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ABSTRACT

This study explored a preservice teacher educator's goals with technology in her teaching methods class at Southern Teachers University (Texas) regarding state and national teacher preparation technology mandates and possible motivational factors for including technology in current preservice education courses. Action research was selected as the theoretical base; data collection methods included interviews, participant observation, and document analysis of course portfolios. Findings were analyzed according to the following levels of the States of Concern about the Innovation model: (1) informational, including relevant applications in regard to preservice educators' personal teaching styles and concerns for state and national technology standards; (2) personal, including relating technology standards to preservice educator and K-12 student needs; (3) management, including desire for technology integration with higher order thinking skills and integrated curriculum emphasis/modeling and resource management concerns; (4) consequence, including portfolios, communication needs, depth of planning in addressing multiple intelligences and higher order thinking skills, user-friendly concerns, and learner motivation through learner ownership; (5) collaboration, including cohort collaboration with technology Texas Essential Knowledge and Skills (TEKS) standards and consistent and equal distribution of technology TEKS in methods courses; and (6) refocusing. Motivational factors were categorized according to technology standards integration, preservice educators' needs, and faculty cohort needs. Contains 28 references. (MES)

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Exploring Motivational Factors in Technology Standards Integration with a Preservice Educator:

An Action Research Inquiry

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Exploring Motivational Factors in Technology Standards Integration with a Preservice Educator: An Action Research Inquiry

Introduction and Research Background

Today's instructional technology (IT) conversations relative to preservice teacher education focus on the quest for effective technology and curriculum integration, as well as instructional technology modeling by teacher educators (Cooper & Glen, 1997; Dooling & Case, 1997; Moursund & Bielefeldt, 1999; Myers, 1997; Stevenson, 1997). Professors who model and incorporate hands-on technology into the curriculum provide prospective teachers with technological experiences within an instructional context (Barker, 1993). The need for effective technology integration in our preservice education courses is becoming more evident with the continued integration of technology in our schools. Failure to integrate technology with purpose, method, or meaning can result in technology anxiety of preservice educators and first year teachers (Wild, 1996). Faculty in preservice education could alleviate some of the first year teachers' anxiety through better incorporation of technology integration in preservice education. Studies indicate the need for interpretivist and developmental research to focus on the integration of instructional technology by faculty in preservice education (Pellegrino, & Altman, 1997; Wild, 1996).

Utilization of Computer Technology by College of Education Faculty Members

Modeling technology use by professors and instructors is important to preservice education students (Widmer & Amberger, 1994). Roblyer (1994) recommends the full inclusion of technology practices and uses into all methods coursework. Assuming that most preservice education students have limited knowledge of educational technology when they enter teacher education programs, professors' provisions of instructional models to emulate technology integration is, in contemporary society, a valued institutional approach (Sheffield, 1996). However, many university faculty who deem models for instructional technology as critical to

the success of teacher education programs also believe themselves to be unprepared to use instructional technology in their own course instruction (Brooks & Kopp, 1989).

In Angkurawaranon's study (1994), which investigated factors influencing a college of education's faculty use of and learning about computers, seven major findings were cited. These findings will be reflected upon in this section's summary and are summarized below:

1) nearly all faculty members had computer experience;
2) a need to use word processing was the main reason most faculty first learned to use a computer;
3) need and time were deemed crucial factors in faculty decisions to learn to use computers;
4) most faculty expressed positive attitudes toward computer use and its impact on education;
5) no significant gender relationships were found among any of the five dependent variables;
6) most faculty wanted to improve their computer skills; and
7) one-on-one instruction was the method most faculty preferred for learning new skills.

A national survey on IT in teacher education (Moursund & Bielefeldt, 1999) provided three key survey findings related to college of education faculty use of technology. First, faculty IT skills tend to be comparable to the IT skills of the students they teach. However, most faculty do not model the use of those IT skills in teaching. Second, most institutions report that even though IT is available in the K-12 classrooms during student teachers' field experiences, most student teachers do not routinely use technology during field experience and do not work with master teachers and supervisors who can appropriately advise them on IT use. Finally, the integration factor –items that addressed graduates' classroom skills and the actual use of IT during college training—was the best predictor of other scores on the survey. The study by Moursund and Bielefeldt (1999) also verifies that colleges of education faculty need to model various types of technology integration within their methods courses.

Following are the (1) research summary regarding the utilization of computer technology by College of Education faculty members, and (2) the interpretation of this research for this study. Angkurawaranon's study (1994) revealed factors influencing a college of education's faculty's use of technology. Crucial findings in that study included need and time for faculty learning, positive attitudes towards computer use and educational implications of computer use, personal desires to

improve computer skills, and a one-to-one preferred learning situation. Moursund and Bielefeldt's national survey (1999) added that most faculty do not model the use of IT skills in their preservice education classrooms, most student teachers do not routinely use technology during field experiences, and the integration factor was the best predictor of other scores on the survey. My interpretation of these findings assists in the verification that college of education faculty needs to model various types of technology integration. However, to do so requires some individual instruction for faculty members according to their need and their time schedules. Personal desires to improve skills and positive attitudes will assist faculty in the integration of technology in their courses and their students' field experiences. These interpretations of the research findings grounded the study discussed in this paper.

Technology's Role in Teacher Preparation:

Technology's role in teacher preparation over the past few years has been continually debated. In order to better frame the direction of this study, reviews of past research related to the adopted view of technology's role in teacher preparation need to be presented and later discussed in the summary and interpretation of this section.

