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# Culturally Relevant Teaching for the 21st Century: The Success and Challenges of Pre-service Teachers when Using Technology in Critical Ways

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**Abstract** This case study examined pre-service teachers' use of technology as they implemented culturally relevant literacy lessons while tutoring elementary students in their field placement sites. As we enter a new decade, we want our students to be future-ready with technology skills. Here, we present an examination of how pre-service teachers integrated culturally relevant teaching with technology along with a discussion of the tools and devices their students used. Findings provided evidence that as pre-service teachers experienced authentic and engaging learning experiences within a supportive space, they emerged equipped to teach in culturally responsive ways that supported student learning and deeper levels of engagement. The implication for practice is for community-engaged teacher preparation models to focus on shaping prospective teachers' orientation toward culturally relevant teaching so that they build learning experiences around students' lives in engaging multiple, multimodal, and multifaceted ways.

*Keywords:* literacy, reading, technology integration, cultural relevant teaching, pre-service teachers, CRT

## Introduction

New 21st century literacies were published by the International Literacy Association (ILA, 2017) focusing on shifts in curriculum development and teaching practices by stating the following:

- Digital tool use requires new social practices, skills, strategies, and dispositions for the tools' effective use.
- New literacies are rapidly changing as defining technologies change.
- New literacies are multiple, multimodal, and multifaceted; thus, they benefit from various lenses seeking to understand how to support our students in a digital age better. (ILA, 2016)

Covid-19 has pushed technology to the forefront of instruction, and while studies abound on technology that can be applied to online teaching, one factor in effective instruction is sometimes left out of the conversation: that of culturally responsive teaching. The purpose of this research was to bridge this gap by viewing technology applications through a culturally responsive lens. The following research questions guided our research:

1. How do pre-service teachers integrate culturally relevant instruction and technology within literacy lessons?
2. What technology devices and tools are being used by pre-service teachers in their literacy lessons?

Culturally Relevant Pedagogy was described by Gloria Ladson Billings (1995) as a theoretical model that addresses student achievement and helps them to affirm their cultural identity while developing critical perspectives that challenge inequities that schools (and other institutions) perpetuate. Chuang (2016) further explains this model by stating how culturally relevant teaching is based on the notion that student success and engagement is encouraged when "teaching draws on each of their individual cultural experiences and language abilities." Teachers can implement this pedagogical practice to encourage students to connect course content to each students' cultural context. Culturally relevant teaching (CRT) is characterized by using students' cultural knowledge, interests, prior experiences, and learning styles to effectively teach (Gay, 2010; Ladson-Billings, 2014). The use of culturally relevant literacy instruction can also be accomplished through the use of multicultural and diverse children's literature, discussions about student interests, values, and lived experiences that affirm the home culture and language of the students when planning literacy lessons (Au, 2011; Bennett, Gunn, & Leung, 2016). Rather than recognizing cultural differences as a hinderance to student learning, culturally relevant teaching views those differences as areas of opportunity for learning (Chuang, 2016).

A significant amount of research mainly focused on the perceptions of in-service teachers when integrating technology during literacy instruction (Christ, Arya, & Liu, 2019). Examples of topics explored were potential problems, and challenges and success of technology integration (Hutchison & Rinking, 2011; Sadaf, Newby, & Ertmer, 2016). A few studies focus on technology integration in literacy lessons (Zoch, Belcher, & Myers, 2014), while others focused on teachers' perceptions of integrating technology in science, and social studies (Blackwell, Lauricella, and Wartella, 2014).

Teachers' perceptions related to integrating technology in literacy instruction were explicitly focused on by only a few research studies (Honan, 2008; Isrealson, 2014). As a result of these studies and their main focus on the perceptions of in-service teachers, this current study seeks to expand upon the limited research on pre-service teachers' perceptions (successes and challenges) when integrating technology through CRT in literacy lessons.

## Theoretical Framework

Ladson-Billings (1995) defined culturally relevant pedagogy as:

…a pedagogy of oppression similar to critical pedagogy, but committed explicitly to the collective, not merely individual empowerment. Culturally relevant pedagogy rests on three criteria or propositions: (a) the need for students to experience academic success; (b) the need for students to develop and maintain cultural competence, and (c) the need for students to develop a critical consciousness through which they challenge the current status quo of the social order (p.

160). Culturally relevant pedagogy empowers students and provides them with a curriculum that builds on their prior knowledge and cultural experiences.

This contrasts from traditional pedagogy that required for students to assimilate to the dominant schooling culture, and instead asks that current schooling culture takes different student experiences into account. As Liu (2020) explained, CRT is a competitive tool to have a strong understanding of diversity given the globalization of many aspects of society today.

Technology can also be used as a tool to incorporate culturally relevant pedagogy to strengthen this valuable skill in students. One way that technology integration within the classroom has been discussed is with the technology acceptance model (TAM) postulated by Venkatesh & Davis (2000). The way in which this model explains technology use is by its ease of use and general usefulness to a user (Ranellucci, Rosenberg, & Poitras, 2020). The model provides a context through which preservice teachers can gauge their comfortability of utilizing technology within the classroom as well as its effectiveness. The complete breakdown of the framework involves several concepts including: "external variables, perceived usefulness, perceived ease of use, attitude towards using, behavioral intention to use and actual system use" (Joo, Park, & Lim, 2018). Specific to preservice teachers, this model assists in describing how well a teacher can integrate technology into their classroom based on their own individual understandings of the ease of use as well as the general usefulness of it. TAM is useful in investigating whether or not technology is being successfully integrated into a classroom, and also describes factors that can hinder or assist in technology integration.

