Moving From Theory to Practice: An Examination of the Factors That Preservice Teachers Encounter as the Attempt to Gain Experience Teaching with Technology During Field Placement Experiences

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This case study describes the experiences of two preservice teachers as they attempt to integrate the use of technology into instruction during their field placement experiences. What factors influence the decisions they made about how and when to teach with technology? How do these factors enable or disable their abilities to gain experience teaching with technology during their field placement experiences? This case is part of a larger study of six preservice teachers, engaged in a program designed to prepare new teachers to teach with technology. This program received $1,3000,000 from the U.S. Department of Education, which was 50% of the total cost. The remaining funding came from a university, school, and business match. Data collected from surveys, interviews, and written reflections was examined to help identify enabling and disabling factors, and gain an understanding of how those factors influence practice.

At the beginning of the year we had intended to have some kind of a technology lab or something each chapter that we go through in the book. And we did a few of them at the beginning of the year. And then we realized how far behind we were, and stuff, so we pretty much said, you know, we can’t actually do that. So, in the beginning of the year I was assuming I would do something in my work sample
with technology. But by the time I got around to planning it, I knew there wouldn’t have been time. (Nancy, Group Interview, 3/23/02)

I was surprised to hear this statement coming from Nancy, a student who had expressed great interest in using computer technology in the past. Nancy had been a student in an introductory computer course that I had taught the previous year, and had participated in a number of math methods courses that focused on using technology for teaching and learning. What was preventing her from gaining experience teaching with technology during her field placement? An earlier conversation with her had provided at least one possible answer to this question: “Unfortunately, my teacher teaches a little bit differently than I anticipate teaching. Mine would be more of an activity-based approach where you could use the computer lab more often because you’re not always following the book and doing lesson-by-lesson, page-by-page. For that’s how hers works, and technology doesn’t fit in as easily.” (Interview, 2/23/01) Clearly, the influence of her mentor teacher was having a disabling impact on her ability to use technology on a regular basis.

In contrast, Suzanne, who had shared serious reservations about using technology at all, reported that she was using it on a regular basis.

I come from kind of an environmentalist family who have always been very skeptical of technology. So when I found out I was in the tech cohort, I was pretty upset, but trying to be open. And then I got placed with Brianna, who’s like tech guru of the world. Here she is this great tech guru… I use it almost daily, and I’ll be in the computer lab all next week, and they’re doing Publisher brochures. It’s just fabulous.” (Interview, 2/23/01)

Why would Suzanne, who was reluctant to use technology in the first place end up routinely integrating it into her teaching and learning, and Nancy, who was eager to use technology from the beginning, not?

As a teacher educator, I was troubled by this question. Through these conversations with Nancy and Suzanne, and others like them, teacher educators can gain a better understanding of the factors that influence a preservice teacher’s ability to practice teaching with technology during field placement experiences. What are the factors that enable them to practice teaching with technology, and what are the factors that disable that process? How do these factors influence the decisions that preservice teachers make about how and when to use technology in their student teaching? Why does a factor appear to be an enabler for one person and a disabler for another? What influence does a teacher preparation program have on these factors?
This article highlights the experiences of two preservice teachers during student teaching. It draws from a larger study of six preservice teachers (Bullock, 2002). The factors they encountered and the way those factors influenced their abilities to practice teaching with technology are representative of the group as a whole. By focusing on the work of these preservice teachers, as described through their own voices, this study provides a unique perspective on the factors that student teachers encounter and the way various factors affect their use of technology in the classroom.

Rationale

The importance of preparing teachers who know how and when to teach with technology has gained national attention over the past three decades. Reports such as *A Nation at Risk* (US Department of Education, 1983), and *Teachers and Technology* (U.S. Congress, 1995) emphasized this importance. The International Society for Technology and Teacher Education (ISTE) (Moursund & Bielefeldt, 1999), the National Council for Accreditation of Teacher Education (NCATE) (NCATE, 1997), and the Milken Foundation (Lemke, 1999) have also produced reports that support the contention that the “most direct and cost-effective way to educate teachers about technology is through the preservice education they receive in colleges of education or other institutions” (U.S. Congress, 1995, p. 166-167). These studies also recommended steps that teacher education programs might take to improve the effectiveness of their programs. Among their suggestions were: integrating instructional technology into all teacher education courses, modeling of technology integrated teaching and learning by teacher education faculty, and field experiences with mentor teachers who support and encourage preservice teachers as they practice teaching with technology (Moursund & Bielefeldt, 1999). Research into effective teacher preparation programs supported these suggestions (Falba, 1997; McCoy, 1999; Smith, Houston, & Robin, 1995; Strudler & Wetzel, 1999; Vannatta & Reinhart, 1999; Voogt & Odenthal, 1999).

Much of the research into the effect of technology preparation on preservice teacher practice included some combination of self-reported survey data on changes in attitudes toward the use of computers by preservice teachers with statistics about the number and kinds of technologies that preservice teachers encounter (McCoy, 1999; Ropp, 1999; Vannatta & Reinhart, 1999). This type of information helped teacher educators examine and improve the infrastructure needed to support technology preparation and use. It also provided us with insight into effective ways to prepare preservice teachers to use technology and develop technology integrated curricula.
This study builds on earlier research, and explores how the work of specific preservice teachers put theory from university labs and classrooms into practice during their student teaching experiences. The stories of preservice teachers, as told through their own voices, will help teacher educators gain a better understanding of range of challenges that preservice teachers face as they attempt to practice teaching with technology. By identifying the factors that enable or disable a preservice teacher’s ability to practice teaching with technology during field experiences, and examining how preservice teachers have dealt with these factors. Teacher educators can gain insight into effective practice.

A case study approach was designed to listen to the stories of specific preservice teachers while they were engaged in the process of developing curricula and making decisions about how technology would be used in their student teaching practice. By identifying and analyzing the factors that these specific preservice teachers describe, I gained a broader understanding of the influences that student teachers encounter beyond the university classroom. New light was shed on the importance of crafting courses, programs and experiences that take these factors into consideration, and better prepare new teachers to teach with technology.

