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Chapter XIV

E-Learning and Virtual Science Centers: Designing Technology Supported Curriculum

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Abstract

A model for partnership with virtual science content providers creates technology-infused science curriculum using interactive videoconferencing technologies and supporting Web resources. The model, based on the work of Project VIEW, demonstrates the viability of videoconferencing and the integration of interactive digital technologies in K-12 classrooms as means to accessing unique science resources for the classroom to engage students in dynamic, self-constructed learning. By bringing enriched content to schools, new structures for pedagogy are emerging that motivate students to learn more, both with and without teacher assistance, effectively promoting increased cognitive development. The chapter offers research results confirming the progress of the model.

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Introduction

As science centers throughout the world enter the interactive arena of digital communications, a need has emerged to design strategies of program development that seamlessly interface new technologies with existing missions and resources. To facilitate this process, Project VIEW[1] (Virtual Informal Education Web), a collaborative undertaking led by the Schenectady City School District, has bought teachers together with major centers of science learning to create templates for developing interactive point-to-point videoconferences with asynchronous Web-based resources that enhance student learning.

The integration of interactive and digital technologies into programs, delivered by science centers to K-12 schools, requires new kinds of strategies and tools to create science resources for classrooms to engage students in dynamic, self-constructed learning. The development process brought to science centers by Project VIEW enables them to design interactive, digital delivery systems of instruction that produce evidence of higher-level student learning and academic performance. In addition, Project VIEW provides unique resources to students who may not otherwise have access to them.

As centers of science learning increasingly employ innovative models to provide enriched content to schools through interactive technologies, new structures for pedagogy are emerging to motivate students to learn more, both with and without teacher assistance. Not surprisingly, to achieve this transformation, it has been necessary to change the construct of educational pedagogy and the structure of instructional content. The end result of this transformation of educational delivery systems has been to facilitate increased cognitive development among participating students.

Research Background

Underlying the work of VIEW is the premise that one of the most highly effective methods of achieving enhanced levels of learning in the sciences among students is to conduct educational pedagogy through interactive, digital technologies. The feasibility of this premise is validated by the recent International ICT Literacy Panel (2002) that proposes that, "… Because technology makes the simple tasks easier, it places a greater burden on higher-level skills." To attain this higher achievement, Project VIEW has created a model of content development that employs training and collaborative design techniques that use interactive videoconferencing and Web-based learning to bring together the needs and missions of diverse yet intersecting educational delivery systems at science centers and schools.

The theoretical ideas behind Project VIEW began in the 1980s during an era of change in American education that began to focus on the benefits of integrating technology into K-12 classrooms (including science classrooms). For example, Ragosta (1982) documented that, when compared to traditional classroom settings, students learned more quickly in a Web-based environment.

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