ISSN 1430-4171
http://journals.springer-ny.com/chedr
S 1430-4171 (96) 01002-3

Course Descriptions

General Chemistry, The City College of The City University of New York, Professor David Gosser

The Workshop Chemistry course at City College of the City University of New York has evolved over the past several years. This section of the first semester of general chemistry for science and engineering majors had an enrollment of 96 students. The course includes two lecture classes of 75 minutes each and a 2-hour workshop each week. In the workshops, the leaders facilitate groups of about eight students in problem-solving discussions and model building. At the end of most workshops, students take a 15-minute quiz that accounts for 15% of the grade. In the lecture, the student groups are asked to sit together; often the instructor takes time from the lecture and directs the groups to work together on problems related to the lecture.

Several leadership training workshops were held in the summer previous to the course and again during the semester. In these workshops, the leaders learned methods to help facilitate group interaction, and practiced specific materials, such as the round robin solution of Lewis Dot structures.

Three student surveys were administered during the course. They showed consistent approval of the workshop concept: 84% agreed that interacting with the workshop leaders increased their knowledge of chemistry, 82% agreed that interacting with other students increased their knowledge of chemistry, 66% said that they regularly explain problems to other students in the workshop, and 80% agreed that the workshops gave them new appreciation about how to do academic work as part of a team.

Baseline statistics of success rate (students obtaining an A, B, or C as a percentage of the initial class roster) in previous fall sections of chemistry offered before the introduction of workshops showed a success rate of 38%. The success rate in the workshop class of fall 1995, offered with a common final developed in cooperation with two other instructors, resulted in a success rate of 48%. This is consistent with success rates observed in workshop classes in previous semesters. For a class of 500 students, this translates into 50 more students succeeding in first semester general chemistry.

ISSN 1430-4171
http://journals.springer-ny.com/chedr
S 1430-4171 (96) 01002-3

Organic Chemistry, The University of Rochester, Professor Jack Kampmeier

The University of Rochester initiated the organic chemistry component of this program in Fall, 1995. The project, a collaboration between the Department of Chemistry and Learning Assistance Services (LAS), began during Spring Semester, 1995, when potential workshop leaders, successful completers of the previous semester's Chemistry class, were invited to apply for the positions. The organic chemistry professor and staff from LAS interviewed and selected the workshop leaders from the pool of applicants. All of the new hires were informed that the responsibilities of being a workshop leader included the completion of a training course. This two-credit course, taught by the director of LAS, provides both instruction and support for the workshop leaders. The course includes practical information (e.g., managing time, dealing with dominating students), a foundation in learning theory (e.g., the work of Perry, Treisman, Belenky), and guidance about the specific components of the workshop lessons. Course requirements include keeping a weekly log or response journal, and completing an oral and written report on a topic of special interest to the students. For instance, one leader has examined the special considerations of nontraditional students in the study of science. Another looked into the impact of different learning styles on the study of organic chemistry.

During the last 30 minutes of each training class session, the chemistry professor reviews and clarifies the materials of the next workshop session. The materials they have developed for the workshop program focus on fundamental ideas and the consequences of those ideas.

In the organic chemistry course itself, a large class with a typical enrollment of about 300, students were asked to choose between the traditional recitation format (review sessions led by graduate teaching assistants) and the workshop program. It is important to note that the workshop materials were made available to all students, regardless of their choice. Interestingly, the class divided itself down the middle, with about one half choosing each option.

The response to the workshop program has been very positive to date. Both students and leaders report that the workshops have been beneficial, and the semester's final grade roster reflected a significant increase in grades (about a 0.3 grade point improvement) and in retention (a 10% improvement) for workshop attenders compared to their peers who chose the more traditional recitation format. The cycle is now ready to be repeated; new workshop leaders will be selected from the fall 1995 semester's most successful students.

