

WEBACADEMICS SOFTWARE DELIVERS MATH ON THE INTERNET by Quentin T. Wells *

Knowledge of math through basic trigonometry is fundamental for students learning vocational trades such as electrician, carpenter, machinist, plumber, etc. Most adults who enter these apprenticeship programs have little skill in math and frequently a past history of difficulty with the subject which makes them still less inclined to study it further.



Figure 1 Math for the Trades course home page.

Connecting new material to be learned with an existing knowledge base and defining its specific application for the user enhances the student's ability to master and retain what is being taught. Allowing learners to proceed self-paced through a course and integrating the learned material into hands-on, job-related tasks also improve the understanding and retention of the related concepts.

Both of these methodologies are utilized in an Internet-based Math for the Trades course designed specifically for trades apprentices by Salt Lake Community College (SLCC). This course provides access to high quality math instruction in both urban and rural areas.

The instruction is delivered and managed through WebAcademics, a program developed by Hathaway Technologies in cooperation with SLCC, which has served as a beta test site for the software.

WebAcademics. is a comprehensive solution for course delivery on the World Wide Web. It provides full interactive capabilities and flexibility, yet is simple enough that many courses can be created and delivered on it in a short time. The program distributes the workload of online course management between faculty, administrators, and staff members. It also allows developers to customize each course while remaining consistent with the proven navigation and operating parameters of the SLCC Web site.

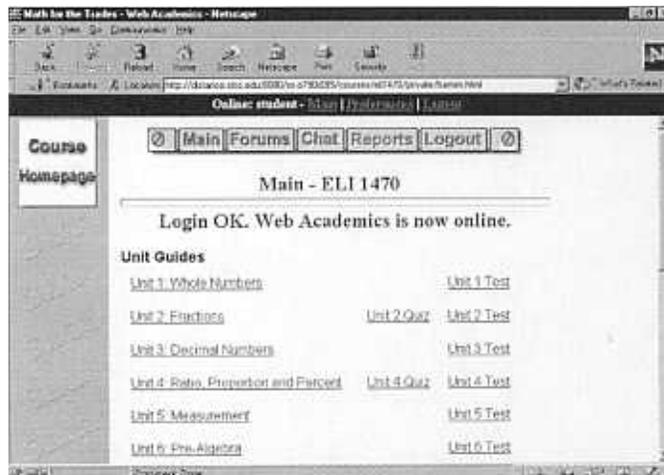


Figure 2 Main page with outline and navigation.

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Figure 3 Unit guide with video clip playing.

Web Academics is actually a specialized Web server that uses dynamic HTML to deliver online course content. The program provides a complete course delivery system that enhances the learning experience yet allows the instructors to apply proven, traditional teaching methods.

Courses are created and delivered through a library of pages which serve as a template. Instructors do not have to write most of the

HTML because it has already been done for them. An easy-to-use interface allows the instructor to create both the look and content of the course including text, graphics, multimedia, quizzes, tests and assignments, without custom programming. An FTP client optimized for WebAcademics permits up or downloading of multiple file changes at the push of a button. Every course also has a built in discussion forum and online chat session which students can access with a click.

Web Academics supports all of the following standards:

1. XML, a new portable data format
2. SQL and JDBC, for accessing existing databases
3. HTML, the "face" of the World Wide Web
4. Java, a robust and comprehensive programming language
5. SMTP, for sending Internet mail
6. DES encryption, the same type used by UNIX servers worldwide
7. TCP/IP, Internet communication protocol
8. FTP, for transferring files to and from the server

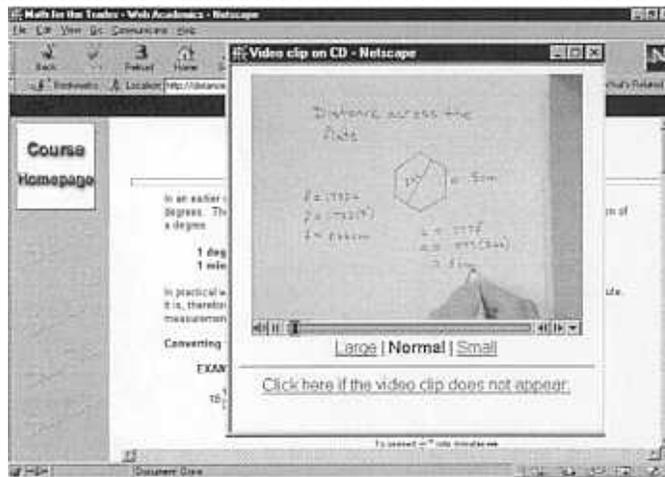


Figure 4 Typical explanation/example video screen.

