INFORMATION AND EVALUATION FROM INSTRUCTORS OF THE SPRING 1996 SEMESTER ON-LINE COURSE "ENVIRONMENTAL AND INDUSTRIAL CHEMISTRY"

Donald Rosenthal, Chair CCCE
Department of Chemistry
Clarkson University
Potsdam NY 13699-5810
E-mail: rosen@clvm.clarkson.edu

I. INTRODUCTION

Previous articles have described the on-line course (1), presented information and student evaluation summaries (2) and provided some evaluation from James Beard (chair of the course organizing committee) (3). In this article information obtained from a course information and evaluation form filled out and returned by sixteen of the course instructors will be summarized.

II. COURSE DESCRIPTIONS

Each instructor was asked about the course as taught at his/her school. Since similar information was obtained from the students and has already been reported (1,2) and detailed descriptions are available about courses taught at nine of the participating schools (4), no summary will be provided here.

III. STUDENT PAPERS

More detailed information about student papers is described elsewhere (1 to 4). The comments below are from instructors and are generally quoted in unedited form.

(1) I was not aware of any problems during the submission of our students' paper. For this reason, I ASSUMED that the paper had been successfully submitted, and I did not request any confirmation from George Long. (N.B. - George Long was in charge of the course website.) Since he did not receive our students' paper, he did not confirm receipt of it and I continued to be ignorant of our problems. I have mixed emotions about our failure to submit the paper. . . . I'm not sure that our students knew much more about the topic than they had already found and written into the paper. Furthermore, problems encountered by my students while sending e-mail would have been multiplied if they had tried to respond to many questions from participating students in other colleges. Basically, we have a two-tiered e-mail system, one for faculty and staff, in which older bugs with "bitnet" addresses have been removed, and one for students, in which there are continuing problems. This realization may have been the major finding by our students and faculty during this course!!

(2) Need to have much better planning for the student paper preparation in the next offering of this course. Rules, possible topics, and exact requirements should be handled ahead of registration and should be listed specifically on the course home page, Faculty should be encouraged to make the student paper assignment as a definite requirement for this course!

(6) From the pre-course information, we thought group papers submitted to the website were not optional. We were disappointed that every participating school did not post a paper. I suggest better cooperation from participating schools, more requirements and a common syllabus.

(8) I suggest there should have been two deadlines - One deadline for early papers from which the two student papers to be read and discussed by all course participants are selected (This deadline was established.) - A second deadline for additional student papers.

(9) The students learned a LOT about writing papers with others when writing that one paper together!!! They learned a lot about the writing styles of others and the need for organization and being thorough with their portion of the responsibility.

(10) The major problem that we encountered is that our semester started relatively late. This gave us little time for an introduction to environmental chemistry. Very early in the course the students had to select topics and begin working on their papers. The first month of the course was a lot of work for everyone. I know that it was not possible, but it would have been much better for us if our semester had started at least two weeks earlier. We had three weeks of the semester

remaining after the end of the on-line segment.

(17) I was not aware of the source of the student papers and had prepared my syllabus without mention of them. The question of student papers seems to be a major source of misunderstanding, now as well as during the course. I am satisfied with the way it was handled. It seems that some may think that it is unfair that some students had to and other students did not have to write papers. If student papers continue to be part of other courses of this type, please keep them optional. Allow free participation by all those who are interested. Course requirements should be determined at each local school.

IV. DISTRIBUTION OF PAPERS VIA THE WORLD WIDE WEB

Course instructors were asked whether the format of papers as they appeared on the WWW was satisfactory.
93 % satisfactory
7 % unsatisfactory

Specific comments:

(9) Preferred HTML format so papers could be read on-line (N.B. some student papers were available on the WWW in RTF or text format and not HTML format).

(11) I appreciated having access to preliminary copies of some of the expert papers available weeks in advance.

