Are Preservice Teachers Prepared for Their Technology Integrated Future Classrooms?

Kristin Webber, NBCT, Ph.D

Edinboro University

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Introduction

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The purpose of this two-part longitudinal study was to explore the self-efficacy of preservice teachers integrating technology. In the first phase, the researcher used surveys and interviews to measure the self-efficacy of preservice teachers in integrating technology into instruction at three distinct points in their programs: after coursework, after field experience, and after student teaching. The results of the first phase indicated that preservice teacher's self-efficacy with integrating technology was the lowest during student teaching. Further exploration was needed to determine why. The second phase of the study explored the experiences of preservice teachers in integrating technology during their student teaching semester. Through focus groups, the researcher and participants discussed their experiences with technology integration in their student teaching placements.

This study sought to answer the following research questions:

1. Are there any differences in the self-efficacy for technology integration in instruction from coursework (ECED 320 and ECED 390), to primary grade field block, to student teaching?

2. What are the experiences of preservice teachers when integrating technology during their student teaching semester?

Results from the survey indicated that the participants were most confident with technology integration directly after completing their coursework, and their self-efficacy declined as they continued through field and student teaching. Analysis of the qualitative data produced through student-teacher focus groups revealed the following themes: 1. Types of

technology used 2. How the technology was used 3. Cooperating teacher support 4. Barriers to technology integration, and 5. Preparedness from teacher preparation program.

Theoretical Framework

According to Yilmaz (2008), "Learning theories are indispensable for effective and pedagogically meaningful instructional practices" (p.161). A constructivist learning framework (Powell & Kalina, 2010; Richardson, 2003; Yilmaz, 2008) is the theoretical foundation for this study, because such a framework is compatible with the learning principles upon which the new literacies instructional perspectives are based (Collins, 1991)

Constructivism is based on the work of John Dewey (1916) and William James (1907) as well as the later work of Jean Piaget (1970) and Lev Vygotsky (1986). Constructivism assumes that knowledge is idiosyncratic, formed ("constructed") by individuals based on their cumulative experiences. According to constructivist theory, there is no one absolute truth in the world; instead, there are multiple realities possible. Yilmaz (2008) states that "the constructivist perspective, therefore, posits that knowledge is not passively received from the world or authoritative sources but constructed by individuals or groups making sense of their experiential worlds" (p. 162).

Although all constructivists believe in the primacy of individuals in the meaning-making process, two constructivist perspectives hold particular significance for classroom teachers: cognitive constructivism and social constructivism. Powell and Kalina (2010) write that "a teacher must understand and use methods of both cognitive and social constructivism, if he or she is to run an effective constructivist classroom" (p.249).

Cognitive constructivism grew from the work of Piaget (Piaget, 1916; Powell &

Kalina, 2010; Yilmaz, 2008). His primary focus was on the individual and how the individual constructs knowledge. Piaget's theory of cognitive development proposes that humans cannot be given information that they can automatically use. Instead, they must use the information they are given to construct their understandings ("knowledge") by filtering it through their existing schemata.

Piaget further claims that children build schemata through the assimilation and accommodation of new information as they progress through four different stages of development (Piaget, 1916; Powell & Kalina,2010) Similarly, social constructivism is based on the findings of Vygotsky. Phillips(2000) explains that "this approach centers on the ways in which power, the economy, political, and social factors affect the ways in which groups people form understandings and formal knowledge about their world" (p. 6).In school settings, social constructivism posits that knowledge results from the integration of a child's social interactions in the classroom with his or her critical thinking process.

Vygotsky (1986) firmly believed that social interaction and cultural influences are an integral part of learning. He developed several theories that are a part of social constructivism, including his widely cited instructional belief that a child's learning occurs within his or her own " zone of proximal development" or (ZPD) (Yilmaz, 2008). ZPD assumes that learning occurs when an experienced adult provides appropriate support to a child who is attempting to understand a new concept by creating an experience or activity that will "scaffold" the child's developing understanding.

According to Collins (1991), a constructivist view holds that teachers should be"facilitators" of knowledge who help students construct their understandings and capabilities

in carrying out challenging tasks. This view emphasizes the activity of the student rather than that of the teacher.

The tenets of constructivism are particularly applicable to the use of technology in classroom instruction. Collins (1991) has observed, for example, that because of computer use requires small student-to-computer ratios; there is an inevitable shift from whole class to small-group instruction in classrooms which rely heavily on computers. As small-group instruction become prominent in these classrooms, the role of the teacher naturally shifts from lecturer to coach: “Much of the learning is meant to take place between the student and the computer, so the teacher becomes a guide who ensures that those interactions are beneficial for student learning (p. 2). Furthermore, Collins (1991) believes that the integration of instructional technology not only creates more engaged students but also enables teachers to focus more attention on weaker students. Besides, it allows performance/product based assessment over test performance, moves students from a competitive learning environment to one of collaboration and cooperation, integrates both visual and verbal thinking, and requires differentiated instructional strategies.

