~ Chapter 3

Assisting Preservice Teachers with the Process of Evaluating and Integrating Technologies in Order to Transform Literacy Practices

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Abstract

Teachers are continually bombarded with a plethora of technologies and told by administrators to incorporate them into their lessons. However, teachers do not always know what to do with all these technologies and professional development is not always available. Thus, this action research study explored 1) preservice teachers' access to various technologies while they were completing their student teaching experience in K-6 classrooms; 2) their comfort level in selecting, evaluating, and using appropriate apps; and 3) their ability to recognize where apps fit within Bloom's six cognitive levels.

Students today are radically different than the students of the past that our educational system was originally designed to teach. Today's students are considered digital natives as a result of growing up with technology (Prensky, 2001). As our society advances in technology use, the demand for classroom technology integration increases, as technology has the potential to increase academic opportunities (Gilakjani, 2014). However, there is a right way and a wrong way to use technology in the teaching/learning process (Gulbahar, 2007). The wrong way would be to build a lesson around the technology because it looks fun and engaging or to use technologies in every lesson. The right way is to

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infuse the technology seamlessly into instruction. In 2009, the International Reading Association (IRA), now known as the International Literacy Association (ILA), issued a position statement asserting that:

> To become fully literate in today's world, students must become proficient in the new literacies of the 21st century technologies. The IRA/ILA believes that literacy educators have a responsibility to integrate information and communication technologies (ICT's) into the curriculum, to prepare students for the futures they deserve. (n.p.)

As a result, the integration of digital technologies into literacy instruction and equipping students with literacy skills needed for reading, writing, and communication in digital environments is a priority for many literacy teachers (Hutchison & Reinking, 2011). The IRA (2009) stressed the importance of integrating information and communication technologies (ICTs) into current literacy programs. In addition, the International Society for Technology in Education (ISTE, 2009) created guidelines for teachers to incorporate technology into their classroom (ISTE, 2015).

As preservice teachers begin to explore the possibilities of integrating technologies into their classroom instruction, it is important to examine how the iPad can help preservice teachers and mentor teachers meet curriculum goals and foster literacy development (Hutchison, Beschorner & Schmidt-Crawford, 2012). This action research study examined the results of a class assignment that had several required activities that all preservice teachers had to complete. The activities were designed to help these preservice teachers explore both their mentor teacher's use of technology and the technologies found within the classroom that they were assigned to do their student teaching. The following questions led this research:

1. How many iPads are in the classroom?
2. In what subjects are the iPads being utilized the most?
3. What is the main use of iPad in the classroom?
4. How often are iPads used for instructional purposes?

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5. What is the mentors' level of comfort using iPads?
6. What is the preservice teachers' level of comfort using iPads?
7. What cognitive level of Bloom's do literacy apps fit?

Literature Review

Today, technology has become an integral part of our lives (Coppola, 2004). "No one sees more clearly than educators how the technologies we use in our daily lives influence how students learn" (Stevens, 2015, para. 1). The literature review provides information on using technology in the classroom, using Bloom's Taxonomy to level technology and iPad apps as learning tools.

Classroom Technology

Teachers are encouraged to create meaningful learning experiences that integrate technologies seamlessly into the lesson. However, teachers need to be technology savvy and wise consumers of the plethora of technologies available in order to create meaningful lessons. Research shows that technology fosters learning, facilitates faster learning at deeper levels, creates better retention, and can be used to differentiates instruction (Jonassen, Howland, Marra, & Crismond, 2008; Marshall, 2002; Smith & Throne, 2007). However, not all classroom technologies engage learners, facilitate thinking, or support higher-order knowledge construction (Jonaseen et al., 2008).

Using Bloom's Taxonomy to Determine Cognitive Level of Apps

Bloom's Taxonomy contains a list of verbs that was created to determine the knowledge level a student exhibits with learning outcomes. There are six cognitive levels, and these levels are hierarchical in nature with the higher levels at the top (Bloom, Hastings, & Madaus, 1971). However, Schrock (2012) suggested that each of Bloom's cognitive processes should be seen as interlocking gears, or cogwheels. This visualization portrays the interacting ability of cognitive processes as learners progress through various cognitive processes during the process of learning. In doing so, teachers have the potential to envision learning experiences that allow for technology integration.

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Table 1 shows the verbs that are used to describe the six levels of the cognitive process. Bloom et al.'s (1971) verbs are geared toward describing the paper/pencil learning skills. In comparison, Schrock's (2012) verbs are geared toward describing the technology skills and abilities.

