University of Washington
Office of Educational Assessment
Program Evaluation Division

PANDORA PROJECT
EE 215 Online/Distance Education Class
Student Interviews [1]

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BACKGROUND

As part of the evaluation of the University of Washington (UW) Hands-on Laboratory-Driven Electrical Engineering Curriculum Program (Pandora), the Office of Educational Assessment conducted student interviews of those enrolled in EE 215 during the spring of 2002. Students were interviewed two weeks into the course and again during the final week of the quarter. The purpose of the student interviews was to gather feedback on course progress and development, as well as to reflect on the overall EE 215 experience.

METHODS

All registered students were contacted by both phone and email to request an interview. At the beginning of the spring quarter, seven of the eight registered students were interviewed. Five out of seven remaining students were interviewed at the end of the quarter. All of the interviewed students were male. Two student interviewees reported having taken online distance learning courses previously.

Students were provided with informed consent information and a description of the project. They were asked to give verbal permission if they consented to participate in the interview. A copy of the consent form was mailed to each participant. Prior to commencing the interview, the OEA researcher reminded the participant that the interview was confidential and no names or identifiers would be used in reporting results. Handwritten notes were taken but there was no audio recording of the conversation.

RESULTS

Initial Course Interviews

Comments below are from the seven initial student interviews and reflect their impressions at the beginning of the course. Interview questions developed by the OEA in collaboration with Pandora staff (see Appendix) addressed the following topics:

Reasons for Enrollment

All students interviewed reported that they are full-time working professionals and were pleased that this course is available online. These students have neither the time nor the money to attend college full-time.

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[1] Submitted as part of the evaluation of the Pandora Program.

This course is seen as either a path to a Bachelors in Science in Electrical Engineering (BSEE), as background for a Masters in Science in Electrical Engineering (MSEE), to enhance professional requirements, or to review basic principles to see if they remain interested in an engineering career.

One student felt this course was easier to enroll in because he does not have to be an EE major to take it. He is looking forward to completing the series of courses as a path to a degree. Another student, who performed an Internet search for electrical engineering distance learning programs across the country, was impressed by the variety of methods employed in the Pandora Program and the accompanying lab kit.

Helpful Aspects of the Course

Several students commented that the web site is well laid out and clear; nicely suited to working at students' own pace. They also mentioned that they have felt sufficiently supported in their learning so far, but some mentioned that it is still early in the course. Several students commented that they felt comfortable contacting the professor. One student cited a recent email offer by the professor to meet on a Saturday or come in on Wednesday afternoon during office hours. Another student has received replies to his emails; his campus visit with the professor was very helpful and answered his questions.

Students reported that the course is not too different from what they expected. Two students reported that they found the videos helpful, but one commented that they were a little rough. He mentioned that he knows it is the first time for the course and is sure they will be improved. One student mentioned that the textbook seems to be thorough, and that information on the web seemed to be a summary. Several other students mentioned that the textbook was important for their learning. One student also noted that lab assignments were helpful for learning the material.

Problems Encountered with the Materials

Two students printed parts of the course (one likes to study from a paper version, one likes to read on his way to work). Both found problems with the printed version. Some figures were split at page breaks. They had to copy figures in pencil from the computer screen. The numbers/decimals were small and it was hard to be accurate; they were not sure if they wrote the numbers correctly. One student mentioned that he had found some "link" errors on the pages. He did let someone know and they have been fixed. One student bought the computer system requirements for the course, but could not view the course video clips even though he could download high speed clips.

When asked about particularly difficult topics at this point in the course, most students reported that they did not have significant difficulties with the material yet. However, one student reported that the part regarding how to assign polarity was confusing, claiming that the online material did not agree with the textbook, and added that circuit analysis with multiple sources was challenging. Two students mentioned the "quick ramp up" on math skills needed for the course. One student wanted more solved homework problems in the textbook to serve as demonstration problems.

One student commented that although the course has a variety of resources available to support student learning, "it doesn't seem like the class is making the best use" of them. He cited confusion over which homework problems were due on which date, and problems with correspondence between homework

assignments and online lessons (i.e., some topics they had not covered online yet appeared on the homework) as examples. One student wanted clarity on what parts of the textbook they should read to correspond to the online lessons. Another student requested a course calendar with actual dates, not "week two." He did not realize he was already a week behind.