The combination of both of the above frameworks served as the foundation and guide for this research.

## Literature Review

Culturally relevant pedagogy recognizes the importance of including students' personal, cultural, and community assets in learning. The incorporation of technology enhances instructional design and practice to facilitate a culturally responsive learning environment centered around the lives of students. Therefore, technology can also be used as a tool to incorporate culturally relevant pedagogy in literacy instruction to meet the needs of all students.

## Culturally Relevant Pedagogy in Teaching Literacy

Notably, culturally relevant instruction has been recognized as a logical method for guiding students of diverse cultural and linguistic backgrounds to higher levels of literacy learning (Au, 2007). It mainly supports tremendous success among culturally and linguistically diverse students (Ladson-Billings, 2014). When teachers understand their students' cultural patterns and create learning environments that recognize and legitimize these patterns, student involvement increases (Alderman, 2013). Research conducted in Hawaiian charter schools discovered that three categories emerged as other teachers look to implement culturally relevant pedagogy into literacy teaching. These categories included outward orientation, connections to the community, and curriculum content in collaborative projects to elevate their community (Kana'iaupuni, Ledwar & Malone, 2017). These collaborations could involve musical performances, art exhibits, or other ways to contribute to the well-being of students' families and communities.

**What is Digital Literacy?**

The publication of "A Nation at Risk" (1983) has prompted national movements towards modifying and having expectations for student learning that are more aligned with college and career readiness because of concerns about the United States school system's global competency. These changes along with being in the times of the COVID-19 pandemic are the root of rethinking the delivery of instruction and the utilization of technology in classrooms as a way to meet those rising expectations and standards. "Digital literacy" is now essential to the success of students in the global economy and falls into at least three areas, including; basic, intermediate, and advanced (Bussert-Webb & Henry, 2016). Students on a basic digital literacy level are characterized as possessing keyboard skills and can navigate different apps and software on the computer. Students on the intermediate skill level are proficient at conducting digital searches online to obtain information or complete research assignments assigned by the teacher, and even for leisure. Students on an advanced digital literacy level can evaluate the information obtained through a critical lens for biases and accuracy (Bussert-Webb & Henry, 2016).

As explained, digital literacy does not cease at a student's ability to utilize technology but goes further into being able to interpret what information technology presents to them in the appropriate manner. Watulak (2016) explains that digital literacy "includes an understanding of the social and cultural norms around technology use, and the valued practices within those norms." When considering how this translates to current classrooms, it demonstrates how students would benefit greatly from explicit teaching on how to interpret the information made available to them digitally. By having students foster the skills necessary to recognize these aspects of the digital lens, they can understand how "all authored texts...situate them as readers, writers, and viewers within particular cultural and historical contexts" (Alvermann, 2004). While it is common knowledge that information available through technology is not unbiased or always completely accurate, students may have a more difficult time identifying such circumstances.

**Integrating Technology to Support Learning**

Historically, the role of technology and its impact on student learning have changed. In the past, technology was used to improve work productivity and promoted lower-level learning through flashcards, drills, and visual presentations. The function of computers in schools has shifted gradually to help students develop higher-level cognitive-based skills (Delgado, Wardlow, O'Malley, & McKnight, 2015). Primarily, Morossan, Dawson, and Whalen (2017) posit that technology-supported learning should be used not only as productivity software, but also as tools to construct knowledge. A new technology plan released by the federal government states that technology is a dynamic tool for transforming learning (U.S. Department of Education, 2016). Technology can help to reinvent our pedagogical approaches and collaboration, decrease equity and accessibility gaps, and modify learning experiences to meet the needs of all learners. Additionally, Chuang, Shih and Cheng (2020) explained that the integration of technology in learning has "been demonstrated to be among the best practices for teaching multicultural classrooms due to...differences in ethnically diverse student populations." The use of technology to scaffold general learning not only provides an innovative way to support students, but can also assist with CRT.

Chuang (2016) describes a method of integrating technology to support learning through "computer-supported collaborative learning (CSCL). This method of teaching involves utilizing

technology as a medium to complete group work and engage in collaborative learning. It is described to encourage critical thinking, student success and student satisfaction (Chuang, 2016). Educators would be able to use technology in a way that facilitates group collaboration, fosters more effective learning through CRT, and builds digital literacy skills simultaneous. Moreover, Chuang (2016) mentioned the importance to ensuring that collaboration among students can successfully occur when considering individual communication styles in instituting such a technique.

Consequently, developing a curriculum that builds on students' Funds of Knowledge, provides access to digital tools, explores social issues, and creates a platform for sharing information with others is paramount (Moll, Amanti, Neff, & González, 1992). This also reflects how we merge this theory into practice. "Funds of Knowledge" is defined as the skills and knowledge that have been developed to enable an individual to function within a given culture (Moll et al.,1992).

