

375P NERVE PHYSIOLOGY REVISITED: AN INTERACTIVE TUTORIAL BASED ON EXPERIMENTS CONDUCTED ON FROG SCIATIC NERVE

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Some years ago we demonstrated a computer simulation program to the Society (Dewhurst & Meehan, 1986) based on a series of experiments conducted on the isolated sciatic nerve of the frog which is a common undergraduate laboratory practical. The program was written for the BBC microcomputer and used data from a "live" experiment to create the simulated responses. The software was accompanied by a paper-based student workbook containing exercises and tasks for students to complete after they had gathered the data. With new authoring packages it is a relatively straightforward task to combine these features and here we demonstrate a program which combines data display with interactive student-centred tasks making the program suitable for independent, student-centred learning.

The program was developed using Multimedia Toolbook® (Asymetrix) to run on IBM PC compatibles with the following minimum delivery platform: 386 SX, 20 MHz PC running Windows™ version 3.1 (Microsoft), a sixteen colour VGA monitor and a mouse.

It is menu driven and includes data for a number of experiments: stimulus strength - response relationship; refractory period; conduction velocity; effect of temperature; effect of a local anaesthetic (procaine). Simulated responses are displayed on a screen display which emulates an oscilloscope and students are expected to take measurements (using the cross-hair cursor facility provided) directly from the monitor display. Where appropriate these data may be plotted using a graph-plotter facility. There is a protocol for each experiment which explains how the data were recorded, how the student can select the variable (e.g. stimulus voltage applied to the nerve) and what the

student is expected to measure from the screen display.

Each experiment also has a number of tasks associated with it. For example, there are multiple-choice and true/false questions with feedback relating to interpretation of the results and the physiological properties of mixed nerves. Thus, students are expected to demonstrate that they have collected the data accurately and are able to interpret it. They are also asked factual questions on the physiology. Since the information to enable them to answer them is not contained within the program this should encourage them to refer to additional learning materials.

The previous program has been used successfully, to replace the traditional laboratory practical class, for many years in my university. Whether the new program could be equally useful to others depends, to some extent, on whether teachers are willing to accept the interactive tasks posed by the program as part of their curriculum. One advantage of having the student workbook in a paper-based format is that teachers can decide whether they want to use it as it stands or modify it to suit their own requirements.

Dewhurst, D.G. & Meehan, A.S. (1986) *Br. J. Pharmacol.* 89, 882P.

376P PHEN WORKSHOP: A SURVEY OF METHODS OF TEACHING AND LEARNING IN UNDERGRADUATE PHARMACOLOGY WITHIN HIGHER EDUCATION - 1996

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In the second survey conducted on behalf of PHEN, 339 questionnaires were forwarded to lecturers currently involved in the teaching of pharmacology in UK universities to find out about their current usage of traditional and non-traditional teaching and learning methods. Of these 288 were sent to lecturers in 'red brick' universities and 51 to the 'new' universities. In total 200 questionnaires were returned giving a response rate of 59%. Only 1% of the questionnaires returned had been completed by lecturers in the 20-30 age range with the majority being in the 40-51 year age group. Analysis confirmed that 93% of the sample did not have a formal teaching qualification, a factor that may be reflected in attitudes to student centred learning. For both groups the majority (84%) viewed their role as 'teaching organisers' (i.e. module leaders or course leaders), while 94% confirmed that they had only worked at two or less institutions, once again indicating the lack of movement and opportunity within the academic environment.

A comparison of the present usage of teaching and learning methods clearly showed that in all instances with the exception of 'Chalk & Talk' lectures (78%), the majority of pharmacology lecturers only used non-traditional student-centred activities occasionally despite unfavourable staff-student ratios. The actual percentage usage for the following teaching and learning methods are given in brackets; problem-based learning (37%), resource-based independent learning (25%), CAL packages (23%), video material (13%), and multi-media (4%), thus confirming the above observations. In addition, 58% did not actively encourage student participation, while methods of assessment including self (83%) and peer (85%) also showed marked under enthusiasm. In terms of attitudes to the usage of non-traditional

teaching and learning methods, although a large majority (81%) were aware of the possibilities, it was clear from the returns that they were not perceived to be vital for the academic health of the department. Although actively encouraged (72%) in most departments, it was highlighted that the development and usage of new methods was constrained by lack of time (70%) and the requirements to carry out research and or consultancy.

In addition to the above responses it was also confirmed that staff perceived the new methods to be more staff intensive (80%), but strongly disagreed (89%) with the concept that these would only be of use to the more academically able students or would worsen examination success rates (86%). Answers to questions relating to resource issues confirmed major deficiencies in many critical areas. These deficiencies ranged from a lack of IT (82%) and library (82%) resources to a lack of administrative (87%) and technical (79%) support, essential for either development or to match demand. All these problems being further compounded by high staff-student ratios (72%) and the lack of adequate teaching accommodation (78%).

It was also apparent that the majority of lecturers have a clear knowledge of the possibilities and a positive perception of non-traditional teaching and learning methods especially with respect to evaluation relating to external influences such as Teaching Quality Assessment Exercises. However, the 'Chalk & Talk' approach still remains a preferred option. Evidence suggests that consideration is given at departmental level but the overall culture for the promotion of these non-traditional methods is not of a sufficient degree to bring about a major change in current teaching practices, a fact further complicated by resource implications.