

# **Preparing Pre-Service Teachers to Use Internet Technology for Early Reading Skills: Insights from an Action Research Project**

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### Abstract

The purpose of this study was to explore how pre-service teachers applied technology pedagogical and content knowledge (TPCK) as they developed lesson plans for early readers. Qualitative analysis of the lesson plans and technology therein, along with a survey, checklist, panel interview, and project/presentation revealed how pre-service teachers used Internet technology, the sources from whom or which they learned about the technology, the criteria they used when choosing technology, and their perceptions of how technology training for early reading instruction could be improved. Themes were noted within and across the data sets with implications for teacher educators as they design pre-service teacher technology learning experiences in the literacy content areas.

*Keywords:* technology, pre-service teachers, teacher education, TPCK, literacy, reading

The Internet has the potential to radically alter instruction for early readers. Thousands, if not millions, of free teaching and learning tools are available to help teachers engage readers and individualize instruction. Little research exists, however, to drive the efforts of teacher educators in developing teachers who are aware and capable of implementing this technology into the literacy curriculum (King, Schenider, Kozdras, Minnick, Welsh, Brindley, Feger and Kurby, 2013; Stobaugh and Tasell, 2011). The aim of the action research described in this paper was to evaluate the efficacy of teaching initiatives in an undergraduate reading methods course designed to build pre-service teachers' competencies in integrating technology into early reading skills lessons. The research questions were:

1. To what extent and how did pre-service teachers use Internet technology in their lesson plans for early readers?
2. What sources did the pre-service teachers find most valuable for learning about technology for reading instruction?
3. What criteria did the pre-service teachers use when choosing technology for their lessons?
4. What perceptions do pre-service teachers hold regarding the technology training they received and how it might be improved?

The International Society for Technology in Education (ISTE), 2013, has identified the ability of teachers to integrate technology within specific content areas as an area of critical importance. This exploration of how pre-service teachers use, find, and choose technology, along with understanding their perceptions of what constitutes effective technology training, will provide information and ideas for other teacher educators who are committed to developing

teachers who can harness some of the potentiality of technology in the literacy content area by implementing it into early reading skills lessons.

### **Theoretical Underpinning**

Technological, Pedagogical, and Content Knowledge, or TPCK (Harris, Mirsha, and Koehler, 2007; Mishra and Koeler, 2006), is the primary theoretical model underpinning this study. The TPCK model captures the challenges of teaching with and through technology. Each area of learning (technological, pedagogical, and content) is imaged as a separate type of knowledge, with overlaps between any two or all three forming other types of knowledge. Technology and content knowledge, for example, combine to form technological content knowledge (TCK) that “supports the decision-making processes and skills necessary to choose appropriate technologies to support content learning,” while technology and pedagogy form technological pedagogical knowledge (TPK), or the ability to “design lessons and activities that use technology to assist in the acquisition of the content” (Young, Young, and Shaker, 2012, p. 26). Both TCK and TPK are relevant to a broad range of literacy education, because as teachers plan for instruction they need to make informed decisions in order to integrate and use technology effectively. Consequently, in this study, TPCK theory informs the integration of technology into early reading skills instruction.

### **Review of Literature**

Both in-service and pre-service teachers are challenged in integrated technology into the curriculum, but there is indication that some types of technology training opportunities can make a difference. Teacher integration of technology in the curriculum is minimal (Leu, 2006; Stolle,

2008). Hutchison and Reinking, 2011, explored this phenomenon more specifically in the reading content area. In a large-scale nation-wide survey of classroom teachers who were members of the International Reading Association, they found that while the vast majority had access to computers and the Internet (86%), and technology support (98%), that few used technology in literacy/reading instruction. Only 20% used the Internet as a supplement or replacement for existing reading materials and instruction, 15% for tutoring, and 13% as a source of alternative texts. Many teachers who did not use technology cited lack of understanding and shortage of time to learn the technology as major barriers. Further analysis revealed that the teachers who *did* use technology for literacy instruction shared the characteristics of having a positive stance toward technology and a higher perceived self-competency rate.