Considering this, Heinrich and Molenda (1996) designed the instructional method ASSURE to provide a model that allowed for the effective integration of technology into lessons based on the needs and interests of students. "ASSURE" is an acronym that stands for the various steps: (a) Analyze Learners (b) State Standards and Objectives (c) Select Strategies, Technology, Media, and Materials (d) Utilize Technology, Media, and Materials (e)Require Learner Participation (f) Evaluate and Revise. It is an instructional design that has the goal of producing more effective teaching and learning through a systematic process that focuses on choosing the best technological tool for students to actively engage with to achieve instructional goals (Chen & Chung, 2011).

While the above studies demonstrate how technology can support literacy instruction, some studies discuss the barriers in doing so. One such study conducted by Pittman and Gaines (2015) found that, out of a sample of third, fourth, and fifth-grade teachers, less than 20 percent of them found themselves to be high-level technology integrators. Potential barriers that inhibited them from embedding higher levels of technology into the classroom included a lack of devices and a lack of time to create and execute lesson plans that incorporated technology (Pittman & Gaines, 2015, p. 248).

**Purpose of the Study**

The purpose of this study was to examine the teaching practices of pre-service teachers' use of computer technology in culturally responsive literacy instruction and to identify the strengths and obstacles they overcame in the process.

Based on the limited studies available, further research is needed to identify pre-service teachers' perceptions (successes and challenges) when integrating technology in culturally responsive literacy lessons. This research is critical to inform how to improve teacher preparation programs to prepare pre-service teachers better to build learning experiences around students' lives in engaging multimodal ways. The following research questions guided our research:

3. How do pre-service teachers integrate culturally relevant instruction and technology within literacy lessons?
4. What technology devices and tools are being used by pre-service teachers in their literacy lessons?

## Methodology

This case study utilized Yin's (2002) approach for implementation in which multiple methods were used to carry out this research according to the research questions; it took place in an elementary literacy methods course in a university setting in southeastern United States. Twenty pre-service teachers received direct instruction on implementing culturally relevant strategies while teaching reading comprehension through the integration of technology for 15 weeks through hands-on experiences.

**Key Definition of Terms for this study:**

**Culturally Relevant Teaching (CRT)** - is characterized as lessons that integrate and embed students' personal, cultural, and community assets throughout in appropriate and meaningful ways.

**Culturally Relevant Technology**-**Integrated Lesson** - is a lesson that is student-centered and culturally relevant with frequent opportunities for students to interact with technology to develop higher-order cognitive-based skills.

Convenience sampling was used to select the participants as they were all a part of one of the researcher's/author's elementary literacy methods class. During each class meeting, the pre-service teachers learned about a specific comprehension strategy and how to integrate culturally relevant practices into their teaching. Examples of discussions and activities related to CRT included discussing and reviewing peer-reviewed articles centered around the topic, learning to think about students' cultural, community, and personal assets, engaging in activities for communicating about students from an asset-based perspective, evaluating children's literature and discussing the importance of utilizing materials that reflect students' interests and assets in a respectful way so that all students feel included. The pre-service teachers also received training and explored a technology application or tool and then created a product using the previously learned comprehension strategy.

Shagoury and Power (2012) served as guides to determine which of the data sources would be relevant in the dissemination of our findings. Data sources included lesson plans along with student artifacts, journal reflections, and pre/post-questionnaires. A total of three lesson plans along with student artifacts, three journal reflections, a pre and post questionnaire were collected from each pre-service teacher during the study. The lesson plans, along with student artifacts, were reviewed and scored through the use of the culturally relevant technology integrated rubric (Figure 2), which was provided to the pre-service teachers as guides for planning their lessons. The lessons were all charted, organized, and analyzed according to the pre-service teachers' use of culturally responsive teaching and the types of technology used. The information compiled from the kinds of strategies used for culturally responsive teaching was further categorized into different themes-interest, culture, and community. If the pre-service teacher discussed utilizing the student's interest to support student learning, the lesson would be placed in the category labeled interest. If the culture of the student were used to support student learning, that lesson would be placed in the category labeled culture. Lessons that used the community as a support for learning were placed in the community category. This information was analyzed to determine in what ways the pre-service teachers integrated CRT into their

literacy lessons after receiving authentic and engaging learning experiences within a supportive space.

 The technology portion of each lesson plan was also extracted and listed in a table into categories according to the type of technology application (the type of device is indicated for each) the teachers received training on during the study-Nearpod (ipad), Kahoot (ipad), Quizlet (ipad), Sock Puppet (ipad), Speak Pic (ipad), Popplet (laptop), Powtoon (laptop), YouTube (Smartboard), and Other apps (Smartboard) (Table 1 and Table 2). This information was tallied for each type of technology application integrated to determine which technology application tools and devices are being used in literacy lessons by pre-service teachers to support student learning.

 The pre and post questionnaires were used to determine themes that arose around the experiences of pre-service teachers while they implemented CRT through technology integration into their literacy lessons.

 Table 1 contains descriptions of each of the technology tools the pre-service teachers explored and received training on during the literacy course. There was a field experience component to this course where the pre-service teachers also created and implemented three, one-on-one literacy lessons to students in the elementary school setting during the literacy block and wrote a reflection on each of the lessons. The rubric in Table 2 is a part of the department-wide lesson plan rubric that served as a guide for pre-service teachers as they created their CRT and technology integrated literacy lessons during this study.