Table 1

Cognitive Levels and Verbs

Student Outcome Levels	Verbs by Bloom et al. (1971)	Verbs by Schrock (2012)
Remembering	Describe, Name, Recite, List, Find, Tell, Recall	Bookmarking, Recalling, Word Processing, Mind Mapping, Searching, Listing
Understanding	Explain, Compare, Outline, Translate, Predict, Discuss, Restate, Summarize	Annotating, Categorizing, Explaining, Blogging, Subscribing, Tweeting
Applying	Show, Complete Use, Classify, Examine, Illustrate, Solve, Implement	Interviewing, Simulating, Illustrating Demonstrating, Presenting, Editing
Analyzing	Compare, Examine, Identify, Categorize, Contrast, Investigate, Sort, Debate	Structuring, Organizing, Outlining, Deconstructing, Mashing, Surveying
Evaluating	Solve, Criticize, Appraise, Conclude, Justify, Judge, Rate, Choose, Prioritize, Check	Posting, Networking, Conferencing, Collaborating, Critiquing, Posting, Moderating
Creating	Create, Invent, Plan, Compose, Construct, Design, Imagine, Generate	Animating, Mixing, Video Editing, Videocasting, Storytelling, Podcasting

Technology is a Learning Tool

Technology has changed both teaching and learning. To help teachers support students' use of technology, many states have created technology standards that provide clear guidelines for the skills and knowledge students need to understand in order to be successful in the digital age (Fox, 2005). Research has shown that technology used can be beneficial in helping to increase students' educational productivity (Bryom & Bingham, 2001; Clements & Sarama, 2003; Kulik, 2002; Waxman, Connell, & Gray, 2002).

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However, this can be very challenging and without strong teacher knowledge on how to use and to integrate various technology apps into lessons, precious instruction time can be wasted (Coppola, 2004). Technology does not belong in every lesson just because there is a tool available (Schwartz, 2014). When designing lessons, teachers must first ensure that state standards are being addressed to meet instructional goals. Teachers should also design lessons that are engaging to students in the classroom. Once these conditions are met, teachers should then consider if the use of technology adds value to the lesson. The following questions may assist teachers in determining the value of infusing technology into planned lessons: Will the use of technology make the lesson better? Will the use of technology make the lesson more engaging? Will the technology app save the teacher or students' time and/or energy if it is used with this lesson? If the answer to these questions is *no*, then technology is not needed for this lesson. Favorable responses to these questions support the integration of technology.

Effective instruction is dependent upon instructional design, rather than availability of technology (Bulger, Mohr, & Walls, 2002). Technology should assist teachers with more meaningful effective instruction (Cassidy, 2014). Similar to reading, writing, and talking, technology has the potential to enhance the learning experience. Using technologies provide a way to change the classroom into a collaborative work environment where both teachers and students share knowledge and have grand conversations where the curriculum objectives comes alive (Tinzmann et al., 1990).

Methods

An action research study was conducted among preservice teachers enrolled in a university-based teacher preparation program in Texas. At this university, student teaching is a year-long experience. During the first semester, preservice teachers are called interns and are in the K-6 classroom two days a week and in the university classroom one day a week. During the second semester, preservice teachers are called residents and are in the K-6 classroom five days a week and in the university classroom only eight days throughout the semester. During this year-long experience, preservice teachers spend half of

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their placement with mentor teachers in early elementary classrooms (i.e., Kindergarten – Third Grade) and the other half with mentor teachers in upper elementary classrooms (i.e., Fourth Grade – Sixth Grade).

Setting

The school district in which the study was done was a large suburban independent school district in Northeast Texas where 73% of the students received free-and-reduced breakfast and/or lunch. All preservice teachers were placed in Title 1 schools to gain experience with diverse student populations.

Participants

Twenty-eight preservice teachers participated in this study: twenty-six females and two males. This study explored preservice teachers' experiences with technology in their assigned K-6 classrooms during their internship experiences.

