move as part of the implementation strategy to increase the involvement of the units.

There was an emerging need for the business model aspects and the wish to re-apply the analysis in the different phases to secure the readiness of the organization and participants to move to the next phase of development and implementation.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- The analysis framework approach was used in combination with another instrument. It kept its analytical performance, but lost some of its value, because of the enlarged scope of the e-learning monitor.
- The analysis was used in close collaboration between the consultant and the project leader and independently by the project leader.
- It was used for the different units at the college, which means different educational contexts and different levels of development.
- There was a clear wish to use the analysis over and over again to ascertain the requirements needed, before moving on to the next phase.

Changes to be made:

- The need for assessment of the 'attitude to e-learning' issue should be taken care of. Previous experiences with innovation were the main source for this need.
- The analysis framework approach represents a sequential and formatted approach. This does not necessarily coincide with the intention, the policy or innovation strategy of the client. The consultant needs to adept and be able to adept the analysis framework approach to the client's context, without losing the 'added value' of the approach. There for there should be a short guideline to help the consultant to decide about the changes to be made in the analysis framework approach, without loosing too much of its accuracy and usefulness.
- A consultant needs to be an expert to make these changes and adapt the analysis to the client's context. The expert preparation of the consultant can not be done incidentally and is beyond the scope of the analysis. An option, which would fit within the scope of this analysis, would be a short description of the knowledge and skills such an expert needs to have.
- Obviously there is a growing concern about the financials when it comes to e-learning. This means that the business model category should be extended to fulfill this need.
- There was a strong desire to use the analysis framework approach repeatedly in the different phases of the implementation process. The argument was, that the evaluation of existing projects, only give you the information on what has been done in the project and that is not enough. You also need information on how the project relates to the overall implementation process and strategy. The analysis would be a good tool to conduct this cyclical investigation.

Appendix G: Analysis Framework Approach Version 1: Attitude to e-Learning Questionnaire.

Pre & Post test of the attitude to e-learning

NB.

The difference between the pre and the post test is that the post test contains an additional question on the experiences of the respondent with the quick scan (question A05).

Name _____

Position _____

Company _____

The use of e-learning in your organization

A01 Do you think it's valuable to add e-learning to the existing training and learning offerings?

- 1 Not at all.
- 2 Little value
- 3 Valuable
- 4 Very Valuable
- 5 I don't know / No opinion

Please comment on why it will or will not be valuable for you:

.....

.....

A02 What benefits do you expect from e-learning?

Please, take a close look at it and give your opinion on the importance of each element.

Expected benefits	Not important at all	Not important	Important	Very important	Don't know
A Reduces costs	1	2	3	4	5
B Learning opportunities anytime, anywhere	1	2	3	4	5
C Provides just-in-time, just enough learning	1	2	3	4	5
D Allows for self paced learning	1	2	3	4	5
F Allows for online communication among participants	1	2	3	4	5
G Allows for more (online) communication with trainers and experts	1	2	3	4	5
H Makes classroom learning more time effective	1	2	3	4	5
J Provides interactive lesson material (improving the learning experience)	1	2	3	4	5
K Enhances knowledge and information sharing	1	2	3	4	5
L Helps to improve learning results	1	2	3	4	5
M Other:	1	2	3	4	5

A03 What barriers could limit your usage of e-learning?

	Not at all	May be	Certainly	Very much	Don't know
A Lack of inter- or intranet access	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
B Bandwidth limitations of the network (consequences: slow access, no video or audio)	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
C Technical problems (PC, browser, other)	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
D Lack of personal PC-skills	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
E Lack of online learning material	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
F Not suitable for most relevant skills within our organization.	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
G Language problems	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
H Cultural resistance	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>
D Other:	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>

A04 What disadvantages could limit your usage of e-learning?

	Not at all	May be	Certainly	Very much	Don't know
A E-learning is not yet well enough developed to <u>support</u> other forms of training and learning	1	2	3	4	5
B E-learning is not yet well enough developed to <u>replace</u> other forms of training and learning	1	2	3	4	5
C E-learning materials do not meet our needs	1	2	3	4	5
D I do not know enough about the opportunities of e-learning	1	2	3	4	5
E Cost of software and hardware are too high	1	2	3	4	5
F Computer based learning is not as effective as face to face teaching	1	2	3	4	5
G People in my organization resist computer use for learning	1	2	3	4	5
H E-learning close to the workplace is not conducive to effective learning	1	2	3	4	5
D Other:	1	2	3	4	5

A05 Use of the Quick Scan analysis method for e-learning

	Not at all	May be	Certainly	Definitely	Do n't know
A The Quick Scan is a tool for analysis to decide whether e-learning could be useful for your organization. Was the analysis successful?	1	2	3	4	5
B Has your confidence in the possibilities of e-learning increased due to the Quick Scan?	1	2	3	4	5
C Are you satisfied with the Quick Scan procedure?	1	2	3	4	5
D Are you satisfied with the final results?	1	2	3	4	5
E Would you recommend the scan?	1	2	3	4	5

Additional remarks

.....

.....

Thank you for your co-operation!

Appendix H: Analysis Framework Approach Version I: Overview of the second Cycle of Case Studies.

The second Cycle of Case Studies

This is the complete collection of case study reports conducted with version I of the analysis framework approach. The findings are discussed and analyzed in chapter 6. The final analysis, including the conclusions and recommendations can be found in chapter 7.

Overview of case studies using version I of the analysis framework approach

#	Period	Company / organization	Version	Consultant	Student	Investigator
7	Oct 2002 – Mar 2003	Steel industry: technical support unit of a hot strip mill	I	X		X
8	Jan – Feb 2003	Health Care: trainings institute for company doctors	I	X		
9	Mar – Apr 2003	Steel industry: logistics and transport	I	X		X
10	Feb – Jun 2003	Glass industry: glass manufacturing	I		X	X
11	Mar – Jun 2003	Service organisation: call centre	I		X	
12	Sep 2003 – Jan 2004	Service organization	I	X		X
13	Jan – Apr 2004	Health Care: hospital for special diseases	I	X		
14	Feb – Aug 2004	Food industry: producer of refined oils and fats	I		X	X

The case studies

Case # 7 Steel industries: technical support team in a metal strip production unit

A. The context of the case study

A1 Company or organization

This case study is about the technical support team of the metal strip production unit of a steel producing company. The company at large has manufacturing operations

Appendix H

in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

The technical support team involved in this case study is responsible for the analysis and repair of the overall machinery used for metal strip production. When technical problems arise in the production process, this team is called in for further analysis and instant repair, and if necessary organize the repair when conducted by external experts. The team has recognized the need to improve their knowledge and information management, but has not yet found a satisfactory solution. The support team has 140 employees working in five daily shifts and most have a middle level vocational background.

The initiative to carry out an analysis framework approach e-learning was taken by this team in collaboration with the central training organization of the company.

A3 Consultant, student, investigator

The analysis was conducted by a senior learning consultant from Cinop and the consultant investigator, in close collaboration with the manager of the technical team, who was equally responsible for knowledge management. Also present was the vice manager of the training centre, because the focus of the analysis would be partially on a course called 'hydraulics', which was a co-production of the technical team and the training centre.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information and paperware.
b. Analysis framework report	X	A full report, discussed and accepted by the management of the technical team and the vice manager of the training center.
c. Specific information on learning and training	X	General information on the traditional way of organizing courses and learning.
d. Outline e-learning pilot	X	The outline of the e-learning course on 'Hydraulics' was part of the analysis

e. User's guide	X	report. Available for the consultant
f. Questionnaire: 'Attitude to e-learning' (client)		
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The senior consultant has been interviewed by the investigator, using the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Consultant-investigator)	X	The investigator actively participated in the analysis.
j. Taped interviews	X	The interview session was recorded.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM		
c. Training organization	X	The analysis included the technical unit and the central training organization.
d. Training program		
e. Training course	X	The focus was on this 'hydraulic' course, but with a link to the overall issue of information and knowledge management.
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	Both for the manager of the technical team and the manager of the training center, this was an exercise in focusing on one issue, while thinking about overall solutions.
c. Operational	X	Thinking about the outline of the course.
A7 e-learning development phase	Present	Additional information
a. Start	X	The technical team did have some experiences using digital information for training and learning purposes, but there was no experience with e-learning.
b. Pilot		

c. Integration

A8 Stages of awareness (CBAM model) **Present** **Additional information**

a. Unaware

b. Information level X Most stakeholders from the technical team were familiar with e-learning, but unaware of the possibilities in their field of work.

c. Initial personal skills X Manager training center and representative from the hot strip mill division

d. Level of routine use of some aspects

e. Extended impact level

f. Contributor's level

g. Leadership level

B. The data collection procedure

B1 Sites and contact persons

Technical team, part of a hot strip mill production unit

Contact person: main contact was the manager of the technical team, a fore runner with clear ideas about where to go and what to expect. The training consultant from the division within the hot strip mill, which was already using e-learning, participated in the discussions.