Al-Ruz and Khasawneh, 2011, also reported a correlation between teacher technology competency and a higher usage rate, and noted further that the perceived quality of technology training received impacted the likelihood that they would put what they learned into practice. Other researchers have looked more closely at the qualities of effective technology training for teachers. They found that teachers feel more competent in using technology when they see modeling of specific examples of technology use in content areas and receive support and coaching as they learn to use it (McKenna and Robinson, 2005; Wepner and Tao, 2002). They are also more likely to integrate technology when they perceive that it is useful (Barcy and Barcy, 2008; Greer, 2008; King, et. al., 2013; Lambert and Gong, 2010; Stokes, Kaufman, and Lacey, 2002) and relevant to their content area (Ertner & Ottenbreit-Leftwich, 2010; Wepner and Tao, 2002) and when they have the opportunity to create instructional materials tailored to their students' specific learning needs (Angeli and Valanides, 2005; Polly, Mims, Shepher, and Inan 2010; Koeler and Mishra, 2005).

Like in-service teachers, pre-service teachers are more likely to use technology in their placement settings when they perceive that it has classroom applicability, although their decisions seem to be weighted toward meeting the minimum requirements set forth by the instructor (Vratulis, Clarke, Hoban, and Erickson, 2011), and they seem to veer toward using more teacher-centered technology (e.g. video presentation of material) even if they were fully engaged and felt competent in using more learner-centered technology applications (e.g. interactive learning games) (Graham, Tripp, and Wentworth, 2009; Vratulis, et. al., 2011).

These studies indicate that the extent to which both in-service and pre-service teachers integrate technology into the curriculum is at least partly dependent on the quality of training they receive. Effective training teaches them about specific curriculum-relevant technology so that they don't have to spend extra time finding and learning how to use it, is relevant to their immediate classroom needs, and helps them feel competent and confident. What this training might look like, for in-service and pre-service teachers alike is an area much in need of study. The purpose of this action research study, therefore, was to evaluate the efforts of a multi-faceted semester-long initiative designed to expose and encourage pre-service teachers to incorporate Internet technology into reading instruction. Qualitative data in the form of lesson plans and the technology referenced within, along with a survey, checklist, panel interview, and technology project presentations provided information and insight on the ways in which pre-service teachers used technology in their lessons plans, how they learned about that technology, the criteria they used in choosing technology, and suggestions they had for effective technology training. These insights may offer guidance to literacy teacher educators as we work together to ensure that pre-service teachers are adequately prepared to make use of the vast possibilities afforded by technology.

## Method

### Participants and Context

The participants in the study were twenty students in two sections of a junior-level, field-based literacy assessment and instruction course. They were in their second semester of an undergraduate teacher certification program in Early Childhood Education (PK-5) (n=17) or Special Education (PK-12) (n=3) at an open-access public teaching college located in an ethnically and economically diverse urban county in the southeastern United States. There were eighteen females and two males. Three students were African-American, one was of Hispanic heritage, and sixteen were White. Students ranged in age from 20 to 45 years old, with most in early to mid-twenties.

The pre-service teachers attended class on campus two hours and 50 minutes one morning of the week. In the campus portion of the course they learned about assessment, instruction, and technology for early readers. During the twelve weeks of field experience the pre-service teachers interned a total of 190 hours in 2<sup>nd</sup> and 3<sup>rd</sup> grade classrooms at one of six Title 1 schools within the same urban school district. In the first six weeks of the field experience each pre-service teacher assessed and informally tutored one early reader and assisted the classroom teachers in administrative and teaching tasks. Simultaneously, during the college classroom instruction part of the class, they learned how to access and use technology related to the needs of the student they were tutoring. The instructor implemented research-based practices by providing explanations for applying the technology that specifically targeted the content area (McKenna and Robinson, 2005; Wepner and Tao, 2002). Additionally, she incorporated research into her approach that suggested that technology use be modeled (Al-Ruz and Khasawneh, 2011;

Lambert and Cuper, 2008; Polly, Mims, Shepher, and Inan, 2010). Finally, in accordance with a social-constructivist learning framework (Vygotsky, 1978) and consistent with research on effective teaching of technology (West & Graham, 2007) she provided opportunities for peers to work together with coaching and guidance from the instructor.