Some instructional technologists see technology as a primary teacher of future educators through self-directed instruction, video simulations, distance education, and virtual reality experiences, all guided by student teachers themselves (Brey, 1991). This belief may be a direction for more long-term rather than short-term technology infusion goals for preservice education. This type of long-range planning may also be more suitable for the belief that educators must be prepared to assume a new role as facilitator in a student-driven learning environment that emphasizes technology in primary through twelfth grade (P-12) settings (Ringstaff & Yocum, 1995).

To address a view more in alignment with short-term technology integration goals, Stevenson (1997) found three levels of technology in teacher preparation. These include (1) teaching future teachers how to use technology as a tool to support broader curricular goals, (2) assisting faculty in delivering technology infused traditional programs of study, and (3) preparing

prospective teachers in knowing how to use a computer in delivering instruction and presenting lessons. These goals of technology towards broader curricular goals, faculty support, and integration techniques for preservice educators provide a more tangible set of technology integration goals for faculty.

Following are the (1) research summary technology's role in teacher preparation, and (2) the interpretation of this research for this study. Ringstaff and Yocum (1995) created a short-term goal in how educators view their role within a technologically infused learning environment. According to their research, educators must prepare to assume new roles as facilitators in student-driven learning environments that emphasize technology. Stevenson (1997) contrived three levels of technology in teacher preparation. These included technology as a support to curricular goals, faculty assistance in technology infusion, and integration techniques for preservice educators. It is my interpretation of these findings in relation to this study that preservice education must support the "educator as facilitator" viewpoint by providing resources and demonstrating to preservice educators how to integrate technology in their classrooms as facilitators. The three levels of technology in teacher preparation provided the participant-researcher collaborative focus for this study. Using the three levels of technology coincided with the participant and researcher's goals regarding seamless technology infusion and practice within the participant's preservice education course.

National Standards for Technology in Teacher Preparation

Teacher education programs need to pay careful attention to the National Standards for Technology in Teacher preparation, developed by the International Society for Technology in Education (ISTE). ISTE recommends that all teachers acquire competencies in basic computer technology operations, personal and professional uses of technology, and in the application of technology for instruction. Few, if any, teacher education programs are currently meeting all of these standards (Wise et al., 1997). The same national report also stated that it is not necessary for all faculty members to use every form of technology in their classes. Nor is this a time when teacher education programs can confidently predict how technology will change the profession,

due to the lack of practice and research in preservice education programs related to technology. Therefore, experimentation during this time of transition is strongly encouraged (Wise et al., 1997). Advocating innovative ventures related to technology infusion and integration with preservice education seems appropriate.

Purpose

The purpose of this study was to explore a preservice educator's goals with technology in her teaching methods class regarding state and national teacher preparation technology mandates. Another purpose of the study was to determine possible motivational factors for including technology in current preservice education courses.

Research Questions

1) What influences do state and national technology standards have on a preservice educator's teaching in her methods course?
2) What motivating factors for technology infusion within this preservice educator's course emerge through the study?

Theoretical Perspective

Action Research

Action research was selected as the theoretical base used to drive the methodology of this study. This design was chosen in order to allow active participation and observation of a particular preservice methods course educator's professional growth with technology integration techniques. Action research has been used for the purposes of researching student learning, curriculum, teaching styles and strategies, and teacher roles (Beane, Ellsworth, Miller, 1996). This action research contained insights into the participant's infusion of technology connections into her curriculum, teaching strategies, and concern for relevancy in student learning.

Creating connections is one part of teaching and learning. Of equal importance is how to link the connected curriculum with standards and assessment (Beane, Ellsworth, Miller, 1996). The Texas Essential Knowledge and Skills (TEKS) technology standards serve as a state mandated student assessment preparation tool. Preservice educators need to be aware of these standards and develop strategies for infusing these standards into their curriculum plans. Action research conducted in this study related to the technology TEKS has possibly provided a strategy regarding preservice education faculty motivation for the inclusion of instructional technology in methods course curriculum.

The participant placed high concern on creating curriculum that enables students to make learning connections. Fogarty (as cited in Peppard, 1991, pp. 9-10) detailed strategies to design curriculums that will enable students to make learning connections. Teachers using Fogarty's strategies often adopt one of his three multidisciplinary approaches – shared, webbed, and sequenced. In this study, the shared approach to creating curriculum connections will be used in the action research conducted between the instructional technology researcher and the preservice methods course instructor. An outline of the shared approach to integrating curricula follows (as cited in Peppard, 1991, p. 9):

> **Shared**: Binoculars – two disciplines that share overlapping concepts and skills.
> **Description**: Shared planning and teaching take place in two disciplines in which overlapping concepts or ideas emerge as organizing elements.
> **Example**: Science and math teachers use data collection, charting, and graphing as shared concepts that can be team-taught.

The participant in this study demonstrated interest in collaborative ventures with instructional technology. Examples such as the one provided by Fogarty have been mentioned in passing in the past between the participant and myself. Using Fogarty's shared approach to integrating curricula will provide an appropriate theoretical framework from which this research study will be approached.

Stages of Concern

Much research in instructional technology has used the Stages of Concern model about an Innovation by Hall and Hord (1987), that was used to drive the collection, analysis, and reporting of data. This theoretical frame was chosen for this study because of the model's potential to describe the emergent motivational strategies discovered throughout the Stages of Concern. The participating preservice educator will most probably experience various stages in the innovation of learning how to infuse technology standards in a preservice education methods course. Using Hall and Hord's (1987) proven model in combination with the action research theoretical frame outlined earlier will provide a base for outlining potential motivating factors in technology course infusion for other preservice educators. Knowing what motivational techniques have been effective in various stages of the model with this participant may provide a foundation of technology infusion techniques for future development with preservice education methods courses.