B2 Data collection plan

- October 2002 – March 2003
- Time investment for the consultants was 70 hours
- There were several preparatory meetings, which were not easy to plan, due to a high workload and unpredictability of the interventions of the team. It took some time to get the right focus. While one particular course was at the centre of attention, a lot of thinking was about overall solutions.

B3 Preparation of the visit

An important issue in the preparation was the collaboration between the technical team and the training centre and if the focus on this particular course would allow for some generalizations. So in preparing the quick analysis interview, it became important to look at the interest of both stake holders parties and add some focus on this issue.

C. Case study observations and experiences

C1 Rational for the use of the analysis framework approach

The main issue: how do you train employees in a timely and adequately manner? The 'traditional apprenticeship model' model did not function anymore, mainly due to the increased mobility, early retirement and the fast changing production machinery. Another issue was the increased cycle time of content. The information needs to be up to date to support the technical crews in a suitable manner. The quality of service though does not just depend on training and information, but also on attitude. The alertness of people to react adequately in connection with their experiences is of prime importance. So there is a need for a new and flexible training model, suited for new situations (machines) and new people, and the storage and updating of information and knowledge.

It is believed that e-learning is a good alternative to help solving these problems, especially were it can add flexibility to the training and learning process.

C2 Observations in the conduction of the analysis framework approach

The normal procedure of the analysis was used, involving preparatory meetings, the interview, the reporting and a discussion about the follow up.

The result of the analysis was that e-learning was expected to help lower the threshold and time involvement for content development by different people, and should help to ease maintenance and upgrading and improve access. It should make training and learning more transparent, so employees and management get a better view on progress and results. An important factor of an eventual success of e-learning is management commitment in time, money and effort. And all in all, the project would require a good communication about the innovation.

The pilot outline was further developed into a project plan, after the analysis was finished. In a later stadium the 'hydraulic project' started and the application of e-learning has become an ongoing activity.

C3 Experiences of the consultant using the analysis framework

There were several preparatory meetings to establish a mutual understanding of the goal and procedure of the analysis. Part of the problem was the slightly different interest of the two stakeholders. One focused on more general solutions and one on a specific problem, but with the intention to use the experiences on a wider scale, but limited to the technical support service.

A complicating factor was the link with information management. It is clear that e-learning builds on the availability of content, but if this is restricted to 'training

content', especially put together for training purposes, without considering existing resources, content will continue to hamper e-learning development.

The position and role of the interviewed people in the development of e-learning is something of ongoing concern. There was a split organizational level, which complicated the analysis. The training center interested in the level of training organization and as supplier, and the technical team interested at the course level and the question of how to transfer the experiences with the one course to other training and learning domains. The awareness of the need was there, including some personal skills. The quick analysis interview partition in categories and sub-categories worked well. The dialogue worked very well, as the manager of the technical team was very much involved and able to clarify the needs and problems. Therefore it was rather easy to position e-learning relative to the needs in the context of the technical team.

An interview with a broader group of representatives would have been useful, especially in preparation of the transition from the start to the pilot phase. This did not seem feasible in this case. The stakeholders were satisfied with the conduction of the analysis and the reporting. Later on this report played an important role in the follow up.

D. Synthesis

D1 Conduction of the analysis framework approach

The analysis was conducted focusing mainly on issues on the tactical level. One might say though, that the attention given to one particular course certainly would have been a reason to extend the group of participants or conduct a second analysis on particular issues. Afterwards one can conclude that the representation of the technical team was too shallow. Involvement from people on different levels might have been useful, but, as in this case, was not possible. This will cause differences in the level of information and subsequently could slow down the transition in the development process from the start phase to the pilot phase. Actually, the analysis has been developed with the idea in mind that this transition could be facilitated by using the analysis. So it is not an unimportant issue.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- Stake holder involvement and the representation of the different organizational levels is an important issue, if the transition from one to the other phase is considered a crucial issue in the analysis and subsequently the development of learning.

- Look at the usability of the final report for other, and maybe not directly involved, stakeholders. The analysis intends to ease the transition from one to the other development phase, as discussed in the CES model.
- The participation of different stakeholders from different organizations should be facilitated if collaboration is crucial for the success of the e-learning development.

Changes to be made:

- Give guidelines for the reuse of ‘parts’ of the analysis, if stakeholder involvement appears to be difficult and a separate meeting could help.
- Improve and extend the report outline in relation to the usability of the report for other stakeholders in other phases of development.

Case # 8 Health care: trainings institute for company doctors

A. The context of the case study

A1 Company or organization

This institute is responsible for the additional training of professionals working in the field of social security and for post academic training, policy support and research for public health organizations and social medical science.

A2 Main activity of the company/organization (profile)

The institute is about to reorganize the training plan to integrate three existing post academic programs for company doctors. The intention is to offer at least 25% of the new program by means of e-learning. The program takes four years of about one day a week and the student must be working in the field. The training focuses on information transfer and knowledge creation. The institute has 100 employees.

A3 Consultant, student, investigator

The analysis was conducted by a senior learning consultant from Cinop. The investigator only had a remote role in the activity.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report	X	A full report, discussed and accepted by the stakeholders.
c. Specific information on learning and training	X	General information given during the intake of the analysis.

d. Outline e-learning pilot	X	The outline of the first pilot and suggestions for additional pilots, were part of the analysis report.
e. User's guide	X	Was available for the consultant – interviewer.
f. Questionnaire: 'Attitude to e-learning' (client)		Was available, but not used.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The senior consultant has completed the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Consultant-interviewer)		
j. Taped interviews		
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM		
c. Training organization	X	It is a training organization working on their new training strategy.
d. Training program		
e. Training course		
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	Focusing on plans of how to achieve the transfer of part of the training program to e-learning modules.
c. Operational	X	The pilot was aimed on the construction of an e-learning module.
A7 e-learning development phase	Present	Additional information
a. Start	X	Initial phase of innovation by means of e-learning.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM)	Present	Additional information

model)

- | | | |
|--|---|---|
| a. Unaware | | |
| b. Information level | | |
| c. Initial personal skills | X | Innovation of the training process by using e-learning. |
| d. Level of routine use
of some aspects | | |
| e. Extended impact
level | | |
| f. Contributor's level | | |
| g. Leadership level | | |

B. The data collection procedure**B1 Sites and contact persons**

- The institute has one central location, but supplies training on several different places in the country.
- Contact person: among the group of stake holders was the project leader/program coordinator, a team coordinator and a program project leader.

B2 Data collection plan

- January – February 2003
- Time investment for the consultant was about 70 hours
- There were several preparatory intake meetings. This was helpful for the formation of a project group on e-learning strategy. There were two interviews with two different groups of interviewees.

B3 Preparation of the visit

The institute differed from the corporate environment in the sense that it was an independent training institute. The analysis had to be adapted to this other setting. All interview items focusing on corporate and business issues were reviewed, changed or left out.

C. Case study observations and experiences**C1 Rational for the use of the analysis framework approach**

There were several reasons for looking at e-learning as a possible alternative.

- Travel time. Students had to attend classes in addition to their working hours.
- The added value of classroom sessions was limited compared to self study by means of a course handout.

Appendix H

- The course material needed a regular update, a central administration and easy access for students.
- Communication and information exchange among students can be improved and increased by means of ICT (communities of practise).

C2 Observations in the conduction of the analysis framework approach

The normal procedure of the analysis was used, involving preparatory meetings, the interview, the reporting and a discussion about the follow up.

The result of the analysis was that e-learning was expected to help:

- Increase information exchange and collaboration among the students.
- Increase the added value of classroom sessions.
- Students to prepare for class, so the individual difference in knowledge level would be reduced.
- Improve the accessibility of students and teachers to the course materials. Absent students then still have access to the correct version of the material and this service lowers distribution costs.
- The cycle time for content development sometimes is too long. E-learning can help to support the workflow-procedures.
- Student profiles help to select and deliver the right information to the right person and in time.