Framework

The purpose of this study is to examine the factors that preservice teachers encounter which influence the decisions they make about how and when to teach with technology during their field placement experiences. Five key questions frame the research for this study:

- What are the factors preservice teachers encounter that enable or disable their attempts to practice teaching with technology?
- How do these factors influence the decisions preservice teachers make about how and when to use technology in their student teaching?
- Why does a factor appear to be an enabler for one person and a disabler for another?
- What influence does the teacher preparation program have on these factors?
- What are the implications for this and other preservice programs?

Identifying the factors encountered by specific preservice teachers, and examining the influence that these reported factors had on the decisions they made about how and when to practice teaching with technology, provides
useful information for teacher educators as they consider programmatic change.

**METHODOLOGY**

When Nancy and Suzanne described their experiences of attempting to integrate technology into their classrooms, I was struck by the different approaches they had encountered in their field placement sites, especially in light of their own preconceived ideas about how and when they might use technology with children. All of the studies I had read spoke of the benefits that teaching and learning with technology offer today’s classrooms. The readings in our instruction and technology textbook provided examples of how to design technology integrated curricula. They had each designed sample lessons that demonstrated their understanding of how technology might be used. Why was Nancy, who clearly wanted to use technology on a regular basis unable to do so? Why was Suzanne, who had expressed doubts about the value of using technology routinely able to integrate it into her teaching?

**Theoretical Framework**

I chose a case study approach for this research, based on an indepth examination of the stories of these preservice teachers as told in their own voices. Stake (1995) described this approach as an opportunity to examine the “uniqueness and commonality” of the persons being studied and “look for the detail of interaction within its contexts” (p. xi). By examining the cases of specific preservice teachers, and “learning how they function in their ordinary pursuits and milieus” (p. 1) we can then attempt to determine why certain factors serve as enablers for some preservice teachers and disablers for others. The words of preservice teachers paint an indepth picture of their practice teaching experiences, the factors that influence the decisions they make related to teaching with technology, and give some idea of the enabling and disabling influence of those factors. For this reason, I chose not to include formal classroom observations as another source of information for this study.

The interactions that Suzanne and Nancy had are representative of all six preservice teachers, and provide a more focused view of the larger case study. Data were collected from three sources: group interviews, individual interviews, and surveys. Since Suzanne and Nancy were placed in the same school, access to technology and technology support was relatively equal.
Comparing the descriptions of their experiences provided useful information about the influence of mentor teachers and some of the other challenges that these preservice teachers faced during their field placement experiences. Researcher Margaret Yonemura (1982) also noted the benefit of this approach: “Such conversations can bring to full awareness neglected perspectives on teaching, its complexity, and richness as a practical art” (p. 241).

Previous research included observational and survey data, and provided some of the answers about effective methods for preparing preservice teachers to teach with technology (Strudler & Wetzel, 1999; Vannatta & Reinhardt, 1999). What it did not provide was a more intimate view, focused on preservice teachers who were dealing with the challenges of integrating technology use into their student teaching experiences. An examination of the specific cases of preservice teachers, engaged in a teacher education program that expect them to practice teaching with technology during their field placement experiences, provided close-up view of the factors that influence each specific case.

**Settings and Participants**

Suzanne spent her field placement experience at Reagan Middle School (pseudonym) in District 14. Built in 1928, Reagan Middle School is representative of many of the schools in this region, with 18% of its students receiving English as a Second Language support. The students at Reagan Middle School score routinely 15-20% below the state average on standardized reading and writing tests, and near average on state math tests over the past three years. Families in this community represent a diversity of ethnic and economic backgrounds, with the majority considered lower middle class. Other schools in District 14 tend to be newer and serve more affluent neighborhoods in the community. Brianna, Suzanne’s mentor teacher was a veteran teacher with over 25 years of experience teaching language arts and computers. Brianna had a great deal of experience using technology in her teaching and helped provide professional development workshops for her colleagues. She participated in the Intel Teach to the Future program (Intel, 2002), which focuses on helping teachers develop and teach technology enhanced curricula, throughout the past two years as a master teacher.

Nancy also completed her field placement experience at Reagan Middle School. Nancy was preparing for initial licensure as a middle school math teacher. Her mentor teacher, Vikki, also participated in the Intel Teach to the Future program, and planned to use technology for several of the classes.
she was teaching. As part of her preparation for the teacher education pro-
gram, Nancy took several courses that focused on the use of technology for
teaching mathematics and other subjects.

Suzanne and Nancy were both part of a cohort of 33 preservice teachers
who entered the Graduate Teacher Education Program (GTEP) at Portland
State University (PSU) during the summer of 2000. This fifth-year teacher
preparation program combines university courses with one practicum and
two student teaching experiences to prepare preservice teacher for State of
Oregon licensure. Preservice teachers were paired with mentor teachers who
were selected on the basis of their expertise and experience as classroom
teachers, but not necessarily their use of technology for teaching and learn-
ing. In most cases the mentor teachers were selected by the school or dis-
trict, not the university.

Three different field placement experiences were integrated into the
GTEP year, normally with the same mentor teacher and classroom.
Throughout their first term in the program, preservice teachers in this cohort
combined a minimum of 90 hours of practicum with their university course-
work. This experience was followed by their first student teaching experi-
ence in which they worked half-time for 10 weeks. During this time period
preservice teachers designed, taught, assessed, analyzed, and reflected on a
two week unit of study (work sample) that was evaluated by their mentor
teacher and university supervisor. Finally, these preservice teachers com-
pleted a second student teaching experience that included full-time class-
room teaching and responsibility for 10 weeks. It was comprised of a mini-
mum of five weeks of solo responsibility for the classroom and a five week
unit of study.