Awareness is the ground level starting point for the Stages of Concern model. During the awareness stage, little concern about or involvement with the innovation is indicated. The progression of the Stages of Concern is as follows below (Hall & Hord, 1987, p.60):

1: Informational • General awareness • Interest to learn more	2: Personal • Questions demands of innovation / role within
3: Management • Processes and tasks • Efficiency of resources	4: Consequence • Relevance and impact of innovation on students
5: Collaboration • Coordination/cooperation with others re: innovation	6: Refocusing • Definite ideas about alternatives to expand the innovation

Assumptions

Computer competency will be seen as an individual faculty member's responsibility, similar to maintaining currency in one's content area (Schieman & Fiordo, 1990). The teacher

educator in this study strongly believes in this view, as well as Ingram's view that institutions should teach future teachers how to use technology as a tool to support broader curricular goals (as cited in Stevenson, 1997).

The above views and the Stages of Concern were appropriate for this study, especially considering the participant's vertical ascension through the stages within this study. The participant did exhibit several stages within the model. Observations and analysis of what motivational factors prompt her to ascend through the Stages of Concern to more ownership of technology infusion within her own methods course have provided answers to the research questions posed in this study. These findings should prove useful to others trying to integrate technology in various courses that do not traditionally include technology.

Context for the study

The primary setting for this study involves Southern Teachers University, one of the four largest state universities for preservice education in this state. Approximately 125 students enroll in the final block of courses each semester before their student teaching experience. Block three courses were chosen as the general focus for the study, since students enroll in this block immediately before student teaching, and since students have had an introductory course to technology prior to this block.

This university consistently struggles with the integration of technology into methods courses. Awareness of the National Council of Accreditation in Teacher Educaton (NCATE) technology standards is of concern to all preservice educators. These national standards are the basis for several states' technology standards, including the Texas Essential Knowledge and Skills (TEKS) standards used in this study. A small percentage of educators have already started to infuse technology into their curriculum and continually look for other technology infusion techniques. Other educators, such as the one selected for this study, express high interest in incorporating technology. As the researcher for this study, I was interested in how more technology could be integrated into the participant's methods courses for possible sharing of

learned motivational strategies with other methods instructors and professors. Therefore, this made Southern Teacher's University a conducive environment for this study, one that focused on motivational strategies of a particular methods course instructor in technology curriculum infusion in relation to NCATE technology standards.

This study took place the spring term of the 1998-1999 school year. Much of the data collection took place through interviews and document analysis conducted in either the participant or researcher's office. Presentations of student course portfolios also provided rich context for motivational factors involved in infusing technology with the current course portfolio development.

One faculty member was chosen for this study, based upon her expressed interest level in infusing technology into her course methods. Careful analysis of one member within the preservice education cohort could possibly lead to emergent motivational strategies with other members of the cohort in future studies.

Method

Participant and Data Collection

An action research case study design was chosen in order to allow a closer look at one particular preservice methods course educator's growth with technology awareness and adaptation into her preservice educator methods course. According to Yin (1994) ". . . the case study allows an investigator to retain the holistic and meaningful characteristics of real-life events. . ." (p. 3). This action research case study provided a method of exploration into a preservice educator's beginning stages of technology infusion into her methods course in a holistic and meaningful environment of technology infusion course support. The quest for determining the preservice educator's most motivating factors for infusing technology will also best emerge from the action research case study design.

One teacher educator in charge of a preservice education cohort was chosen as the specified case study participant, due to her level of interest and her perceived level of participant

motivation. "Marie" will be her assumed name. This teacher educator instructs one of the four methods courses within the cohort. Incorporating models of teaching also comprises one of the reasons this teacher educator was selected. Overall, this participant exhibits the best fit for the theoretical framework and study.

Action research was the strategy of inquiry chosen for this study. The "look, think, and act" action research interacting spiral was a basic method of data collection for this study (Stringer, 1996, pp.15-18). Stringer notes:

> This is a collaborative approach to *inquiry* or *investigation* that provides people with the means to take systematic *action* to resolve specific problems. This approach to research favors consensual and participatory procedures that enable people (a) to investigate systematically their problems and issues, (b) to formulate powerful and sophisticated accounts of their situations, and (c) to devise plans to deal with the problems at hand. (p. 15)

The basic action research routine includes an interacting spiral of the look, think, and act process. Stringer's (1996) specific tasks within the routine are summarized below (p.16):

A Basic Action Research Routine

Look	• Gather relevant information (Gather data) • Build a picture: Describe the situation (Define and describe)
Think	• Explore and analyze: What is happening here? (Hypothesize) • Interpret and explain: How / why are things as they are? (Theorize)
Act	• Plan (Report) • Implement • Evaluate

A goal in action research is to link theory with practice. Action research is based on the assumption that the mere recording of events and formulation of explanations by an uninvolved researcher is inadequate in and of itself. (Stringer, 1996, p.7) Stringer continues to state that all subjects should participate directly in research processes and that the processes should be applied in ways that benefit all participants directly. This is one reason why action research was chosen for this study. The participant has stated a desire to be directly involved with the research process more extensively than other forms of qualitative research.