Table 1. **Technology Apps and Tools Explored**

| Technology Tool | Description |
|---|---|
| Nearpod | Nearpod is a cross-platform, device agnostic, tool used to engage students with interactive activities, connect them through collaborative discussions, and gain instant insight into student learning through formative assessments. Students can access Nearpod from their personal tablets, desktops or laptops. |
| Kahoot | Kahoot is a game-based learning platfom. Its learning games, "Kahoots", are multiple-choice quizzes that allow user generation and can be accessed via a web browser or the Kahoot app. The teacher creates a learning game or trivia on any topic. The teacher then hosts a game with the question on large screen or projector to engage students. The students are to join the game with a pin provided by the teacher and answer questions from their own devices. |
| Quizlet | Quizlet is a mobile and web-based study application that allows students to study information via learning tools and games. |

| Sock Puppet | Sock Puppet is a storytelling app that allows users to create puppet shows in seconds. Students can use this tool to present ideas via digital storytelling elements. |
| --- | --- |
| Speak Pic | Speak Pic is an app that allows users to transform any portrait photo into a moving 3D avatar that repeats every word recorded. Students can type or record any text, adding and giving life to a photo of a friend or someone famous. It will say everything they want. It can be used as a tool to teach literacy. |
| Popplet | Popplet is an app used as a mind-map that helps students think and learn visually. Students can capture facts, thoughts, and images and learn to create relationships between them. |
| Powtoon | Powtoon is an animated video and presentation platform that allows students to share information with their audiences in an engaging way. |
| YouTube | YouTube is a website where videos and music viewed, original content can be uploaded, and shared with friends, family, and the world. |
| Smartboard | Smartboard is an interactive whiteboard with a large display that is typically used in educational settings. It is a combination of a projector and whiteboard that also has internet capabilities. |
| Laptop | Laptop is a portable desktop computer that can be used to access the internet for various purposes. In schools, it is used for researching on the internet, writing papers and other educational purposes. |
| iPad | An iPad is a touchscreen tablet, which is a portable computer, made by Apple. It is used in the same way that a laptop or desktop computer would be used. |

Table 2. **CRT and Technology Integration Rubric**

| Element | Theme/Thread | Unacceptable (Level I) | Approaching (Level II) | Minimally Proficient (Level III) | Desired Outcome (Level IV) |
| --- | --- | --- | --- | --- | --- |
| | | | | | |

| Inclusive Learning Environments | *Culturally Relevant Teaching* | Little or no evidence of connections to the content standard(s) and personal, cultural and/or community assets within the lesson.  OR  Deficit thinking may be evident. | Connections are **loosely** tied to the standard(s) and content of the lesson.  AND  Integrates personal, cultural, and/or community assets within the lesson. | Connections are **clearly** tied to the standard(s) and content of the lesson.  AND  Integrates personal, cultural, and community assets throughout the lesson. | Connections are **clearly** tied to the standard(s) and content of the lesson.  AND  Integrates and embed personal, cultural, and community assets throughout the lesson in clear, appropriate and meaningful ways. |
| Technology | | Teacher-centered with no opportunities for student interaction with technology | Teacher-centered with few opportunities for student interaction with technology | Student-centered with frequent opportunities for students to interreact with technology  AND  Purposefully used to support learning | Student-centered with frequent opportunities for students to interact with technology; purposefully used to support learning  AND  Justifies its use to create differentiated learning experiences |

## Results

The results of this research uncovered several interesting strategies for technology implementation used by the pre-service teachers during the execution of their culturally relevant literacy lessons. First, the process pre-service teachers used to be culturally relevant when teaching literacy lessons emerged. Second, pre-service teachers used technologies in ways that allowed for innovative informal literacy assessment opportunities. Finally, the pre-service teachers found great value and had meaningful experiences of using culturally relevant practices and integrating technology to enhance their student's literacy learning and achievement. Figures 1, 2, and 3 show the amount of technology implemented for each of the three lessons taught by the pre-service teachers. Of all of the technology implemented during literacy lessons, the pre-service teachers implemented other applications through the Smartboard (52%) the most across all of the lessons. During lesson one, eight pre-service teachers implemented YouTube