(12) In the future, I hope a CGI-BIN form could be added to allow comments to be posted on the web page, and viewed by subsequent readers.

(13) It would have been good to standardize format. Perhaps all HTML.

(17) One of the papers could have been better edited to appear more unified and less disjointed.

V. OLCC-STU DISCUSSION LIST

This Listserv was designed to provide interaction between authors and students, and between students.

Instructor evaluation of OLCC-STU
88 % Satisfacory
6 % Unsatisfactory
6 % Abstained

Course instructors read or skimmed the discussion.
The average percentage of discussion saved or printed by the course instructors was 60 %. (S.D of mean = 12 %). 35 % saved or printed all of the discussion. 18 % saved or printed 0 to 4 % of the discussion. The discussion was archived on the website and the OLCC-STU discussion list. Some instructors sorted the discussion and archived them in separate folders or mailboxes by paper. (I printed each of the messages and sorted them by paper and topic. None of the course instructors seem to have done this.)

Most of the course instructors read all of the discussion.

Some specific comments:

(1) I believe we made an error in designing OLCC-STU when we decided to have papers from "experts". I wish we had referred to them as "authors", "moderators", "discussion leaders" or "resources", so that students would have felt more equal to them when writing their questions. Many students thanked our experts for sharing their time with us. Unfortunately, we never convinced the students that the experts were really approachable. Some students definitely had the feeling that they had one chance to petition the expert for information. This feeling encouraged, if not caused, a one-way flow of information, instead of a broader discussion which I would have preferred. In particular, there were very few conversations among students to obtain information. Even the answers to questions about the student papers seemed to be a one-way flow of information.
How do you encourage students to have more confidence and to take more initiative and responsibility for their own education? I believe you have to take the fear away from the students and encourage them individually. For this reason, our class met weekly. There were lively discussions about environmental and industrial chemistry. We were not completely successful, as evidenced by the few questions posted by our best students. We would like to try again and I would sign on to a similar course in the future.

(2) Insist on accurate and definitive subject lines for each message!!! Continue the procedure of NOT allowing faculty to post to the OLCC-STU Listserv. This should be

preserved as the student domain!

(4) I wasted a good deal of time pairing questions with answers. In those postings which were answers to specific earlier postings, I would have asked that the earlier question be included in the response in its entirety - though possibly broken up sentence by sentence to clarify which question was being addressed - and that the response keep a fragment of the question header including time and author. This is not too different from what was, in fact, done. I would have preferred to be able to count on it since it would have saved me a lot of time. This could lead to a string of comments being transmitted - and being available together.

(5) It would be useful if someone (a moderator) could format the titles to some standard form so sorting and reading could be done more intelligently.

(6) Getting used to a high volume of mail, and maintaining multiple threads of discussion are challenges to novice e-mailers.

(9) Use a bulletin board or notes format in the future with a bulletin board or note number for each paper. . . need to separate subjects - - have authors post discussion questions - don't stratify the timing so tightly.

(12) I think it would be a big advantage to use eudora or something similar. The students had more problems than I did since they typically can't use eudora and are given only a small amount of disk space.

(13) Quality of discussion was very mixed. The best response was generated to the student papers.

(17) I know that some were overwhelmed with the number of messages arriving. I feel that the lesson in organization and information management was an important aspect of the course. Consistent adherence to the instructions concerning use of subject lines would have been a big help. "Question for Dr. Trehy" as a subject line does not say a lot to many people and it turns out to be useless when one looks through the index in order to find something.

VI. OLCC-FAC DISCUSSION LIST

This Listserv was designed to provide interaction between course instructors, expert authors of the papers and the organizing committee. Instructors had an opportunity to ask questions, to make suggestions and to discuss various aspects of the course.

Instructor evaluation of OLCC-FAC
82 % satisfactory and useful
18 % abstained

Most read and saved messages.

The average percentage of discussion saved or printed by the course instructors was 65 %. (S.D of mean = 8.5 %). The percent saved or printed varied from 4 to 100. 25 % of the instructors saved or printed all of the discussion.