Data Collection

Data for this study was collected primarily from group and individual
interviews. Additional data from surveys and written reflections was used to
help corroborate information gained from the interviews.

Group interviews. Two group interviews were conducted: one at the begin-
ning and one mid-way through the study. Interviews were audio-taped and
transcribed. Questions were derived from a pilot study conducted in the fall
of 1999. They included:

• What types of technologies are available for you to use at your student
teaching site?
How are you preparing to use technology in your teacher preparation courses? Does the preparation seem adequate?

What would you like to see your teacher preparation program improve?

How have you seen technology being used in your field placement site?

How have you used technology in your student teaching to-date?

What factors have you encountered that have affected your decisions about whether or not to teach with technology?

One of the advantages the group interview format was that it allowed me to dig deeper into unexpected issues that came out of the discussion. During the pilot study for this research, I found that the interaction among participants encouraged individuals to remember and talk about experiences they had not mentioned during individual interviews. This provided an opportunity for these preservice teachers to have a conversation about their experiences learning to use technology, and gave me the opportunity to witness and record their interaction.

**Individual Interviews.** “Two principle uses of case study are to obtain the descriptions and interpretations of others” (Stake, 1995, p. 64). I used in-depth interviews as a follow-up to the group interviews to learn more from these preservice teachers. These interviews provided an opportunity to hear the stories of each in greater detail, and from their unique perspectives. Suzanne and Nancy were each interviewed three times: after the first group interview, after the second group interview, and at the end of their field placement experiences. I began these interviews with the same questions I had used during the group interviews and added other questions as needed to clarify information. Each interview was audio-taped and transcribed. Participants were invited to review each transcript and add comments.

**Surveys.** All of the study participants completed pre and postsurveys as self-reports of their individual skill levels, anxiety levels, and attitudes toward the use of technology in the classroom. Data from these surveys helped corroborate interview data related to each participant’s preconceptions about the importance of using technology in teaching, and any influence that their individual skill levels might have had. While the survey data did help confirm that previous experience and attitude can be a factor that enabled or disabled their ability to teach with technology, it did not provide any new information.
Data Analysis

Group and individual interview data was analyzed in part with qualitative QSR NU*DIST software (QSR, 1997). I used this software to facilitate the coding and analysis of words and phrases gleaned from interviews and documents. During interviews I noted who was talking as I asked questions. In addition, a research assistant tracked speakers on a minute-by-minute basis using a Microsoft Excel worksheet to record who was speaking and when. This added information helped me verify the accuracy of my own notes when I transcribed these conversations. I chose a “basic transcript” format, as described by Ochs and Schieffelin (1979), to record these data, focusing on the “message content” of the participants.

In nearly all linguistic, sociological, and psychological treatments of adult-adult speech behavior, nonverbal considerations in the immediate situation are minimized or ignored. By and large, the message content is considered to be conveyed through language. (p. 52)

Stake (1995) also took this approach a step further by suggesting that, “Getting the exact words of the respondent is usually not very important, it is what they mean that is important. A good interviewer can reconstruct the account and submit it to the respondent for accuracy and stylistic improvement” (p. 66). Following Stake’s suggestion, participants received copies of all interview transcripts and were given the opportunity to add their own comments or clarifications. This review of the data, combined with my notes and those of the graduate assistant, helped assure an accurate account of these conversations.

To help validate my findings, I used three different approaches to coding the interview transcripts: by individual, by general category, and by type of enabling or disabling factor. For the first analysis I looked at the transcripts of my conversations with each individual and highlighted phrases that identified enabling or disabling factors. I then grouped those phrases under the categories of “enabler,” “disabler,” or “both” for each individual. Based on this information I was able to cluster the enablers and disablers into categories, and develop a strategy for coding the data a second time.

For my second analysis I sorted the phrases into groups of enablers or disablers for each individual within each of the larger categories. This helped me to see how some factors can serve as either an enabler or disabler depending on the individual and look for patterns of relationships between factors. During this process I discovered factors that did not readily fit into my predetermined categories. These factors included: planning (or lack of it), concern about equitable access to technology by children, collaboration
within this particular group of subjects, and onsite training opportunities (e.g., Intel’s Teach to the Future). I used this information to verify and broaden the categories of enablers and disablers, and decided that a third coding approach was needed to help validate the additional information.

To help verify the factors and categories that I had derived from the previous two approaches to coding, I decided to use one last approach, and reviewed the transcripts with no predetermined categories or groups. This time I read through each of the transcripts again, and as I encountered a factor that appeared to influence a preservice teacher’s ability to practice teaching with technology, I decided whether or not it was an example of an enabler or disabler. Then, I created a subheading for it under one of those two categories. This third coding approach helped me to look at each factor without the focus on individual subjects, allowing me to review the categories I had originally developed for enablers and disablers to determine whether or not the broad category groups were accurate. Using all three coding approaches helped me identify factors that served as enablers and disablers for each individual based of the interview transcripts. After identifying these factors, I was also able to examine the decisions each participant reported making, and the methods they used to practice teaching with technology in light of these factors.

RESULTS

The preservice teachers studied encountered various factors that both enabled and disabled their attempts to practice teaching with technology during their field experiences. Some of these factors: workshops and coursework, modeling, and faculty expectations were within the scope and control of our teacher preparation program. Others factors such as school and district requirements, support from mentor teachers and parents, individual attitudes about how technology should be integrated, and past experiences using technology were outside the program. How each preservice teacher dealt with the enabling and disabling factors they encountered varied from person to person. The following describes the cases of Suzanne and Nancy, primarily told through their voices.

**Suzanne.** Suzanne spent her field placement experiences in a language arts classroom at Reagan Middle School. Brianna, her mentor teacher, was also the technology coordinator for the school, providing easy access to technology and helpful mentoring. Brianna’s expertise and enthusiasm proved to be
an important enabling factor for Suzanne, who was initially skeptical about using technology in the classroom.

