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Technology Integration at the University Level: An Analysis of an Elementary Social Studies Methods Course

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Advocates of integrating technology education in teacher education face a significant obstacle that may not be experienced by other curriculum reformers – they probably do not know much about curriculum reform. By examining models of curricular change, technology integration advocates may be more successful in implementing their ideas.

Tanner and Tanner (1995) presented a model of "Curricular Sources and Influences" to explain the development of the K-12 school curriculum. The model shows the school curriculum in the center of a circle. Around the circumference of the circle are political influences, social influences, economic influences, and technological influences. These four types of influences affecteach other as they help determine the curricular decisions made by school boards, administrators, teachers, parents, and students. Specific examples of the four influences are governmental agencies, publishers and testing companies, professional educational organizations, and colleges and universities. "Curriculum development is a process of synthesizing the forces that influence the experiences that learners have under the guidance of teachers" (p. 594).

The Tanner and Tanner model appears to describe curriculum development effectively at the K-12 level, but may also be useful in understanding curricular changes at the university level. This article focuses on a series of curricular changes in a single course, Elementary Social Studies Methods, over a 10-year period. Although there were many adaptations and adjustments in the course, this analysis will examine only attempts to integrate technology education into the course. The Tanner and Tanner model will guide the discussion.

Review of the Literature

How Teachers Use Technology

Over the years greater access to computer technologies in the home and school has encouraged teachers to develop their abilities to utilize these tools. In addition to greater access, state and national competencies, The National Educational Technology Standards (NETS) Project of the International Society for Technology in Education (ISTE, 2000) has placed greater importance on and new requirements for preparing teachers for technology use. In Maryland, 53% of teachers reported being comfortable using the Internet in 1997. In 2002 the reported percentage was close to 90%. Most of these teachers reported that they were applying their gained knowledge and skills by regularly using technology "to improve their efficiency and productivity, especially for tasks such as maintaining attendance, grades, data on students; creating instructional materials; and communicating with staff members and other colleagues" (Maryland State Department of Education, 2002, p. 2).

Although positive self-reports are encouraging, other data—some from the same study—raise concerns. Only 14% of schools in Maryland reported that their students use technology to manipulate and analyze data or information on a regular basis. Tasks that involve critical thinking and decision-making skills were reported to make up only 12% of the types of tasks involving technology given to students. The two areas of significant improvement over the past 3 years have been students' use of technology to gather information regularly from the Internet (60% in 2001 vs. 49% in 1999), and communicating information and results of investigations (46% in 2001 vs. 29% in 1999). Disturbingly, nearly 52% of the highest poverty schools in Maryland reported that their students never have opportunities to use technology to manipulate and analyze data, and 62% indicate that their students never use technology to perform measurements and collect data. The only area where a gap is not evident in the use of technology between the high and low poverty schools is in the remediation of basic skills.

Similar results were found when more than 90,000 teachers, who were given laptops by Michigan Virtual University as part of program to provide laptops for all teachers in Michigan, were surveyed to find out how they were using the laptops in their practice (Newman, 2002). The survey data indicate that Michigan's teachers are confident they can use technology to learn, but most were uncertain whether they could use the technology to enhance their students' learning. Few of the Michigan teachers (only 1 in 9) stated that they could use spreadsheets, presentation software, digital imaging, or other advanced technology tools to enhance their teaching. In this program teachers were required to submit a plan for how they would use the laptops, but no additional training or commitment of time were required after the teachers received the laptops (Newman, 2002). These data suggest that simply providing access to technology and presenting standards for its use, without adequate training and support, does not guarantee it will be used to extend and deepen student learning.

As a result of these studies, researchers are

> increasingly asking new questions about how technology is integrated into educational settings; how new electronic resources are interpreted and adapted by their users, how best to match technological capabilities with students' learning needs; and how technological change can interact with and support changes in other parts of the educational process, such as assessment,

> administration, communication, and curriculum development. (Honey, Culp, & Carrigg, 1999, p. 2)

Researchers are now emphasizing questions about "the intersections of design, learning, and school culture and practices, and other factors that shape the impact technology can have in schools" (p. 3). The President's Committee of Advisors on Science and Technology (1998) has issued a strong recommendation for large-scale, longitudinal studies that examine the effects of technology use in school settings within a context of a broad range of factors. Honey et al. (1999) stated that the educational communities' professional expertise and energies should be focused on improving circumstances of learning and on determining how technology can help make that happen: "This requires viewing technology not as a solution in isolation, but as a key component in making it possible for schools to address core educational challenges" (p. 5).

