Using Web-Based Modules to Support an Introductory Computing Course for Preservice Teachers

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The utilization of online materials and/or online modules is being rapidly implemented in many higher education courses. With online modules students and instructors are not confined by the limits of scheduled face-to-face class time. Online modules can provide learners the opportunity to work at any time that fits into the individual’s schedule and at their own pace. We decided to explore the potential of using online modules in our introductory computing course as a means for preparing prospective teachers to learn and teach with technology. This self-paced module is designed to help students understand the nature, purpose, and function of graphic organizers as a cognitive tool to represent information and support learning.

Preservice teachers at The University of Tennessee are required to take a semester long introductory computing course which covers topics ranging from word processing to Web page design. “Breadth” versus “depth” is a typical challenge for these types of introductory computing courses. Instructors struggle between (1) the need to cover a wide range of tools so students can begin to envision the possibilities of learning and teaching with technology, and (2) eliminating certain topics in order to focus on a smaller subset of skills and information in more detail. An ever-present challenge for course instructors is to provide students with optimal learning experiences, balancing acquisition and application of skills within a given, and often limited, period of time.

Due to their significant benefit as an educational tool, graphic organizers seemed to be an appropriate choice for our initial module. As part of the course, students learn how to use Inspiration, an electronic concept-mapping software application. Since time is limited, students are often introduced to basic graphic organizer formats (such as brainstorming webs and concept maps) and do not learn about other functions and formats that are available for representing information. Students may be unaware of the various types of graphic organizer formats such as Venn diagrams, Fish Bones, KWHL, T-charts, matrices, and cyclical diagrams.
However, students who participate in the online self-paced module are exposed to a wide variety of graphic organizers, their suggested uses, and their advantages. By asking students to complete a self-paced module, we believe that students will come to class with a broader understanding of graphic organizers and their educational applications. In a face-to-face class that follows, students can use software to create meaningful graphical organizers and apply the knowledge gained from the module.

Because of time constraints, we see the value of using online modules to prompt the thinking, learning, and reflecting process prior to formally introducing a topic in class. We believe this pre-exposure will facilitate more informed in-class discussions and a more complete understanding of the subject matter. However, as with all out of class assignments, it is essential that students are interested in completing the assignment. Therefore, our challenge has been to ensure that the modules we develop actively involve students in constructing their understanding of the topic as opposed to passively reading information from a computer screen.

To facilitate active student involvement, interactive components were developed within the online module using Flash software. This type of interaction allows students to view a “show me” sample on screen, followed by the opportunity to construct their own graphical organizer. In addition, students are provided with immediate feedback regarding their performance at frequent intervals throughout the simulation.

The online graphical organizer module will be pilot tested during the spring 2002 semester. Preservice teachers enrolled in the introduction to instructional computing course will have the opportunity to explore the content of the site as an online self-paced module. By allowing instructors to cover essential topics in an online environment, we believe this module will assist instructors in maintaining the breadth necessary in introductory courses. Moreover, online modules will conserve the limited face-to-face instruction time for in-depth coverage of more complex topics. Finally, the interactive format of the online module facilitates an active learning experience that increases student participation both in and out of class.