Methods included in data collection were interviews, participant observation, and document analysis. Multiple interviews with the participant provided the participant's identity of herself, her role, and her purposes regarding instructional technology in her methods course. Limited participant observation provided a conceptual framework for physical context, formal positions and roles, related acts, and further insight into the purposes of involving instructional technology in the methods course. Document analysis included recent course portfolios for the purpose of determining how national standards can be incorporated into the current course instruction, as well as the analysis of state and national technology standards for basic themes to integrate into the curriculum.

I first approached Marie two years ago as a colleague and possible collaborative partner in attempts at infusing technology within the college's preservice education methods courses. This *gatekeeping* activity was used to gain entry into the preservice educator cohorts that were already established in the college (Seidman, 1998). Marie continues to demonstrate interest in learning more about the effective use of instructional technology throughout the methods courses.

Marie was interviewed during the second semester of the academic year. A combination of semi-structured and open-ended interviewing techniques was used (Bodgan and Biklen, 1998). Semi-structured interviews were used to specifically direct the questions and reflections related to instructional technology and TEKS integration. Open-ended interviews were used to encourage Marie to talk about her areas of interest concerning instructional technology in order to ascertain Marie's key issues and topics (Bogdan & Biklen, 1998). Interviews varied in length from forty-five to ninety minutes. All interviews were audiotaped and transcribed to preserve exact conversations and provide multiple data reviews as needed (Seidman, 1998). Field notes made during the interviews reflected non-verbal communication. These notes helped add emphasis to the transcribed notes.

I also had the opportunity to observe and talk with Marie informally over the past two years in relation to possibilities of technology infusion within her course. These interviews occurred within a participant-observation interviewing technique, as described by Bodgan and

Biklen (1998, p. 94). Informal interviews were conducted in multiple thirty-minute to one-hour sessions one and one-half years up to and before the spring semester study. The participant-observation studies allowed introductory conversations with Marie to ascertain her proficiency level in technology; her growth interests in technology, and direct observations of her teaching and relations with her students and subject matter. These participant-observation studies provided the groundwork conversations that led into the semi-structured and open-ended interviews conducted in this spring semester study.

Bogdan and Biklen's (1998) recommendations for use of public documents and testimony in an action research approach were used in the document analysis of this study's research (pp. 230-231). The Texas Essential Knowledge and Skills (TEKS) technology documents and the National Educational Technology Standards for Students (NETS) documents were analyzed through comparison methods to determine the basic skills needed for preservice educators. The base level skills resulting from the comparative analysis were shared with Marie to further her knowledge in state and national standards expectations of preservice educators and their eventual K-12 students. The TEKS were also interpreted for Marie in terms relevant to the possibilities for curriculum integration. The comparative analysis was deemed necessary for collaborative efforts in this action research study.

Document analysis was also conducted with selected course portfolios. Marie chose two representative course portfolios for analysis in determining where technology could be infused within her course. Marie was extremely interested in how to integrate technology into her existing methods instruction. Analysis of this primary data allowed reflection of possible technology integration with the students' expected coursework and contributed to subsequent interview content.

Documents, observations, and interviews were coded and then analyzed using Strauss and Corbin's (1998) constant comparative method. The steps to evaluation, including purpose, audience, and procedures, as cited by Stringer (1996) were also used in the evaluation of the study. Transcriptions and field notes were coded and sorted into categories, according to the

theoretical framework. As data analysis continued, categories were modified as necessary. Motivational relationships and patterns within the categories lead to the development of overall themes.

Data Analysis

According to advice given by Wolcott (1994), I chose to employ the following strategies in the analysis and conclusion of my study:

- highlight the findings
- display the findings
- flesh out whatever analytical framework guided the data collection

The findings will be highlighted according to the Stages of Concern model outlined in the theoretical perspective section of the research paper. The instructor interviews, observations of the instructor working with students in a class and individual settings, and document analysis of course portfolios provided data that correspond well with the Stages of Concern model.

Results

Marie was chosen for this study due to her established ability to excite students about subject matter and teaching methods. She seemed a logical choice for trying to find motivational methods to integrate technology into methods course instruction that may prove useful to expand the field of preservice education with technology not only in her college, but in other colleges as well. The findings she provided proved her concern in motivating colleagues and students in her preservice education cohort or group.

In the semester long study that was preempted by a year long, informal sharing of technology with teaching methods, Marie managed to exhibit movement into or through five of the six levels in Hall and Hord's (1984) Stages of Concern model. The analysis of her movement through these stages provided some insight into possible motivational factors that instructional technologists may find useful employing with professors and instructors who have little experience or are hesitant with the infusion of instructional technology into their courses. Findings of what motivated Marie and corresponding motivational strategies related to her

ongoing journey of technology infusion are shared below in a progressive pattern of the Stages of Concern model.

Level 1: Informational Stage of Concern

Relevant applications in regards to preservice educators' personal teaching styles

Marie's interest in learning more about technology was effervescent and evident each meeting with her students and me. This interest to learn more is basically an intrinsic factor that Marie provided the study. I found, however, that *samples* of possible student work and *how preservice educators could use technology for their personal teaching styles and benefit* extremely motivated Marie to learn more about how to include technology in her course. Marie said:

> I don't have that kind of background to think it [integrating technology], but I know we're going there, and I want to see what people are doing, and I want us to be able to go into school districts and to see the products our students have produced and to watch them [school districts] go 'Wow! You went where and you did what?' I want our students to be ahead in technology. I think that is important for our students; technology is something that will draw attention to them. They [employers] are going to pay attention to students who have a technology background. I think it will be a real plus for putting our students first in the door.