Specific comments:

(2) I knew exactly what to expect by monitoring the OLCC-FAC Listserv. Any local instructor had equal opportunity to ask and participate in the OLCC-FAC discussion for smooth course operation.

(4) There was far more use of it in the semester before the course was offered. I gather we were all busy with other work while the course was being offered. There wasn't time for discussion!

(17) I soon realized it was not necessary to respond to all messages. I did try to respond promptly to some messages.

VII. ON-LINE QUESTIONS AND DISCUSSION

88 % Found the scheduling of questions and discussion to be satisfactory
12 % Found the scheduling to be unsatisfactory

Some specific comments:

(2) It was difficult for some schools to work around the various spring breaks (but this is unavoidable).
I would like to see a larger portion of the full semester used for the on-line portion (start earlier and finish later). This would likely hurt schools on the quarter system. Perhaps if more offerings occur, separate discussions might be designed for the semester and quarter courses.

(4) Perhaps the question and discussion periods could be shortened a bit.
It was different from what I'd expected, but my sense is that it is quite similar to what happens when a seminar speaker comes as long as
(a) there are more than a few minutes available for questions, and
(b) faculty stay out of the discussion.

(8) Some more focussed suggestions for starting off discussions.

(11) More time for questions would help in some cases. We did not get the level or amount of student discussion I anticipated.
(12) Looking back, I would make the discussion period longer, and try to move away from a rigid question and answer session.
(14) Especially towards the end, it got confusing. Some way of keeping the questions and answers to separate papers separate would have been very nice.
(15) More time is needed for questions and discussion.
(17) With three weeks before the start and two weeks at the end (at my school) it would seem that some of that time could have been used to extend the discussion time, but if I were to do it again, knowing what I do now, I would want to use that time to help the students get organized and to get in the mood (correct attitude) for working on-line.

VIII. SOME EVALUATIONS

Evaluation scale 1 to 5 -
1 is Poor, 3 is Average and 5 is Excellent

(a) Overall evaluation of on-line papers
Average evaluation = 4.08, S.D. ave. = 0.11, n = 17

Comments:

(2) Expert papers need to be "hotlinked and interactive" as were the student papers.
(6) Student papers were written for a student audience; expert papers were edited professional papers, not intended for a student audience . . . many things left unexplained, and the quality of the student response showed that.
(9) Papers did not offer areas for discussion. Rather they were a description of processes and systems about which students knew little. In the future, similar papers with a series of questions, discussion areas of interaction or politics could stimulate more discussion.
(10) The major difficulty I had as an instructor was to put the papers in context -- to provide background. Most of the references in the expert papers were inaccessible to us.
(12) All the papers were good, but the lengths were inconsistent.

(b) Overall evaluation of OLCC-STU questions, answers and discussion
Average evaluation = 3.64, S.D. ave. = 0.20, n = 14
(The average evaluation by the course students was 3.86)

Comments:
(2) I would like to see more technical questions posted by the students that would produce more actual discussion of chemistry in the answers and subsequent discussion. This began to occur toward the end of the on-line session.
(4) Our students reported being quickly overwhelmed by the volume of discussion. Because the faculty couldn't know what to anticipate, it was difficult to focus our local discussions. After a seminar, if there is a question which we do not understand or which doesn't interest us, we tend to ignore it and turn our listening strength back up to high when the next question starts. We aren't experienced in doing that with text.
(6) It got better with time.
(9) Students asked questions largely because that was how the course was structured. Most of the students were juniors and seniors. We functioned pretty well that way. In the future, how about beginning with one expert paper as a model, then student papers with expert (supportive) comments extending areas for discussion . . . to promote student work and discussion.
(10) Many questions were fairly simplistic and required answers that the students could have found by themselves. Other questions were trivial. I expected more interactions between students.
(11) Ranged from trivial to well thought out. Expert answers 4. Some answers were too shallow, and some bias was evident. Student answers 5
(12) There were redundancies, and some trivial questions - though the majority were very good
(13) Mixed in quality. Some screening at each institution might have helped.
(14) I was hoping for more discussion between the students but there was very little of that. I guess I shouldn't be surprised since discussions in class are even hard to get started.
(15) A mix of very good, very bad and in-between questions (as expected)
(16) Excellent! I was surprised and delighted with the general sophistication of the student comments and questions.