I come from kind of an environmentalist family who have always been very skeptical of technology. So when I found out I was in the tech cohort, I was pretty upset, but trying to be open. And then I got placed with Brianna, who’s like tech guru of the world. Here she is this great tech guru. The first program of the year she did a PowerPoint unit with the kids, and she’s got a ton of computers in the classroom, and a scanner and an InFocus (computer) projector, and all sorts of neat fun stuff. And we use it almost every day. I have found that in my student teaching I rely more on the InFocus projector than she does for a couple of reasons. One, I like to turn the lights off. It calms my kids down. And they’re kids that have been raised in the digital age, so they are responsive to stuff that I project up onto the wall. So I’ve been really fortunate. I use it almost daily, and I’ll be in the computer lab all next week, and they’re doing Publisher brochures. It’s just fabulous. (Interview, 2/23/01)

This change in attitude from skeptic to enthusiast carried throughout her field placement experience. Suzanne quickly saw the advantage of having access to both technology and training as an important enabler.

I think I was lucky because I came into Reagan Middle School at the year when it kind of exploded on the scene there, with just a huge huge increase of software and hardware in the school. But also training for staff and kind of just this rising level of excitement. So I had access. Access was easy. (Interview, 6/7/01)

Suzanne also had the opportunity to attend and help Brianna conduct technology workshops within her school and district. This collaboration served to enable Suzanne’s ability to plan and teach with technology.

In terms of seeing how to use technology, and getting to experiment with ways to use it in the classroom, and getting to be with other teachers who are learners at the same time, my field experience has been really helpful. To be able to be in kind of a learning process together, is almost the ideal situation because you’ve got people at all ability levels and experiences, and even if you don’t have a lot of experience with computers, you might have a lot of content knowledge. And having to create a technology rich work sample. I’m like, “Okay, where do I begin? What topic, what book should we read?” I mean, I had no idea. So I was able to help a veteran teacher with the technology part, and she was able to help me with the curriculum part, and there was so much synergy in that classroom. (Group Interview, 2/9/01)
I gave a presentation at a staff development workshop for the district on Microsoft Publisher. That was really fun. And it was neat because our school has traditionally been the lowest economically supported school in the district and, other teachers and the community kind of look down their noses at this particular school and they came into our computer lab and said, “Like wow this is cool!” And our staff felt really neat about that. (Group Interview, 3/23/01)

Because of their work with Brianna, students in Suzanne’s classroom were accustomed to using technology on a regular basis. As a result, their skills with and attitudes toward the use of technology helped enable Suzanne to practice using it.

My students were making their Publisher brochures and I only did a 15 minute tutorial. And because they’d done so much PowerPoint at the end of fifteen minutes they were like, “Okay, we get it.” They wanted to get on and start it. And they went to town, and they were teaching each other stuff, and they were teaching me. And they love lectures with PowerPoint. They want them every day. They see the InFocus projector and one person says, “Is there gonna be...are you gonna lecture with PowerPoint today?” They really like it. (Group Interview, 3/23/01)

Brianna considered teaching children to use technology more important than focusing on preparing for tests to meet state standards. This perspective was different from other teachers in her building, and other mentor teachers encountered in this study. While Suzanne eagerly followed Brianna’s lead, her initial skepticism prompted her to be thoughtful in her approach to teaching and learning. Suzanne expressed concern that the curriculum might become more technology driven, and lack balance.

My mentor teacher is a tech guru. That’s what she calls herself and she’s the tech coordinator for our school, which is a position she shares with the media specialist. And so she teaches 5 classes a day and then is supposed to have, to use one of her prep periods to go around and help people troubleshoot. We don’t have a language arts book that we have to get through and so she, my mentor teacher, has taken on the responsibility of (because she wants to) doing tech stuff with the kids and I think at the expense of literature and writing. And I feel like, and she has told me flat out, “I’m sick of language arts.” She’s been teaching for 25 years. “Technology’s my passion.” My kids are learning a passion for technology, but I think at the expense of some really other wonderful things that could happen, too. And I
would like to see more of an integration of the two than I do now. (Group Interview, 2/9/01)

While test preparation did not drive the approach of her mentor teacher, Suzanne did express concern as state testing time approached. This was a concern shared by other participants in this study as well, and in several cases a disabling factor.

One sad thing is our reading. We’re coming up on our reading test and we’ve been preparing because we haven’t really read up to this point, and so now we’re kind of preparing for the test, and taking all these sample tests. And even kids that I thought would be able to read independently, that I thought would be okay are not doing well. So, you know, just sort of another reminder that it’s a language arts class, not a technology class. And that my number one job is to teach reading and writing and critical thinking skills. And if I can do that by using technology as a tool, awesome. But, I can’t, I can’t do it in place of. (Group Interview, 3/23/01)

This could have become a disabling factor for Suzanne. Instead it prompted Suzanne, during the last term of her program, to deliberately focus on integrating more literature and reading into her teaching while continuing to use technology for other unit activities.

My kids are reading a lot. We’re doing literature circles with parent volunteers, and I’m really excited about that. The kids are so excited about it. And we’re reading Ann Frank, and my teacher did the ITF (Intel Teach to the Future) thing, and her unit was on Ann Frank, and it was really good, so I’m gonna incorporate some of what she used into it. But, I don’t want to do the whole gamut of everything because I want to stay focused on the text. And so I’m gonna definitely, especially use a lot of the Internet. We’re gonna go to a lot of the sites on the Internet and look at visual pictures, and there’s lots of songs from that era that um.. so I’m gonna do a lot of that stuff. (Group Interview, 3/23/01)

Suzanne became so adept at knowing when and how to use technology, and sensitive to the potential abuses that she was able to effectively use it during an unplanned “teachable moment” in her classroom.