In his seminal work, Bandura (1977) introduced the concept of self-efficacy beliefs as a way to gauge one's capabilities to attain the desired level of performance in a given task. Additionally, he argued that confidence in one's abilities was powerful in determining actions, the amount of effort one puts forth in a task, the persistence of that effort, and the amount of resilience when facing setbacks. Furthermore, Bandura (1977) identified four major influences on self-efficacy: vicarious experiences, verbal persuasion, physiological arousal, and mastery experiences. Research in these areas revealed that vicarious experiences in the form of modeling

by the teacher educator/master teacher positively influenced preservice teachers' self-efficacy for effective literacy instruction. (Tschannen-Moran & Johnson, 2010).

Research Methods

This was a multi-method longitudinal study that sought to answer the following questions:

1. Are there any differences in the self-efficacy for technology integration in instruction from coursework (ECED 320 and ECED 390), to primary grade field block, to student teaching?

2. What are the experiences of preservice teachers when integrating technology during their student teaching semester?

For Phase 1, participants were purposefully selected voluntarily based on their enrollment in two specific undergraduate courses - ECED 320 Literacy Foundations Grades 1-4 and ECED 390 Technology Integration in Early Childhood, both classes were developed and taught by the researcher. Quantitative data was collected using the *Self-Efficacy for Technology Integration Instrument* (Wang, Ertmer, & Newby, 2004)which was administered at three distinct points in the teacher preparation program – at the completion of ECED 320 and/or ECED 390, at the conclusion of their field experience, and at the end of student teaching. All survey data analyzed using descriptive statistics. Data was also collected through individual structured interviews and was analyzed using the constant comparison method to identify themes and patterns. The following questions were asked of the participants during a one-on-one interview directly after completing the survey.

1. If you were in a placement, what kinds of technology was used?

2. What do you do when technology does not work as intended?
3. When was the technology used in placements?
4. Is technology necessary to integrate into instruction?

For Phase 2, participants were asked to participate in focus groups during their student teaching seminar. At the time of the focus group interviews, participants had completed one eight-week placement and were half-way through their second eight-week placement. Qualitative data was collected through semi-structured interviews and focus groups and was analyzed using the constant comparison method.

Results

For Phase 1 of the study, participants (*n*=20) were administered the Self-Efficacy for Technology Integration Instrument (Wang, Ertmer, & Newby, 2004) during the fall 2015 semester. The demographics of the participants were as follows:

- 64% completed only ECED 320
- 14% completed both ECED 320 and 390
- 22% completed ECED 320, ECED 390, and Primary Field Block

The survey responses were averaged for each demographic, and the outcomes indicated that participants enrolled in ECED 320, ECED 390, and Primary Field Block reported the highest self-efficacy in integrating technology with an average score of 4.2. Participants enrolled in ECED 320 alone reported an average rating of 4.1, and the students enrolled in both ECED 320 and ECED 390 reported the lowest self-efficacy score of 3.7.

The survey was administered again at the end of spring semester 2016. Participant demographics (*n*=18) are as follows:

- 22% completed only ECED 320
- 11% completed both ECED 320 and 390
- 34% completed ECED 320, ECED 390, and Primary Field Block
- 33% completed ECED 320, ECED 390, Primary Field Block, and Student Teaching

Following the same analytical procedure as the fall semester, the survey responses were tallied and averaged. Participants enrolled only in ECED 320 reported an average self-efficacy score of 4.1. Participants enrolled in both ECED 320 and 390 reported the highest self-efficacy score of 4.35. Participants enrolled in ECED 320, ECED 390, and Primary Field Block reported a self-efficacy score of 4.15 which is significantly lower than the previously reported group but still higher than the students solely enrolled in ECED 320. Finally, the participants that have completed ECED 320, ECED 390, Primary Field Block, and Student Teaching reported the lowest self-efficacy score of 3.95.

Once the participant finished the survey, they were interviewed to gauge their thoughts and experiences on using technology in the classroom. The participants reported that they had experiences with ipads, computers, interactive whiteboards, and Elmo projectors while in a field or student teaching placement. During their internships, the participants stated that technology was used mostly during morning meetings, center/station time, and when directly teaching lessons. All participants agreed that technology was essential to integrate into the classroom citing “it is a necessary skill to have,” “ we use it every day.” and “students need to be familiar on how to use technology.” Lastly, all participants agreed that you have to have a backup plan if the technology fails.

Phase 2 of this study answered the question: What is the experiences of preservice teachers when integrating technology during their student teaching semester? Through the constant-comparison method, the data revealed the following patterns and themes.

1. *Types of Technology Used in the Classroom*

   iPads, Chromebooks/laptops, Smartboards, and Elmo/document cameras were all reported as being used in the student teachers' classrooms. Many of the participants also discussed having to use their laptops and/or iPads in their placements.