and other applications on the Smartboard Technology; during lesson two, eleven pre-service teachers implemented other applications on the Smartboard Technology; during lesson three, twelve pre-service teachers implemented YouTube and other applications on the Smartboard Technology into their culturally relevant literacy lessons. The technology that was least used was the Powtoon on the laptop (1%) technology with zero implementation during lessons one and three, and one implementation for lesson two. Nearpod on the ipad (13%) was the next mostly implemented technology. During the execution of all three literacy lessons, lessons one and three consisted of two pre-service teachers who chose not to implement technology into their culturally responsive literacy lessons.
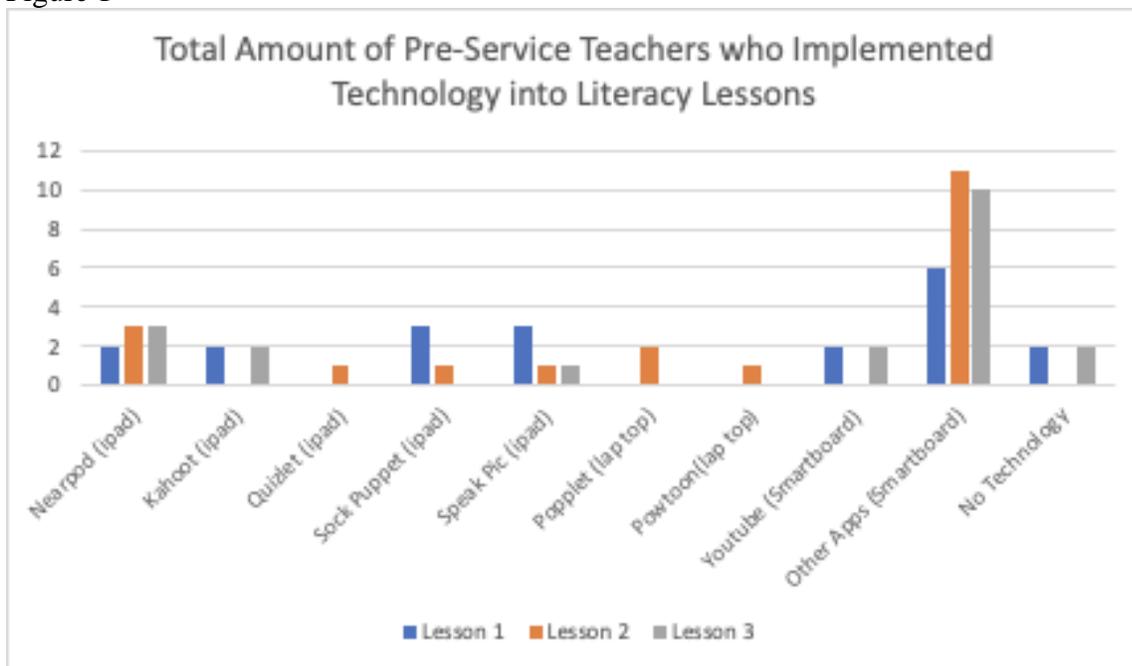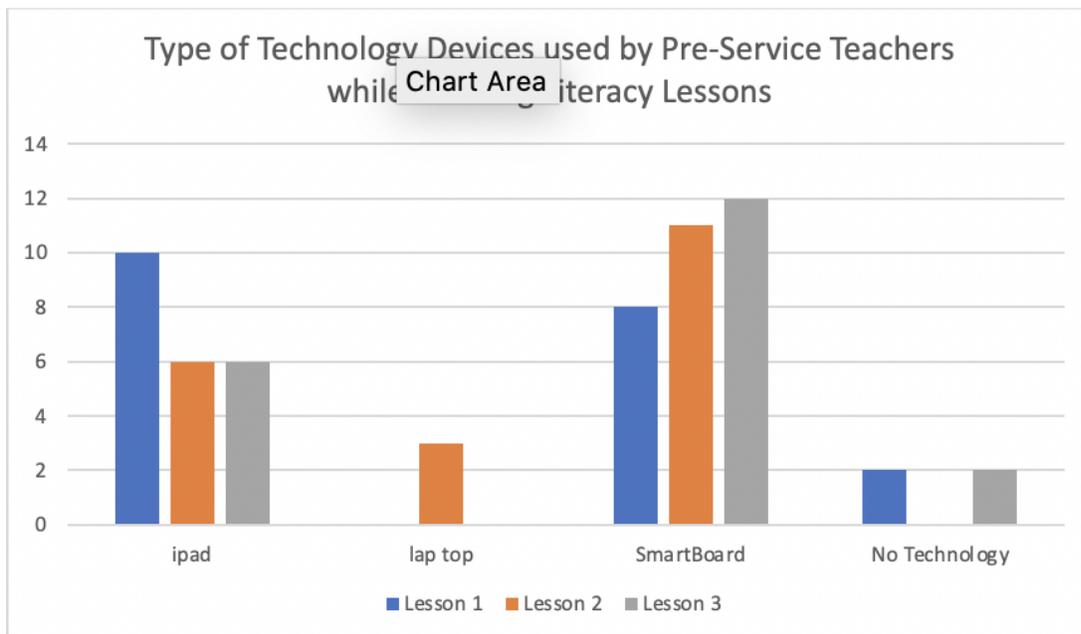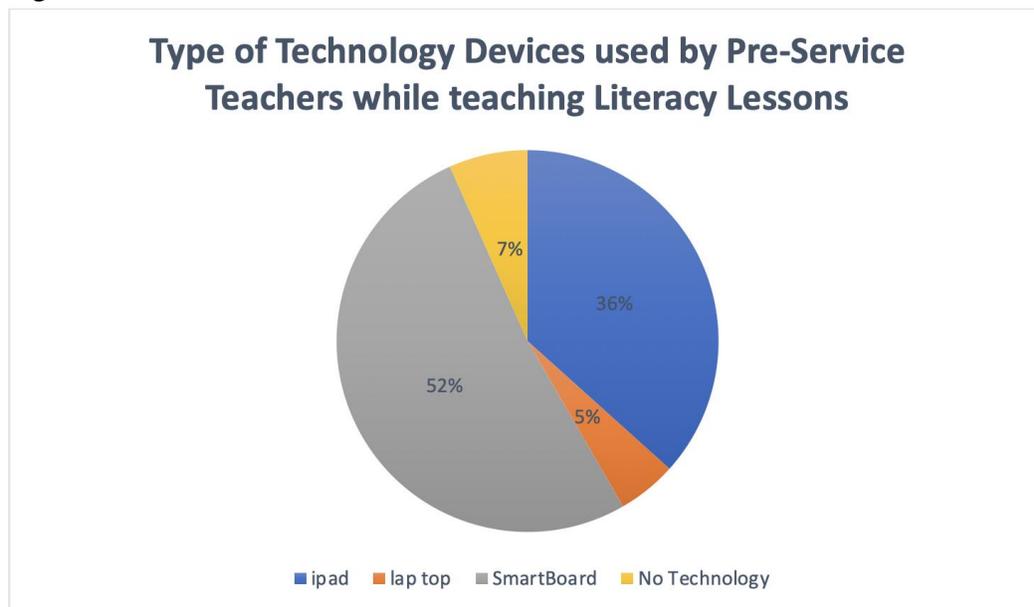
Figure 1