In the long term e-learning might be helpful to add efficiency to skills training. To ease the implementation and operation of the personal development plan in relation with competence development. Also external collaboration and educational partnerships for content development and maintenance could be considered.

The pilot outline was further developed into a project plan and executed in close collaboration between the consultants.

C3 Experiences of the consultant using the analysis framework

This was the first time the consultant used the analysis. Preparation was done with the help of the guide and two group sessions at Cinop for the learning consultants. The investigator had a remote role. There were several preparatory meetings to establish a mutual understanding of the goal and procedure of the analysis. A project group e-learning strategy was established. There was a representative selection of stakeholders. Management was involved, but from a distance.

The analysis functioned well, but for the interview not all items did apply to this independent training institute. Questions were erased, adapted or replaced. Some questions did not fit in the context and for example, the questions on knowledge management were replaced. The systematic approach worked well, as well as the

dialogue. The interview took quite some time, because some of the issues were new for the participants. The interview especially helped to create a broader look at e-learning than just the pilot.

It is advisable to use the context of the organization to position e-learning. This and the wish to assess the institute's ability to use e-learning, can be difficult, because of the short period in which one is expected to get an overview of the ins and outs of the organization. Sufficient knowledge of the organization, the recognition of different interests, politics and positions, remain difficult to judge.

There was one report and unfortunately not an immediate follow up. The client appeared to be very much satisfied with the conduction of the analysis and the reporting. It helped to raise awareness about the usability of e-learning in the organization.

D. Synthesis

D1 Conduction of the analysis framework approach

The analysis functioned well and the client was satisfied. It gave structure to the analysis process and supplied the organization with a report, which obviously was used to continue thinking about the possibilities of e-learning and how to make the next step. Apparently it took some time for the organization to make up her mind, but the consultant stayed involved in the development process.

The analysis seemed flexible enough to adept to the context of this training institute. The focus of the analysis is on the corporate sector. To make the analysis more flexible, this scope should be reduced.

In the starting phase, the consultant will be rather unfamiliar with the organization and using the context of the organization to explain the possibilities of e-learning, will remain difficult.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- The preparation of the consultant was based on the short guide and the information received during two group sessions on the analysis. The consultant confirmed that participating in a real life session, is the better way to prepare for the conduction of the analysis. The investigator had a remote role.

Appendix H

- The analysis showed enough flexibility for the use in a different, not business-like, organization. The emphasis on corporate issues could be reduced, but this should not lead to another, but a broader focus.
- Or, the comparison of the changes made to adept the analysis to a particular situation, could help to develop several 'context bound' analyses, with a certain focus on for example corporate, smaller companies, training organizations, etc.
- Within the course of one project, it is thinkable that different groups are interviewed. The analysis allows for this shifting focus, relying on the assumption that adding up all the information, would still supply the consultant with a complete picture of the situation.
- If the results are to be used in a follow up, by other people in other situations, than it is advisable to add a paragraph in the report on the context of the analysis, to achieve mutual understanding of the reasoning behind the innovation.

Changes to be made:

- The adaptation process should be looked at more carefully.
- The strategy on 'quickly getting to know the organization' should be extended.
- A paragraph on the 'reasoning' of the organization for the innovation should be added to the outline of the final report.

Case # 9 Steel Industries: Service Unit Logistics and Transport

A. The context of the case study

A1 Company or organization

This case study is about a unit, responsible for the storage and internal and external transport of the companies' products (L&T unit). A major share of the activities is carried out by third party organisations, specialized in road and sea transport.

The company at large has manufacturing operations in many countries with major plants located in the UK, The Netherlands, Germany, France, Norway and the USA. Its share of the total EU production is approximately 11%, which positions the company as Europe's third largest Steel producer. The company aims to be recognized as a leading global metals provider with a strong technological base and an outstanding level of service. This requires well-trained employees and professionalism. There is an important commitment to creating a stimulating work environment and enhancing employability by the provision of competitive remuneration, creating opportunities for employees to develop their skills, providing an open and fair working environment.

A2 Main activity of the company/organization (profile)

Training within the unit is the responsibility of the training officer. General training, like on environmental issues, truck driving, e.g., is supplied by the corporate training center. More specific training, like on the use of particular cranes, is developed by the unit itself. Of particular importance are safety issues. There are 600 employees.

The initiative to carry out an analysis framework approach for e-learning was taken by the training officer, who participated in a workshop of the training center on e-learning activities in the company. The training center funded the analysis.

A3 Consultant, student, investigator

The analysis was conducted by a senior learning consultant from Cinop, with the consultant-investigator in a participative, observing role.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report	X	A full report discussed with and accepted by the training officer.
c. Specific information on learning and training	X	General information given during the intake of the analysis.
d. Outline e-learning pilot	X	The outline of the first pilot was part of the analysis report.
e. User's guide	X	Was available for the consultant – interviewer.

f. Questionnaire: 'Attitude to e-learning' (client)	X	Was used by the training officer and an apprentice.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The questionnaire was completed by the consultant.
h. Observation (Investigator)		
i. Participative observation (Consultant-investigator)	X	Consultant-investigator
j. Taped interviews	X	The interview was recorded.
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM		
c. Training organization		
d. Training program	X	Training program for the unit and how to use e-learning effectively. Focus in the pilot outline was on special crane training.
e. Training course		
f. Customer training		
g. Other		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	The focus was on the effectiveness of the training organization and the improvement of the training.
c. Operational		
A7 e-learning development phase	Present	Additional information
a. Start	X	Initial phase of innovation by means of e-learning.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level	X	Familiar with computer based training and the e-learning phenomenon, but not applied to the unit context.
c. Initial personal skills		
d. Level of routine use of some aspects		
e. Extended impact level		

-
- f. Contributor's level
 - g. Leadership level
-

B. The data collection procedure

B1 Sites and contact persons

- The L&T unit is located at the site of the steel company.
- Contact person: the training officer and an apprentice.

B2 Data collection plan

- March – April 2003
- Time investment for the consultants was about 70 hours
- There was one preparatory meeting, followed by the interview meeting and the meeting on the report.

B3 Preparation of the visit

The information on several other analyses conducted elsewhere in the company was very helpful in the preparation. The intake meeting was used to specifically get a grip on the items L&T considered important.

C. Case study observations and experiences

C1 Rational for the use of the analysis framework approach

The time factor is a dominant issue, because training and learning should be in line with company processes to adequately fulfil their role. It is virtually impossible to attain this goal under the existing circumstances. Therefore e-learning is being looked at to see what the possibilities are.

Other considerations are:

- The positioning of training and learning as strategic means to achieve business goals.
- L&T is a process oriented organisation, in which chain management plays an important role. The same should apply to training and learning.
- Tailor made solutions to increase the involvement of staff employees in training and learning.
- The need for flexibility to be able to handle the increased demand for training and learning.
- Update existing content, using appropriate didactics.
- Increase access to 'learning computers' and improve the digital skills to lower the threshold for computer based learning.
- There is a priority for courses on safety and the well being of the employees.

C2 Observations in the conduction of the analysis framework approach

The normal procedure of the analysis was used, involving one preparatory meeting, the interview, the reporting and a discussion about the follow up.

The result of the analysis was that e-learning offered good opportunities:

- To support the innovation and improvement process of existing courses
- To support development, administration and maintenance of content, and facilitate delivery and use of content.
- To structure and model learning activities and learning content.
- To plan, administer and register learning activities.
- To report on progress and results of learning activities.
- To facilitate (self) tests and exams.

A presentation was prepared for a management meeting on the results of the analysis and the pilot outline. The pilot outline was developed into a project plan, but the consultant was not involved in the follow up.

C3 Experiences of the consultant using the analysis framework

The initiative to conduct the analysis was taken by L&T, but the funding came from the training center. This obviously lowered the threshold for L&T to participate. There was no representative selection of stakeholders. Especially the 'end user' was missing. Although most of the discussion was about tactical issues, the focus was on how to apply e-learning in a particular course, to start with. Although the training officer did not have any experience with e-learning, he was very much in the mood of 'how can I work together with others to exploit the value of this innovation', the contributor's level in the 'CBAM, stages of awareness model'. So his mind set was very much in favor of e-learning, but showed a realistic view on the possibilities in the short run.

The consultant experienced that the division in sub categories did not work well. The line of interview items was abandoned as soon as the conversation moved away. It was not difficult to return to the interview items, but it was not easy to keep track of all the issues which had been covered in the meanwhile. It was clear though that the analysis facilitated the reflection on e-learning in relation to the needs and wishes of the unit itself.