Concerns for state and national technology standards

General awareness of instructional technology varies with experience. Marie felt as if she had little awareness of the potential of instructional technology. However, general awareness of the National Council for Accreditation of Teacher Education (NCATE) appears to be more common within the preservice education arena. This general awareness of these standards appeared to provide a feeling of familiarity regarding the structure and need for the educational standards. Marie also has another project that corresponds to technology integration and her methods instruction that reaches beyond the college clientele she serves:

> With the VISTAs [a state standards curriculum project Marie is co-authoring], that [technology integration] is something the state is encouraging. One of the comments we had in this last round was that we were only one of the groups to use technology out of the elementary through high school level. We just got selected again with the grant and we have to look at technology.

I discovered with Marie that *conversations in terms of state and national technology standards were extrinsic motivational factors* for the infusion of technology within her course. These standards became such a motivational factor that Marie started to internalize the management of these standards, which led her to higher levels within the Stages of Concern.

Level 2: Personal Stage of Concern

Relating technology standards to preservice educator and K-12 student needs

Marie frequently questioned her demands of the innovation and her role within the innovation of technology infusion and preservice education. When asked about her attitude towards the impact of the NCATE standards and technology TEKS, Marie had this to say:

> Well, this is the direction they have to take; we've got to go. I really feel we'll all be obsolete if we're not there. . . I feel desperate to help get us there. I'm telling you again, I don't have the training. . . I feel desperate for the students. I think this is what's opening our door in requiring that we get there [to be able to integrate technology in instruction].

Personal struggles of learning how to relate the technology standards to preservice educators in an inviting and non-threatening manner that would entice students to include technology with their curriculum plans troubled Marie for quite some time.

> I see my role as telling them [preservice educators] how to incorporate technology. It's that simple. I am expected to show them how to incorporate technology, and I don't have adequate training.

Marie stated several times in various ways that although she does not yet posses as much knowledge as she desires related to instructional technology, she is very willing to learn and grow with the knowledge and possibilities to expand her creativity. She commented on her views of integrating technology into her instruction as a model for her preservice education students:

> I don't see that this [technology integration] is something added for me to do. I'm really looking for a way to enhance what kids learn and to make us better, stronger teachers.

Marie often alluded to her apprehension of attaining a personal level of standards based technology integration. However, the *intrinsic motivating factor* of *relating the technology to her preservice educator and eventual K-12 students' needs* appeared to be the strongest intrinsic

motivational factor for Marie to learn more about technology integration with her methods course. Improving her students appeared to be the driving force behind Marie's hunger for technology, "I'm hungry. I'm open to anything that will make my students better. I'm wanting to keep things realistic. I think this [instructional technology integrated and intercurricular journal idea] is something that would be a start for them."

Marie started with a few collaborative ideas, such as the integrated and intercurricular journal and a multimedia portfolio. Such collaboratively generated ideas lead Marie in and out of the third Stage of Concern.

Level 3: Management Stage of Concern

Observations of Marie working with students on an individual basis, classroom observations, and interviews with Marie contributed data for the categories that follow. These themes emerged as consistent themes throughout the study.

Desire for technology integration with higher order thinking skills

Marie mentioned several times that one of her main goals in education is to empower students to create knowledge for themselves to the point of ownership of knowledge. When asked to explain more about expanding technology areas within the VISTAs project, Marie had this to say, ". . . and to be able to show kids to do things in classrooms. And it is getting beyond finding sites. We really want them to be able to process their own information."

Along with her interview comments, Marie also demonstrated such concern with her preservice educators. She frequently asked probing questions to have the preservice educators determine what higher order thinking skills they wanted from their lesson designs.

In explaining what Marie expected from her students in final course portfolios, she stated:

> I want some depth, not just "cute." That's where the technology incorporation can help. . . with the depth. . . So important are the multi-intelligence activities and responding to the needs with multiple intelligences. I think technology can help us address those needs. I'm excited about possibilities involved with technology and look forward to what work we do!

Marie expects higher order thinking skills and incorporation of multiple intelligences in most of her student projects. She expects the same with the eventual integration of technology into components of the course.

Integrated curriculum emphasis and integrated curriculum modeling

Marie consistently demonstrated a great desire and effort in collaborative work with her peers. Her reasoning for this concerned her demonstrations of models of teaching for her preservice educators and her desire for her preservice educators to in turn demonstrate such techniques in their student teaching and professional service. Marie explained one example of such existing cohort collaboration in which she desired to incorporate technology:

> I'd have my students journal, but they're learning all these skills in their content reading course that their teacher wants them to incorporate into their math, science, and English methods. Therefore, it would work well with all courses, as well as show students how to integrate curriculum.

Marie questioned ways in which technology could be incorporated into these journals. She provided another formative thought in possible integrated curriculum amongst herself and the content reading instructor, which, in future conversations, eluded to the incorporation of the technology standards:

> Content reading is very helpful for them [our preservice educators]. If anything, I've found that they want to have a book enhance their science lesson. I want to see that they engage kids in manipulative, etc. In [my course subject matter] and the way [the preservice educators design a lesson] is that the kids journal what they've done, using their content reading skills. I wish we would do this in all subjects.

This comment provoked further comments, questions, and formative thoughts on processes in which Marie and I could involve technology standards with the already existing intercurricular project.

When referring to preservice educators' lesson preparation through Internet research in trying to find interactive web sites, Marie had this to say:

> Actually having this requirement [Internet research for interactive web sites] of a technology component would be good. They could do that in math, science, social

> studies, content reading, . . .basically all subjects. This is still basic in that they look at one subject's integration. However, that's using what's there, it's not building on it. So tell me what is next.