My kids have been saying “ghetto” a lot lately. Like if a desk is broken, they say, “this is a ghetto desk.” So I was kind of ignoring it, and I didn’t know how to address it, and then we did character silhouettes
where you outline your body and then you draw it, and then you write
descriptions of your character in there. And somebody drew really
big lips on his character and said, “Those are ghetto lips.” And then
said, in front of the whole class, “Look at these ghetto lips.” And I
stopped the class, and I talked about, you know, what ghetto means,
and asked them what they meant when they used it, and talked about
the politics of language. And, so then, they didn’t use it in relation to
race, but every now and then they’d come in and they’d be like, “This
is a ghetto classroom.” And if it wasn’t specifically tied to some-
body’s body part or whatever, then it was okay they thought. They
were just kind of doing it to needle me. So I got up, another teacher
told me about this web site that she’d found from the Warsaw ghettos,
and so I showed pictures of them on the Internet. And I talked about,
where the word came from, that it initiated in, around, World War II,
with the Warsaw ghetto, when all the Jews were forced into these
slums. And so anytime you segregate somebody, now, into a really
low income, bad place to live, then, and it’s usually made up of one
ethnic minority or another, then it’s called a ghetto. And they were
just dead silent. I mean just total dead silent. Like just seeing those
pictures was so, I mean this was so powerful. And no amount of
preaching or whatever could have been as powerful as those visuals
were. And so, that was a tool. And I think, “Okay, this is what the In-
ternet, this is what it is supposed to be used for in the classroom. This
is real teaching with technology.” So I felt, cause sometimes I feel
like it’s just all, it’s really impressive, and people are really impressed
by technology, but the content just isn’t there. And so, when I kind of
got those, like magic moments when I’m teaching and using technolo-
gy at the same time, I’m like, “Okay this is what it’s supposed to feel
like.” (Group Interview, 3/23/01)

Brianna also did her own technical support most of the time. To Su-
zanne, this additional duty that Brianna took on was both a blessing and a
curse.

This woman is there at 6am and leaves between like anywhere be-
tween 4 and 10 PM at night. And she is like, she’s obsessed with the
school and with technology. And she like, with anything that has to
do with language arts, if there’s a conference or seminar, anything,
she doesn’t want to go and so my kids are learning a passion for tech-
nology, but I think at the expense of some really other wonderful
things that could happen, too. (Group Interview, 2/9/01)

Of all the factors that Suzanne described, seeing the time and energy
that Brianna invested was the only one that had the potential to be a disabler,
but all of the other enabling factors allowed her to routinely integrate technology into her practice teaching. It is no surprise that she is now employed full-time at Reagan Middle School.

Nancy. Nancy completed her field experience in a mathematics classroom, preparing for initial licensure as a middle school math teacher (grades 5-10). Before entering the teacher education program, Nancy took several courses that focused on the use of technology for teaching mathematics and other subjects, and was looking forward to using technology as part of her field experience.

At the beginning of the school year Nancy and Vikki, her mentor teacher, participated in a Technology Institute that was part of the this PT3 project. This three-day experience combined “getting to know you” activities with workshops and demonstrations by university faculty, experienced teachers, and project partners. Teams of preservice and mentor teachers were encouraged to use this time to think about the possible ways they might integrate technology into their teaching during the coming school year, and began planning some of the activities they might include. Nancy and Vikki spent their time together, talking about how they would include one technology experience in each unit that they taught. To start off, they planned for Nancy to introduce spreadsheets to her students as part of a unit activity.

This collaborative experience had an enabling influence on Nancy’s attitude and initial approach to practice teaching. She was very eager to find other ways to integrate technology as well.

They put in a new computer lab this year, so at the beginning of the year my mentor teacher and I were all excited, thinking we were going to do at least one type of a computer lab activity per chapter. It ended up that we did have one successful thing working with Excel, so that was good. And then one of my methods courses required me to do a language arts lesson, and I ended up doing a speech lesson. So we decided to integrate PowerPoint into that, and then we tried to integrate math into that by having them do a speech on a mathematical idea or concept. And so, it was kind of cool. (Interview, 2/23/01)

Unfortunately, despite the new computer lab in the school, overall access to computers was limited. The one-day experience they planned ended up taking a full week and used a large portion of Nancy and Vikki’s allotted computer lab time. Nancy’s mentor teacher decided that they should abandon their plan for the rest of the year. To Vikki it was more important to make sure that the students completed all of the chapters in their textbook by
the end of the year. If there was time remaining at the end of the year, they could consider adding another technology experience then. For her, the use of computers was something to be added to the math curriculum rather than a method for enhancing instruction. What had been an enabling factor became a disabler.

My mentor teacher probably wouldn’t have done the Excel lesson without me being there. And now, we’re at the point, because we took the time out of the curriculum, we’re behind. We were planning on doing a technology lesson for my work sample and stuff, but we’ve decided to cut that out because we’re gonna be behind at the end of the year. (Group Interview, 2/9/01)

While Vikki used technology in her own teaching, the expectation that Nancy would complete every chapter in their textbook took precedence over the need for Nancy to practice teaching with technology. Though it might have been possible for Nancy to gain additional experience with technology in the classes that Vikki taught, she was not given that opportunity. In addition, the requirement to teach a speech lesson, which Nancy saw as something unrelated to her preparation to teach math added stress.

It took four days from start to finish, so that put us behind, so now we are trying to catch up still. We’re like a whole chapter behind what they were at last year. And so I really doubt that we’ll go to the computer lab again with my students. My teacher also does an accelerated geometry class, which I don’t teach. I just observe. But she’s planning on taking them to the lab to use Geometer SketchPad. But I doubt that we’ll go to the lab again with my kids. We just don’t have the time. (Interview, 2/23/01)

The opportunity to observe Vikki teaching with technology did provide Nancy with some modeling, but not the opportunity to apply that modeling to her own practice. At a later interview, when asked if she had used technology in her teaching, or observed her mentor teacher using technology, Nancy responded:

No, we haven’t done anything in our classroom, at least with my pre-algebra students. My mentor teacher is in the middle of her master’s project which is a fractal geometry unit, and I haven’t really been involved with that. But I have been observing it a little bit. They did research, they created a PowerPoint, they created a brochure using Publisher, and I’m not sure what her next step is. It’s either going to
be Logo or Geometer Sketchpad, one or the other or maybe both. They’re supposed to actually create some kind of fractal piece. But that’s something she’s been doing that hasn’t really been my creation.