Problems Encountered with Interaction

One student mentioned that he did not think the first introductory session was efficient. It was more like a conference call in which each person waited for typing to appear on the screen. One student mentioned that the e-post discussion format was "clunky" and too slow for live discussion. Another student commented that it was difficult for him to make the mid-week online discussion session.

Receiving timely feedback on assignments was a problem cited by several students in the course. Two students were not sure how to submit homework and get it back. It had been mentioned that assignments should be submitted on e-post, but that process needs to be clarified. One student commented that he felt disconnected since he had turned in a homework and lab assignment the week prior but had not yet received feedback. He also mentioned that he was waiting on an email response from the professor and felt like he was "working in a vacuum." Another student also reported that they were not able to get feedback soon enough. For example, he mentioned that he had been FedEx-ing his homework and could not get solved problems back in time to help him prepare for the midterm. One student mentioned that most of the material was challenging for him and added that he had sent in several questions but had received responses from the professor that were too brief.

Suggestions from Students

- All of the students wanted more communication with the professor, other students, and the technical person. They thought communication was good at the beginning, but that it dropped off subsequently. They wanted online/real-time interaction with sound and video.
- Students wanted more detailed answers to their questions. Since the textbook does not have answers, they suggested having more student-to-student and instructor interaction scheduled at regular times. Students wanted confirmation that they are understanding the intricacies of course content.
- Students wanted pages to print out as they appear on the screen.
- One student wanted to receive clarification on what parts of the textbook should be read to correspond with the online lessons.
- One student would like more video clips. He commented that building circuits is difficult and viewing additional clips would be helpful.
- One student requested more solved homework problems.
- One student wanted to see the objectives for each lesson.

End-of-Course Interviews

Comments below are from the five end-of-quarter student interviews, and reflect their impressions at the end of the course. Interview questions (see Appendix) developed by the OEA in collaboration with Pandora staff addressed the following topics:

Helpful Aspects

Several students felt that the professor was available and accommodating throughout the course and felt comfortable contacting the professor if needed. One appreciated that the professor was flexible and accommodating with lateness of submissions. Another student was pleased that the professor was "accessible and very helpful." One student came to campus every Wednesday to attend the professor's office hours in person. Another student reported that the few times he was able to meet with the professor in-person was very helpful.

Several students noted that the textbook was the most helpful aspect of the course for helping them to understand the material. One student mentioned that problem sets and homework assignments were helpful. Another student noted that the “web material was very well done. One student commented that that online lessons were “secondary, but helpful” to using the textbook.”

One student kept in close email contact with another student as a means to support his learning.

Persistent Problems with Materials

At the end of the course, several problems with materials persisted. One student noted that reading assignments, labs, homework assignments, and topics on the midterm and final exams were “out of sync” at times. The syllabus still needed to be clarified to indicate what week students are working on. One student reported that he spent an inordinate amount of time looking for examples outside of the textbook in order to demonstrate concepts.

Material presented in the last week of the course (RLC circuits and RLC circuits with forcing function) was brought up as difficult for students. Several students reported that the last few chapters were more difficult than earlier parts of the course, yet they had less time to focus on this material. One student added that the textbook did not explain this material sufficiently.

Persistent Problems with Interaction

E-post format was problematic throughout the course. One student commented that although he was using e-post initially to communicate, the professor was not able to gain access to e-post for the last three weeks of the course and had to resort to email. Another student reported that he had to resort to using email to communicate after he had posted messages twice on e-post but did not receive a response.

Receiving feedback on student work seemed to be a critical problem. Problems cited with homework feedback included a delay in posting solutions and giving feedback, distorted images, and problems and assignments were disorganized at times. One student reported a good turnaround time on email responses from the professor but that the responses were limited to one to two lines. Another student reported that people wrote in a lot but only received "cryptic" responses from the instructor. Another

student said that he was not receiving email responses from the instructor and that the professor told the students that it was "too difficult over email." The student said he had to take a couple of days off of work to see the professor during office hours. One student felt that assignments took longer due to lack of feedback. He explained that he would get “stuck on trivial things” that would take up a lot of time.

Students noted that a lack of homework feedback presented difficulties for learning the material. One student appreciated that the professor corrected and returned homework assignments within a few days of receiving them but felt that the postal delay combined with the fact that the professor could not possibly make extensive comments on every student’s homework, as a persistent barrier to learning.