The consultant did not consider the users guide for the analysis as sufficient in the preparation for the conduction of the analysis. One should at least participate in a analysis to get the feel of it and see how it works in practice.

In this case it was not difficult to position e-learning relative to the needs of the company, because the previous conducted analyses and the consultancy work done in an earlier stage provided sufficient insight.

The client was satisfied with the procedure and the results of the analysis. The consultant felt that key people, as the end users, were missing. This might have affected the outcome. Other priorities delayed the start with e-learning.

D. Synthesis

D1 Conduction of the analysis framework approach

The analysis mainly focused on the tactical level, but moved in the course of the project to the ins and outs of a particular training. The consultant felt that the end user could have contributed to the results of the analysis. The training officer though wanted to first clarify on a tactical level of how to position e-learning relative to the existing training and learning offerings.

The client was satisfied with the outcome and used it to develop further plans. The analysis helped to reflect on the added value of e-learning within the context of the organization. It took some time for the organization to decide about a follow up, but, unfortunately, the consultant was not involved.

The consultant considered the users guide not adequate enough as preparation for conducting a analysis. Acting in at least one situation as an observer is seen as a minimum.

The training officer and the apprentice filled out the 'attitude to e-learning questionnaire'. Both considered e-learning as 'very valuable', expecting that the time and place independent opportunities would certainly be of prime importance. Both qualified the use of the analysis as successful, and their positive judgment of the potentials of e-learning was better than before. They were satisfied with the results and would recommend the analysis to others.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- The preparation for a consultant to use the approach needs to be reconsidered. Obviously the user's guide is not sufficient.
- Participating in at least one analysis as an observer is necessary.
- A competency matrix would help to clarify the skills and knowledge a consultant would need to conduct the analysis in a satisfactory manner.
- It seems like a first analysis tends to focus on the tactical organizational level. In most cases because people looking for solutions function on that level. Such a focus though might limit the possibilities to get a good overview of what is going on in an organization. On the other hand this level seems to be the best

entry for a consultant. The conclusion could be that the analysis should be leveled to become more efficient and easier to handle in different situations.

Changes to be made:

- Add guidelines to the consultant user's guide for situations in which the interview outline is hard to follow.

Case # 10 Production industry: Glass ware company

A. The context of the case study

A1 Company or organization

This case study is about the Dutch branch of a glass manufacturing company, with production units in several European countries.

A2 Main activity of the company/organization (profile)

The most important business segments in the glass production are: wine, beer, spirits, non-alcoholic beverages, and food jars. Economic developments forced the company to reduce the number of employees, from 500 to 280 employees per factory, but still produce high quality glass as efficiently as possible. To maintain or even improve the level of production, the competencies and skills level of its workers became part of the business strategy. The head of training started with e-learning development in 1999-2000. E-learning was considered to be one of the instruments to achieve the training goals in relation to the business objectives. In total there were approximately 800 employees in the Netherlands, equally divided over the three locations.

A3 Consultant, student, investigator

The analysis was conducted by two groups of students. One group of e-learning master students from the university of Twente and a group of master students participating in an elective course on e-learning at the Delft university of technology. The group of the Twente University participated to have a first experience in conducting the analysis. Later on they would conduct another analysis. In our overview this is case study # 11. Both analyses were part of their master thesis. For the Delft group, the conduction of the analysis was an assignment in the elective course. The consultant-investigator coached the two groups in collaboration with their mentor, professor at the Twente University, Faculty of Behavioural sciences, and a colleague from the Centre of Education and Technology at the Delft University.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report	X	A full report discussed with and accepted by the head of training.
c. Specific information on learning and training	X	General information given during the intake of the analysis.
d. Outline e-learning pilot		
e. User's guide	X	Was available for the student-interviewer.
f. Questionnaire: 'Attitude to e-learning' (client)	X	Was completed by the head of training.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The questionnaire was completed by all the student-interviewers.
h. Observation (Investigator)	X	The mentor of the Twente students, a colleague investigator and the consultant-investigator.
i. Participative observation (Consultant-investigator)		
j. Taped interviews	X	The interview was recorded by the students and used for reporting purposes..
A5 Organizational level	Present	Additional information
a. Company learning strategy	X	The role of e-learning as part of the business objectives.
b. HRD & HRM		
c. Training organization	X	Organizational issues on content development and implementation of e-learning in the different locations.

d. Training program	X	Information on how the program was set up and how the transition from the traditional approach to the e-learning setting was foreseen.
e. Training course		
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	The focus was on the effectiveness of the training organization and the improvement of the training.
c. Operational		
A7 e-learning development phase	Present	Additional information
a. Start	X	Initial phase of innovation by means of e-learning.
b. Pilot	X	Implementation of the first e-learning modules.
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level		
c. Initial personal skills		
d. Level of routine use of some aspects	X	The head of training certainly was moving back and forth on the levels d – f. This was partly due to the fact that he was a fore runner, so the connection with other stakeholders, functioning on the a. and b. level, might be under pressure.
e. Extended impact level	X	
f. Contributor's level	X	
g. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

- The company had three sites in the Netherlands, which all participated in the e-learning innovation.
- Contact person: the head of training and a training coach.

B2 Data collection plan

- February - June 2003
- Time investment for the students was related to the time needed to fulfill the assignments for their respective study programs.
- There was one preparatory meeting, followed by the interview meeting and the meeting on the report.

B3 Preparation of the visit

There were preparatory meetings with the students, both in Twente and in Delft, to discuss the analysis and prepare for the intake session with the head of department. Then there were the analysis sessions with the client, but in between there were several meetings with the students to discuss the findings and prepare for the next step. Part of the preparation was a guided tour in one of the locations, to really develop an idea of the production and organizational processes at hand. Also there was a session in which the e-learning products were shown to the students.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

The situation at hand in this company was very different from those in the previous analyses. This was not a start up, but a company which was already well underway with e-learning. The rational for the use of e-learning was the need to connect training and learning to the business goals and to be able to do so, innovation was necessary and e-learning was believed to be a most important vehicle to make it work. The argument was that e-learning could help to achieve the required innovation.

- Provides training in a more structured and professional way. The traditional way of knowledge transfer was lacking behind. The new way was not just simply transforming the old content into a digital format, but to redesign the training and learning process, including the content.
- Allows for more focus in using the function profile of the workers and for the monitoring of progress and achievements.
- Allows for a timely and more accurate updating process for training and learning content.
- Will allow for training and learning on the job.

The rational for executing the analysis was the aspiration of the head of training to verify if he was on the right track. Up till then the 'go' was given on the basis of 'persuasion'. Now it was time to come up with proof that it all did work.

C2 Observations in the conduction of the analysis framework approach

The normal procedure of the analysis was used, involving one preparatory meeting with the client, the interview, the reporting and a final discussion. The intake was extended with a guided tour, which helped the students to improve their knowledge about the context of the analysis.

The analysis was focused on the question if the company was on the right track with their e-learning activities. The students used the following research question as the main orientation in their work:

“Is the organization on the right track in the way they are incorporating e-learning into the company?”

From our analysis we concluded that the company is on the right track. The main supporting factors are the *cultural shift* (towards a company-wide e-learning committed mentality), *embedded learning strategy* (learning goals are linked to business goals), *organizational impact* (awareness considering the organizational changes that come along with the implementation of the new learning environment), and *infrastructure readiness* (is it truly enabling e-learning). The company has generally recognized these factors and has dealt with them.

There were, however, some aspects that needed more attention and the following was recommended:

- ROI – The Company should find ways to evaluate the achievements and to measure the return on investment of its e-learning investment. Meaningful effect measurement of e-learning is impossible at this moment.
- Outsourcing - The company should tackle its intention to outsource the e-learning activities as carefully as during the initial stage of e-learning implementation. Outsourcing means a profound change in organization and requires a solid strategy as well.
- Cooperation with educational services – Finally, the company should look for more opportunities to establish a shared interest way of cooperation with educational services and realize more benefits from its e-learning strategy (inflow of young recruits, image building).

C3 Experiences of the consultant using the analysis framework

The two groups of students, in total six people, functioned as consultants. They felt that their level of information on e-learning could not meet the level of the client. If the client group would have had more stake holders, then this problem would have been less obvious, assuming that the head of training was a clear fore runner. In any event, it did not really interfere in the conduction of the analysis. In some instances

the students could add to the dialogue from their previous, theoretical knowledge. The client was very cooperative and willing to share his knowledge. The students felt that it was sometimes difficult to correctly interpret the interview items and found that not all questions were clearly stated. So it was not always possible to 'connect the questions and answers'. The students assessed themselves as 'sufficient', when it came to judging their interview and writing skills. The client's reaction on the final report was quite positive and the recommendations made were seriously considered. This has led to a follow up on the issue of evaluation.