Procedure

To achieve the purposes for this study, preservice teachers were given a university-based assignment to learn more about their mentor teacher and the availability of technology in the classroom. The first part of the assignment entailed the completion of a Technology Survey in collaboration with their mentor teachers. The survey contained the following questions:

1. Is there classroom access to iPads? Yes or No
    a. If yes, how many are available for use by students?
2. What subjects are the iPads utilized?
3. What apps are consistently used?
4. What is the main use of iPads? Check all that apply.
    a. Teacher productivity
    b. Classroom management
    c. Stations

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d. Assessment

e. Games for reinforcement

f. Student learning

g. Other

5. How much are iPads used in your classroom? (Rating of 1 Never to 10 Daily)

6. Rate your level of comfort using iPads for instruction on scale 1-5

(1 = uncomfortable; 2 – somewhat comfortable; 3 = comfortable; 4= very comfortable; 5= I'm a Pro)

a. Rating for mentor teacher ____

b. Rating for preservice teacher ____

For the second part of the assignment, preservice teachers engaged in several collaborative seminar activities. During the seminar activities, preservice teachers (a) explored iPad literacy apps already in use in the classroom, (b) found iPad reading apps on their own, (c) evaluated each iPad app using a rubric tool (see Figure 1), (d) explored the English Language Arts (ELA) curriculum to determine the best use of iPad apps, and (e) determined the cognitive level of each iPad app.

Seminar Activity

One of the assignments given during seminar was designed to help preservice teachers get acquainted with their mentor teacher, to find out what technologies are used in the classroom, and determine how the mentor teacher uses these technologies. This information was intended to help the preservice teachers as they plan and teach lessons during their student teaching. During the seminar, both Bloom's (1971) and Schrock's (2012) Taxonomies were reviewed, as well as sample question stems (see appendix). This allowed preservice teachers to become aware of the specific question stems and verbs associated with each cognitive level. The preservice teachers created folders on their iPads for each of the six cognitive levels (i.e., remembering, understanding, applying, analyzing, evaluating and creating) that they would use to place the technologies.

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Next, the preservice teachers were assigned homework. First, they researched the list of literacy apps used by their mentor teachers, if any. Second, the preservice teachers were asked to explore different/new literacy apps they found on the web. Third, using the stem questions, they were to determine the cognitive demand for each app and place them in the respective folder on iPad. In addition, the preservice teachers used the App Evaluation Criteria Rubric (see Figure 1) to determine if the apps were useful and added value to the lesson.

During the seminar class, the preservice teachers worked in grade-level collaborative groups to discuss iPad apps. The students examined the apps in relation to stem questions the app addressed and discussed the rating of the app from the App Evaluation Criteria Rubric. The preservice teachers and the seminar instructors had to agree both with the placement of the app in the correct cognitive level folder and the rating on the App Evaluation Criteria Rubric.

Instruments and Materials

Technology survey. The survey consisted of seven questions that elicited preservice teachers' responses with a Likert-scale, a checklist, and questions requiring short answers.

List of literacy apps. As previously described, a list of iPad apps was generated and categorized by grade level.

Preservice teachers were then placed in grade-level groups and used the English Language Arts TEKS to determine if identified iPad apps were appropriate for supporting students' understanding of grade-level skills and knowledge.

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Figure 1. App Evaluation Rubric

	Yes	Somewhat	No
Intended user: Is the app meant for students to use independently or with a teacher or parent? Teacher-utility apps are meant for teachers to use in planning or delivering instruction.			
Breadth and depth: Is the content accurate and research-based? Are activities varied, with multiple levels of complexity? Is there scaffolding to support learners of different abilities?			
User-friendliness: Is it intuitive? Can the user move easily between tasks? How do teacher-utility apps improve teaching quality or save time and effort? Are oral or written instructions readily available? Do web-links enhance the content?			
Images and sound: Are the illustrations, graphics and sound attractive and engaging? Do they enhance content, or detract from it?			
Feedback: Is the feedback timely, specific, and motivating? Is feedback delivered at multiple levels?			
Engaging: Do the activities promote involvement? Are there motivating goals and attractive rewards? Are activities interactive and challenging and do they involve problem solving? Are student apps fun and enjoyable, compelling students to want to use them again and again?			

Data Analysis

Data from the Technology Survey were analyzed with simple tallying which were reported as percentage. With respect to data generated from the App Evaluation Criteria Rubric, apps that scored a 5 or 6 were placed in the appropriate Bloom's folder on their iPad. Preservice teachers then incorporated these apps into several planned lessons during their student teaching experience.

Results

RQ 1 - How many iPads are in the classroom?