Each instructor-led mini-lesson lasted about twenty minutes in each of five of the first six weekly class periods. These lessons included modeling, coaching, content-specific explanations, and the opportunity to use the technology for authentic purposes, all qualities reflected in the research supporting the likelihood of technology integration. In one lesson the instructor taught the pre-service teachers how to find lesson plans from [Readwritethink.org](http://Readwritethink.org). In another the pre-service teachers learned about making practice materials on [Puzzlemaker.com](http://Puzzlemaker.com) and using ideas from [Pinterest.com](http://Pinterest.com) to create materials. On another day the instructor explained how to access high-interest/low reading level reading materials on [Nationalgeographic.com](http://Nationalgeographic.com) and [Timeforkids.com](http://Timeforkids.com). There was another mini-lesson on how to develop interactive flashcards using [Quizlet.com](http://Quizlet.com), [Scholastic.com](http://Scholastic.com), and [Proprof.com](http://Proprof.com) for interactive practice, and one on how to use [Audacity.sourceforge.net](http://Audacity.sourceforge.net) to practice oral reading skills and perform reader's theater scripts. Additionally, the pre-service teachers worked in small groups to create a brochure of an assigned comprehensive reading skills website ([bbc.co.uk](http://bbc.co.uk), [readingrockets.org](http://readingrockets.org), [abcya.com](http://abcya.com), [roythezebra.com](http://roythezebra.com), and [starfall.com](http://starfall.com)), which they presented and distributed to the class during one class period.

In the second six weeks the pre-service teachers developed and taught five lessons that were geared toward their student's specific reading skill needs. The rubric for grading the lessons had a scoring area for use of materials, that could, but did not require that they include

technology. Each pre-service teacher had access to an interactive whiteboard, the cooperating teacher's classroom computer, and at least three computers per classroom for student use. Additionally, there were 25 computers in each school library that were available to everyone. Each computer in the classroom and in the library was outfitted with a variety of software and website subscriptions, that included literacy-related applications on Brainpop, Accelerated Reader, Spelling City and Study Island. All schools had wireless Internet access throughout the building. The pre-service teachers could work with their assigned student in the classroom or library and had access to all of the school software when teaching and preparing lessons.

### **Data Collection and Analysis**

The pre-service teachers' lesson plans provided insight on what technology they used in their lessons and the way in which it was used. A checklist determined the sources from whom or which they learned about the Internet technology in their lessons (see Appendix A). A student project/presentation (see Appendix B), three survey questions (see Appendix C), and the first question asked in a panel interview of six participants (Appendix D) offered perspectives on the criteria they used in choosing the technology. Two additional survey questions and the second question from the panel interview indicated the participants' perceptions of how technology training might be improved.

The lesson plan technology was sorted and tabled by participant, the name of each technology, and its purpose the within the lesson. In cases where the nature of the technology was not immediately apparent that technology was accessed and its qualities fully analyzed. Frequency counts provided an indication of how many times content area technology applications were used by each pre-service teacher across the five required lesson plans (Miles

and Huberman, 1994). After tabulating the total technology use per participant, the name of the technology, its type, and its purpose within the plan were decontextualized (Marshall and Rossman, 2006) by sorting and counting each column separately. Common themes within each data set were analyzed according to Tesch's (1990) model of open coding with a constant-comparative approach (Glaser & Strauss, 1967) as the categories were developed.

Seventeen of the pre-service teachers filled out a checklist. The sources from whom or which pre-service learned about the technology were determined by tallying the checklist responses for each category (Miles and Huberman, 1994) and triangulated by the first question in the panel interview. Seventeen of the twenty study participants filled out an open-ended survey on the technology they used in their lesson plans.

The brochure projects offered a glimpse into what the pre-service teachers deemed to be the most important qualities when choosing technology for learning. Students worked in small groups to explore the assigned comprehensive website list the broad and specific reading skills that could be learned and practiced using this site, decide what was special or appealing about that site and how it would appeal to children and teachers, and then create a brochure to "sell" their site to their classroom peers. Each group presented the brochures on the document camera and distributed copies to each class member.

**How Did Pre-Service Teachers use Internet Technology in Their Lesson Plans?** The twenty pre-service teachers had used technology applications in their lesson plans 156 times. Every student used technology at least six times and 70% of the students used technology over ten times throughout their five lessons. This technology use fell into six categories: interactive

practice, interactive learning, digital text, stand-in teacher, learning materials, and pedagogical knowledge. Each category is listed in Table 1 and explained in detail below:

***Interactive Practice.*** Interactive practice made up 35% of technology uses. Interactive practice was distinguished from interactive learning by its place at the end of the lesson where the student was practicing a skill independently. These were activities with a clear beginning and end with a goal such as earning points, getting on a new level, or receiving verbal positive reinforcement. The interactive practice activities allowed for multiple attempts, provided varied levels of scaffolding, gradually increased in difficulty, and involved multiple modalities of learning.