Web Academics has an extensive online testing system. Grading is automatic for multiple choice and true/false type questions. Short answer and essay questions are deferred to the instructor for evaluation. A set of comprehensive, hyper-linked score reports are bundled with every course. All grading is organized into a simple spreadsheet. At the instructor's option, it can be condensed to show only those students waiting for evaluation of a quiz or assignment.

Rather than attempting to replace the human teaching function; WebAcadem extends that function in the distance learning environment. by encouraging and facilitating communication between students and the instructor. All instruc-

tion is competency-based and any number of alternative methods for completing a unit or module can be provided to accommodate a wide variety of learning styles and evaluation techniques.

The software is platform independent and will run on UNIX, Windows NT, or LINUX servers. It is also scalable to the point that several servers can be running Web Academics, coordinating data when needed.

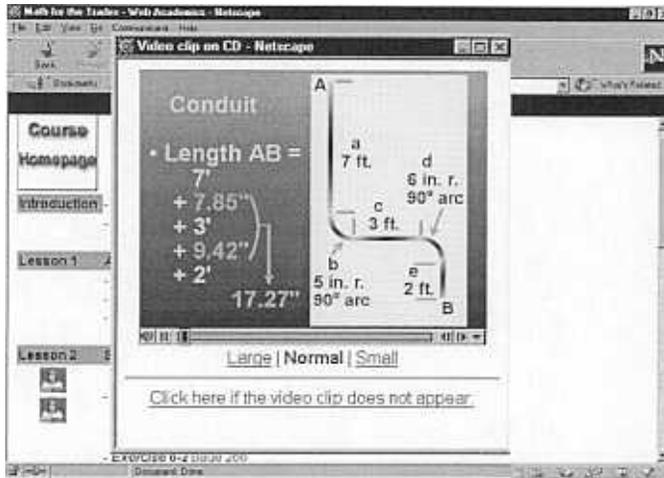


Figure 5 Practical application exercise video.

The WebAcademics-based Math for the Trades course features an extremely rich learning environment including on-line concept explanations, electronically graded exercises, forums, chat rooms, textbook, and more than 13 running hours of video instruction by a developmental math professor and a journeyman trades professional. The video instruction is delivered in compressed format from CDs provided to each registered student.

Each learning module includes all of the following instructional features:

1. Competency to be achieved
2. Instructional outline
3. On-screen explanation of concepts
4. Computer graded exercises with instant feedback
5. Video explanations with instructor handwriting step-by-step solutions to problems.
6. Video explanations with step-by-step graphic solutions to problems.
7. Chat room for on-line student and instructor interaction.
8. Bulletin board for instructor posting of responses to frequently-asked questions.
9. Written assignments submitted for grading by mail, e-mail, or fax showing actual student work.

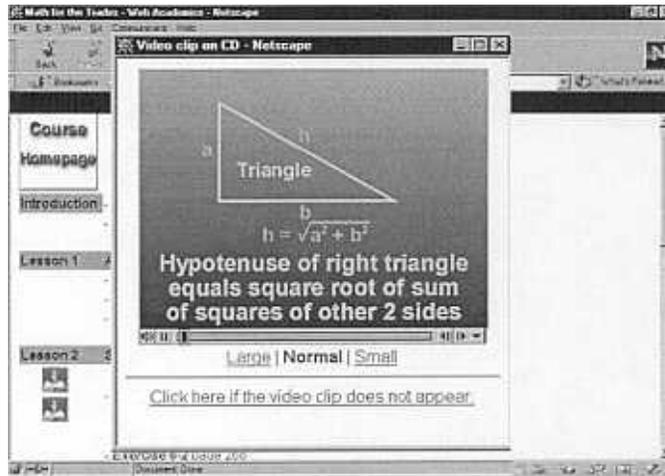


Figure 6 Elementary geometry video explanation

Math for the Trades is now being delivered on the Web. In the fall of 1999 the SLCC distance education server was completing more than a gigabyte of data transfers per month for this and other courses.