D. Synthesis

D1 Conduction of the analysis framework approach

This case study differed from other case studies in two ways. It was the first time that rather inexperienced students were conducting the analysis. Secondly, the analysis was mainly developed for the upfront analysis of the readiness for e-learning, but in this case e-learning development was well underway. In addition the student-consultants were confronted with a head of training who was better informed about e-learning than they were. Still, the analysis was executed in line with the procedure. The report was extended in the sense that it followed the outline of the final report of the analysis, but several sections were added to produce a report, which would be acceptable as a research report for the elective course in Delft. The students from Twente contributed to this report, but also developed their own version.

The client was satisfied with the outcome and he felt that his main question, 'are we doing the right thing' was satisfactorily answered. This meant that, although the students were not as well informed as the client and the analysis lacked specific questions for the analysis of such an ongoing process, the outcome was rewarding.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- This was the first time that a different group of people used the analysis. These were rather inexperienced students, less knowledgeable on the subject of e-learning, but still capable of conducting the analysis and who came up with some interesting conclusions and recommendations.
- Unlike the learning consultants, the students were having difficulties in interpreting the interview questions. This is quite understandable thinking about the level of expertise and the different background. Most of these international students came from the Far East. We have not been able to pin down the questions at stake. In addition it would be interesting to find out if other learning consultants, than those from Cinop, would meet the

interpreting problem as well. In the first round of experiences, there was a difference in 'interpretation' between learning specialist and e-learning specialists, so it would not be surprising when e-learning specialists from another organization, would face a similar problem.

- Using the analysis in a different situation. Not as an upfront analysis, but as an 'evaluator' of the actual situation of e-learning development. And then judge whether 'they are doing the right thing'. It is to be expected that in the near future, most companies will have already started with e-learning, so the need for an upfront analysis will decrease. The need for an ongoing analysis of the existing situation relative to the desired situation and the readiness to move from one to the other phase will increase. It is in that sense that the analysis should be looked at.

Changes to be made:

- Take a close look at all the questions from the interpretation perspective. Change the questions and add context when necessary, so they become more 'one sided'.
- Consider the possibilities to prepare the analysis for broader use. Not just as an upfront analysis, but as an analysis tool which can repeatedly be used to measure the state of affairs and to assess the requirements to make the next step. The term 'multi tasking' can be applied here.

Case # 11 Service industry: a call center

A. The context of the case study

A1 Company or organization

This case study is about a call center provider, offering a wide range of integrated custom contact solutions from help desk to technical assistance and live web chat. The centers of this organization are strategically located across the globe. This case study is about a center in the Netherlands.

A2 Main activity of the company/organization (profile)

The location in the Netherlands offers services in 12 languages to 16 countries and covers 13 projects from different clients. The company uses state of the art technology to support these services, including e-commerce, pre-sale, order status, and add on sales, etc. The quality of service is a very important business goal and therefore the employees' performance gets a lot of attention. This includes product knowledge, communication skills, and problem solving skills. Hence the business and training goals are highly integrated, because agents working in the call centre represent the client company's representatives facing the clients customers.

A3 Consultant, student, investigator

The analysis was conducted by a group of three master students from the University of Twente. This group had already experienced an analysis in the production industry, together with students from Delft University of Technology (see case study # 10). The group was coached by their mentor and remotely by the investigator. This analysis was part of the master thesis research of all three students.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information
b. Analysis framework report	X	A full report discussed with and accepted by the head of training.
c. Specific information on learning and training	X	General information given during the intake of the analysis.
d. Outline e-learning pilot		
e. User's guide	X	Was available for the student-interviewer.
f. Questionnaire: 'Attitude to e-learning' (client)	X	Was completed by most stakeholders at the call center, but only the pre and not the post test.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The questionnaire was completed by all the student-interviewers.
h. Observation (Investigator)		
i. Participative observation (Consultant-Investigator)		
j. Taped interviews	X	The interview was recorded by the students and used for reporting purposes.
k. Master thesis	X	Information collected by the students and used in their master thesis.
A5 Organizational level	Present	Additional information
a. Company learning strategy	X	
b. HRD & HRM		
c. Training organization		
d. Training program		
e. Training course		
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic		
b. Tactical	X	Focus was on the benefits of e-learning in the prime operation, and the application in practice.

c. Operational		
A7 e-learning development phase	Present	Additional information
a. Start	X	On the starter's level with no experience.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level		
c. Initial personal skills	X	Awareness is available, but not so much in relation with the companies own business goals
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

- The location involved in this research in the eastern part of the country.
- Contact person: Manager of project management & training, soft skill trainer, European director of ICT, interim call center manager.

B2 Data collection plan

- March - June 2003
- Time investment for the students was related to the time needed to fulfill the assignments for their respective study programs.
- There was one preparatory meeting, followed by the interview meeting and the meeting on the report.

B3 Preparation of the visit

There were preparatory meetings with the students in Twente, to discuss the analysis in relation to the intake session with the stake holder group of the company and other elements of the analysis procedure. The students did not use prior information on the company to prepare for the intake meeting. There was though a guided tour on the companies' premises, to show the students the ins and outs of the call center activities.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

The performance of the call centre employees determines the quality of the end product, which is 'the interaction with the call centre client's customer'. The rational for conducting the analysis can be found in the key needs for training:

- Knowledge update – the necessary knowledge and information is changing rapidly and needs to be communicated with the employees. Especially when the work pressure is high, classroom training is not sufficient and not efficient enough.
- Flexible learning needs – There is a need for the agents to individually decide about when and what to learn. Agents work very different hours, have different tasks and projects and differ in information level, depending on prior knowledge, experience, e.g.
- Training evaluation – A systematic evaluation to measure the training impact, is lacking.

The stakeholders believe that e-learning can find solutions for these key needs. There is a general notion that the company is ready for an innovation as e-learning. This is partly related to the fact that the motivation of agents to participate in training is high and it is expected that when the agents have their chance to make their own individual choices, they would be better off with e-learning.

C2 Observations in the conduction of the analysis framework approach

The normal procedure of the analysis was used, involving one preparatory meeting with the client, the interview, an intermediate and a final report, and a final discussion. This process was guided by the mentor. The outcome of the analysis was used for the final report for the company and for the three master theses.

- In general e-learning is highly recommended in relation to the training and learning needs.
- The best solution seems to be a blended learning situation.
- The organizational environment is mature enough to make a start with e-learning.

C3 Experiences of the consultant using the analysis framework

The role of the three master students was that of a junior consultant.

The students did not consider the interviewee group as a representative selection of stakeholders. End users, like the agents, were missing. Also they found that the position and function of such a selection should be better analyzed in order to enhance the validity and reliability of the information.

They found that some of the interview questions were not clearly stated and caused confusion for the interviewer as well as for the interviewee. The 'connection of the question and answer' though, was, in most instances, solved after some further explanation. The dialogue worked well. The students qualified themselves as sufficient considering the invitation of the right people, knowledge of the company, i.e..A suggestion is that students should have the opportunity to get more training and experience, before executing a analysis.

The responses of the company people on the attitude to e-learning questionnaire showed a high level of expectation. They all consider e-learning as very valuable and see anytime and anywhere self paced learning as important benefits. They see very few barriers for using e-learning. Although most would recommend the analysis as a tool, they did not seem to be fully satisfied with the results.

D. Synthesis

D1 Conduction of the analysis framework approach

The investigators observation from the discussion with the students and mentor, the reports and the questionnaires, is that they did not have sufficient operational knowledge of the subject, were in need of interview skills and lacked experience to work with a tool, like the analysis. The students all considered it a good experience, but the 'client' was not completely satisfied with the result. This was partly due to the division in tasks between the students, each focusing on one or two interview categories. As a result the analysis was fragmented and it was not possible to develop an 'outline of a pilot', as the finishing touch in the final report. In fact it is the extrapolation of the findings into a 'concrete pilot', which supplies the client with a context related translation of the outcome of the analysis and what to do next.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- It is rather difficult for inexperienced students to conduct the analysis with a satisfying result for the client. The client in this case was a commercial company looking for real solutions. The students themselves thought that with some extra training they would be able to do it better.
- The students were having difficulties in interpreting the interview questions. They also had difficulties in interpreting the answers in relation to the question.
- Looking at the student reports it became clear that the 'overlay' (existing situation, desired situation, thresholds and solutions) one should apply when asking interview questions, was not applied properly.

