environments created for these purposes. This is a digital multimedia microworld that motivates and develops children's fantasy and creativity by means of enigmas and puzzles, seeking to generate cognitive and affective imbalances. This interactive environment leads children to action. It promotes curiosity and experiential learning; it allows speculating, discovering, learning from mistakes; and it stimulates the desire to learn.

Teaching Dynamics of Dairy Herd Health and Management
Claudia Haferkamp-Wise, Cornell University, USA; Heather G. Allore, Cornell University, USA; Yrjo T. Grohn, Cornell University, USA; Lorin D. Warnick, Cornell University, USA

Cornell University offers "Dynamics of Dairy Herd Health and Management" (http://courseinfo.cit.cornell.edu/courses/vetmed745) - a newly designed web-based distribution course to its off-campus veterinary students and to students at 9 off-campus test sites within the United States and abroad. This course uses a computer-based instructional delivery system (DairySim) to teach basic concepts of epidemiology and economics of dairy cattle disorders, experimental design, and statistics. The courseware provides two simulation models - SIMHEALTH and SIMMAST - with an interactive user-friendly interface and output analysis - thus making research tools accessible to a broader audience. DairySim and its accompanying user guides are available online. Lectures can be attended in person on-campus or viewed via the internet. Students can print handouts for use in computer laboratory sessions, take on-line quizzes and download homework assignments. Completed assignments are handed in by uploading the documents. Instructor-student and student-student communication for off-campus students takes place via email and an on-line discussion board.

A Comprehensive Model for Improving Technology in Teacher Education
Robert (Bob) Hannafin, College of William and Mary, US; Robert (Bob) Hanny, College of William and Mary, US.

This paper identifies the professional development model developed at the College of William and Mary to close the gaps between its strategic vision for the teacher education program and its capacity. The College's vision is to produce teachers who seamlessly integrate technology by designing and assessing authentic student-centered learning activities. Three areas were identified as requiring parallel effort: faculty development, institutional development, and clinical faculty/PDS development. Goals were established that addressed capacity shortfall and advance the program to the point where significant innovation could occur. Both our students and faculty needed to master both basic technology skills and the subtler art of practicing creative integration strategies. It also required placing our students with teachers who are competent technology users and encouraging in technologically-adequate classrooms. Institutional changes were necessary on two fronts: upgrading the technology available in School classrooms, and instituting incentives to entice faculty to use and integrate technology.

Web-Based Tools For Courses On Transport Phenomena
Bernardo Hernandez-Morales, Universidad Nacional Autonoma de Mexico, Mexico; Rafael Fernandez-Flores, Universidad Nacional Autonoma de Mexico, Mexico; Jorge Tellez-Martinez, Universidad Nacional Autonoma de Mexico, Mexico

Even though multimedia applications have been extensively used in many courses, the field of transport phenomena has received comparatively less attention. Thus, we are developing interactive tools, to be accessed through Internet, to solve problems observed when traditional teaching techniques are used. The material consists of modules to solve typical problems in transport phenomena. Each module is a Webpage that includes the theoretical background (with hyperlinks to all course material) and an interactive worksheet to solve a particular problem. The worksheets are built with Java applets (JDK 1.1. compatible) and may be used in any of three modes: example mode (fixed set of values), training mode (variable set of values), and exploration mode (range of values of a key independent variable). Thus, unlike problems found in traditional textbooks, the student may explore a range of values for key independent variables to establish its influence on the dependent variables.

Shaknoma: A collaborative tool for shared knowledge management
Oriel Herrera, Pontificia Universidad Catolica de Chile, Chile; Sergio Ochoa, Pontificia Universidad Catolica de Chile, Chile; Vidal Rodriguez, Pontificia Universidad Catolica de Chile, Chile; David Fuller, Pontificia Universidad Catolica de Chile, Chile

Nowadays, the amount of scientific knowledge produced is overwhelming and it is clear that it will grow even more. Shaknoma (Shared Knowledge Manager) is a tool useful to make available and share the people's individual knowledge. The activities carried out on this tool respond to a model that ensure the input, validation, use and evolution of the knowledge. The process is implemented through four major components: the shared repository, the management model (see Herrera et al. 2000), the representation language of the knowledge, and the collaborative environment. The knowledge management model provides decision-making mechanisms, which mainly includes discussion and voting activities. As a way of structuring and graphic representation, Shaknoma uses a language based on conceptual maps (Novak 1984). The information repository does not store only knowledge, but also the information of its use and evolution.