ISSN 1430-4171
http://journals.springer-ny.com/chedr
S 1430-4171 (96) 01002-3

General Chemistry, New York City Technical School, Professor Victor Strozak

The Chemistry Department at New York City Technical College (City Tech) implemented a pilot workshop course in CH110, General Chemistry I, for Spring, 1995. After a successful experience with the pilot course, a full-scale workshop course was offered for Fall, 1995. The City Tech program goal is to integrate the workshop approach into the traditional three-hour lecture, three-hour lab format that is currently used in General Chemistry I and II. The two-hour pilot workshop that was part of one section of General Chemistry for Spring, 1995 was added to the three lecture hours and three lab hours. Thirty-eight students enrolled in this course, and all but two completed it. The Fall, 1995 workshop section of General Chemistry also included three lecture hours, two workshop hours, and three lab hours. Forty-nine students enrolled in this course, and all but five completed it. The department has charged the professor with revising both the lecture and laboratory components of the general chemistry course so that lecture, workshop, and laboratory activities will be coordinated and integrated.

The CUNY Workshop Chemistry Manual was used in the spring semester. A revised version of the manual was used in the subsequent fall semester. We plan to continue to use this material and revise both the manual and the curriculum until we achieve a complete integration of lecture, workshop and lab.

In each semester, a required two-hour workshop was added to the regular course hours. In the first semester, the class was divided into six groups comprised of six or seven students. However, only three workshop leaders were recruited, so it was not possible for each student group to have its own workshop leader. As a result, the professor and the three workshop leaders circulated among the groups and assisted them as needed. In each workshop session, students worked on group workshop activities or problem sets chosen form the CUNY manual. In the following semester, the course followed a format similar to that of the previous term, but with sufficient workshop leaders to provide each group with its own leader. Group size was relatively constant at seven students per group.

During both semesters, the workshop leaders met with the professor once per week, for one hour, to learn how to manage and direct a group as well as to prepare for the following week's workshop. These meetings usually followed the workshop so that the leaders could discuss problems they were experiencing with the workshop groups, exchange ideas on how to best manage their group and have an opportunity to plan for the following week's workshop. Leaders were trained in the round robin method of promoting group interaction,

ISSN 1430-4171
http://journals.springer-ny.com/chedr
S 1430-4171 (96) 01002-3

and they frequently practiced this method by working as a group on one of the problems for the following workshop. The professor served as the group leader for these sessions.

Bridge to Chemistry, The City College of The City University of New York, Professor Stanley Radel

Bridge-to-Chemistry has been offered at City College and the Borough of Manhattan Community College as part of the CCNY Chemistry Workshop Program. This module-based course, which is designed to provide a jump-start for students intending to take first-year chemistry in the future, consists of 15 three-hour team workshops that include problem solving, model building, graphing, and other skills. Each workshop consists of no more than 10 students divided into two subgroups and guided by a peer leader. Workshop leaders are experienced undergraduate students who have been chosen on the basis of their previous workshop performance, their command of the English language, and their ability to get along well with other students. Bridge-to-Chemistry has been offered during intersessions and during the regular semester, and has been taken by about 150 students since January, 1995. Performance data show that the passing rate of Bridge students in first-year chemistry is greater than that of the class as a whole.

Principles of Organic and Biochemistry, St. Xavier University, Professor Pratibha Varma-Nelson

Principles of Organic and Biochemistry, a course primarily for St. Xavier University students pursuing a nursing degree, consists of four 50-minute lectures and a two-hour lab each week. During Fall, 1995, two sections of this course included workshops, with three students and the instructor leading the groups for the 76 students enrolled. The fourth lecture each week was usually converted into workshop time. The workshop materials, prepared by the instructor, require that the students read the text and complete assigned problems beforehand. The problems used for the workshops are ones that previous semesters' students found difficult. When appropriate, topics not covered in lecture are introduced in the workshops.

Attendance at tutoring sessions outside the class has been consistently higher for the workshop students. In fact, the demand for help following a workshop session has been so high that leaders have donated two additional hours of their time per week to conduct

ISSN 1430-4171
http://journals.springer-ny.com/chedr
S 1430-4171 (96) 01002-3

help sessions. In the past, tutors often spent the entire hour doing their own homework because students did not come for help. In the workshops themselves, students definitely preferred to work with the student leaders, rather than the instructor. It is surmised that students felt more comfortable asking for help from a peer.