Students felt that the final was a lot harder than expected. One student commented that the final exam scheduled for June 7 included material that they had not received the homework and feedback on yet, and that they had not covered in the online course yet.

One student commented that if he had not taken advantage of the professor's office hours in-person every Wednesday "it would have been almost impossible for [him] to finish" the course. The same student was not able to access the online session and was reluctant to use e-post. Another student commented that although some students in the immediate area were able to meet with the professor, others were “kind of left to fend for themselves.”

Persistent Problems with Technology

One student commented that the web-based environment for the course was challenging and complicated. He added, "unless you have a mentor to guide you, a lot is gibberish. Another student noted that homework posted on the Internet was "almost impossible to read" and that items were incorrectly numbered.

One student reported that the web site had some incorrect information posted. He noted that there were only four homework assignments listed on the site but later found out that there were actually seven assignments due. At the end of the course he found himself working on two assignments at once.

Suggestions from Students for the Web Designer and Instructor

- One student, citing confusion over the number of homework assignments required felt that the course needs to be “more organized up front.”
- A student who commented that the first class meeting on E-post was the most successful, advised that they should fix e-post and have more simultaneous meetings throughout the quarter. However, another student who cited a problem with a firewall at work felt that there was an over-reliance on the chat program throughout the course. He recommended using a newsgroup rather than a chat program in the future.
- Have more interactive tutorials and quizzes.
- “Format materials for printing.”
- The textbook needs to provide solutions.

- The syllabus needs to focus more on later assignments. “Spend less time on the first two chapters and put more emphasis on the last two chapters that was two-thirds of the final.”

- Get homemeeting, netmeeting software to send diagrams

- Make sure that subsequent courses are available. It is a problem to wait for courses to be offered.

Students’ Suggestions to Future Students

During the student interviews, OEA staff asked what advice they might give to future students who choose to enroll in the EE 215 online course. The following are their responses:

- "Get in touch with each other directly, early." and “Push harder in the beginning to form a support system with other students.”

- "Make sure you have a lot of time." The homework assignments are very time consuming. Lab assignments were also time consuming and visiting the professor.

- "Gets as many other books for reference" as possible. Get PSPICE software and begin to work on it as soon as possible.

- “The course moves rapidly. Get homework [assignments] and labs done week one so you can focus on interaction with others the second week."

- “Make sure you know where you’re at in the course.”

- ”Topics on the midterm and final are the most difficult concepts.” Put more emphasis on studies just before the midterm and final.

To Enroll or not to Enroll

Asked in hindsight if they would have enrolled in EE 215, three of the five students interviewed replied “yes.” Students had the following comments:

One student said that he probably would not have enrolled in the course knowing what he knows now because the time commitment was much bigger than he had expected.

Another student said that he still would have enrolled but does not plan to continue with the next online EE course because his interests are changing.

One student would have taken the course because he wants to get prerequisites out of the way so that he can get into the industry.

One student commented that “doing the course via distance learning was many times better than doing it alone, but still not as quality [an] experience as [being in a] classroom.” The same student noted that “this was partly related to a lack of interaction with students and the professor.” He added that the lab kit was a “neat tool” and felt that the course would be improved if problems were resolved. He plans to

enroll in the next course in the series and feels that both he and the course will be more successful with the benefit of this experience.

Conclusions from EE215 Student Interviews

The fact that regardless of initial difficulties most students responded that they would in hindsight still enroll in the course, attests to the importance of providing EE distance learning opportunities. The students enrolled in EE 215 had neither the time nor the opportunity to take an on-campus course. Those students who said they did not plan to continue with EE distance learning courses stated that they did so because their interests had changed. One student who said he would not have taken the course knowing what he knows now cited the fact that it was more work than he had expected as the reason.

While all of the participants appreciated the efforts of the instructor to make himself available to students, there are some concerns regarding distance learning objectives for EE 215. First, not all students can attend Wednesday afternoon sessions (online or in-person) without taking time away from work or other responsibilities. Although several students appreciate the offer extended by the instructor to meet in-person on the UW campus, it should be examined whether this option is counterproductive to distance learning goals. Students who live too far away or whose schedules do not permit such meetings are at a clear disadvantage to those who are able to come to campus or log on to an online session.