A consensus is emerging that the larger issue that should be addressed across a wide range of collaborative research projects is gaining an understanding of successful technological innovations as they are implemented and begin to have an impact within local, district, regional, and national contexts (Honey et al., 1999).

Technology and Social Studies Teacher Education

The issue of how teachers use technology in their classrooms has also intrigued educators and scholars within the content-specific field of social studies education (Berson, 1996; Mason et al., 2000; Whitworth & Berson, 2002). A comprehensive literature review by Whitworth and Berson (2002) revealed that as technological advancements have grown over the past few years, only a slight emergence of new and innovative uses of technology in the social studies has emerged. After reviewing over 300 pieces of literature in the field they determined that accessing information on the Internet remains the most common use of technology in the social studies. "It appears that computers continue to serve the primary function of facilitating students' access to content and remain somewhat relegated to being an appendage to traditional classroom materials" (p.18).

Mason and her associates (2000) presented guidelines for the use of technology within social studies education, suggesting that social studies educators need to focus on (a) utilizing technology to engage students in learning experiences that are impossible without it; (b) integrating technology to support student learning not just to teach technology skills; (c) reducing the "digital divide," while presenting learning experiences with technology that encourage critical thinking and decision-making skills in all students; (d) developing the skills and knowledge necessary for students to be active and productive citizens in a democratic society; and (e) conducting ongoing investigations of how technology can be used to enhance teaching and learning in the social studies.

Who is responsible for meeting the guidelines suggested by Mason et al. (2000)? According to Diem (2000), encouraging the appropriate and effective use of technology in schools begins with teacher education. Diem argued that introducing technology to new teachers is a manageable endeavor; however, the challenge is found in creating comfort levels with technology skills so that teachers feel secure in their choices for instructional and non-instructional use of technology. Mason et al. (2000) supported the need for preservice teachers to acquire technology skills, yet also emphasized that

> Preservice teachers must not simply acquire skills that make them proficient at using technology, but also learn how to use technology to make their teaching better than it would be without it. Therefore, preservice instruction enabling

> teachers to integrate technology seamlessly into lessons is more productive than technology instruction that merely teaches preservice teachers how to use specific computer skills. (p. 3)

Extending the dialogue even further, Doolittle (2001) called for social studies teacher educators to not only make a concerted effort to integrate technology into social studies methods courses in meaningful ways, but to clearly communicate the theoretical foundations that support the methods selected and the pedagogical decisions made in using technology in the classroom. He asserted that "a theoretical foundation for social studies provides an answer to why we employ various teaching strategies in the social studies' classroom and why we recommend those strategies to others" (p.14).

Ways to Promote Technology Integration in Teacher Education

Berson (2000) argued that emphasis should be placed on the importance of content-specific uses of technology to enhance preservice teachers' ability to use technology creatively (p.128). Transforming curriculum and instruction in ways that enhance and extend student learning through technology is the primary goal. A wide range of scholars suggest that this goal may be accomplished by (a) offering sufficient access to technology (b) infusing technology into social studies methods courses and continue by providing ongoing sustained professional development experiences for practicing teachers and (c) promoting dialogue and problem-solving centered around the daily demands of a teacher that may prevent technology use in the classroom (Berson, 2000; Mason et al., 2000; National Council for Accreditation of Teacher Education [NCATE], 1997; Rose & Fernlund, 1997).

As in the case of the K-12 classroom, the broad goals of technology are not being implemented. Colleges and universities often treat technology as a separate topic entirely – not as a method and learning tool to be infused across the preparation program (NCATE, 1997). Consequently, preservice teacher education programs may not model, support, or provide a variety of opportunities for their students to apply technology skills.

The reasons for this dilemma are tied to political power within the university. Rice and Miller (2001) reported that higher education faculty members have typically not engaged in decision-making regarding the acquisition of administrative or instructional technologies. Most professors were not aware of the broad wave of technological change until it landed on their doorsteps. Most of the early investment in computer technology was not geared toward instruction. "In the past, when technology was used administratively, the fact that faculty did not have input or decision-making power was not as important as it is currently, when faculty are using more technology in instruction and are more affected by technology planning and implementation decisions" (Rice & Miller, 2001, p. 5).

Survey data indicates that higher education faculty members believe they should be involved in many aspects of both administrative and instructional technology planning (Rice & Miller, 2001). Faculty members will be the individuals most affected by the use of instructional technologies and are the best judges of what they require to use instructional technologies effectively in their courses. Now that they are aware of the technologies in which their institutions are investing, they are beginning to take a more direct interest in the matter. Because they will ultimately be affected by their universities' technological investment decisions, Rice and Miller urged them to begin planning for changes that will need to occur in their instruction.