(17) While some of the questions were very good, others probably should not have been asked. If I were to do it over, in the classroom I would challenge them as a group to evaluate each others' questions before posing them on-line.

(c) Overall evaluation of OLCC-FAC
Average evaluation = 4.06, S.D. ave = 0.17, n = 16

Comments:

(2) This is only as good as the participation of the ones using it. It could have been more useful, but each of us was extremely busy with this experiment which was probably in addition to our normal duties.
(4) The experience we received from this communication was helpful. The authors of the expert papers were very responsive to questions. The format allowed us to offer a course on this subject to only two students, and "bring in" real expertise.
(6) Often helpful and useful . . . I expected there would be more traffic than there was . . . were we a bunch of lurkers?
(10) I would have preferred more discussion between faculty on how they were conducting the course at their location. However, I certainly didn't provide much information.
(11) More use by individual teachers would have helped us all.
(12) I had hoped for more discussion of what the students were thinking about. With a few exceptions discussion was mostly technical.
(13) Useful for networking of instructors
(14) Good information and exchange of information
(15) There should have been more instructor participation.
(16) I thought it all went better than we had any reason to expect. It was after all an experiment. I think it was a huge success.
(17) I am strongly in favor of more faculty interaction on any level. I seek it out on my campus and would have liked to see more more of it on OLCC-FAC, but I think that available time did not permit greater involvement by faculty.

(d) Best paper
14 % of course instructors rated Paper 1 best
14 % rated Paper 2 best
36 % rated Paper 3 best
25 % rated Paper 4 best
11 % rated Paper 5 best

The average evaluation of the best paper was 4.35, S.D. average = 0.17, n = 13

Comments:

(1) The author was careful to introduce many topics related to environmental and industrial chemistry.
(2) It contained the most technical chemistry content and probably induced students to learn more actual chemistry than the other papers.
(3) This paper presented more issues that the students could discuss and debate. Since the issues were not black and white, the students had to consider more of the complexities of the real world.
(4) We did not work with all the papers.
(6) The students from Niagara did a fantastic job . . . well researched, well written. They were knowledgable. Responses were every bit as good . . . writing to and for other students . . . I was completely impressed with their efforts.
(9) Lent itself best to discussion
(10) This had more technical information on actual chemistry.
(12) The student papers were at a better level for the students and took more advantage of the World Wide Web.
(13) The two student papers did the best job of engendering discussion. The quality of the expert papers was excellent.
(15) Well written - very interesting
(17) It was well written with a lot of first-hand information (obtained from their tour). I would have liked to see a "purpose" for the paper and an analysis by the authors of the situation with conclusions.

(e) Best discussion
27 % of the course instructors rated the discussion of Paper 1 best
20 % Paper 2 discussion best
0 % Paper 3 discussion best
10 % Paper 4 discussion best
43 % Paper 5 discussion best

The average rating for the best discussion was 4.38
S.D. ave. = 0.14, n = 13

Comments:

(1) Questions were wide-ranging and thoughtful.
(2) This paper created the most questions, answers and discussion. Students responded very rapidly, providing an opportunity for follow-up discussion. It was the most comprehensive of all the papers.
(3) See (d) above
(5) Probably because everyone was fresher and ready to start. Also, this paper needed a lot of clarification to help the group see the underlying chemistry.
(6) We got the "hang" of it . . . lots to comment on.
(8) the most "chemical"
(9) had the most ethical and political ramifications
(10) This paper was more general and required less knowledge to pose good questions. The subject matter was more controversial.
(12) More comments for this paper. I think this is because the students were more familiar with the medium.
(15) Maybe because it was the first paper, there was considerable motivation.
(17) I feel that he was excellent and to the point in answering questions. He seemed very relaxed.