It is clear that a lot went into getting EE 215 up and running in time for spring quarter and it is understandable that a number of details are still in the process of being worked out. However, there were problems that occurred which would have been avoided had the syllabus been more detailed and organized. Students should not have been confused on such basic points as what week they were on in the course and how many assignments were due. Pacing also needed to be corrected to leave time for more challenging material toward the end of the course.

Recommendations for The Pandora Team

These students may have been away from higher education for an extended period an/or unaccustomed to distance learning courses. They should be given as much structure as possible to successfully navigate the course. For example, students should be told how often they receive responses to questions. For those who need a refresher before taking the course, faculty can point students to appropriate review material. As well, students need assistance with accessing course software and online communication and chat programs. Professors should be encouraged to continue to be flexible and accommodating with distance learning students who are most likely to have full-time jobs.

Faculty should be comfortable navigating the online environment. It would have been helpful for the professor to have be given more training and technical assistance prior to teaching the course. Homework and assignment feedback needs to reach student more expediently. If it is not possible to give students detailed online feedback, mailing homework back and forth should not be used as a substitute. Faxing materials would be preferable to mailing. The course syllabus needs to be clarified and exams should draw on material that has been covered and been given feedback on previously.

Distance learning courses must contend with isolation not merely from the professor but from other students. Whenever possible, students should be encouraged to develop supportive virtual relationships

with each other while taking the course. The professor could require a certain amount of online group interaction weekly, including group projects and discussions. Perhaps students could write bios about their professional experience and why they are taking the course as a means to get to know each other.

It is clear that a great deal was learned by faculty and students regarding how to design and operate a course within the online environment. The professor should be encouraged share lessons learned with others who plan to teach online EE courses. As well, students who continue with the online EE sequence could share their experience with new students to help assure the success of a virtual community of learners.

Appendix

Pandora Project
Online Course Initial Interview

Student Name:_____ OEA Staff Name:_____

EE Class: _____ Date: _____

Phone: _____ Time begin: _____ Time end: _____

Best time to call: _____

Previous Distance Education Course Experience? ___yes ___no

This is _____ ; I am an outside evaluator for the EE 215 project and am calling to interview you about the course. Is this a good time to talk? The purpose of the interview is to gather information on class processes and progress. I would like to remind you that you have the right to abstain from answering any question and that your responses will be confidential. Information from all the interviews will be grouped into useful categories and given to the project manager for program improvement. Do you have any questions before we start?

1. Why did you choose to enroll in the EE online distance learning course? What are your learning goals?

2. So far, which aspects of the course are most helpful for understanding the material? What aspects of the course detract from your learning? What part of the curriculum seems to be most difficult to understand?

3. Do you feel your learning has been sufficiently supported throughout the course? Are you able to have your questions answered in a timely manner? What procedure or support would have been helpful?

4. How often and through what means have you been communicating with the instructor and other students throughout the course and how is it going? Do you feel comfortable contacting the instructor? Have you developed a student support network?

5. If you had the time and ability to enroll in this course on campus rather than via distance learning, would you do so? Why or why not? How many other online courses have you taken?

6. What changes would you suggest to improve the course?

Pandora Project
Online End-of-Course Interview

Student Name:_____	OEA Staff Name:_____
EE Class: _____	Date: _____
Phone: _____	Time begin: _____ Time end: _____
Best time to call: _____	
Previous Distance Education Course Experience? ___yes ___no	

This is _____ ; I am an outside evaluator for the EE 215 project and am calling to interview you about the course. Is this a good time to talk? The purpose of the interview is to gather information on class processes and progress. I would like to remind you that you have the right to abstain from answering any question and that your responses will be confidential. Information from all the interviews will be grouped into useful categories and given to the project manager for program improvement. Do you have any questions before we start?

7. Which aspects of the course were most helpful for understanding the material? What aspects of the course detracted from your learning? What part of the curriculum seemed to be most difficult to understand?

8. Do you feel your learning was sufficiently supported throughout the course? Were you able to have your questions answered in a timely manner? What procedure or support would have been helpful?

9. How often and through what means had you been communicating with the instructor and other students throughout the course? Did you feel comfortable contacting the instructor? Did you develop a student support network?

10. If you had the time and ability to enroll in this course on campus rather than via distance learning, would you do so? Why or why not?

11. What changes would you suggest to improve the course?

12. Knowing what you know now, would you have enrolled in EE215?

13. What advice would you give a student who is planning to enroll?