(Interview, 4/20/01)

Vikki was also concerned about preparing her students to meet State of Oregon standards and pass unit tests. To do this, she chose to use the textbook as the curriculum. As a result, technology use was seen as an add-on or enrichment activity rather than a way of preparing students to meet these standards. The add-on perspective proved to be a major disabling factor for Nancy.

Unfortunately, my teacher teaches a little bit differently than I anticipate teaching. Mine would be more of an activity based approach where you could use the computer lab more often because you’re not always following the book and doing lesson by lesson, page by page. For that’s how hers works, and technology doesn’t fit in as easily.

(Interview, 2/23/01)

Despite having a new computer lab in the school, Nancy expressed concern and frustration over the lack of technology in her classroom, and the challenges of scheduling use of the computer lab: “Another challenge is that the computer lab is pretty much booked for the rest of the year anyway, so even if we did have the time, we probably couldn’t get in there.” (Interview, 4/20/01)

Nancy also expressed frustration over her mentor teacher’s unwillingness to allow students to use classroom calculators, the only technology that was readily available in her classroom. Concern for possible theft or misuse of the calculators appeared to take precedence over the potential for assuring increased access to technology.

I don’t know how many kids actually have a calculator at home. I would assume probably all of them. Maybe one or two exceptions like if a kid’s homeless or something like that. Which we do have one kid who’s living out of a homeless shelter, and she’s failing. So, you know, at that point do you give her a calculator to take home, you know? And actually that was one thing that happened the other day. And I knee-jerked the answer and said no. A kid asked if he could borrow a calculator overnight, and I said, “No, we can’t do that.” And when I thought about it I said, “Well, why not? Why can’t we loan it to him?” So I guess that’s something you have to start thinking about. I mean we have probably 20 calculators and we never use them. We
never pull them out and hand them out to students, we assume that they have calculators. And it’s kind of funny because when they asked to come borrow a calculator at the first of the year, it was kind of like she expected them to bring their own. Well, why do we have calculators then? Why do we have these 20 calculators in the closet if we’re not gonna use them. So, I don’t know. A lot of stuff it’s like, you know, it doesn’t make sense as to what our method is, and rationale behind it. (Interview, 2/23/01)

Nancy was eager to use technology in her teaching when she started the program, and excited about the initial plans that she and her mentor teacher had made. Her experience with curriculum limitations and the resulting change in plans dampened her enthusiasm, and severely disabled her ability to teach with technology. She frequently expressed disappointment that she wasn’t allowed to do more.

We can pretty much do it how we want to do it. But generally, we do one section each day, then one day for review and one day for a test. And so it’s pretty linear, pretty, you know you don’t have to think too much about it. You just turn the page. So I’m not really learning a whole lot as far as planning a curriculum and all that. You know, I’m a little, I don’t know, disappointed, disappointed in that. (Interview, 2/23/01)

Despite her disappointment, Nancy continued to express enthusiasm for integrating technology in her teaching, which enabled her to look for ways to provide experiences for her students within the parameters that were set by her mentor teacher.

I want to incorporate as much as possible, but just like we’re talking about with the graphing it needs to be consistent with what you’re teaching them throughout the year. Otherwise I think it gets way too confusing throwing in different versions and different ways to look at it and stuff. But it depends on what it is you are working on. When we did the Excel lab at the beginning of the year with our students, we were talking about order of operations and arithmetic sequences and stuff like that. And that worked really well because they were learning the language of Excel, but at the same time it was reinforcing the math. So that worked out just fine. And the class I took last summer, Computers for Middle School Math Teachers, they had stuff like Logo and Geometer Sketchpad, and stuff like that. And I think those are very powerful tools if you can get them in with the right class, and have enough computers and software and stuff to get it actually working and have them spend enough time on it to make it worthwhile. We really didn’t do any geometry with our students, so I couldn’t use
any of that this year. But in the future, I think that would be a great thing to do. (Interview, 6/1/01)

Nancy completed her program and received her license to teach middle school mathematics. When she last contacted me she was still looking for a full-time teaching position.

FINDINGS

The enabling and disabling factors that these preservice teachers encountered fell primarily into five categories:

1. Factors influenced by the instruction they received through their program from faculty and from their mentor teacher:
   - mentor teachers who collaborated with preservice teachers to develop technology enhanced lessons, regularly used technology in their own teaching, and encouraged preservice teachers to do the same (enabler);
   - mentor teachers who did not use technology in their own teaching and saw the use of technology as an “add on” rather than additional approach to teaching and learning (disabler);
   - workshops and other instruction provided by the university and/or school district including Intel’s Teach to the Future (enabler); and
   - modeling (or lack of modeling) by university faculty in methods and other teacher preparation courses (both enabler and disabler).

2. Factors influenced by their own personal expectations, those of the teacher preparation program, those of their mentor teachers, or those of students and parents:
   - faculty expectations that students would use technology in their teaching and learning (both enabler and disabler); and
   - student and parental enthusiasm and support for the use of technology in the classroom (enabler).

3. Factors influenced by mentor teacher, school, district, or state requirements:
   - district/school expectations and support for technology use in the classroom (both enabler and disabler).

4. Factors influenced by the type of technical support, or technology available for their use:
• access to technology, software and/or technical support (both enabler and disabler).

5. Factors influenced by the attitudes, fears, and experiences that the preservice teacher had before or during their field experiences:
• a preservice teacher’s desire to use technology and a vision of technology as an integral part of instruction rather than an “add on” (enabler);
• successful experiences working with technology and children that led preservice teachers to see this approach to instruction as valuable and worthwhile (enabler);
• fear of what might happen if the technology failed during a lesson (disabler); and
• past negative experiences working with technology or using technology with children (disabler).