- The students were clear about the stakeholder issue. To assure that the information given by the stakeholders can be correctly interpreted; one needs additional information on the position and the role of the interviewed.
- Changes to be made:
- Again, take a close look at all the questions, to see whether change is needed or the context should be more clearly stated. There might be another solution to increase the level of understanding for a broader user group.
- Add the 'Pilot outline' as a sixth category to support the integration of all findings into a 'context driven solution for a training or learning need of the company itself'. This will support the transition to the pilot phase in a very concrete way.

Case # 12 Service industry: organization for the development of standards

A. The context of the case study

A1 Company or organization

This service organization coordinates the development of standards and regulations, supplies information and offers training to promote the use of standards. There are approximately 2,000 specifically Dutch, 6,000 European and 9,000 international standards used in the Netherlands.

A2 Main activity of the company/organization (profile)

The organisation is considered the knowledge centre for standards. The focus in this case study is on the business unit Courses and Events, which organizes courses and events relating to standards and standardization aimed at top and middle management. The basis is the standard or practical directive as it is published by this organisation.

A3 Consultant, student, investigator

The analysis was conducted by a learning consultant. The consultant-investigator operated as an observant.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information and paperware.
b. Analysis framework report	X	Develop by the learning consultant, using the given format for reporting.
c. Specific information on learning and training	X	The main organizational and training model. And for example the quarterly bulletin of the training center.
d. Outline e-learning pilot	X	Short outline was developed and discussed.
e. User's guide	X	Available for the learning consultant.
f. Questionnaire: 'Attitude to e-learning' (client)	X	Both the pre and post test are filled in by all interviewees.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The learning consultant, not being the investigator, answered the questionnaire.
h. Observation (Investigator)	X	The investigator was not actively involved.
i. Participative observation (Consultant-investigator)		
j. Taped interviews	X	All interviews were recorded, but one. This was due to a broken device.

A5 Organizational level	Present	Additional information
a. Company learning strategy	X	
b. HRD & HRM		
c. Training organization	X	The Unit Courses and Events is responsible for external training offerings to support the main products of the organization.
d. Training program	X	
e. Training course	X	
f. Customer training	X	
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic	X	The added value of e-learning for the BU Courses and Events.
b. Tactical	X	Need for new organizational model for work processes, which include e-learning.
c. Operational		
A7 e-learning development phase	Present	Additional information
a. Start	X	The organization is at the beginning of e-learning development.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		
b. Information level	X	A majority of the representatives were on the 'information level'.
c. Initial personal skills		
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

- There is one main location in the western part of the country.
- Coordinator BU Courses and Events and the manager BU Courses and Events.

B2 Data collection plan

- Period: September 2003 – January 2004
- The sequence of activities was interrupted due to an internal reorganization, and caused a substantial delay in the conduction of the project plan. These delays also lead to an increase in time and effort to achieve results.

B3 Preparation of the visit

Two preparatory meetings with the two contact persons to plan the analysis process select the stakeholders and fine-tune the analysis framework approach for this client.

C. Case study observations and experiences

C1 Rational for the use of the analysis framework approach

The organization wanted to get a good idea of the possibilities of e-learning for the BU Courses and Events. There for it was decided to contract Cinop to conduct the analysis framework approach. The contact persons considered the analysis as a thorough, flexible and systematic approach, compared to the proposals from other consulting organizations.

There were several thresholds, considered to have a negative influence on the performance of the BU Courses and Events:

- Inadequate flexibility in the organisation of courses.
- Possibilities for tailor made solutions were restricted.
- Course material was too theoretical and not suitable for self study.
- The effectiveness of the courses was considered to be moderate.
- The production cycle time for courses was too long.
- Actual offerings served only a minority of the target group.

The expected added value of e-learning in this situation.

- More flexibility in time and place
- Diversification of course offerings (blended, online, coaching, collaboration, e.g.)
- Better integration with the daily practice.
- Application of active learning processes.
- Decrease of development time by using learning technology and a related workflow.

C2 Observations in the conduction of the analysis framework approach

There were two preparatory meetings with the contact persons. There were three interview meetings with different groups: (a) BU manager and cluster managers; (b) trainer-consultant and trainer; (c) manager of the BU publishing department and a

person responsible for marketing of the BU Courses and Events. The organization wanted to skip familiarization, because e-learning, as a general idea, seemed to be present among most stakeholders. So each meeting started with a short introduction of the analysis to create an appropriate level of expectations. A concept final report was produced and discussed with the contact persons. The final report was presented to the whole group of interviewees except from the trainers. All six participants used the e-learning attitude questionnaire at the start and four also filled out the post questionnaire at the end of the final meeting. The two who did not, were not present at the presentation of the final report.

Several suggestions were made for the follow up, like: the development of a course on safety with a large target audience; an introductory course for new employees and participants in the different commission boards; and a didactical upgrading for teachers on new and more efficient approaches for their teaching practice. These ideas were not developed into a project outline.

C3 Experiences of the consultant using the analysis framework

The basic analysis procedure could be followed. There were three interviews with different groups of stakeholders. This was done, because of the need to collect information from the different perspectives of the stakeholder groups, although the end user or eventual client was not involved. There was no pilot outline developed and this limited the view on the ability of the organization to use e-learning, and to see if the level of awareness had been raised by the analysis procedure. The client was positive about the final report, but obviously e-learning was not a priority at the time. So there was no follow up.

This was the first time that almost all participants filled out the attitude questionnaire. There were remarks made like: 'training problems might be solved by e-learning' and 'leads to the improvement of customer relations'. Interesting enough the first questionnaire showed a lot of 'don't knows' as an answer. In total seventeen. The second or post questionnaire only shows two 'don't knows'. The conclusion can be that people obviously have been influenced by the analysis and feel more confident in what they think of e-learning. This confirms the impression we had, that going through the analysis procedure, including this problem related interview and report discussion, is like going through a learning process for the participants.

D. Synthesis

D1 Conduction of the analysis framework approach

The analysis, conducted by the learning consultant, went well. The client was satisfied, but there was no follow up. The organisation was undergoing a reorganisation process and this was not the best period in time to do the analysis. Therefore the analysis took

Appendix H

so long. The outcome of the analysis was not surprising, but very much to the point and realistic.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- The focus of the analysis was on customer training, using one or the other service product of the organisation. This was the first time a analysis was conducted for such a situation.
- There was a combination of three interviews with different stakeholder groups to avoid a one sided vision. This worked well and in this sense it appeared that broadening the scope in this context is feasible.
- Going through the analysis procedure means going through a learning process. Although this is only confirmed by a small amount of data, it leads to the idea that this learning factor supports the use of the analysis in different circumstances.

Changes to be made:

- Add to the user's guide a remark on the 'capacity for change', or the 'readiness for e-learning'. One should ask if this is the right time to do the e-learning analysis, when other events are taking place at the same time, having a higher priority like reorganization.

Case # 13 Health care: Organization for special diseases.

A. The context of the case study

A1 Company or organization

The organization combines a clinic and a research center. The clinic functions as a specialized treatment center to improve remediation and the quality of life for the patients. The research center covers all major areas of research in relation to the specific disease.

A2 Main activity of the company/organization (profile)

The analysis has been executed for the department of radiotherapy with the focus on the paramedic group of laboratory employees. This group is considered to increase their availability for different tasks, so the organisation becomes more flexible.