Description of the Procedure for Course Analysis

This paper presents an anecdotal description of one instructor's attempt over a 10-year period to integrate technology into a single course, Elementary Social Studies Methods. The university offering the elementary social studies methods course is an urban state university in the southeastern United States. During the 10-year time period, the university moved gradually from a comprehensive university to one that offers several doctoral degrees. Most of its students are first generation college students, primarily from the immediate region of the state.

The professor of this course, the second author, has been teaching elementary social studies methods for over 20 years. Although not a leader in technology at his institution, he was usually among the first professors to learn about new devices and used them in his personal and professional activities. In his earlier work as an elementary school teacher, before the popularity of personal computers, he tended to integrate multimedia technology into his curriculum.

Data sources examined included (a) course syllabi, (b) annual reports and (c) interview responses. Course syllabi and the teaching section of annual reports over the 10-year period were analyzed for changes in course objectives, activities, assignments, and assessments related to the use of technology. The professor of this course was interviewed as a means to triangulate and elaborate on the data uncovered through the analysis of course syllabi and annual reports. The themes and patterns within the data led to the development of the curricular changes described in the following section.

The curricular changes that took place have been organized into nine stages that reflect various aspects of the Tanner and Tanner (1995) model of Curricular Sources and Influences. The model was used to explain the changes.

Significant Stages of Curricular Change in Technology

1. *Get Ready!* In the earliest stage, the professor was the instigator of the curricular change. He wanted to alert the preservice teachers of forthcoming developments in technology (e.g., greater accessibility of the Internet) that would influence their elementary social studies classrooms. The nature of the change was limited to discussion, because neither the university nor the students had access to the technology.

2. *Look at This!* When the federal government began to provide grants to universities for technology, the teacher education program used the funds to create a technology classroom. With this innovation, the professor (on his own volition) began to demonstrate some of the social studies applications of advanced technology (e.g., software to create timelines.) Because the students still did not have access to the technology at home or school, there was no application.

3. *Get Your Feet Wet!* As an incentive to promote its new technology goals, an additional phase of state funding was offered to teacher education programs. The faculty leaders in technology used the funding to create computer labs in the College of Education. Now it was possible for students to access the technology even if they did not have the necessary hardware at home. The professor decided to require students to conduct Internet searches for social studies resources and use email to share their findings. His goal was to have students use the technology themselves in the hopes that they would become skilled in their uses.

4. *The State Steps In!* The State Department of Public Instruction, concerned about reports of slow integration of technology in K-12 programs, began to require each teacher education program to demonstrate how it meets the state technology goals. In response, the teacher education professors met to assign competencies to each course. The social studies methods course expanded its technology integration with additional assignments and instruction.

5. *Take Your Work Home With You!* The personal computer revolution finally reached the point when, because of dropping prices and growing popularity, nearly every preservice teacher owned or had easy access to a computer. The professor began to encourage online submission of assignments by offering test point bonuses as an incentive. Most students were drawn to the incentive and subsequently developed considerable technological comfort and skill.

6. *Get Organized!* The computer revolution turned into a financial windfall for many companies. Several successful individuals and corporations invested their profits into foundations to promote technology education. Through this outside funding, professional organizations hopped on the bandwagon to create new organizations, conferences, and journals. In the field of social studies education, a group of young faculty members developed a project to expand technology integration in their field. The professor of the methods course became involved in this project and received further stimulation and training in technology. These experiences were translated into new components of the methods course, such as geographic information systems and listservs.

7. *Here Comes the Test!* Dissatisfaction with the progress of technology integration in K-12 programs led the state to develop a testing program to force students to meet the competencies. After a series of invalid and unreliable assessments, student anxiety reached its peak when they learned that failure on the state test would delay their teacher certification. The testing program was then replaced by a plan to have each university develop its own assessment. The faculty responded by creating a simple form for students to demonstrate the technology competencies. They were required to meet 18 of the 24 competencies to graduate. In response, students in the methods course eagerly sought the technology education that was offered by the professor.

