

VisionQuest®: Helping Our Future Teachers Envision and Achieve Technology Integration

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Abstract: The purpose of the VisionQuest® project is to help current and future educators envision and achieve technology integration by providing access to electronic models of technology-using teachers. By helping teachers envision and achieve exemplary technology use, we promote widespread, fundamental changes in teaching and learning methods that foster the development of both exemplary teachers and learners. We describe both the development and organization of the VisionQuest® CD-ROM. Potential future uses are also examined.

Introduction and Background

The Office of Technology Assessment (OTA 1995) recently stated that "the challenge of integrating technology into schools is much more human than technological. It is about helping people, primarily teachers, integrate these technologies into their teaching as tools of a profession that is being redefined through the process" (p. 28). Although most of our students who are preparing to teach recognize the importance of using technology in their classrooms, they tend to enter our education courses with limited visions of how technology can be used to achieve new instructional goals or implement new teaching practices. Despite the fact that the prevailing wisdom about how teachers should use technologies in schools has evolved—from teaching programming, to encouraging individualized drill and practice, to participating in electronic communities (OTA 1995), most of our students have never witnessed or experienced integrated technology use. We concur with the President's Panel on Educational Technology (PPET 1997) that integrated technology use will be achieved when technology is used to "facilitate fundamental, qualitative changes in the nature of teaching and learning" (p. 33). As such, technology will be used to support new interaction patterns and activities (e.g., changes in teacher/student roles, classroom organization, curricular emphases, assessment practices) that "simultaneously alter both the means and ends of classroom thought and action" (Fisher, Wilmore, & Howell 1994, p. 122).

Examples of integrated technology use are not readily available in our local schools. Even if they were, arranging for a large group of students to visit, and interact with, teachers in these classrooms would be logistically impossible. In previous semesters we have relied on instructional videos to illustrate exemplary technology use, yet most of these examples are situated in technology-rich schools and provide little information regarding the beliefs that support effective use or the steps that teachers have taken to

achieve current levels of integration. Students often respond to these examples with varying degrees of frustration. How will they achieve this level of use if their schools cannot support this amount, or this type, of equipment? Students need more than video examples of how to use technology in the classroom. They need opportunities to examine and reflect on the beliefs that support and shape integrated classroom practice.

Rationale (Why this CD-ROM?)

The purpose of the VisionQuest[®] project, and the primary purpose of this CD-ROM, is to help current and future educators envision and achieve technology integration by providing access to electronic models of technology-using teachers. Based on PPET's recommendation (1997) that "education students should be given the opportunity to observe uses of educational technology" (p. 55) yet, recognizing that many classroom teachers have not yet effectively integrated technology into their curricula, we are developing CD-ROM cases of technology-rich classroom practice. By examining both the pedagogical beliefs and classroom practices of exemplary technology-using peers, pre- and in-service teachers may gain a better understanding of *how* technology can be used (the practical considerations), as well as *why* it should be used (the supporting pedagogy) to enhance and transform current classroom practice.

We believe that technology integration is not achieved by merely providing teachers with access to technology. Research has shown that availability and access are not the sole determinants of technology integration (Hadley & Sheingold 1993). The use of technology may be associated more with teachers' beliefs about teaching, the purpose for which technology is used, and the value teachers assign to particular uses of technology. Teachers need opportunities to examine and reflect on the beliefs and practices of other teachers who are currently integrating technology. This CD-ROM provides pre- and in-service teachers with models of technology integration. The CD-ROM can transport these teachers into others' classrooms so that they can examine the instructional practices, classroom organization, and curricular emphases of exemplary users of technology. They can see for themselves the roles played by the student, the teacher, and technology in a classroom where technology is integrated.

Methodology

Application Process

Six CD-ROM case studies are currently being developed that illustrate the beliefs and practices of exemplary technology-using teachers from across the state of Indiana. The selection process began by soliciting self- and peer nominations from K-12 school colleagues located within an hour's driving distance of the university. Letters were sent to the principals of 358 public and private schools, asking them to recommend any teachers known to be exemplary users of technology. Nominated teachers completed application forms in which they briefly described their beliefs and practices regarding classroom technology use as well as their visions for technology use in the future.

Selection Process

Upon receipt, applications were reviewed using research-based criteria that placed learning at the core of the integration process. Informal conversations with "promising" teachers (via phone or e-mail) helped narrow the list. Classroom observations and interviews were conducted with the most favorable candidates to obtain additional information about teachers' classroom organization; curricular emphases; their use of technology in the classroom; the roles played by the teacher, students, and technology; and the assessment practices of the teachers.

Development Process

Videotaping

Six teachers were selected from among their peers to be featured on the CD-ROM. During the 1998-99 school year, videotape was recorded in four teachers' classrooms, with an additional two classrooms slated for taping during the 1999-2000 school year.

The video team consisted of a small camera crew (one-two people), the principal researcher, and two graduate assistants. Using a qualitative approach to research and development, we began with a general outline of what we planned to videotape, but remained open to new ideas during taping.

Before videotaping, we held planning sessions with each teacher about the lessons to be videotaped. While we did not want to stage the classroom sessions, we were intent on capturing a representative sample of the teachers' classroom practice, including specific instances of technology integration. Using the same guiding questions that were included on teachers' project application forms, we looked for shots that illustrated the guiding visions of the teachers, their approaches to classroom organization, the roles of the teacher, student, and technology, and teachers' assessment practices.

