

Technology Workforce Development Grants Program – 2002, 2003, 2005
Project Report – TWD – Summer 2006

This project is centered on *Hybrid Courses*, where classroom lectures recorded on Tablet PCs are made available online and the students attend the class only for discussions, quizzes, tests and other hands-on aspects of teaching, typically 6-10 times a semester. The project is developing a suite of upper level hybrid computer science courses. The flexibility of hybrid framework allows students to enroll in courses that may not be possible otherwise because of significant conflicts (e.g., work and taking care of children) often combined with logistical difficulties (long commutes). As a result, we expect this project to reduce the time it takes to complete a bachelor's degree in computer science, and improve enrollments in the long run by making the program more attractive.

Accomplishments: The key accomplishments in this 1st year of the project are the following:

- *Infrastructure development:* Acquired Tablet PCs, microphones and accessories, along with essential software, for presentation and recording of lectures. The streaming server at University of Houston was upgraded to manage the additional traffic.
- *Hiring of personnel:* Two graduate assistants have been recruited to work on this project; one directly supported by this grant and the second supported by University of Houston as part of their commitment to this project.
- *Hybrid courses offered:* 3 different courses have been developed in the hybrid format.
 - Hybrid sections were added to *Introduction to Computer Graphics* and *Introduction to Computer Networks* courses in Spring 2006. In this format, the students are free to attend classes or rely on recorded online lectures.
 - Hybrid only versions of the above 2 courses, as well as *Fundamentals of Software Engineering* course, are being taught in Summer 2006.
- *Evaluation Framework:* A form to gather student feedback on hybrid coursework has been developed and is being refined with experience.

Evaluation and analysis: In the final session of every hybrid course, feedback is collected through forms and discussion with students. Our experience so far is limited to the 2 courses taught in Spring 2006. However, some tentative conclusions can be drawn:

- Students attach a lot of value to online lectures. Some students choose the online lecture over attending a class live, and most students consider them valuable study material irrespective of whether they attended the corresponding class or not.
- Students consider the quality of online lectures and delivery mechanisms at least satisfactory and typically good to excellent. We have also identified several areas of improvement that we are working on – a specific goal is good indexing of video lectures.
- Performance of students in hybrid and regular sections shows no significant difference.

While our statistics show an increase in the number of students graduated from last year – and certainly some of them were assisted by this project, we think it is premature to do a detailed cost benefit analysis at this stage. The true value of this project is in the medium to long term as the combination of flexibility and quality of hybrid courses makes our program more attractive.

Future plans: Making classroom lectures available online with Tablet PCs and developing hybrid sections have been received warmly by students and colleagues alike. Our future plans center around expanding hybrid offerings, and improving the quality of the technology as well as the structure of hybrid courses by learning from experience. We are in the process of assisting our colleagues in the development of hybrid versions of several courses.

Leveraged funding: *The team executing this project, with Dr. Olin Johnson as PI, was awarded a grant through The Faculty Development Initiative Program (FDIP) at University of Houston titled "Improving Existing Hybrid Classes Via Broadband Indexing and Animated Sequences".*