The following sections describe each type of factor as they were encountered by these two preservice teachers, and the influence the factors had on the decisions they made about how and when to use technology during their student teaching experiences.

The Influence of Instruction

The courses that Suzanne and Nancy took as part of their teacher preparation program included one that specifically focused on instruction and technology. They also took teaching methods courses that used different approaches to technology and teaching. Faculty experience with, and modeling of technology in instruction varied widely, nevertheless an overall expectation that preservice teachers would use technology in their teaching and coursework whenever possible existed. Technology focused workshops were offered throughout the program to help provide additional opportunities for preservice teachers to learn how to use technology for teaching and learning.

Suzanne and Nancy started their year-long program by attending a technology “institute” along with their mentor teachers. This three-day experience combined “getting to know you” activities with workshops and demonstrations by university faculty, experienced teachers, and project partners. Teams of preservice and mentor teachers were encouraged to use this time to think about the possible ways they might integrate technology into their teaching during the coming school year. Both pairs of mentor and preservice
teacher used this opportunity to begin planning activities to use in their classrooms. Response to the experience was positive overall. The most heavily attended sessions were hands-on, focused on specific technology applications, and those in which experienced teachers shared how they were using technology in their classrooms.

Mid-way through the program, preservice and mentor teachers were invited to attend two additional workshops: one on visual learning and concept mapping, and one on digital video production. Both Suzanne and Nancy attended these workshops. Their mentor teachers did not. Suzanne also had the opportunity to participate in technology inservice workshops sponsored by her school district and Intel’s Teach to the Future program. These workshops proved to be a strong enabling factor for her.

Nancy had taken a number of technology-focused courses before entering the program, including a course on computers in education, and math education courses that focused on the use of computers in mathematics instruction. When she began the program, Nancy was excited about the possibility of trying out some of the ideas she had gained through these experiences. She and Vikki planned to integrate a variety of these activities throughout the year. While this initially served as an enabling factor for Nancy, she was unable to put her plans into practice due to time and curriculum restraints.

The Influence of Expectations

Program expectations had a definite impact on the extent to which each of these preservice teachers practiced teaching with technology, and served as both an enabling and disabling factor. When first introduced to the GTEP program, preservice teachers were told that their cohort would be a “technology” cohort, and that they would use technology in their practice teaching and develop an electronic version of their final work sample portfolio. Suzanne was one of those initially resistant to the idea of using technology in this way. She shared the concern of her peers that they were not adequately prepared, and considered it unfair to be asked to take on the added challenge. For many of her fellow preservice teachers this became a disabling factor, however in Suzanne’s case it did not, due in part to the influence of her mentor teacher.

The expectations of mentor teachers also had a significant influence on how preservice teachers used technology. Brianna encouraged Suzanne to participate in the faculty development workshops she was conducting for Intel and her school district. Brianna’s encouragement had a strong enabling influence on Suzanne’s confidence with technology and her attitude toward
using it for teaching and learning. The combination of university expectations, workshop opportunities, and Brianna’s mentoring proved to be an enabling factor for Suzanne.

The expectations of students and parents also served as an influence. In Suzanne’s case, the attitudes of students toward the use of technology in their own work, and the encouragement they gave Suzanne when she used technology in her teaching was a strong enabling factor. They expected her to use it, and let her know they enjoyed and appreciated it.

While Vikki, Nancy’s mentor teacher used technology in her own teaching she discouraged Nancy from doing the same. Nancy was able to teach a series of lessons using Microsoft Excel early in the year. The spreadsheet lessons took longer than she and Vikki had originally planned, and as a result Vikki decided that it was more important to focus on moving students through the textbook without additional technology activities, something she saw as supplemental. This decision disabled Nancy’s further efforts to practice teaching technology.

The Influence of Mentor Teacher, School, District, or State Requirements

The expectations that mentor teachers, schools, and districts had were frequently influenced by district and state requirements such as preparing children to meet State of Oregon benchmarks (Oregon Department of Education [ODE], 2001). Each mentor teacher’s approach to these requirements was different, impacting each preservice teacher’s ability to practice teaching with technology in different ways, and helping to determine whether or not this factor enabled or disabled the preservice teacher’s ability to practice teaching with technology.

In Suzanne’s case, Brianna considered teaching children to use technology more important than focusing on preparing for state tests. As a result, Suzanne became concerned about a possible lack of balance in the curriculum. The lack of balance could have become a disabling factor for her, however Suzanne used this as an opportunity to deliberately focus on integrating more literature and reading into her teaching, partly to help prepare students for state tests. She took this as a challenge to make sure that the ways she used technology with her students helped her achieve her goal of balance, ultimately becoming an enabling influence for her.

Vikki, on the other hand, viewed the use of technology as something extra, an “add-on” to the curriculum. Because of her add-on perspective she was reluctant to allow Nancy to bring computer activities into the classroom other than the Excel lesson that she taught at the beginning of the year. Vikki insisted that Nancy focus on moving her students chapter-by-chapter
through their math textbook, and save any additional technology activities for the end of the year if they had time left over.

The Influence of Technology Support and Availability

During our first interviews, the availability of technology and technology support was a factor that was frequently discussed. How each mentor teacher, school, and district dealt with this factor had a strong influence on each preservice teacher’s ability to practice teaching with technology.

Suzanne was fortunate to work with a mentor teacher who was considered the “technology guru” in her building. As a result, she had more technology in her classroom, and better access to computer labs when she needed them. In addition, most of the time, Brianna did her own technical support, and had access to a wealth of equipment due in part to her work with Intel. Though Suzanne expressed concern about the amount of time Brianna devoted to this endeavor, she was able to see beyond that concern and take full advantage of the technology and support that was available to her. These factors enabled Suzanne to practice teaching with technology throughout her field experience.