Researchers found that 26 of the 28 mentor teachers had access to iPads in their assigned classroom. As seen in Table 1, the data showed that 11 (39%) mentor teachers in kindergarten through

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second grade indicated that they only had access to five or fewer iPads while the same number of mentor teachers in first grade through sixth grade reported they had a class set of iPads.

Kindergarten mentor teachers had access to five or fewer iPads in the classroom. However, this number increased as the grade level increased, as fourth-sixth grade mentor teachers had a class set of iPads. In addition, the two teachers who indicated they did not have iPads in their classroom (one mentor teacher in first grade and one mentor teacher in second grade) did not have them because of choice, as the other mentor teachers in those grade levels had iPads in their classrooms.

Table 1

Number of iPads in the Classroom

Number of iPads	K	1st	1st/2nd	2nd	3rd	4th	5th	6th
0	-	1	-	1	-	-	-	-
1-5	5	5	-	1	-	-	-	-
6-10	-	2	1	-	1	-	-	-
11-15	-	-	-	-	-	-	-	-
16-20	-	-	-	-	-	-	-	-
20+	-	1	-	2	1	2	2	3
Total Number of Teachers	5	9	1	4	2	2	2	3

RQ2 - In what subject areas are the iPads being utilized the most?

Findings showed that iPad usage was most common among mentor teachers during ELA instruction, as 22 (41%) of the mentor teachers indicated usage. Eight (15%) mentor teachers reported they used iPads during math lessons. Seven (13%) mentor teachers reported that they used iPads during science, while nine (17%) mentor teachers indicated iPad usage during social studies.

Further examination of Table 2 showed that of the five Kindergarten teachers, two reported using the iPads in ELA and math, two reported using it in Science and none used iPads during social studies. The nine first grade teachers used the iPad in all subject areas except science. The one first/second grade

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split teacher only used iPads during ELA. Third grade teachers only used iPads during ELA and math lessons while fourth, fifth, and sixth grade teachers used iPads in every subject area.

Table 2

Content Areas and Grade Levels for iPad Usage

Subject	K	1st	1st/2nd	2nd	3rd	4th	5th	6th
ELA	3	6	1	3	2	2	2	3
Math	3	3	-	1	2	1	2	2
Science	2	-	-	1	-	2	2	2
Social Studies	-	1	-	2	-	1	2	3
Total Number of Teachers in Grade Level	5	9	1	4	2	2	2	3

RQ3 - What is the main use of iPad in the classroom?

Findings from the Technology Survey suggested that all the teachers used iPads for various reasons. Four (8%) mentor teachers indicated they used the iPads for teacher productivity, five (10%) used it for classroom management, 14 (27%) used it during work stations, seven (13%) used if for both assessment and games that reinforce skills and 15 (29%) used iPads for student learning. There was a place for mentor teachers to report other uses, but nothing was written.

Further examination showed that very few teachers used iPads for teacher productivity or for classroom management (Table 3). However, K-3 teachers reported they used iPads at stations for reinforncement activities while fourth-sixth grade teachers did not have work stations. Finally, the one teacher who had a split first/second grade level only used the iPad during workstations.

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Table 3

How iPads Were Used (Check all that apply)

iPad Usage	K	1st	1st/2nd	2nd	3rd	4th	5th	6th
Teacher Productivity	-	1	-	-	1	2	-	-
Classroom Management	1	1	-	-	2	1	-	-
Stations	4	5	1	2	2	-	-	-
Assessments	2	-	-	1	1	1	2	-
Games for Reinforcement	-	4	-	1	1	1	-	-
Student Learning	1	3	-	3	1	2	2	3
Total Number of Teachers	5	9	1	4	2	2	2	3

RQ 4 - How often are iPads used for instructional purposes?

On the Technology Survey, preservice teachers and mentors were asked to mark only one response on the checklist indicating the frequency of iPad usage for instructional purposes. Although data showed varying uses for iPads in the classroom, six (21%) of the mentor teachers reported that they never used their iPad for instructional purposes.

Further examination of Table 4 showed eleven (39%) teachers used technologies one time per day while three (11%) teachers stated they used technologies more than one time per day. The other six (21%) teachers reported they used their iPads once a week to once a month.