Marie experiences a continual struggle with the management issues of efficiency in gathering Internet resources. Observations of individual and small group student conferences, portfolios, and interviews all reflect Marie's strong desire to learn more about the Internet and how to effectively and efficiently integrate such resources into meaningful instruction.

Resource management concerns

Technology standards management, tracking, and technical support concerned Marie. An eventual rubric that simplifies the technology standards for preservice educators according to their K-12 students' expectations has been discussed for implementation in Marie's courses. This appeared to be a great motivational factor not only for Marie's infusion of technology within her methods course, but also provided the impetus of technology infusion to be shared with the other professors in her teaching cohort. Tracking of multiple technology standards would be able to be implemented into Marie's courses through the use of the rubric. This same rubric could also be used with other professors' courses for preservice educators' continued review and practice of technology standards.

Time management in regards to lesson preparation and implementation were also resource management concerns for Marie. Informal, collaborative discussions and interviews emerged with this theme. An excerpt of one such situation follows:

> But you could do this [scanning in the classroom] with schedules, which would also mean the need for adequate time. I try to aim for tasks that take 15-20 minutes, unless it is a long-term, ongoing project. Elementary classrooms are 45-50 minutes in length. If it would be simplified, they could do this. Kids could be in groups of 2-3 and have two tasks.

Marie was clear in her quest to maintain a 15-20 minute alternating task schedule for students in a K-12 classroom. Therefore, she had concerns regarding the preparation and implementation of such technologically infused standards. One motivating factor for Marie

became the issue of time to task implementation and success for preservice educators' planning and K-12 students' academic achievements.

Uncertainty of available hardware, software, and human support resources in the K-12 schools concerned Marie. When discussing available hardware resources in schools, Marie realized, "I have to look at situations in schools. Therefore, I should anticipate that I won't have that many computers, right?"

In a discussion related to available human support for technology within the schools, Marie questioned, "Can they [teachers] sign up for computer times [in labs], do they have a computer teacher? I don't know this. It's all new to me. Can the [subject matter] teacher take the kids there and do this thing?"

Marie recognized potential hardware, software and human support problems, but was not defeated in her need to resolve the problematic situation. "I don't want them [preservice educators] to go out and be obsolete because they don't have technology tools. So, I want them to have these tools. Are there certain things I can expect schools to have?"

I could not provide Marie with a conclusive answer to her question. However, she and I did agree on the issue by realizing that the preservice educators need to be exposed to the technology standards, practice curriculum integration of the standards, and be prepared for advisement and use of the acquired technology skills in their eventual school settings.

Level 4: Consequence Stage of Concern

One of Marie's greatest motivations in integrating technology and technology standards in her preservice education courses was that of the relevance and impact of the innovation, or the infusion of technology standards, on her students. She stated, "I think this [integration of technology standards] does fit and clearly makes the students take on some ownership in their learning. That's motivating to me. . . if I can attain this."

Marie's concern for the relevance of the standards on the students' curriculum plans was evident throughout the entire data collection period. The most repeated themes follow in this outlined section:

Portfolios

Marie and the entire college of education curriculum and instruction faculty have been and continue to discuss the developments related to portfolio assessment within their courses. Marie claims portfolios that demonstrate skills learned in all courses can best help preservice education students receive jobs:

> We're developing portfolios and producing quality work that help them get jobs. We want our portfolios to be the best for the competitive nature. And we've talked some about electronic portfolios, and that would be something we [cohort educators] would have an interest in. Right now we've got our packets we're carrying around. Getting us up to date and innovative in that way [would be helpful].

Marie still has concerns regarding the infusion of technology within these portfolios. Once again, time appears to be a constraining factor to the creative innovations Marie is capable of seeing in her own course development:

> I can see that there can be so much more in these portfolios. . . The thing that concerns me is that I've had to cut back in my thinking from my first semester. Students have been saying "Oh, my gosh, I can't believe you all expect so much. This is the toughest semester we've had."

Inclusion of the proposed technology rubric and intercurricular projects, such as student journals, emerged as definite items for proposal within portfolio development plans. Observations of submitted portfolios for this study reflected the need of technologically enhanced curricular samples, if the preservice educators are to demonstrate proficiency in the application of technology. Although the state licensure board does not demand such a requirement at this point in time, Marie has demonstrated

her personal desires and motivations for making technological applications evident in her preservice educators' work.

Communication needs

Another item needed for relevance to the development of the preservice education students is that of communication. Marie personally communicates with 100-125 students on a weekly basis while students are in the field during the observation and participation requirements of the course. She stated:

> Honestly, putting students out there in the schools for five weeks. . . one of the reasons it is very difficult to find me is because I'm out there driving. I think if we could all be on computers at the same or different times. . . that could eliminate some of the travel time and create better ways to communicate.

Observations of Marie concluded that several student contacts are made through phone messages. Email and discussion group possibilities would allow a progressive conversation, as well as a participant conversation, if communicated through a discussion group open to all.

Depth of planning in addressing Multiple Intelligences and Higher Order Thinking Skills

Marie deems technology as a tool to promoting and creating greater depth and creativity to lessons planned by her students:

> [regarding conversations about portfolios and preservice educator work]
> It bothers me when I go through portfolios and I can't tell differences between theory, philosophies, and student prepared samples. Do I see work that meets multiple intelligences? I think we need all these tools available to us to produce a type of package.

Observations of individual and small group office visits and advisement also reflected numerous occasions in which Marie directed questions towards students reflecting the analysis of the incorporation of higher order thinking skills and multiple intelligences. Marie stated in

informal interviews that she believed technology appeals to multiple intelligences, especially considering the capabilities of multimedia hardware and software.