A3 Consultant, student, investigator

The analysis was conducted by two learning consultants. The consultant-investigator had no role in this.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information and paperware.
b. Analysis framework report	X	Developed by the learning consultant, using the given format for reporting.
c. Specific information on learning and training	X	The existing organizational and training model.
d. Outline e-learning pilot	X	An outline was developed and discussed.
e. User's guide	X	Available for the learning consultant.
f. Questionnaire: 'Attitude to e-learning' (client)		Available, but not used.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	The two learning consultants filled out the questionnaire.
h. Observation (Investigator)		
i. Participative observation (Consultant-investigator)		
j. Taped interviews		
A5 Organizational level	Present	Additional information
a. Company learning strategy		
b. HRD & HRM	X	The need to increase the flexibility of employees in relation to the different work stations.
c. Training organization	X	Involvement of the training department of the organization.
d. Training program	X	Focus on radiology training programs, but with the intention to use the approach also for other departments.
e. Training course		
f. Customer training		
g. Other ...		
A6 Management level	Present	Additional information
a. Strategic	X	Besides the radiology department, the analysis was also used for the extrapolation of e-learning possibilities for the organization at large.
b. Tactical	X	Reflection in the form of pilot outlines of how to achieve the needed changes?
c. Operational		

A7 e-learning development phase	Present	Additional information
a. Start	X	The organization is at the beginning of e-learning development.
b. Pilot		
c. Integration		
A8 Stages of awareness (CBAM model)	Present	Additional information
a. Unaware		Certainly aware of the possibilities, but on the first place looking for ways to solve problems with e-learning and become familiar with the consequences.
b. Information level		
c. Initial personal skills	X	
d. Level of routine use of some aspects		
e. Extended impact level		
f. Contributor's level		
g. Leadership level		
h. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

- The organisation is situated on one location in the western part of the country. The main contact persons were the head of the training department, the head of the radiotherapy cluster of the paramedical group and the head of the IT unit.

B2 Data collection plan

- Period: January 2004 – April 2004.
- Time spend was about 40 hours.
- The contact persons eased the organization aspect for the conduction of the analysis.

B3 Preparation of the visit

There was one preparatory meeting with the contact persons, being the main stakeholders. Important was the decision to establish a e-learning project group, lead by the main stakeholders. In addition the meeting was helpful to get to know the limitations of the present training mode. This information, next to some other material, was used to tailor the questions to the organization and the situation. The interview items were adapted, by leaving out items, change items or adding particular

questions. This is not a company working for profit, but an internal training organization.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

The organization wanted to get a good idea of the possibilities of e-learning and the consequences, firstly for one of the clusters of the paramedic group and secondly to consider the usefulness of e-learning for the organization as a whole.

The main issue is that employees need to increase their availability to work in different places in the radiology department, so the organisation becomes more flexible. This is virtually impossible to achieve with the existing training methods and possibilities. The most important thresholds are:

- The lack of basic knowledge, so the start up programme takes too long.
- The availability of a simulator for training purposes is restricted.
- The availability of mentors is restricted.
- The students need to control their own performance and communicate this with their mentors, causing an administrative overload.
- The number of people who can stay up to date and informed is too small.

It is believed that e-learning can help to solve these thresholds.

C2 Observations in the conduction of the analysis framework approach

There was one intake meeting, two interview sessions, one session on the interim report and one on the final report. Also there was a pilot outline developed and discussed.

The analysis showed that e-learning could contribute to the solution in the following way.

- Offer entree level tests, so students know better what is expected and needed.
- Offer upfront course material, so students can prepare and extend their knowledge beforehand.
- The training situation becomes more transparent when students and mentors have access to information on progress and results.
- Offer additional exercises, which will reduce the use of the simulator or even can replace it.

When looking at the usability for the organisation at large, e-learning might help to:

- Acquire and train knowledge by using a case approach.
- Integrate and develop knowledge by the exchange of experiences and questions among the employees using the e-learning system.

Appendix H

- To test the actual level of knowledge and offer suitable learning materials and activities.
- Offer administrative functionalities for progress and study results.

Several suggestions were made for the follow up, like: the development of an entrée level test, learning content and assignments, the registration of progress and results and the development of an e-learning module for the introduction of a new planning system.

C3 Experiences of the consultant using the analysis framework

The basic analysis procedure could be followed. There were two interviews with different groups of stakeholders and the meetings on the intermediate report and the final report, which contained several suggestions for a follow up. The contact persons were a representative selection of stake holders, who would be involved in the follow up as well. There was a mix of different organizational levels in the discussion about e-learning. The interview could be conducted in line with the format, although some tailoring of items was needed. The categories worked well as guideline, taking the questions as 'exemplary' and to be formulated by the consultant. The focus of the interview was set by the client's main problems and issues, and the attention given to the introductory program for the department of radiotherapy. Clearly the interview helped to increase awareness of the client on the possibilities of e-learning. The best preparation for an analysis is joining such an event as a participating observer. The consultants divided up the work. One was taking the lead and did the talking; the other one added questions for clarification and took notes. It was possible to position e-learning relative to the needs of the target group, but this did not supply the consultants with a total overview of the companies' ability to use e-learning. It is an organization with twelve hundred employees, so more than a general view was not feasible. The consultants assessed themselves as 'sufficient to good' concerning their interview skills. The client was satisfied with both reports, but eager to know more about costs and time involved in developing a pilot. The analysis certainly is acceptable for the client and was qualified as doable by the consultants.

D. Synthesis

DI Conduction of the analysis framework approach

The analysis, conducted by the two learning consultants, went well. The client was satisfied. The follow up was there and involved the consultants. In any event it took quite some time to mature, before action was taken. This was a different kind of organisation, so the interview items needed to be adapted, also because the agenda was firmly set by the main problems and issues of the client. The division in categories worked well. In these situations though, the interview items clearly work better as reminders than as requirements.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- The interview items predominantly have a function as guide and reminder and not so much as a 'have to ask' item.
- The analysis though, was originally developed for the analysis in a business environment. To be fully operational in another environment, one needs to add, change and replace items to come as close as possible to the clients context.
- Some guidance is needed to apply this change process in an appropriate way.
- It would be helpful, when the consultants could refer to a broad collection of adapted interview items, developed for specific businesses, service organisations, and so on, especially when the items have shown to be useful.

Changes to be made:

- Add careful considerations to the user's guide for the adaptation process of the interview items to better support the interview process.

Case # 14 Food industry: producer of refined oils and fats.

A. The context of the case study

A1 Company or organization

The company produces and supplies refined oils and fats to the European food- and feed industries as well as to technical applications. The products are distinguished into commodities and specialties. There is a strong focus on the quality aspect and product safety. Also the environment issue is a focal point in the operation. The plant in the Netherlands is part of a world wide operating company with a strong representation in Asia.

A2 Main activity of the company/organization (profile)

The organization operates in a very competitive market and is very much process and result oriented. There is a shared responsibility for the performance of the organization and therefore training and learning is considered crucial for the empowerment of the employees. All employees should be well trained and fit for their job, while making maximum use of each others skills and competencies. Care for safety, quality, environment and working conditions are regarded as everybody's business. The care for employees is reflected in a balanced social policy. The company employs 200 people, with a majority working on a middle vocational level.

A3 Consultant, student, investigator

The analysis was conducted by a group of three part time master students participating in an elective course on 'e-learning in corporations' at the Delft University of Technology. They had a strong background in vocational education and training and worked as consultants at a vocational training institute in the western part of the country. The investigator was coach of this group of students and supported the conduction of the analysis.

A4 Resources	Available	Additional info
a. Information on the organization	X	Online information and paperware.
b. Analysis framework report	X	Developed by the students, using an adapted format for reporting.
c. Specific information on learning and training	X	The existing organizational and training approach.
d. Outline e-learning pilot	X	Several suggestions were made and

e. User's guide	X	discussed with the client.
f. Questionnaire: 'Attitude to e-learning' (client)	X	The student user's guide.
g. Questionnaire: 'Evaluating the use of the Analysis' (interviewer)	X	Used by almost all stakeholders. Five group levels were chosen as the most representative clusters of stakeholders.
h. Observation (Investigator)	X	All three students filled out the questionnaire.
i. Participative observation (Consultant-investigator)		The investigator was involved in the preparation, was present at one interview session and at the presentation of the final report for the main stakeholders.
j. Taped interviews	X	
A5 Organizational level	Present	Additional information
h. Company learning strategy		
i. HRD & HRM	X	The interviews were recorded and the information was used for analysis and reporting.
j. Training organization	X	
k. Training program	X	
l. Training course		
m. Customer training		
n. Other ...		
A6 Management level	Present	Additional information
d. Strategic	X	The need to collect information and reactions and discuss e-learning on the different levels to reach the main groups of stakeholders (operating on the levels b, c and d).
e. Tactical	X	
f. Operational		
A7 e-learning development phase	Present	Additional information
d. Start	X	Depending on the group of stakeholders, the analysis moved mainly on the strategic and tactical level.
e. Pilot		
f. Integration		The organization is bound to decide on e-learning, using the analysis analysis.