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Table 4

iPads Usage

	K	1st	1st/2nd	2nd	3rd	4th	5th	6th
Never	2	3	-	1	-	-	-	-
1x month	-	-	-	1	1	-	-	-
2 x month	-	-	-	1	-	-	-	-
1 x week	-	1	-	1	-	-	-	-
2 x week	-	-	-	-	-	-	-	-
3 x week	1	-	-	-	-	1	-	1
Daily	2	5	1	-	-	1	-	1
More than once daily	-	-	-	-	-	-	1	1
Other	-	-	-	-	-	-	-	-
Total Number of Teachers	5	9	1	4	2	2	2	3

RQ5 - What is the mentors' level of comfort using iPads?

Mentor teachers ranked their comfort level towards using iPads with a Likert-scale that used the following categories: 1=*Uncomfortable*; 2=*Somewhat Comfortable*; 3=*Comfortable*; 4=*Very Comfortable*; and 5=*I'm a Pro!* Only primary elementary teachers rated themselves *Uncomfortable* and *Somewhat Comfortable* while only upper elementary teachers rated themselves as *a Pro.* Two (8%) mentor teachers rated themselves as *I'm a Pro*, while two (8%) mentor teachers said they were *Uncomfortable* using iPads. Findings revealed that 11 (42%) mentor teachers rated their comfort level with iPad use as *Very Comfortable* while six (23%) reported they felt *Comfortable*. and five (19%) said *Somewhat Comfortable.*

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Table 5

Teachers Self-Reported Comfort Level

	K	1st	1st/2nd	2nd	3rd	4th	5th	6th
Uncomfortable	-	2	-	-	-	-	-	-
Somewhat Comfortable	-	2	1	2	-	-	-	-
Comfortable	2	2	-	-	-	-	-	2
Very Comfortable	3	1	-	2	1	2	1	1
I'm a Pro	-	2	-	-	1	-	1	-
Total Number of Teachers	5	9	1	4	2	2	2	3

RQ 6 - What is the preservice teachers' level of comfort using iPads?

Preservice teachers rated their own comfort with use of the iPad using the same Likert-scale categories that mentor teachers used. The majority of preservice teachers rated their own comfort level with iPads as either *Comfortable* of *Somewhat Comfortable* (see Table 6). Three (11%) of the preservice teachers rated their comfort level as *Uncomfortable* and no preservice teachers selected *I am a Pro*.

Table 6

Preservice Teachers Self-Report Comfort Level

	K	1st	1st/2nd	2nd	3rd	4th	5th	6th
Uncomfortable	-	-	-	1	-	-	-	2
Somewhat Comfortable	-	3	2	-	1	1	1	-
Comfortable	2	3	1	-	1	1	1	1
Very Comfortable	3	3	1	1	-	-	-	-
I'm a Pro	-	-	-	-	-	-	-	-
Total Number of Preservice Teachers	5	9	1	4	2	2	2	3

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RQ7 –What cognitive level of Bloom's do literacy apps fit?

Preservice teachers explored a number of literacy iPad apps that were used in their mentor teachers' classrooms, researched on their own, and identified during collaborative working groups during their university seminar. Through these efforts, preservice teachers determined the respective cognitive level for each app as reported below.

Remembering. This level is simple recall of facts or information. Remembering means that one can retrieve relevant knowledge from long term memory. Preservice teachers categorized many of the free literacy apps in the *Remembering* cognitive category since users were prompted to select an answer or find matches (see Table 7). However, literacy apps at the *Remembering* cognitive level were interactive and focused upon foundational literacy content.

Table 7

Apps and Literacy Sites for Remembering Cognitive Level

Name of App or Website	Description of App/Website
Starfall.com	The basics of reading- Features interactive books and phonics games; including Long O Picture Hunt and Long Vowels Matching
StarfallABC.com	Phonics games for each letter of the alphabet
Sight Word Matching	Helps students recognize and match high frequency sight-words
Literactive.com	Works with beginning reading skills
Literacy center.net	Helps students learn their colors, letters, writing and words
Augmented Reality (AR) ABC Flashcards App	This is a free interactive app that helps students learn their letters and names of animals.
Spelling City	Works with one's own spelling list: Dolch sight words, multiple meaning words, onset/rime words, and compound words
Smarty Pants School	Tests and develops early reading skills (e.g., letter knowledge, phonological awareness, phonemic awareness, and phonics)

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Understanding. At this cognitive level, students are putting the learning into their own words. Understanding means that one can construct meaning from different sources of information. Preservice teachers described literacy apps at the *Understanding* cognitive level as interactive and focused upon the explanation of ideas or concepts into one's own words, the retelling of events, or the provisions of examples (see Table 8).