IX. WHAT LIKED BEST ABOUT THE ON-LINE COURSE

(1) The opportunity to participate!
(2) It was a demonstration of the teaching effectiveness of the Internet for national distance learning coursework. It introduced our students to a communication medium that they will be using in many ways for the rest of their careers. It demonstrated a national collaborative effort among teachers and students in Chemistry.
(3) The opportunity for the students to consider various sides of the issues. Through the discussion they were able to give and take.
(4) The dedicated involvement of industrial chemists, and students at other schools, which gives our students an additional window.
(5) The wider discussion group than is possible on a small college campus.
(6) the diversity of backgrounds of the participants, and the wealth of viewpoints, comments and questions
(7) the variety of students enrolled
(8) the exposure of my students to policy issues linked to science
(9) brought new information that would have been difficult for me to collect alone
(10) a- The opportunity to have our students interact with industrial chemists
b- The requirement that the students use e-mail and the World Wide WEb
(11) The timely thoughtful answers from student authors - This clearly showed other students what is possible.
(12) My students were very excited about the course - that made it fun to teach
(13) the availability of experts - the way students worked with each other across national and international boundaries
(14) the way the students got interested in the topics and in the Internet
(15) Ability of students to access material not covered in a traditional course - ability of students to interact with the authors and other students - flexibility of the work
(16) Brought together students and faculty from diverse academic institutions
(17) The opportunity for a wider range of interaction for the students as they learn from other - both authors and readers

X. WHAT LIKED LEAST ABOUT THE COURSE

(1) Our local failure to enable and encourage students to send e-mail.
(2) I felt like a slave to my computer terminal for about one hour each day this semester. We need to make this virtual classroom more personal in some way. I miss the student to faculty one-on-one interaction that occurs in the regular classroom.
(3) The students viewed the authors with too much sense of authority.
(4) Coming in on Monday to find over forty e-mail messages
(5) The large volume of e-mail found in my box every morning
(6) That there was no background provided for the "expert" papers. None of my students had any industrial experience. . . A primer paper on how chemical industry works is a must if I do this course again.
(8) I wish the balance had been a bit more toward chemistry. The course seemed roughly at the sophomore level and I would have advertised it that way had I known far enough in advance.
(9) the message system and no time to apply a foundation for discussion
(10) the huge amount of e-mail generated
(11) An overwhelming load in OLCC-STU at times in February - many of the messages were trivial

(12) The information glut
(13) The mixed quality of the discussion
(14) Trying to keep track of the questions and answers
(15) Huge number of messages, my students suggested maybe having a smaller number of institutions or students participating or having another way to "pace" the messages - they were overwhelmed by all the messages and questions they received - sometimes not enough time to digest all the information
(16) The time it took - For me, it was effectively a very small overload.
(17) The short time for discussion on-line

XI. ADVANTAGES OF ON-LINE COURSES

(1) Wide-ranging topics, and more freedom to relate to students.
(2) Instructor expertise can be applied on a variety of topics for the smaller college curriculum.
(3) It allows the mixing of ideas and learning over a more diverse student population. It also allows us to marshall resources which might not be available to individual institutions.
(4) See my answer to IX above
(5) A pooling of talents and expertise not available otherwise
(6) flexibility of hours, ease of communication
(7) easy access to experts at little expense
(8) broadening of our departmental offerings without addition of faculty; ease of monitoring student discussion
(9) multiplicity of expertise
(10) See my answer to IX above
(11) discussion and cooperation between students on different campuses - up to date material presented by both experts and by students
(12) There are many - the access to experts and information is very powerful - the students ability to research a particular issue and then respond to the list immediately also is an important advantage
(14) exposure to information that we do not have at our school
(15) See my answer to IX above
(16) Expands the meaning of an academic course
(17) wider involvement of the students and the opportunity to communicate with authors directly and in "real time"