A8 Stages of awareness (CBAM model)	Present	Additional information
h. Unaware		
i. Information level		
j. Initial personal skills	X	The awareness of the need to find other ways to solve the training needs, was there. There was an upcoming awareness, fueled by the analysis activities, that e-learning might help to solve the problems.
k. Level of routine use of some aspects		
l. Extended impact level		
m. Contributor's level		
n. Leadership level		

B. The data collection procedure

B1 Sites and contact persons

The company is located in the western part of the country. The main contact persons were the human resource manager and the supply chain operations manager. One of the students was involved in training activities in the company prior to the analysis. This connection was an important incentive for the company to allow these students to conduct the analysis. There was no official contract, then the project proposal as part of the e-learning course.

B2 Data collection plan

- Period: March 2004 – August 2004.
- Time spend was about 170 hours.
- The preparation of the analysis was done in close collaboration with the main contact persons. The line of activities was extensively discussed and included the decision to interview at least five levels of stakeholders, to be able to develop a good insight into the readiness of the company to start using e-learning.

B3 Preparation of the visit

There was one official and several unofficial preparatory meetings with the contact persons for an introduction of e-learning and to make sure that the analysis was set up in line with their expectations. The analysis format was adjusted to the context of the company and five groups of stakeholders were selected and subsequently interviewed. These were: management, middle management, IT-employees, trainers and operators.

These groups were selected, because they were involved in the current activities concerning the training policy, training requirements, conduction of the training or as a participant. Each group counted at least three people. Each interview session started with a short introduction of the main features of e-learning. This presentation was adapted to the information level of the stakeholders.

C. Case study observations and experiences

CI Rational for the use of the analysis framework approach

Since training and learning were considered important issues, the desire to find other and new solutions for the current training needs was present. The opportunity to perform an analysis to see whether e-learning could make a difference was therefore welcomed.

The main thresholds to improve training and learning were considered to be:

- Difficulties in organising courses and training.
- The coaching and tracing and tracking of students.
- The storage, maintenance and retrieval of critical information for production purposes.

It is believed that e-learning can help to solve these problems, especially because training and learning can become more flexible and the digital storage of information offers new opportunities to access information when needed and from all locations.

C2 Observations in the conduction of the analysis framework approach

There were several preparatory meetings, five interview sessions, information exchange on the interim report and a session on the final report. During the final session, several suggestions for a follow up were discussed with the groups of stakeholders. Also at this time the stakeholders filled in the 'post attitude to e-learning questionnaire'. Students completed the 'analysis questionnaire' at a later moment in time.

The students have used the analysis, but in an adapted format. It was decided to reduce the number of categories and only use the interview items, which fitted into three main categories: (a) training level, (b) schooling and (c) knowledge. An important reason for this shift was the preference given by the contact persons, the limited available time for the interviews, and the wish to move as close as possible to the companies' context. This meant a major change in the format. The overlay in the analysis: existing situation – desired situation – thresholds and solutions, was used in the interviews. From there though, things were different. The focus was on these three categories, which in the context of the analysis are considered to be sub categories. The outcome of the interviews was described as an ideal picture of learning in the company. And this picture was converted into a number of success factors. On the basis of this ideal picture, three types of solutions were suggested:

Appendix H

1. Hire a training coordinator.
2. Outsource all training and learning activities
3. Apply e-learning.

These solutions were rated using a multi-criteria analysis. The basis for this analysis was the success factors, which had been given a certain weight in relation to their economic priority. The outcome shows that e-learning is the preferred solution and in line with the analysis information, three activities were seen as most favourable:

- The development of an online information and knowledge base.
- A website with an overview of course offerings and online courses.
- Training and learning using e-learning.

These activities can be considered complementary, but do not necessarily need to be developed at the same time.

C3 Experiences of the consultant using the analysis framework

The three part time master students having a strong background in vocational education and training executed the analysis. The analysis procedure was followed with some changes in the interview categories and the way the analysis was conducted to come to the final results. There was a good representative group of stakeholders, combined into five different groups of about three employees, ranging from the operator level to the management level. In almost all cases the interviewees were very cooperative and eager to contribute to the analysis. The IT group was reluctant, indicating that they had already an overload of work. To prepare for the analysis, one needs at least a hands on session, but joining as a participative observer in a real life session is a better way. The students took different roles: active interviewer, observer, note taker. The fact that one of the students was involved with the organization already for some time, made it easier to position e-learning relative to the needs of the company. Concerning the tasks of the interviewer, the students qualified themselves as sufficient and good. The reports were firstly presented to the HR manager to assure that the message was in line with the expectations of the client. The reports were well received. In general the conclusion was that the analysis procedure helped the client to further develop her opinion about the possibilities of e-learning.

At some point the interview items had to be explained a little bit more and in some instances the students felt that the analysis might not be an easy way for everyone to share their thoughts about e-learning. The students found that the analysis procedure was followed, also in the reporting. In fact there was an obvious divergence in the way the analysis was conducted and the report was structured. Important though was that the client felt comfortable with the results. Although a decision has not been taken yet, it looks like there will be a follow up.

When looking at the 'attitude to e-learning questionnaire', the students concluded that apparently there is a solid support for e-learning in the organization on all levels. Comparing the pre test with the post test, is helpful to see what has changed in the attitude or opinion of the respondents during the analysis procedure. In the pre test, 26% considers e-learning of little value, 47% think it is valuable and 27% sees it as very valuable. In the post test 25% think its valuable and 75% find e-learning very valuable. Apparently the opinion on the value of e-learning for training and learning in the company is rated higher after the analysis than before. The comments given in the post test, focus more on individual training programs and information management issues (maintain knowledge, save knowledge), than just on the flexibility topic. Interesting enough, the post test shows that the opinion of the respondents about e-learning has less discrepancy than in the pre test and the 'don't know' column is sparsely used anymore and indicates a reduction in uncertainty. All respondents believe that the analysis was a good tool for analysis. 100% is satisfied with the analysis procedure and 71% is satisfied with the results and would recommend the analysis to others.

D. Synthesis

DI Conduction of the analysis framework approach

The analysis, conducted by the three students, went well. The client was satisfied and most likely there will be a follow up for the students as consultant of the vocational training college.

The reduction in the number of categories, and the focus on such particular sub categories as the items (a) training level, (b) schooling and (c) knowledge, decreased the bandwidth of the analysis. As a consequence the analysis was not as thorough as it could have been. One issue, which the investigator qualifies as a missed opportunity, was the financial aspect. The company was willing to provide the numbers over the past few years, but in the hectic of interviews and reporting, this issue got lost. An interesting aspect about the different approach is that the sub categories were taken as a starting point, using the main categories as sub categories. So instead of the flow: category 'process' and then the sub category 'training level', the students switched: they took the sub category 'training level' as their entry level and then went through the main categories, looking at 'organisation for the training level', 'processes and the training level', e.g. subsequently the 'ideal training and learning situation was described', which was used as the basis for the development of the success factors. These factors then were used in a multi criteria analysis, to rate each of the proposed solutions. This was a tricky approach, since there was no validation of the factors, or of their rating or of the proposed solutions. Such a validation though, would have exceeded the level of this analysis exercise.

Appendix H

Although this different approach was criticized, it seemed to fit the priorities of the company. The danger is though, that the analysis gets entangled in the existing structure and situation, so new and other possibilities are not considered.

One other issue should be looked at carefully. Almost all stakeholders showed a 'solid support' for e-learning in the belief that this would help to solve problems. The management of expectations is important in any project, but especially in a situation where e-learning tends to be qualified as the ultimate solution.

D2 Conclusions concerning the portability and the changes to be made in the analysis framework approach (RQ 7 & 8).

Concerning the portability:

- Changing the procedure, and in this case also the bandwidth, does effect the character of the analysis and has consequences for the outcome. It does not necessarily effect the level of satisfaction of the client. One should be aware of this though, as has been pointed out before in the cases # 4 and # 6.
- It seems that training organizations like to add or change things in the analysis approach, based on previous experiences. As in case # 6, the analysis categories were adapted and another analysis approach, the multi criteria analysis, was added.
- Trying to zoom in on the companies' context is a good thing to do. One should be cautious though, not to get too much entangled in the existing structure and situation. It might effect the process negatively of looking for and applying other and new solutions.
- The 'attitude to e-learning questionnaire' shows that the analysis procedure seems to help the client in reducing uncertainty and building consensus about the usability of e-learning in their environment. This questionnaire should become an integral part of the analysis and consequently be upgraded using the experiences.

Changes to be made:

- Add information on the bandwidth issue using the experiences in this case study.
- Add evaluation of the 'attitude to e-learning questionnaire' to the analysis procedure for the consultant.