Figure 2

**Type of Technology Devices used by Pre-Service Teachers while teaching Literacy Lessons**

Chart Area

| | | | |
|---|---|---|---|
| 14 | | | |
| 12 | | | |
| 10 | | | |
| 8 | | | |
| 6 | | | |
| 4 | | | |
| 2 | | | |
| 0 | ipad | lap top | SmartBoard | No Technology |

■ Lesson 1  ■ Lesson 2  ■ Lesson 3

Figure 3

**Type of Technology Devices used by Pre-Service Teachers while teaching Literacy Lessons**

7%

36%

5%

52%

■ ipad  ■ lap top  ■ SmartBoard  ■ No Technology

How do pre-service teachers integrate culturally relevant instruction and technology within literacy lessons? Pre-service teachers fit cultural relevance and technology into literacy lessons by thinking about their students' interests. The pre-service teachers were able to choose materials to help their students reach their learning objectives based on interest (65%) and cultural assets (15%). Many of the pre-service teachers provided opportunities for their students to choose their own books for the reading lessons. The technology was integrated into the middle and end of the majority of the lessons to assess students' level of understanding engagingly.

Some examples of technology that were integrated included Nearpod (Figure 4), Powtoon (Figure 5), Popplet (Figure 6), and Sock Puppet (Figure 7). Another example is how one pre-service teacher candidate's literacy lessons were centered around her student's Funds of Knowledge. Her student enjoyed reading graphic novels, so during one of her reading lessons, she and her student read the book, "Big Nate on a Roll" by Lincoln Pierce. The story is culturally meaningful and relevant because it pertains to her student's personal interests. Her student stated that he enjoys reading books by author Lincoln Peirce. Because the pre-service teacher-supported culturally relevant practices through the use of technology in literacy lessons, she engaged her student in writing a personal narrative using the Speakpic app (Figure 8).

**Pre-service Teacher Voices on CRT and Technology Integrated Practices**
Preservice Teacher 5:
**Culturally Relevant Teaching**
*When the student completed the Interest Survey, she commented on how she would like to read more biographies "so they can know more". When possible, I'd like to incorporate the use of biographies to enhance and support this students' learning. In order to create a connection with the student involving her Hispanic heritage, I selected a biography about Frida Khalo. This is particularly relevant considering the school just concluded its Hispanic Heritage Month learning opportunities school-wide. Using the student's funds of knowledge, when she comes across an unfamiliar term, and is able to successfully use context clues to develop an understanding of the new vocabulary, I'll ask her to make a connection from the word to the world, more specifically her community. By creating these connections to new words, it will help strengthen my student's retention of the word long-term, but also give her an opportunity to demonstrate further comprehension if she's able to make strong connections.*

**Culturally Relevant Technology Integration**

*The student will use www.popplet.com to create a Popplet with Frida Khalo being the central focus and the web stems extending out from her being the events in Frida's life.*

Preservice Teacher 9:
**Culturally Relevant Teaching**

*My student enjoys creativity based off his interviews. He likes coming up with new ideas and tries to make things interesting. I will give him a list of writing prompts to choose from so he can be creative in finding one that he feels like he can add the most detail to. The student has expressed how being kind is important to him and how his mom says he has a kind heart. In class he is always helpful and kind to all students. Some of the writing prompts presented to him will allow for him to use this about himself to make his writing more interesting. The student lives in a community where there is a library. He will be able to read and remember a lot of the books he has read there to make his writing more interesting.*
**Culturally Relevant Technology Integration**
*The student also has technology for him to used supplied by the school so this could be used to create a Popplet or look up any information he needs. The student loves using the computer, so*

*this will engage him. The YouTube video about supporting details was used to explain important concepts about writing narrative essays with important details.*

Preservice Teacher 10:
**Culturally Relevant Teaching**

*My student has a strong interest in camping. He goes camping with his boy scout troop and he goes camping with his family frequently. I plan on using his love of camping to connect with him on an academic level. I will use a book about camping to teach reading comprehension. It is a tradition for the student and his family to go camping for every major holiday. I will be able to help the students make connections between his real-life camping and the camping that he is reading about in the story. According to the student, his boy scout camping place is close to the school. Since this is the story, we will be using during the lesson, I will have him use the knowledge that he has learned from the book the next time that he goes camping. This will activate his comprehension skills because he will have to remember and understand what he read enough to put it to use in the real world.*

**Culturally Relevant Technology Integration**
*The student will complete the graphic organizer on an iPad. The student has shown interest in using the iPad as much as possible, so this will give him an opportunity to use technology while he is learning. I will use the iPad to show the student the anchor charts as well as to assist the student while he is completing the graphic organizer.*