XII. DISADVANTAGES OF ON-LINE COURSES

(1) Technical difficulties and fears about using e-mail
(2) The actual workload for this course seemed to be much higher than I expected. Perhaps this only comes with the first offering of such a course.
(3) The students often had trouble dealing with the large amount of diverse incoming e-mail.
(4) Not appropriate for groups as large as the one this semester. It takes a LOT of organizational work, which is not easily done because the faculty never met face to face. The paper-discussion format seems inappropriate unless students are beyond the introductory level.
(5) Little face-to-face discussion - I lose the ability to evaluate the presenters and their personalities.
(6) Managing high volumes of mail (but not a major problem).
(8) less control of what happens (in a course run by this many institutions); harder to change flow of course if instructor wishes to
(9) spend time opening messages rather than communicating
(10) The necessity of designing the course to be applicable to a diverse student and institution population
(11) growing pains - variety of requirements between different campuses
(12) Students were overwhelmed with information at first. They also would occasionally lag. Then they were lost.
(14) too much mail some days

(15) See my answer to X
(16) The additional time it takes
(17) We had several challenges with hardware breakdowns - so that would be the disadvantage in my mind. One student used his own computer exclusively and missed a portion of the course when his hard drive crashed. In the future, I would require them all to have accounts on the school system.

XIII. CHANGES WHICH MIGHT HAVE IMPROVED THIS COURSE

(1) Get rid of the "experts" and designate them as "authors" instead
(2) Preregistration would help plan for the total number to be handled (you will probably need to restrict registration next time to between 75 - 100 students) and allow those pre-enrolled to start paper preparation to obtain better student papers. Consider different offerings for those schools on the quarter and those on the semester systems.

See if expert papers could be created that were more "interactive".

(4) Limit the amount of communication from any one student on any one paper or set of papers, in the way that faculty moderating discussion in a classroom would delay recognizing those who had spoken previously. We had expected that our two students might work with others on preparation of a joint paper. That possibility (a) is important to those students enrolling at sites with few other course students, (b) needs more support from the organizing committee, if just to better describe it to faculty.

(6) Better cooperation between participating schools

(8) copies of the papers well in advance of the start of the course (our students registered in November — it would have been nice to be able to give them a better idea of the emphasis of the course)

(9) use a bulletin board and notes - use more student generated papers and experts facilitating and promoting discussion

(10) Have all the papers linked to web site references or use readily available hard copy sources.

(11) We are clearly now in a position to suggest things to try differently the next time or for a larger experiment. I do not think that less or more planning would have been better - we hit very close to an optimum.

(13) Some screening of responses - Otherwise I think it was very successful.

(14) organize the mail better

(15) Smaller groups participating - fewer papers to be studied and/or make the class longer - consider the fall semester to avoid conflicts with different spring breaks

(17) Locally, I would make changes in the requirements of class meetings locally and include the possibility of student papers.

XIV. ADDITION COMMENTS OR SUGGESTIONS

(2) Should a formal proposal be submitted to ACS to fund this course on a continuing basis?

(8) We used an outside expert of our own (a recently retired industrial chemist with an interest in environmental chemistry) to be a resource for the students and to help read and grade their final papers — this was an enormous relief for the faculty member in charge (i.e. me)

(10) The utilization of web based references in Paper 5 was extremely helpful.
I would like to thank the Organizing Committee and others who worked on this course. My students and I learned a great deal. It was worth the time and effort.

(11) We need one or more follow-up attempts. The electronic record of this trial should be kept available on the www.