Nancy was in the same school and had access to the same resources as Suzanne. She did note, however, that it would be difficult to schedule the computer lab for any length of time on a regular basis. Suzanne confirmed this by noting that it appeared that computer lab scheduling did not appear to be equitable. Though Nancy’s students did have access to computers in their classroom, Nancy did not see this as a workable alternative. Just providing calculators for students was a problem. While they had a classroom set of calculators that she could use for teaching, Vikki was reluctant to allow students to use them out of fear that they might become lost or stolen. As a result, if Nancy wanted to assign work outside class that required students to use a calculator, they had to provide their own.

The Influence of Attitudes, Fears, and Experiences

The attitudes, fears, and experiences of the preservice teachers who participated in this study served as both enabling and disabling factors. During group and individual interviews all of the participants expressed a desire to find ways to integrate technology into their teaching. Fears about using technology in teaching did not appear to play a major factor, except for the fear of equipment failure. Successes with technology before and during the program
appeared to be an important enabler, especially when coupled with the opportunity to observe their mentor teachers successfully teaching with technology.

Suzanne was skeptical about using technology in teaching when she first entered the program: “I come from kind of an environmentalist family who have always been very skeptical of technology. So when I found out I was in the tech cohort, I was pretty upset. But, trying to be open.” (Interview, 2/23/01) Observing her mentor teacher, and teaching lessons with technology helped decrease her skepticism. As a result, Suzanne came to see technology as an integral part of her teaching, rather than something to be added on. Her view of technology as integral enabled her to develop technology experiences that balanced enhanced teaching and learning with her desire to use technology as much as possible.

Nancy was eager to use technology when she started the program: “They put in a new computer lab this year, so at the beginning of the year my mentor teacher and I were all excited, thinking we were going to do at least one type of a computer lab activity per chapter.” (Interview, 2/23/01) Unfortunately Nancy was not able to maintain her enthusiasm and put another plan into practice: “And now, we’re at the point, because we took the time out of the curriculum, we’re behind. We were planning on doing a technology lesson for my work sample and stuff, but we’ve decided to cut that out because we’re gonna be behind at the end of the year.” (Group Interview, 2/9/01)

For Suzanne and Nancy, no single factor appeared to be an overwhelming disabler or enabler. Instead, the combination of factors, especially the combination of attitude, experience, and modeling appear to have had the most influence on the decisions they made about how and when to use technology in their teaching. Though some of these factors fall within the control of the teacher preparation program, others like attitude and mentor teacher modeling do not. How a preservice teacher reacts to potentially disabling or enabling factors varies depending on all of the other factors they have encountered before or during their student teaching experiences.

CONCLUSION

This study provides a focused view of one aspect of teacher preparation, practice teaching, a key part of preparing preservice teachers to effectively teach with or without technology. “Practice” gives preservice teachers the opportunity to transfer the knowledge they gain through their courses and modeling. It is an opportunity to see whether or not they can apply what they have learned in the university classroom to real life situations, an essential part of their preparation.
The experiences that Suzanne and Nancy described provide a clear understanding of the factors that served as enablers and disablers for them, and insight into why these factors varied from individual to individual. The information gleaned from the words and voices of these individuals provides a new perspective on the factors that influence the decisions that preservice teachers make about how and when to teach with technology and suggests ways that teacher educators might better prepare preservice teachers to integrate the use of technology into their classrooms.

Though Nancy and Suzanne, like all six participants, took the same university classes and received the same modeling and expectations from university faculty, there were big differences in what they accomplished during their practice teaching experiences. They each encountered similar enablers and disablers in terms of access to technology, technical support, and university instruction and modeling. Yet only Suzanne routinely practiced using technology in her classroom. What was it about the factors these participants encountered that made led them to become disablers in some cases, enablers in others, or have no apparent influence at all?

One of the most obvious differences was the level of encouragement and support they each received from their mentor teachers. Brianna routinely used technology in her own teaching and expected Suzanne to do the same. Her students were accustomed to using technology on a regular basis and expected Suzanne to continue to provide them with technology enhanced learning experiences. Suzanne had easy access to the technology she needed to turn her plans into reality. Interestingly, Suzanne expressed some initial skepticism about the place of technology in the classroom, a concern that Nancy did not share.

In contrast, Vikki used technology in her own teaching, but discouraged Nancy from doing the same. Vikki saw the use of technology as something extra that could be added on if they had time left after students had finished working through the textbook. Viewing technology as a add-on prevented Nancy from practicing teaching with technology for all but one lesson during the year. Clearly, the role of the mentor teacher is critical.

Further research into the influence of enabling and disabling factors, individually or in combination, will help determine to what extent the experiences these individuals encountered are representative of preservice teachers as a whole. In addition, a longitudinal study that follows preservice teachers through their first few years of teaching could provide valuable insight into the effectiveness of current approaches to teacher preparation, and give a different perspective on the pervasiveness of the factors these preservice teachers encountered. What influence do the enabling and disabling factors that they encounter during their field placement experiences have on the way they use technology as they journey into their future classrooms?
Finally, the findings of this study suggest that a combination of effective mentoring and modeling, clear expectations, easy access to technology and technology support, and positive experiences with technology in the classroom, will enable preservice teachers to practice using technology on a regular basis. Teacher education programs need to know which mentor teachers will best serve as good models, and which school environments can provide access and support. Assuring positive experiences with technology is a little more difficult. Faculty can help by encouraging collaboration between mentor and preservice teachers, and guiding preservice teachers as they develop their plans. Additional study of these factors could prove very useful. Current research into partnerships between universities and K-12 schools is leading that direction (Wetzel, Zambo, & Padgett, 2001). Further study of effective practice may help teacher education programs develop a model that encourages preservice teachers to see the factors they encounter as enablers rather than disablers, and better prepare them as technology using educators.

References