Students' portfolio work demonstrated the use of multiple intelligences and higher order thinking skills. However, the examples submitted for the study and examples viewed in the formative, informal study revealed the need or enhancement possibilities for technology integration. Marie's concerns for technology infusion regarding the depth of planning would possibly enhance and better demonstrate the quality work students are already producing with their lessons.

User-friendly concerns

Another resounding item Marie deemed vital to innovation relevance for students was that of the need for user-friendly resources and approaches to technology integration with curriculum planning. Marie noted the following, "I want my students to be motivated, not overwhelmed with the technology. Whatever is expected of them needs to be something friendly [for them to want to use the technology]. "

One item that met Marie's interpretation of user-friendly resources and opportunities to include technology included the collaborative reading content journal:

> I like this. . . I like the ideas of the journal. It's workable, it's real, it's not "Oh, my gosh, you're expecting too much." I think it would have an impact on our students in the classroom after [their college experience].

Learner motivation through learner ownership

Marie recognizes the importance and value of learner ownership. When discussing possible ideas of how to integrate technology in her course, Marie had this to say in specific regard to the electronic journal topic:

> That [electronic journal capabilities] would take me to a place where people ask me [to go related to technology]. I want students to have ownership. That's

> because you have to put it in your own terms to understand it. That's where I want the kids to be.

Marie also recognizes the need for teachers to become proficient in guiding students toward learner ownership:

> If we can put this in terms where kids put this in terms that they understand. . . that's my big push always. That works for me! I'm really excited about that! I'm motivated! Oh, gosh. I'm not supposed to be that simple, am I?

Level 5: Collaboration Stage of Concern

Cohort collaboration with technology TEKS

Regarding the question of whether Marie saw any possibilities of involving technology in her cohort that could be used throughout the methods courses:

> Actually, that's why I want [another professor's] input. She's been instrumental in teaching a course communicating with her students at home. There are all kinds of cases in which her students are communicating [via email]. . . I'm looking for something else. . . with the communication capabilities that we have, I think we can do a better job [of communicating with our students in the cohort]. . . They [preservice educators] have social studies, content reading, and science. They have the opportunity to combine to do something, or do separate things. I've learned that they learn a lot when they combine projects. So that's something I'm debating.

This *need for cohort collaboration in communication and curriculum planning* appeared as one of the most emergent themes. Marie's concerns for preservice educators communicating asynchronously and synchronously with their peers and professors is based upon individual reflection and recognized cohort needs. She also values students sharing products and results with other students.

Marie noted in several observations and explicitly stated in an interview that she recognized the state mandated TEKS objectives and technology objectives were expected of the K-12 students. In reflection of this fact, she stated, "Since these [TEKS] are the objectives for our students [K-12 students], these would be good for our students [preservice educators] to learn."

When attempting some preliminary ideas for effective technology integration throughout the educator cohort, Marie generated the idea of a *technology standards rubric* with limited assistance from me as a technologist:

> What if we devise a rubric, such as a tic-tac-toe rubric in which students choose tools from a selected block. For instance, one can scan; another may use the digital camera. Our students [preservice educators] could be responsible for having [K-12] students integrate technology into their [subject] lessons. . . Let's give them choices based upon their resources [in the school].

In a rather lengthy dialogue regarding the instruction of preservice educators in *the use and development of K-12 student journals*:

> If they had to go beyond writing it and do different things with that journal, it would really give them better comprehension of what they're doing. I think that could be more powerful. And so, that's why I'm thinking, "Wow." They could tell it in more ways than just writing: graphs, pictures, images, what if they had to show me [what they learned] in several ways?

Regarding her views on motivating and sharing these ideas with others in the cohort:

> I think it would be good to share with others in the cohort. Still, I think we're open to doing better. As long as it goes into that "seamless" thing, not that we're adding, I think the cohort would go along.

The "seamless" comment Marie refers to in the above statement regards *the incorporation of technology in a fashion that does not detract attention from the subject content.* In other words, the technology becomes a tool in the process of instruction, much like a pencil is a tool in the process of writing. She restates a similar comment in another interview:

> I don't want to take it at a pace that creates a lot of raucus in the cohort. I think this [rubric idea] is reasonable; something that enhances the course; is in the direction we are going. I don't think I'm adding stuff to be adding stuff.

Consistent and equal distribution of technology TEKS in methods courses

Previous discussions with Marie and other faculty reflect the sentiment that *technology standards need to be practiced in all preservice education courses*. In regards to a conversation about the one required technology course for preservice educators at the college:

> I just hate that we're taking a class and that's it [for technology instruction related

> to preservice educators]. I'm adamant about being competitive;. . . the [college of education] does very well in placing students in good jobs. We just want them to be better. Technology would do that for them. Overall in our program, they need to use it and do it. Its going to take a lot of practice before they can feel confident in knowing which skills they can incorporate into their lessons.

Another supporting quote from a conversation regarding preservice educators' needs to be exposed to various hardware and software throughout their preservice education experience was stated as follows, "I think you would eventually see things you could do with hardware and software if you had that resource all the time."

Level 6: Refocusing Stage of Concern

Discussions related to the refocusing stage did not occur, due to the needed progression of this study. Future studies for evaluative analysis of perceived success and revisions of the technology tools devised for Marie's classes will be revealed to other cohort members for possible integration in their courses.