***Interactive learning.*** Interactive learning made up 29% of technology use, and was distinguished by its place within the lesson as an active opportunity for knowledge construction. Examples included a site where students could move animals to zoo pens labeled with their beginning letters, and one where the student would click on a picture, listen to a word, and click on the picture of the letter that made the beginning sound. A few pre-service teachers used technology as a tool for more student-centered teaching such as writing acrostic poems using an on-line template and discerning differences in prosody among characters in popular commercials.

***Digital text.*** Twenty-five percent of total technology use served as reading material context for practicing or teaching a reading skill such as digital versions of written text that included high-interest passages, poems, songs, and raps.

*Stand-in teacher.* Introducing or modeling a skill or topic made up 16% of uses. The technology served as a passive means of information delivery, doing little more than taking the place of a lecturing teacher.

*Learning Materials.* Two percent of the technology was used to locate resources with printed learning materials to be used during or after the lesson, such as cut-and-paste activities, flashcards, puzzles, word finds, worksheets, and assessments.

*Pedagogical knowledge.* Two percent of technology was used in building the pre-service teachers' own background knowledge prior to the lesson. These included lesson planning ideas, directions for a lesson activity, and building teacher content knowledge, such as finding lists of phonograms for the student to learn.

**What sources did the pre-service teachers find most valuable for learning about technology for reading instruction?** The majority of the technology (57%) was found by the pre-service teachers independent of what they had learned about in the instructor-led mini-lessons. They had learned an additional 31% of the technology from peer project presentations and 12% from their field cooperating field experience teachers. The least amount of technology used was learned through the instructor mini-lessons (4%). These categories were repeated to the same general degree in the survey question answers (see Table 1)

**What criteria did the pre-service teachers use when choosing technology for their lessons?**

An open-ended survey, the brochure project, and the second question from the panel interview triangulated one another (Lincoln and Guba, 1985) in understanding the criteria by which the pre-service teacher chose technology. These findings are summarized in Table 1.

***Criteria from survey data.*** Of the fourteen students who answered the questions about the sources they did and did not use, seven responses indicated that the source was “easy to use”, seven said that they were “fun”, three stated that they were the “best way to learn the topic”, and two mentioned “lots of ideas/lessons”. Five respondents put that they did not use technology that seemed “difficult”, and three didn’t use technology that they felt was “boring”. Three said that they just didn’t think to use it. One respondent felt that none of the technology met the needs of her students. The third question was “Do you plan to use any of the sources above in lesson planning for teaching literacy in your future classrooms? If so, which ones and why?” All seventeen of the survey participants responded to this question. The most frequently mentioned technology were the websites [teacherspayteachers.com](http://teacherspayteachers.com), [pinterest.org](http://pinterest.org), [readwritethink.org](http://readwritethink.org), [starfall.com](http://starfall.com), [readingrockets.org](http://readingrockets.org), [abcya.com](http://abcya.com), [bbc.co.uk](http://bbc.co.uk), [brainpop.com](http://brainpop.com), [scholastic.com](http://scholastic.com), [flashcardmaker.com](http://flashcardmaker.com), [mybrochuremaker.com](http://mybrochuremaker.com) and [kidsnationalgeographic.com](http://kidsnationalgeographic.com), and [learning.org](http://learning.org). Again, the purposes for using particular resources (from most to least common) were that they were “fun”, had “lots of good resources”, were “easy to use”, and were “effective”.

***Criteria from brochure project data.*** Descriptive words for what was “special” about their sites fell into categories of quantity/types of resources (5 groups); was easy to use (4 groups); had a novelty/fun factor (3 groups); had an attractive appearance (2 groups); could foster parent involvement (2 groups); could increase professional knowledge (2 groups); was free of charge (2 groups); offered the ability to interact (1 group); offered language support (1 group);

had many features (1 group); were developed by qualified professionals (1 group) and had high quality content (1 group). Within the the six brochure projects they listed that the sites offered interactive games (33 times), scaffolded reading opportunities (21 times), materials for learning (15 times), oral language and listening practice skills (10 times), skills practice (6 times), and contained professional development tools (3 times).