Table 8

Apps and Literacy Sites for Understanding Cognitive Level

Name of App /Website	Description of App/Website
Prezi	Helps present information Similar to PowerPoint.
MyHistro.com	Allows students to create sequential timelines for history
Mural.ly	Allows students to create sequential timelines
Mindmapper	Organizes and groups ideas around content being learned
Socrative	Used for quizzes, exit slips, or poll questions and provide feedback to teachers
Corkboard.me	Allows students to write notes, exit slips and paste to central corkboard for the whole class to see.
Doodle Buddy	Allow one to paint, draw, scribble, and/or Sketch their understanding of text
Trading Card Creator found at readwritethink.org	Allows students to add picture and write short summaries about picture.

Applying. Students operating at this cognitive level can use the materials or their understandings in a new situation and apply the information or rules. Apps at the *Applying* level means that the information can be used in creative ways to show one's understanding (see Table 9).

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Table 9

Apps and Literacy Sites for Applying Cognitive Level

Name of App/ Website	Description of App/Website
Animoto.com	Allows you to create a video of skits, plays, art, or music creations to show of what has been learned
ScreenChom	Allows for placement of pictures that show connection with other ideas
Haiku Deck	Helps user create presentation or telling a story
Idea Flip (formerly Idea)	Mind mapping that allows for ideas to be connect
Bookabi	Allows use of story grammar to create stories
Puppet-Pals-hd at itunes.apple.com	Allows students to create their own understanding of story; provides animation and audio

Analyzing. Analyzing helps students to determine what is relevant and irrelevant, fact from fiction, and to determine relationships and/or biases. The *Analyzing* apps helps to examine critically the presented information (see Table 10).

Table 10

Apps and Literacy Sites for Analyzing Cognitive Level

Name of App/ Website	Description of App/Website
Whiteboard Lite	Allows students to work together and share a drawing
Popplet.com	Allows students to create a mind map to capture facts and create relationships between them

Evaluating. Evaluating is the ability to judge materials/information on certain criteria. This helps students to judge the information's reliability. *Evaluating* apps help the user check for accuracy,

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correctness and critique solutions (Table 11). This cognitive level has repeated apps, as some apps can be used at multiple levels of the taxonomies. Therefore, it is important to work through each program to see how they are designed.

Table 11

Apps and Literacy Sites for Evaluating Cognitive Level

Name of App/ Website	Description of App/Website
VoiceThread	Allows students to share their ideas
Audioboo	Allows students to record up to 3 minutes of comments
PrimaryWall.com	Allows groups of children to work collaboratively using different points of view
Corkboard.me	Allows students to write notes, exit slips and paste to central corkboard for the whole class to see

Creativity. Apps at this level help students to create a product to demonstrate their learning. The *Creativity* apps are interactive and help the student to design a product composed of ideas to produce a solution (Table 12). This cognitive level also has repeated apps, as some apps can be used at multiple levels of the taxonomies. It is important that teachers become familiar with each program to see how they are designed and how each program can be used at different levels.

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Table 12

Apps and Literacy Sites for Creativity Cognitive Level

Name of App/ Website	Description of App/Website
Pic Collage	Imports photos to create a collage
StoryKit	Creates an electronic book
Story Creator	Free app where students can collaborative document editing app, as it allows users to work together in separate locations
Trading Cards	Free app where student can create trading cards with elaborate pictures and description of characters in order to write their own narrative stories
PiratePad.net	Free app where students can collaborative document editing app, as it allows users to work together in separate locations
Prezi	Helps present information Similar to PowerPoint
MyHistro.com	Allows students to create sequential timelines for history
Mural.ly	Allows students to create sequential timelines
Animoto.com	Allows you to create a video of skits, plays, art and or music creations to show of what has been learned
ScreenChom	Allows students/teachers to import PDF/pictures that show how the information learned is connected with other ideas

Discussion

Preservice teachers found that evaluating educational technologies before using them enabled them to see that not all technologies perform as advertised. Preservice teachers had to critically analyze the content to make decisions on whether the program would help reinforce the content they wanted taught in an engaging way. Preservice teachers learned that there are free and low-cost apps that can be valuable in helping students learn. Most importantly, a preservice teacher learned that just because something is labeled as "educational" or advertised to teach a specific skill, does not always mean it is accurate.