Discussion

The failure to integrate technology with purpose, method, or meaning can result in technology anxiety by preservice educators and first year teachers (Wild, 1996). Marie's commitments for purpose, method, and meaning of technology integrated within this study demonstrate her dedication to successful integration of technology within her methods courses. This methodical approach and concern for purpose, method, and meaning of technology integration should prove successful for Marie in the future developments of technology integration.

Marie also exhibited dedication to modeling and incorporating the needed hands-on experiences in order for her preservice educators to have experiences with the integration of technology into instruction (Barker, 1993). Although Marie clearly stated she did not have adequate training to provide such modeling at this point in time, she did indicate a desire to learn

and an awareness that the state and national technology standards must be addressed across preservice education courses.

The study's first question's concern for the incorporation of state and national technology standards did prove to be a major external motivational factor in Marie's development of technology integration within her course. Furthermore, her concerns for technology standards integration were in alignment with ISTE's quest for preservice educator basic competencies in technology operations, personal and professional uses of technology, and in the application of technology for instruction (Wise et al., 1997).

Two major findings resulted from this study in regards to the integration of technology standards within this preservice educator's methods courses. First, cohort collaboration with technology standards appeared to be a motivating concern for Marie's integration and implementation strategies related to the infusion of technology standards in her course. The second major finding is directly related to the first finding. Marie desires consistent and equal distribution of technology standards in her methods course.

Cohort collaboration appeared to be consistent with Wild's (1996) concerns for purpose, method, and meaning in instructional technology preservice education integration. Roblyer (1994) would also approve of this collaborative approach to an attempt at the full inclusion of technology practices and uses into all methods coursework. What moves these previous research works a step further towards the infusion of technology in preservice education is the glimpse into one specific attempt at discovering these needed motivational factors.

Subcategories found within the first finding of cohort collaboration needs related to technology standards curriculum infusion include the need for cohort collaboration in communication and curriculum planning, as well as the desire to develop and implement a cohort

technology standards rubric. The use and development of K-12 student journals and the incorporation of technology in a fashion that does not detract attention from the subject content were also two subcategories within this theme.

The second major finding related to the consistent and equal distribution of TEKS technology standards in methods courses contained basically one category of concern. The concern that technology standards need to be practiced in all preservice education courses appears to be not only of concern for Marie, but also for the entire college of education. This motivational factor to infuse technology into all courses also supports Sheffield's (1996) finding that instructional models that emulate technology integration are considered a valued institutional approach to technology integration. Roblyer (1994) would also agree with his recommendation that full inclusion of technology practices and uses is needed for all methods coursework.

It became evident throughout the study itself that Marie was becoming more comfortable with the technology state and national standards. The ideas reflected in this study were devised primarily from collaborative conversations with Marie. She has had limited contact with me in learning how to operate the technology. However, she has obtained a strong grasp of the available technology capabilities and can therefore move throughout the Stages of Concern model with greater ease and fewer apprehensions regarding the innovation of technology infusion within her curriculum. As long as the finding related to technology standards motivational categories are approached in future studies, Marie should be a good candidate for future studies related to successful technology standards integration into coursework.

A few of the motivating factors findings in the categories developed through the Stages of Concern model proved interesting and greatly contributed to the findings in this study. These findings will also be discussed in relation to Roblyer's (1994), Sheffield's (1996), and Wild's

(1996) previous findings and recommendations in order to support the second major question of the study.

Marie had four major categorical definitions of what motivated her to integrate technology in regards to the direct concerns and needs of her students. These included (1) relating technology standards to preservice educator and K-12 student needs, (2) the integration of higher order thinking skills and Gardner's multiple intelligences, (3) a concern for an integrated curriculum emphasis, and (4) time.

A second category of motivational factors that Marie defined as being needed in regard to faculty cohort support and development also emerged from this study. Time and resource management, integrated curriculum planning and outcomes development, cohort communication needs, and depth of learning appeared to be the most prominent emerging subcategories within this category of motivational factors related to faculty cohort support.

Summary

The purpose of this study was to explore a preservice educator's goals with technology in her teaching methods class regarding state and national teacher preparation technology mandates. Specifically, the study sought to provide some insight into motivating factors for a preservice educator to include technology within her preservice methods course. These motivational factors were finally categorized as follows:

Technology Standards Integration Motivational Factors:

a) cohort collaboration with technology standards,

b) consistent and equal distribution of technology standards throughout methods courses.

Motivational Factors Related to Preservice Educators' Needs:

a) relating technology standards to preservice educator and K-12 student needs,

b) integrate higher order thinking skills and Gardner's multiple intelligences,

c) include an integrated curriculum emphasis,

d) consider time management factors.

Motivational Factors Related to Faculty Cohort Needs:

a) time and resource management,

b) integrated curriculum planning and outcomes development,

c) cohort communication needs,

d) greater concern for depth of learning and outcomes.

Considering these three major categorical findings and needed motivational factors expressed by Marie should prove useful in future studies in working with Marie and other faculty cohort members in trying to find general motivational factors and needs of all faculty. Such future studies should prove useful to other colleges of education struggling with similar issues regarding the infusion of technology standards within preservice education courses.

The reciprocal working relationship that has been developed by Marie will prove valuable in possible future relations with other preservice educators in her cohort. In future studies, I plan to use the snowball sampling technique as described by Patton (1990), who suggested, "Those people or events recommended as valuable by a number of different informants will take on special importance" (p.176). For future studies, I feel those named by Marie to work on interdisciplinary technology projects will be key participants in developing a model for TEKS integration with core disciplines in preservice teaching methods.

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