8. *Report Card Time!* The Department of Public Instruction began to survey teacher education graduates concerning the quality of their preservice experiences. The results of these surveys, combined with various test results, were incorporated into a "report card" that would be shared with the public. The university did not do as well on the first few reports as it would have liked. Technology was the main weakness. Interview data indicated that many recent graduates did not understand the competencies or felt that they received inadequate instruction. Further analysis revealed that many students took shortcuts in meeting the competencies, or sought out part-time faculty members to sign off on their forms without providing evidence. In response, various administrators pushed for a new technology course that would be required for all preservice teachers. Because the proposed course would be taught separately and not be integrated with the rest of the program, several members of the elementary education faculty, many of whom were strong believers in curriculum integration, were resistant.

In order to forestall the creation of a stand-alone technology component, the professors who taught the curriculum course and the social studies methods course devised a plan to integrate all of the technology competencies into their courses. Their proposal attempted to reduce the students' confusion, maintain control over assessment, and enhance the instruction in technology. Social studies methods became the primary course for technology integration.

9. *Changing the Culture.* The reform was unsuccessful. Even though the rules had changed, many professors and students maintained the previous system. Administrators were not vigilant in implementing the requirements. Advisors did not inform students of the changes or were ignored. Students continued to seek out professors' signatures, usually with success. Students who were new to the program imitated the upperclassmen.

The following semester, administrators pushed a little harder to get the new technology course, and one was created. To respect the principle of technology integration, the course also emphasized instructional planning models. It was viewed as an acceptable compromise for all parties involved.

Application of the Tanner and Tanner Model

The preceding saga fits the Curriculum Influences model, even though Tanner and Tanner (1995) designed it for explaining K-12 curricula. The curriculum of the social studies methods course appears to have been transformed by economic, political, social, and technological influences. The economic stimulus of state funding was an immediate influence on the use of technology in the course through the creation of technology classrooms and labs. After its initial economic impact, the political maneuvers of the State Department of Public Instruction, through its development of technology goals, testing programs, and report cards, became a major influence on the nature of the preservice curriculum. Social factors, such as the popularity of computers and the Internet, along with the university's public relations concerns, also played a role in shaping the curriculum. Professional organizations played a significant role in the expectations and activities of the course. Of course, the role of technological influences cannot be underemphasized.

Implications

Integrating technology into the social studies methods course was not simply a function of adapting the technology for student learning. Professors must be cognizant of the social, political, and economic influences that advance or retard the process.

The segment of the professorate that tends to focus on relatively narrow areas of specialization (e.g., technology, social studies methods) may not be sufficiently aware of the panoply of influences that could affect curricular reform. For those reformers, effective preparation for technology integration should, therefore, include colleagues who are more attuned to social, political, and economic trends. Although the virtues of collaboration in research are well known, the concept of political collaboration in curriculum reform is less popular.

The political influences on education have been rapidly increasing over the past several decades. Recently, the power of the state has been expanding further into the domain of the university. Any curricular changes in teacher education must be planned with an eye toward the state's expected role. This may be the most crucial aspect of technology integration. Curriculum developers may not be well versed in governmental matters and may have to change the ways they prepare for reform.

Politics does not only exist outside the academy. Faculty governance is filled with landmines for curricular reform, especially when it requires substantial change in what professors do. Resistance exists for any type of change, but technology may be particularly threatening for any faculty members who are unfamiliar with the new technology-related paradigms and who lack the skills and/or interest in modernizing

their teaching practices. Because faculty governance is usually based on democratic decision-making, it may only take a handful of resistant faculty members or administrators to sabotage reform.

Even when the votes are there, the culture of the institution may remain resistant. Education is a loosely coupled system in which decisions at one level are usually altered at each stage of implementation. If the reform is not monitored by administrators, communicated to faculty members and students, or adjusted when necessary, the status quo will hold sway. The research on curricular reform is clear in its insistence on shepherding changes through its various stages, based on the study of an ever-growing collection of failures.

This analysis also reminds us of the temporary nature of trends. For most of the period described in this paper, economic and technological changes were helpful in transforming the course to the professor's goals. As any stock market observer can attest, those influences do not always continue to be positive. The downturn in the economy, particularly in the technology sector, has already led to a reduction in funding for research in educational technology. It may also lead to a slowdown in student access to and interest in technology.

Conclusions

With these implications in mind, any methods professor seeking to integrate technology education may wish to review these lessons:

1. In the planning process, include colleagues who are attuned to social, political, and economic trends.
2. Plan with an eye toward the role that the state may choose to play.
3. Anticipate and plan for resistance and sabotage from certain faculty members.
4. Include strategies by which the proposed changes are monitored by administrators, communicated to faculty and students, and adjusted when necessary.
5. Consider whether current trends are likely to persist, and develop strategies for when those trends die out.
6. Consult models of curricular change to guide the planning process.

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