2. *How Technology was Used in the Classroom*

   Videos and PowerPoints were overwhelmingly identified as the most used technologies. The student teachers' described using a variety of apps such as Go Noodle, various math apps, Kahoot!, Class Dojo, and Epic! Books in their classrooms as well as computer-assisted instruction programs (i.e., Study Island, Lexia, and Accelerated Reader). Other uses mentioned included internet research, QR codes, ebooks, projected worksheets, and assistive technology.

3. *Cooperating Teacher Support*

   When asked about technology support from their cooperating teachers, the participants' answers varied widely. Some reported their cooperating teachers as being strong supporters and role models for technology integration. Some cooperating teachers were hesitant to using technology but were open to the student teachers using technology while they were teaching. A few cooperating teachers were identified as being resistant to technology integration favoring traditional methods of instruction.

One cooperating teacher felt technology was too distracting for special education students while another cooperating teacher had a class set iPads, but they were never used during the eight-week placement

4. *Barriers to Technology Integration*

Access to technology was a significant obstacle for technology integration as student teachers discussed having limited resources, only have resources available on "Computer Day" and having to share resources between classrooms and/or grade levels. The participants also stated that the reliability of the technology was also a barrier as many of them dealt with inconsistent Internet connectivity, dead batteries on devices, and broken or outdated devices. They also had difficulty accessing the Internet and websites because they did not have log-in credentials or the guest credentials were limited, or the desired app/website was blocked by the school. The participants also viewed their cooperating teachers as barriers to technology integration because some did not provide support for the student teacher or were not knowledgeable in integrating technology. The student teachers expressed frustration with their cooperating teachers wanting them to "teach as they teach." Lastly, the student teachers said that scripted and prescribed curricula did not allow freedom or creativity to use technology.

5. *Preparedness from the Teacher Preparation Program*

The participants felt that the required technology course (SEDU 183) came too early in their program (Freshman year for most) and that the technology they learned about in that course was irrelevant by the time they began student teaching or they were not able to remember what had been previously learned. On a side note: the ECED 390

technology course mentioned in Phase 1 is an optional elective in their programs, not a required course. Next, they stated that technology should be integrated and modeled in all of their methods classes. They believed that some professors tried, but that is was inconsistent across the program. They suggested that a Special Education technology course would have been beneficial as well as a technology refresher workshop before student teaching. They were very adamant, saying that any technology integration in teacher preparation should be purposeful and not using technology to use technology. They want it to be relevant to their future teaching contexts.

Conclusions

To deepen our understanding of how prepared preservice teachers are for their technology integrated future classrooms, this study sought to determine the self-efficacy of teacher candidates in incorporating technology into instruction at various points in their teacher preparation programs as well as determine what experiences in integrating technology are student teachers having.

The participants reported being most confident in integrating technology while they were still completing coursework and least confident during their student teaching semester. The researcher attributes this outcome to only surveying students in her two classes, both of which have purposeful technology integration modeled throughout the courses. One of the barriers to being prepared for technology integration identified by student teachers was the lack of consistent technology integration in their teaching methods courses; therefore, university

professors and teacher preparation programs need to model meaningful technology integration throughout the entire program.

The student teachers were eager to try technology but were sometimes impeded by the cooperating teachers. The technology integrations that did occur were lower level thinking and often did not add to student achievement or transform learning. Again, consistent modeling of technology integration in all methods courses would help preservice teachers use technology in a way that elevated student learning. Universities can vet cooperating teachers more thoroughly and provide professional development and support for in-service teachers that agree to be cooperating teachers.

This longitudinal study measured the effect of technology instruction received through two methods courses on undergraduate students' self-efficacy when using technology for literacy instruction in their primary grade field experience and student teaching experience. The Speak-Up Survey (Project Tomorrow, 2014) identifies trends in digital learning through yearly national surveys. The current trends focus on innovative classroom models as more engaging and purposeful learning environments for teachers and students. Key points of this trend include:

• 93%, district administrators say that the effective use of technology within instruction is essential for achieving their school or district's core mission of education and preparation of students.

• 84% of parents indicate that they see school technology use as a value-add for their child’s learning

• One-third of teachers in traditional classrooms have seen the impact of digital education on developing collaboration, critical thinking, and creativity skills in students; while a majority

of teachers who have implemented blended learning in their classrooms see that their students are developing critical thinking and collaboration skills, and almost as many say the same about creativity skill development

Based on these statistics, it is vital that preservice teachers be prepared to integrate technology into their instruction when they secure their first jobs. Results of this study revealed that participants displayed the highest levels of self-efficacy right after completing their coursework. This outcome upholds Bandura's (1977) belief that vicarious experiences have a positive outcome on one's self-efficacy. The results further indicated that the participants' self-efficacy decreased as they progressed through their field experience and student teaching. These results warrant further research to determine what factors are contributing to the decrease in self-efficacy

Study Limitations and Future Research

This study was conducted with a small, limited population. New research is needed in this area to determine if results are generalizable. Additional research is also required in the field of technology integration into teacher preparation programs and methods courses.

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