Digitizing

The videotapes were logged and transcribed by two graduate students involved in the project from its inception. Segments were identified that fit into the different categories identified on the application form. For example, teachers in one school gave an oral quiz in their Biology class. We marked that segment as evidence of "Assessment." In another example, the students came into the classroom and took their class notebooks from the shelf and started working. We marked that segment as possibly relating to either "Classroom Organization" or "Role of the Student."

Storyboarding

Our storyboard was revised and refined after we had logged the videotapes from our first video shoot. This differs from common practice, in which videotaping tends to follow a finalized script. Although we knew which components each story should include, those components took shape only after we had begun the videotaping process.

After videotaping, we examined each tape to identify appropriate segments for each part of the story we wanted to tell. After we had lined up the visual evidence for the story, we determined how to narrate the story and how to supplement it with additional visuals, such as digital pictures. Our storyboards went through several drafts, starting with handwritten outlines and progressing to detailed notes, in which we decided exactly which visuals--graphics, video clips--went with which audio clips.

Authoring

We then started the process of creating the interface and synchronizing the video and audio clips. We began by using Flash as our authoring tool, but ran into memory problems. We then switched to GoLive CyberStudio, an HTML authoring tool. Once the first case "prototype" was on the way, the graduate students on the team began the development process for the next two cases.

Lessons Learned

A Qualitative Approach to Development

Due to the research nature of this project, we adapted an iterative approach to development,

modifying various components of the outline to reflect new themes that emerged in our classroom video shoots, and thus, in our storyboards. In this sense the development did not follow a conventional production path; we began videotaping prior to having a finalized script and storyboard. This was a learning experience for all team members—those who were used to a more systematic approach developed an appreciation for the qualitative “work in progress;” those with a qualitative approach developed an appreciation for the up-front technical aspects of development. Yet, throughout the project, the team worked together to make the project a success.

Thus this project allowed both the research and the technical teams to share and adjust their ideas and practices related to the development of a product. On the one hand, the technical team adopted a more flexible approach to development. On the other hand, the research team came to appreciate the benefits of having a more definitive style of working, similar to that which is prevalent in professional multimedia production settings.

Organization and Use of the CD-ROM

The CD-ROM is organized around the metaphor of a journey. Users explore the paths that six teachers have taken to achieve their current levels of technology use. They can examine how teachers' pedagogical visions of classroom practice have shaped their journeys. In addition, users can examine how teachers' journeys began, the roadblocks and challenges they faced, as well as the incentives that have propelled them forward. On yet another level, users can examine the relationships among teachers' beliefs (about the role of the teacher/student/technology, classroom organization, curricular emphases, and assessment practices) and current classroom practices related to technology.

Cases currently are being constructed such that users can explore teachers' classrooms either one at a time (case by case) or collectively (i.e., comparing features or themes across cases). Each case contains a variety of elements that combine to illustrate how teachers' visions for technology use are translated into practice. Classroom video examples comprise the center of each case and are integrated with teachers' interview comments, reflections on the lesson's effectiveness, descriptions of how each lesson evolved, as well as a discussion of the supporting pedagogy. Users also have access to information about classroom layout, available hardware and software, and resulting student projects.

As an instructional tool, the CD-ROM is designed to provide opportunities for users to explore a variety of examples of how effective technology use can be achieved. Although, optimally, initial uses of the CD-ROM would be completed in a whole class setting, this is not essential to effective use. Users have the option of working individually, or in small groups, to examine and compare the six cases. Users will explore and compare case components within a “reveal-reflect-refine” framework (Lesh & Kelly, in press). That is, teachers' beliefs and practice will be revealed within multiple contexts that prompt users to reflect on critical similarities and differences across cases. Recognizing that even “exemplary” technology integration is ever-changing, users are challenged to articulate testable suggestions that refine observed practices. During concurrent and/or subsequent field experiences, students' ideas can be piloted, then further refined in a continually “evolving expert” process.

Future Uses and Plans

Still in a prototype format, formative evaluation data are currently being gathered from intended users (pre-service teachers) of the CD. Based on the evaluation feedback obtained, the CD-ROM will be revised and finalized during the current (Fall 1999) semester. During the Spring, 2000 semester, materials will be piloted in two sections of *Classroom Applications of Educational Technology*, a one-credit course that serves as a companion to our 2-credit *Introduction to Educational Technology* course. During the spring semester we will begin gathering data to assess the effectiveness of the materials in fostering the growth of students' visions for classroom technology use.

The CD-ROM materials will be used to improve our k-12 teacher preparation program. In the future, use will also be extended to support local in-service teachers' efforts to envision and achieve technology integration. By providing electronic access to the beliefs and practices of technology-using

peers, this project implements a cost-effective solution to a persistent problem. Using realistic pedagogical models, these materials can help current and future teachers envision and use available technology resources to create learning environments that simultaneously support and benefit from the use of instructional technology. By including teachers and students from both the University and local public schools we establish a close connection between technology, teacher education, and k-12 education. By helping teachers envision and achieve exemplary technology use, we promote widespread, fundamental changes in teaching methods that foster the development of both exemplary teachers and learners.

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