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Teachers must evaluate carefully the benefits of using technology in their classrooms and never make an assumption based on the app description. Preservice teachers' noted that within the lower cognitive levels, technologies were interactive computer-based skill and drill worksheets. However, they were considered more entertaining, and the preservice teachers felt that these apps would keep students engaged longer. Preservice teachers also noted that the technologies categorized within the higher cognitive levels could also be used for teaching and/or presenting a lesson. Thus, a teacher could potentially model how to use these higher order apps before students complete inquiry projects and present what they learned to class. In addition, the apps at the higher cognitive levels could also be used at several cognitive levels. Upon further examination and comparison of these results, it was found that two cognitive levels had the least examples of technologies – analysis and evaluation. This may be true for all technologies as these two cognitive levels require a user to use metacognitive skills.

Completing the Technology Survey with their mentor teachers helped preservice teachers to understand that not all teachers have the same access to technology and that all teachers are not comfortable using the iPad. Two preservice teachers who rated themselves as *Uncomfortable* with using iPads were actually placed with two teachers who rated themselves as *I'm a Pro!*, so these preservice teachers were hoping to learn and become more comfortable with the use of the iPad throughout their student teaching experiences.

Implications

Previous research (e.g., Smith & Greene, 2013) has demonstrated the importance of providing opportunities for preservice teachers to use technology as part of a student teaching experience. Therefore, it is important to not only model ways to incorporate technology into instruction but to create opportunities that provide preservice teachers with practice in evaluating the plethora of technologies available. Not all technologies are designed well, and it is both important to evaluate how a specific technology tool achieves its purpose, aligns with curriculum objectives, and reinforces use of cognitive

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skills. The "full potential of technology is only realized when it is used effectively and in ways that connect to the curriculum of the classroom and support creativity and critical thinking" (Gilakjani, 2014, p. 151).

Preservice teachers need to be provided with various activities that help them choose appropriate technologies wisely in order to improve the quality and effectiveness of instruction with students. This knowledge, both content knowledge and pedagogical knowledge, is important, as research has shown that it is the knowledge one has that can predict what will happen in the classroom (Baker, Herman, & Gerhart, 1996; Trafimow & Sheeran, 1998). Therefore, it is important that university teacher educators incorporate learning experiences that help preservice teachers learn about effective technology integration as part of thoughtfully designed lessons that build students' foundational knowledge and cognitive skills.

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Appendix

Knowledge • What happened after . . .? • How many . . .? • Who was it that . . .? • Can you name the . . .? • Described what happened at . . .? • Who spoke to . . .? • Can you tell why . . .? • Find the meaning of . . .? • What is . . .? • Which is true or false . . .?	**Comprehension** • Can you write in your own words . . .? • Can you write a brief outline . . .? • What do you think might happen next . . .? • Who do you think . . .? • What was the main idea . . .? • Who was the key character . . .? • Can you distinguish between . . .? • What differences exist between . . .? • Can you provide an example of what you mean . . .? • Can you provide a definition for . . .?
Application • Do you know another instance where. …? • Could this have happened in . . .? • Can you group by characteristics such as . . .? • What factors would you change if . .? • Can you apply the method used to some experience of your own . . .? • What questions would you ask of . . .? • From the information given, can you develop a set of instructions about . . .? • Would this information be useful if you had a . . .?	**Analysis** • Which events could have happened . . .? • If . . . happened, what might the ending have been? • How was this similar to . . .? • What was the underlying theme of . . .? • What do you see as other possible outcomes? • Why did . . . changes occur? • Can you compare your . . . with that presented in . . .? • Can you explain what must have happened when . . .? • How is . . . similar to . . .? • • Can you distinguish between . . .? • What were some of the motives behind . . .? • What was the turning point in the game . . .? • What was the problem with . . .?
Synthesis • Can you design a . . . to . . .? • Why not compose a song about . . .? • Can you see a possible solution to . . .? • If you had access to all resources how would you deal with . . .? • Why don't you devise your own way to deal with . . .? • What would happen if . . .? • How many ways can you . . .? • Can you create new and unusual uses for . . .? • Can you write a new recipe for a tasty dish? • Can you develop a proposal which would . .	**Evaluation** • Is there a better solution to . . .? • Judge the value of . . .? • Can you defend your position about . . .? • Do you think . . . is a good or a bad thing? • How would you have handled . . .? • What changes to . . . would you recommend? • Are you a . . . person? • How would you feel if . . .? • How effective are . . .? • What do you think about .

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