*Criteria from the panel interview.* The second question asked in the panel interview was “What were some benefits or non-benefits about using technology in your reading lesson plans?” The participants in the panel interview were in agreement that using technology in the lesson plans had many positive benefits. Individual responses were confirmed by the group as a whole, which included that technology helped them work efficiently with their early readers; provided more hands-on, interactive instruction; made learning interesting, and resulted in better lessons overall. This was reflected in comments like Shemika’s: “The kids seemed to love it...it’s easy to use and it keeps them engaged” and Stephanie’s: “There is a lot to still learn, but I do like how its interactive and how much the kids enjoy it – their learning style and how it adapts to that.”

**What perceptions do pre-service teachers hold regarding how technology training might be improved?** The fourth question on the survey asked, “Do you have any suggestions of other ways in which pre-service teachers could become knowledgeable about technology sources for literacy instruction?” Responses fell into categories of continued learning opportunities, more interactive training, more practice opportunities, presentations from peers, and more demonstrations by the instructor. This data was triangulated with the third question from the panel interview, which asked, “How can professors improve the quantity and range of

instructional technology used in literacy lesson plans?” The interview participants thought that professors could improve the quantity and range of instructional technology used in literacy lesson plans by providing continued learning opportunities, including workshops on the basics of using technology for those who needed help. The interview participants also suggested providing interactive training where they could follow along with their laptops as the instructor demonstrated. They suggested more opportunities for practice, and peer-to-peer teaching.

Table 1: Themes Within Data Sources

	Research Question #1: Technology Uses	Research Question #2 Sources from Which Technology was Learned	Research Question #3 Criteria for Choosing Technology for Lessons	Research Question #4 Suggestions Regarding Training
Data Source	Lesson Plans	Checklist/ Survey	Survey/Brochure Project/Interview	Survey/ Interview
Number of Participants	20 with 5 lesson plans each	17/17	17/20/6	17/6
	Interactive Practice (35%)	Found independently (57%)	Easy to Use (50%) / Not Difficult (29%)/Easy (6%)	Continued learning opportunities (29%/100%)
	Interactive Learning (29%)	Peer Presentations (31%)	Fun (50%)/Not Boring (18%)/Fun (12%)	Interactive training (6%/100%)

	Digital Text (25%)	Cooperating Field Experience Teachers (12%)	Best Way to Learn the Topic (18%)	More practice opportunities/ (12%/100%)
	Stand-In Teacher (16%)	Instructor Mini-Lessons (4%)	Lots of Ideas (12%)/Variety of Ideas (24%)	Peer teaching (12%/100%)
	Learning Materials (2%)		Just Thought to Use It (18%)	
	Pedagogical Knowledge (2%)		Met Needs of Students (6%)/Effective Resources (18%)	

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### Discussion and Implications

Pre-service teachers seemed enthusiastic and flexible in how they used Internet technology for teaching early reading skills. Everyone used technology in her lesson plans multiple times and for different purposes in the lesson, and the most common theme mentioned for improving technology training was that they wanted to learn more. They used technology in the beginning and middle of the lessons as a means of interactive learning and at the end of the lessons for interactive practice, and some accessed digital texts to use throughout the lesson. That technology was used in an interactive and learner-centered fashion was an encouraging find in that research supports teaching approaches such as this for early readers (see Roschelle, Pea, Hoadley, Gordin, and Means, 2000 and Rose and Meyer, 2002, for example).

Most of the technology used in the lesson plans was learned from peers or found independently. The peer-created brochure project and presentation assignment seemed to be a

worthwhile endeavor to expose themselves and their peers to the features of websites they could use in their lessons. Since so much of the technology was found independently teaching the skills involved in finding and critiquing technology may be more aligned with pre-service teachers preferred ways of learning and more relevant to the ever-changing technology environment.

Interestingly, very few of the mini-lessons offered by the instructor seemed to inspire the pre-service teachers to use that technology in their lessons. When looking back over the instructor-led mini-lesson topics (on the checklist in Appendix A) a common characteristic became apparent: the technology from the mini-lessons all required preparation, whereas most of the technology used by the pre-service teachers was instantaneously available for use in the lessons. To some extent this phenomena also explained why few pre-service teachers used the resources listed on the class website. Going to the course D2L site to access these suggested websites and spending the subsequent time to go through them also required some extra effort, even if the sites themselves held instantaneous interactive experiences.

