

Learning with In-class Technology (LIT): The 15-Minute Learning Module Approach Rouskas and Miller (CSC)

Highlights of accomplishments:

As part of this project, the PIs will develop 10 modules each for two core courses in Computer Science: CSC 216 (Programming Concepts -- Miller) and CSC 316 (Data Structures -- Rouskas). Each module will provide a new abstraction, concrete connections to explain the relevance of the material and an exercise for the student. Each of the modules for a course will correspond to one of the learning outcomes that we have identified for the given course. The learning outcomes for the two courses can be found at the URL: <http://www.csc.ncsu.edu/courses/list.php>

The timeline for the project, as approved by LITRE, is as follows:

- Develop the modules starting in summer 2006.
- Implementation and assessment of CSC 216 - two sections of 216, one technology-based and one non-technology-based for fall 2006
- Implementation and assessment of CSC 316 will be in Spring 2007

The PIs started developing the modules in June 2006, and they are on target to complete the development process by the end of the summer.

Assessment of Student Learning:

In coordination with Dr. Dianne Raubenheimer, we have developed two outcomes for the project:

- 1) Students will be able to apply Linked List and Tree data structures to solve realistic problems.
- 2) Students will construct Linked List and Tree data structures and implement recursive and non-recursive algorithms for managing these data structures.

Outcomes 1 and 2 are currently outcomes of CSC216 and CSC316. CSC216 covers Linked List data structures. CSC316 covers both Linked List and Tree data structures.

These outcomes will be assessed using the following plan:

1. Special questions at mid-term and final exams will be developed to assess the students' ability to solve realistic problems using Linked List and Tree data structures. Results from a non-technology-based class and a technology-based class will be collected and compared.
2. Students will complete programming projects common to a non-technology based class and a technology-based class. A portion of these projects will focus on Linked List and

Tree data structures. In CSC316, there will be one common project. In CSC216, there will be two. Results from the grading rubric will be collected and analyzed for the non-technology-based and technology-based classes.

3. Dr. Dianne Raubenheimer, COE Director of Assessment, will observe at least one class for each course for each format and provide feedback regarding the learning environments in the classroom.
4. Students' attitudes to the course will be assessed using surveys at the end of the semester to compare attitudes in courses using technology and those not using technology.

We will report our findings and conclusions once we complete the assessment plan in Fall 2006 and Spring 2007 for CSC 216 and CSC 316, respectively.

Assessment of Impact on Faculty:

We have not yet implemented the project in the classroom. We will report on how the learning modules and related technology affected the pedagogy, workload, course content, etc., any technical challenges, and lessons learned, once we complete a full semester of teaching according to the above timetable.