Preservice Teacher 11:
**Culturally Relevant Teaching**

*My student is very interested in sports, and he loves to read. I learned that he enjoys reading in his free time outside of class and is always excited and ready to read when it is time to read in class. He explained to me that he loves starting new fiction books in class during novel studies. My student also has an older sister, whom he says he likes to hang out with a lot. He considers her one of his best friends and loves when she comes to watch his baseball games. Lastly, when asking my student what he was most excited to read this year he explained to me that he could not wait to read the book Wonder by R.J. Palacio. This is a book that Miss Rosa's class started reading at the beginning of October. Because of this, and the connections that he can make to the book's main character in regard to his relationship with his sister, I plan on using the book, Wonder, to support my student's learning to improve his reading comprehension.*
*The content in my lesson is connected to my student's personal assets in many ways. One way is that my lesson allows for my student to have choice about what he writes about. He is not being told what to write or what details he has to include. Because my student has a choice in what he does in the lesson, he will be further engaged and more excited about learning.*

**Culturally Relevant Technology Integration**
*I will use technology to explore Powtoon to prepare to teach the student how to use it. The student will use Powtoon to present a final draft of his narrative piece of writing.*

Preservice Teacher 12:

**Culturally Relevant Teaching**
*My student loves spending time with her family. She enjoys roller coasters and going to six flags regularly. She is involved in her community by playing with her neighborhood friends. They play outside together and she enjoys going to church with them. She loves animals and enjoys playing games. My student explained because of her culture, she helps her mother make dinner every night. Her culture is a big reason for her strong family values. She stressed the importance of how "proud she is to be black". I will find activities that integrate games and the outdoors. I, also, will also provide books that have African American protagonists and definitely can integrate technology into my lessons.*

**Culturally Relevant Technology Integration**
*The student will use the teacher-created Quizlet.com flash cards to randomly generate blends for the scavenger hunt before reading the story Last Stop on Market Street by Matt de la Pena. After reading the story, the student will type a writing piece summarizing the story.*

Preservice Teacher 15:
**Culturally Relevant Teaching**

*My student is motivated to read because she understands the importance of reading. She has favorite books and has many opportunities to read at school and her public library. She likes to read graphic novels and fairy tale type stories. I will use a text on her instructional level that connects to her preference of fairy tale stories by selecting the book Rapunzel for us to read. To connect the student's family culture to the lesson, we will discuss how my student's family structure is different to that of Rapunzel. I will connect the lesson to the student's community by having her practice the strategy from the lesson when reading a book of her choice at her public library.*

**Culturally Relevant Technology Integration**

*After explicit demonstration and to help facilitate this lesson, the student will use the sock puppet app to retell the story. My student likes action books and monsters, so I chose a book that relates to his interests. I will also link his prior academic knowledge about concepts of print and sequence into the lesson through the sequencing train game from Room Recess:*
*https://www.roomrecess.com/ .*

Preservice Teacher 18:
**Culturally Relevant Teaching**

*My student told me about a memory she has of going with her grandmother to a local church to play bingo. Her grandmother likes to get out of the house and do activities that they can both participate in. I decided to include this fond memory my student has of her grandmother into my lesson. That is how I came up with the bingo scenario. This is a personal connection to my student because it is based on an activity she shares with her grandmother. This is a connection to community because my student and her grandmother likes to do activities together around their local community (bingo at church). This is a cultural connection because my student's grandmother is from El Salvador and most El Salvadorians attend catholic churches.*

**Culturally Relevant Technology Integration**

*I will have my student create a Chatterpix (Speak pic) of a scenario of the book we are reading to show her understanding of character point of view. She will need to create or extend on a dialogue from one of the events in the story.*

Preservice Teacher 20:
**Culturally Relevant Teaching**

*My student's family is from Mexico. She has rich cultural experiences that I can use in the lesson to keep her interested. I can use books that highlight her culture or ask her to talk about ways that she sees her family doing things in the lesson to help her to connect to ideas of reading and literacy that she may not know that she already has. My student loves poetry, mysteries, and*

*reading about animals, so I will make sure to bring in texts and activities that highlight her points of interest. In this lesson specifically, I will be using a mystery book to engage my student. I will ask my student to talk about places that she sees people asking questions in her community as an extension.*

**Culturally Relevant Technology Integration**

*I will use technology to create the Nearpod lesson to show the vocabulary and the video as well as instructions throughout the lesson. My student will also use technology to create the graphic organizer. The student will use technology by going through the Nearpod activity. She will also use the Nearpod to create her questions as sticky notes on the Nearpod collaboration activity pages as well as using the Sock Puppet app to show her comprehension of the story by using the questioning strategy to retell.*