The criteria used in the decision-making process supported these themes. The most common theme throughout the criteria was that the technology they chose was “easy to use”. The pre-service teachers did not elaborate on what they meant by “easy” but no doubt being able to access the activity instantly rather than having to do preparatory work was probably a major factor. Another major theme was “lots of variety”. Again, they saved them time and effort when all that they needed was on one site. Another word that occurred repeatedly in the data was “fun”. This criterion supported the data showing that technology was used primarily for interactive teaching and learning activities, which were most likely engaging and highly motivating to their students. Efficiency and engagement, while important, are not the only

considerations when choosing appropriate technology for lessons. Teaching pre-service teachers to critically evaluate Internet technology is an important next step, especially since so much of what they used was found independently. Research is needed to adapt existing or develop new criteria specifically for evaluating technology in the reading area (among other content) and in how to teach that criteria to pre-service teachers.

The idea of interactive and engaged learning came full circle in the pre-service teacher recommendations for improving technology training. They wanted more opportunities to learn and practice technology but through interactive opportunities independently or with peers rather than having more instructor-led mini-lessons. This finding refutes the notion that the same conditions under which in-service teachers are likely to adopt the technology applies to pre-service teachers. Despite the efforts of the instructor in this study to emulate the research on successful in-service technology training (by modeling specific examples of technology use in the content area, providing support and coaching, and showing how the technology was useful and relevant to the specific needs of their students), the pre-service teachers adopted very little of the technology in which they had been instructed.

In sum, the pre-service teachers in this study embraced technology and enthusiastically used it to make learning engaging. They looked for the most efficient ways of finding and using technology, embraced technology presented to them by their peers, and explored and learned about technology on their own. Action research is needed to explore the effects of peer-based learning opportunities such as the brochure project. Additionally, the limited criteria they used in choosing the technology points to the fact that pre-service teachers need training not so much in what technology to use but in how to qualitatively assess the technology they find beyond the characteristics of “fun” and “easy”. Action

research, therefore, is also needed in how to teach pre-service teachers to apply more appropriate criteria in making their selections.

### **Limitations**

This study is subject to the limitations inherent in qualitative action research. First, when the instructor of the course and the primary (and only) investigator are the same person, bias may infiltrate interpretations of data. Efforts were made to examine and re-examine the data findings to ensure a logical chain of progression that best supported the interpretations (Lincoln and Guba, 1985). However, bias from knowing the participants and having created the course activities and assignments may have colored the findings. Secondly, self-reported data is sometimes not reliable. Despite efforts in this study to triangulate multiple data sources the pre-service teacher participants may have said things to please the researcher or refrained from saying things that they believed might not please her. The enthusiasm expressed in the interviews and surveys, therefore, may have been inflated. Finally, this study took place within one classroom setting and is thus not generalizable, although the findings may be transferable to the experiences of instructors teaching similar reading courses to similar populations of pre-service teachers. All of these limitations point to the need for more action research to bolster these findings and possibly some naturalistic inquiry where the researcher and the classroom teacher participant are not the same person.

### **Conclusion**

The purpose of this action research project was to explore Technology Pedagogical and Content Knowledge (TPCK) in the literacy content area to evaluate and refine current practices in the classroom. Wepner, Ziomek and Tao state that teacher educators "...need to see ourselves as catalysts for change because of the nature of our positions as leaders of educational thought

and practice; in other words, the impetus and incentive for students to think of technology as an essential component of their teaching” (2003, p. 60). This initial foray into how pre-service teachers choose, use, and learn about technology for teaching early reading skills may provide insight for other teacher educators as they explore pertinent and effective techniques in creating technology-based learning experiences. This study and others like it serve to interpret TPACK in the context of reading instruction and further the goal of preparing teachers who possess the ability to enhance reading instruction in the myriad of ways that technology has to offer.