(17) One of the great challenges we face is the great quantity of information on the Internet presented without review of any kind. In a course such as this I would emphasize the need to critically review information presented in an open forum such as the Internet. The students must be taught to realize that defense and peer review are important parts of scientific information presentation. If they think that just because it is on the Internet, it is authoritative, they need to correct their thinking!

XV. AMOUNT OF WORK REQUIRED OF EACH STUDENT

82 % of the course instructors believed the amount of work was About Right
18 % Too Little
(Student responses to this question - 83 % about right, 17 % excessive)

Comments:

(2) About right for my students whose paper was selected for on-line discussion. The student on-line defense of their own paper was a very productive portion of the course at our school. It would be good if all students could benefit from some type of experience such as this. Perhaps a "paper exchange" could take place between "non posted" schools in which they could ask questions of each other in private messages off-line.

(10) The reading and discussion of five on-line papers and the writing of one paper did not come close to making sufficient work for a three hour course. I should have made it a two hour course, but I thought it better to overestimate. Since this is not a required course and our majors don't have any electives, all the students took this as an extra course on top of their regular courses. This lowered the priority.

(14) Too little, but that was partly my fault for not requiring more off-line work.

(17) I originally planned for much greater student involvement in the discussion than they ever achieved. Perhaps all of the two weeks for each paper could be designated for

on-line discussion with the second of the two weeks as the time for the author to respond to questions. I imagine that getting a commitment for two complete weeks from the "experts" would be difficult.

XVI. AMOUNT OF WORK REQUIRED OF THE INSTRUCTOR

79 % About right
3 % Too little
18 % Excessive

Some comments:

(2) It seemed excessive for this first offering. My students' paper was selected which required additional effort. I would do it again, just plan more time to be spent. It was probably not as much effort for those who did not submit papers, or did not have student papers on-line. This inequity needs to be addressed so that all local courses will share in the total effort put forth in this course. The intercollegiate competitive nature of this course must be maintained and encouraged. Student papers should be made a firm requirement. Many chemists will be hesitant to make their students WRITE! But it should be encouraged, because the writing component of this course is one of its strongest attributes.
(4) The work wasn't really excessive (except for the organizing committee), but it was more than I had anticipated and, because it put me at the maximum load faculty are allowed to have, more than I could easily handle. It was a load I hadn't previously learned to handle efficiently. It was a load that I couldn't easily move to different days and times.
(5) This course was in addition to my normal load. So it became excessive for me. If it was part of my normal teaching load, it would have been about right.
(6) I had a very enjoyable course.
(8) Once it got rolling, nothing much required. At the beginning, a bit of an overload.
(10) Like the students, I undertook this course in addition to my regular course load (Organic I and II, three labs, half of our non-science major course and two research students). As a result, I was unable to provide as much additional material and homework as I had wished. If this had not been an uncompensated overload, the amount of work would have been about right.
(13) This course was done as an overload on my part to make it available to students.
(16) About right, but in my particular case it was an overload.

XVII. INTERESTED IN PARTICIPATING IN A FUTURE ON-LINE COURSE

88 % Yes
12 % Maybe

(4) Yes, if the topic would supplement what we can offer our students

XVIII. INTERESTED IN HELPING TO PLAN A FUTURE
ON-LINE COURSE

56 % Yes
19 % Maybe
25 % No

Comments:

(5) Yes, depending on the topic
(17) Yes. Since we have no chemistry major, I would like to see the topic "Environmental and Industrial Chemistry" is one I would like to see repeated, perhaps with different authors and/or papers, since it fits so well into the Environmental Science major that we do have.

XIX. REFERENCES

(1) Computers in Chemical Education Newsletter Spring 1996, p. 17 to 20
(2) Computers in Chemical Education Newsletter Fall 1996, p. 9 to 18
(3) Computers in Chemical Education Newsletter Fall 1996, p. 21 to 22
(4) http://www.clarkson.edu/~rosen2/olcc.html