

Utah State University

**A Multimedia Instructional System for
Computer And Information Literacy**

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1. Overview of Goals and Objectives

At Utah State University (USU), the importance of computer and information literacy to a student's career is well recognized. For this reason, computer and information literacy will no longer be viewed as a course requirement. Instead, it will be viewed as a college skill. Beginning Fall 1998, computer and information literacy will be required of all majors at USU.

Providing the necessary traditional classroom instruction for computer and information literacy for all students in the University would be an enormous undertaking for the Computer Science Department. It would require a large number of qualified instructors who are not currently available. Other disadvantages of classroom instruction are: 1) students have to attend at a fixed time; 2) the needs of students with different backgrounds cannot be met; 3) lab experiments separate from lectures; 4) students have no control on their learning pace. Our solution to this problem is to develop interactive, computer-based instructional technologies to assist and empower instructors. Computer-based instructional technology has demonstrated its ability to carry out numerous education and training functions effectively. The objectives of this project are:

- develop courseware for computer and information literacy
- develop a set of tools for creating computer application courseware
- develop computerized computer and information literacy tests

2. Current Status and Accomplishments

The computer and information literacy courseware consists of is a set of core knowledge modules. These knowledge modules define computer and information literacy. By developing multiple modules, it is possible to have more than a single or generic definition of computer and information literacy. By choosing different knowledge modules, departments can tailor the definition of computer and information literacy to meet the needs of their majors. Some knowledge modules are common to all disciplines and hence are breadth. Other modules re specific to a discipline and hence are depth. Each of the knowledge modules is developed as a self-contained and self-paced learning entity.

Currently, six modules are under development. They are Public Access Computer Labs. & Electronic Mail; Computer Basics; Operating System Basics; Computer Networks and Information Superhighway; Document Preparation; Data Visualization and Spreadsheets; and Library Information Systems. Except the library information systems module, all other modules have been completed or are nearing completion.

The first version of the instructional delivery tool has been completed. In our computer and information literacy courseware, content knowledge is separated from the instructional delivery tool and stored in the content knowledge base. Currently, we are building seven knowledge bases each for one module. All these seven modules share the same delivery tool. Authoring a new module is to create a new knowledge base. In addition to the knowledge base and the instructional delivery tool, the instructional system includes a student database and a test question databases. The student database stores student records. The test questions database consists of all test questions that are used to assess how well the student learns.

A simple simulation tool has been developed to create simulations of software applications. Simulation of a software system provides an environment for the courseware to perform demonstrations and for the student to practice. A simulated software application consists of a set of simulated screens and a simple parser. A simulated screen could be exactly the same as the actual software application and hence the student may not know whether he/she is working on a simulated or an actual software application. The parser receives the input from the student and checks for correctness. If correct, the response of the software application is printed on the simulated screen and some reinforcement message is given by the courseware. If not correct, feedback about the error is available from the courseware.

A tool for generating computerized tests has been developed. The tool is capable of generating and controlling two general categories of questions, i.e. concept-based and performance-based. Concept-based questions determine how well the student understands the concepts presented in the courseware, and performance questions evaluate the proficiency of the student in using a particular software tool. Currently, the tool allows for the use of six types of concept questions: matching, sequencing, true/false, multiple choice, fill-in-the-blank, and graphic.

3. Plans for Remainder of Project

The following is a list of tasks to be completed for the remainder of the project.

- Complete all modules
- Enhance and improve the modules completed
- Make test questions
- Complete a content knowledge base editor
- Improve the tools developed for creating computer application courseware
- Evaluate the courseware developed

4. Materials That Have Been Developed

The materials that have been developed so far include:

- Six computer and information course modules: Public Access Computer Labs & Electronic Mail; Computer Basics; Operating System Basics; Computer Networks and Information Superhighway; Document Preparation; and Data Visualization and Spreadsheets. Some of these six modules are still under development.
- A computer-based course delivery tool
- A software application simulator
- A computerized test generation tool

5. Dissemination Activities

Our courseware are being developed on PCs and we plan to distribute it using CD-ROMs. Because our courseware is highly interactive, it is very difficult to distribute through networks. Network version will be our future work. The governing board for higher education in Utah, the Board of Regents, is considering to implement the computer and information literacy requirement state wide. We will make the courseware available for all Universities and Colleges in Utah.

6. Evaluation Activities

We have implemented a module for the survival class at Utah State University. The survival class help new students develop their study habits and provide a practical orientation to the University policies, procedures, and people. The module we implemented teaches the student computer basics, computer labs on campus, how to activate a computer account on the University machine, internet basics, how to use email, how to access internet newsgroups, and how to use Netscape. This module was applied to two groups of students, each having about 30 students. The module worked well for some of the students. The two problems we encountered were that most students spent much more time than we expected and

students need more instructions about how to use the module. We are currently installing the module in some of the computer labs at Utah State University and hope more feedback will be collected.