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## Appendix A

## Technology Checklist

Thank you for agreeing to participate in this study. This semester you may have used technology for teaching and/or learning in your literacy tutoring lesson plans. As best you can, please put a checkmark next to the sources from which you learned about that technology:

\_\_\_\_\_ **Searched independently on the Internet (including tablet apps)**

\_\_\_\_\_ **Found independently as a link from another site**

\_\_\_\_\_ **Found in textbook for this class from this semester**

\_\_\_\_\_ **Found in textbook from another semester or class**

\_\_\_\_\_ **Found in a professional journal or other teacher book you found on your own**

\_\_\_\_\_ **Explained at your field school this semester as a professional development session**

\_\_\_\_\_ **Learned about from cooperating teacher or other teachers at field school**

\_\_\_\_\_ **Explained by peer but not as part of an assignment for class**

\_\_\_\_\_ **Explained by peers in the Internet site brochure/ presentation.** (abcya.com, bbc.co.uk/schools, roythezebra.com, readingrockets.org/strategies, starfall.com)

\_\_\_\_\_ **Explained by professor and used in your own college classwork** (scholastic.com flashcards, proprof.com flashcards, puzzlemaker.com, pinterest.com)

\_\_\_\_\_ **Explained by professor and practiced as part of an in-class group project** (Word or scholastic.com brochure maker, audacity.com)

\_\_\_\_\_ **Explained but not used in instruction by your classroom literacy professor**  
(prometheunplanet.com; readwritethink.org; [freereading.net](http://freereading.net); montessorimom.net; riginst.org )

\_\_\_\_\_ **Looked through the list of technology resources instructor posted on D2L but did not model or explain.**

[ilovethatteachingidea.com](http://ilovethatteachingidea.com)

[wordgametime.com/grade/1st-grade](http://wordgametime.com/grade/1st-grade)

[pbskids.org](http://pbskids.org) (Sesame Street and Between the Lions)

[ldshomeschoolinginca.org/vft.html](http://ldshomeschoolinginca.org/vft.html)

[kids.nationalgeographic.com/kids/](http://kids.nationalgeographic.com/kids/)

[reading.ecb.org/teacher/strategies.html](http://reading.ecb.org/teacher/strategies.html)

<http://teacher.scholastic.com/activities/scrapbook/>

<http://www.khake.com/page96.html>

[http://interactives.mped.org/view\\_interactive.aspx?id=110&title=](http://interactives.mped.org/view_interactive.aspx?id=110&title=)

<http://landmark-project.com/evaluation/dic1.php>

<http://www.readwritethink.org/files/resources/interactives/flipbook/>

<http://www.worksheetworks.com/miscellanea/graphic-organizers.html>

\_\_\_\_\_ **Can't remember**

\_\_\_\_\_ **Other (please explain)**

## Appendix B

### Brochure Project Directions

You will create a brochure to convince the rest of the class to “use” your assigned website in their classrooms.

1. First, explore your website and take notes on what kind of resource(s) it offers (e.g., videos, interactive games, etc.)
2. Secondly, list the broad and specific reading skills that could be practiced using this site:
  - concepts of print
  - alphabet recognition
  - phonological awareness (phonemes)
  - phonological awareness (graphemes)
  - word families
  - sight words
  - fluency
  - comprehension
3. Under the broad category list the specific skills that can be practiced on this site.
4. Next, decide what is special about your site and how it will appeal to children and what will appeal to teachers, for example:
5. Put all these things into a brochure and decorate it. You can print it out and decorate or decorate with printer colors.

5. Present it to the class and make copies of the brochure to hand out to your classmates.

Group 1: <http://www.abcya.com>

Group 2: <http://www.bbc.co.uk/schools/>

Group 3: <http://www.roythezebra.com/reading-games-word-level.html>

Group 4: <http://www.readingrockets.org/strategies/>

Group 5: <http://www.starfall.com/>

Appendix C  
**Survey Questions**

Please explain why you chose the sources you chose and didn't choose.

1. The sources I DID choose:

---

2. The sources I DID NOT choose:

---

3. Do you plan to use any of the sources above in lesson planning for teaching literacy in your future classrooms? If so, which ones? Why?

4. Do you have any suggestions of other ways in which pre-service teachers could become knowledgeable about technology sources for literacy instruction?

5. Do you have any other comments?

## Appendix D

### **Panel Interview Questions**

1. What were some benefits or non-benefits about using technology in your reading lesson plans?
2. If you did use technology in teaching and/or learning, explain how you learned about that technology:
3. How can professors improve the quantity and range of instructional technology used in literacy lesson plans?