

Clipper Project Takes Off

By Steve Bronack and Tim Foley

Overview

Lehigh has embarked on an exciting project to provide pre-admitted freshmen the opportunity to take first year introductory web-based courses in the second half of their senior year of high school. This project started two years ago with a planning grant from the Andrew W. Mellon Foundation to investigate the feasibility of enhancing the freshmen learning experience. The Clipper project got its name from Lehigh President's inaugural address:

Let's suppose for a moment that it's the 1930's. You're the captain of the luxury liner, the Queen Mary, steaming across the Atlantic to New York. Suddenly, you hear a low drone. You look up and see a Pan Am Clipper, winging its way from London to New York. Would you realize that the age of steamships is about to end? Would the steamship company understand that its business actually is transportation, not ships? Would the passengers guess that seats at the captain's table, strolls on the deck, steamship trunks, and days at sea are about to become a six hour-flight in row 17 – a window or aisle please, but not the middle?

-- April 9, 1999, President Gregory C. Farrington's inaugural address, Lehigh University

Farrington suggests that technology may be the catalyst for an entirely new and better learning opportunities for students and that educational institutions must realize that learning, not teaching, is the business of education. Will the transformation to these better learning opportunities be comfortable? Probably not, but education needs to examine the business at hand and develop mechanisms to enhance the learning process. The use of technology and web-based instruction may be introducing a new way of thinking about how we provide basic learning opportunities to students.

The Clipper project's goal is to enhance the collegiate experience of Lehigh freshmen by accelerating their entry into advanced studies and to research the overall development and delivery of these on-line courses. The project has developed web-based versions of courses commonly taken in the freshmen year. The first two courses developed - Calculus I and Economics I -- went live in January 2001. Three other courses, English Composition, Chemistry, and Engineering I, will go live January 2002. The project has also developed a quasi-experimental research study utilizing both on- and off-campus students with both qualitative and quantitative measures to determine the behaviors of students, the extent to which this instruction has prepared them for advanced instruction, the amount of time taken to produce the courses, and the effects of such a project on the faculty involved.

Recruiting the Crew

A year-long planning grant from the Andrew W. Mellon Foundation supported the pre-project consideration and design phase. Faculty from the College of Education designed longitudinal research models and recruited faculty interested in web-based instruction from Lehigh's four colleges to take part in the project design. Faculty interested in designing and delivering instruction in the project content areas were added to the planning team. The enthusiasm of the recruited faculty members is one of the most important features of the project. The faculty members have been very receptive to investigating the interaction between the best features of on-line learning and their own teaching methods and styles. Instructional Technology specialists in Lehigh's Information Resources (IR) department -- a merged library and computing organization -- worked with the faculty to explore available resources and mechanisms for course delivery. Information Resources uses a team-based approach for providing services and computing infrastructure to the campus. The Information Resources department also provided the necessary instructional design and infrastructure support for these courses once the Clipper Project began. Finally, the planning team surveyed incoming freshmen to identify technical and curricular considerations pertinent to the project. The survey results provided important guidance for designing when, how, and to whom courses would be offered. For instance, more than half of those surveyed indicated their willingness to take at least one web-based course during the first or second semester of their senior year. Other Lehigh staff that have been involved in the Clipper project have been the admissions and the registrar's office.

In-flight Entertainment

Because Clipper courses are outside of the mold of everyday courses at the university, the university had to look at these courses in a different light from traditional courses that measure credit hours in seat time. One might state that educational institutions emphasis on seat time rather than learning is stressing the wrong part of the student's anatomy. The first two Clipper courses were totally asynchronous, with no scheduled class times. There were scheduled office hours and real-time communications through chats, but in general most of the communications came in way of content presentation either through streaming video or interactive simulations, and through assigned projects, email and threaded discussion groups. Tests and quizzes were done on-line; in some cases exams were proctored at local high schools.

Flight Plan

The development and implementation of Clipper courses brought together faculty and Information Resources instructional technology consultants to explore the pedagogical issues relating to the delivery of web based course materials. Even though the faculty members involved in the first two courses were highly computer literate and were very comfortable in a web-based learning environment, they worked closely with the instructional designers to create a course that was more than an on-line textbook or a series of PowerPoint presentations. The Calculus course employed Flash animations along with assigned readings and on-line exercises to deliver interactive content. The Economics course utilized streaming media files that synchronized the faculty member's voice with his lecture notes. This content can be controlled and reviewed by the students at their leisure. Economics also had assigned readings and on-line discussion and chat room activities. The two courses were designed and materials piloted during the fall of 2000 with the roll out planned for the spring of 2001. Education faculty planned the research design, and monitored the progress of the entire project. A database was developed to track the amount of time for each developer. A team approach for content development was adopted for the first two courses the team mostly consisted of and Instructional Technologist and the faculty member involved. As the process evolved, it became apparent that each team needed the support of a web applications programmer and a graphics/web designer, as well. These resources were added during the latter phase of development. Infrastructure support for the project has come from Information Resources Technology Management team.

Recruiting the Passengers

As word of the Clipper project spread, the big question on everyone's mind was how many students would be interested in taking these courses. The project plan called for soliciting students who accepted Early Decision status at Lehigh to participate in the Clipper courses. Before students could be contacted, however, a number of issues associated with admitting "non-traditional" students to this program emerged. The project staff had to coordinate with many different parts of the University before the invitation letters could be sent. For instance, they had to make sure that the Registrar could admit these students for credit and place them in our administrative software system. This system had just gone live with the motto of "plain vanilla" which basically meant few exceptions would be implemented in the standard software and this type of student had no category in our systems. Also, the Admissions Office was concerned that the pre-admitted students have an equal chance at the limited number of available slots in the program. With these initial problems worked out the first mailing elicited a very positive response from Lehigh's pre-admitted freshmen. With more students interested than initial spots available, participants were chosen from a random drawing and those not selected were placed on a waiting list.

Evaluating the Ride

The experimental design to evaluate the Clipper project is focusing on finding answers to the following questions:

1. What are the implementation considerations (e.g., institutional, practical) when offering college courses to high school students via the Web?
2. How do faculty transform “traditional” on-campus introductory courses from a variety of disciplines to effective Web-based courses?
3. What are the costs (including time and financial resources) associated with developing and implementing a Web-based introductory course for high school students?
4. What are the short and long-term outcomes for students who participate in Web-based courses?
5. What are the short and long-term outcomes for faculty who develop and teach Web-based courses?

To answer these questions the following research design is being implemented: Three instructional conditions have been created to allow within and between group comparisons across time such as student achievement, satisfaction, learning behavior, and long-term outcomes (e.g. course of study, GPA). The three instructional conditions are: 1) “traditional” method of instructional delivery: on-campus face-to-face, 2) web-based instruction for high school students only, 3) web-based instructions for a class comprised of equal numbers of high school seniors and first year students at Lehigh.

Another unique evaluative component of the project is the call for external review both before the project got off the ground and in the future by a review board. For example, a counterpart in Information Technology was brought in to review the current status of the project and to make recommendations for improving the project before all five courses go live at the same time. External reviewers will be invited on campus at various points throughout the project to act as an external advisory and review board for Clipper.

By considering the questions described - and through open communication with reviewers and colleagues at other institutions - the Clipper Project is likely to provide valuable insight into the administrative issues and impact on learning behaviors associated with designing and delivering freshmen-level courses online to high school students.