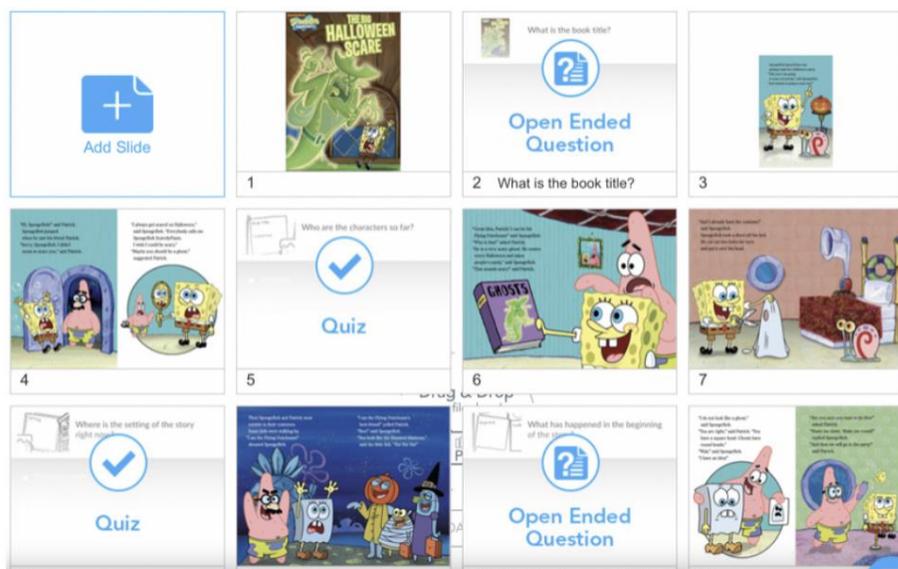Figure 4. Nearpod: The Big Halloween Scare (Spongebob Squarepants), by Nickelodeon Publishing



Figure 5. Powtoon: Student used Powtoon to present the final draft of his narrative writing piece.

Once I went to the movies with my dad to see Ant-Man and the Wasp.

0:12/1:04 | POWTOON

Figure 6. Popplet: Frida Kahlo: Mexican Painter, by Kristen Woronoff

The student used www.popplet.com to create a Popplet with Frida being the central focus and the web stems extending out from her being the events in Frida's life.



popplet: my new popplet

home    view all    zoom  −  ●  +    ■  ⚙

your name — Frida Kahlo born in 1907
your name — 1. Born in Mexico
your name — 4. Moves to San Francisco
your name — 3. Marries Diego Rivera
your name — 2. Injured in Accident
your name — 5. Moves to New York
your name — 6. Moves back to Mexico
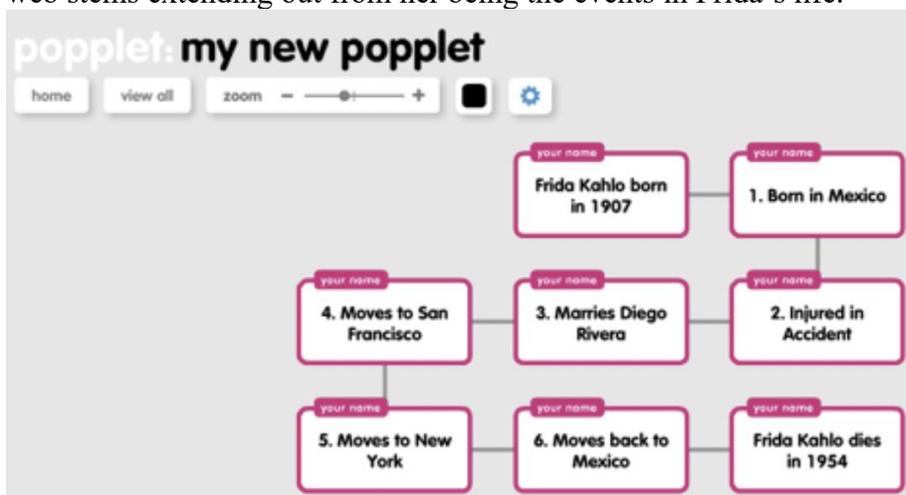your name — Frida Kahlo dies in 1954

Figure 7. Sock Puppet: There are Monsters Everywhere, by Mercer Mayer
The student used the Sock Puppet app to retell the story in order to demonstrate her level of comprehension.

Figure 8. Speak Pic App and Chatter Pix App

The student used Speak Pic App to record a voice over of his personal narrative piece.



What technology devices and tools are being used by pre-service teachers in their literacy lessons? Fifty-two percent of pre-service teachers integrated the Smartboard into their literacy lessons. Thirty-six percent used I-pads and five percent used laptops to integrate technology into their literacy lessons. Technology applications that were integrated by pre-service teacher

candidates into literacy lessons were Nearpod (13%), other applications on SmartBoard, Kahoot (6%), Sock Puppet (7%), and YouTube at (7%). The reason why the use of Smartboard technology device was chosen over all of the others was because of availability. Many of the pre-service teachers stated that it was difficult to gain access to iPads and tablets for student use in the classroom. Additionally, seven percent of the pre-service teachers' candidates decided not to use technology in their literacy lesson. These teachers reported that they did not use technology because there was a lack of access to technology devices or the technology they used with the student malfunctioned.

Preservice Teacher 3:
*My student could have created a graphic organizer on Popplet. We ended up doing it on paper because of technology malfunctions.*

Three percent of pre-service teacher candidates used Popplet in their literacy lessons. Only a few pre-service teachers used Powtoon (2%) and Quizlet (2%). All of the technology being integrated had similar characteristics- they were student-driven and kept the students engaged in higher-level learning and allowed the students to be creative while showing their understanding.

**Implications for Practice**

The implication for practice is for community-engaged teacher preparation models to focus on shaping prospective teachers' orientation toward CRT so that they build learning experiences around students' lives in engaging multiple, multimodal, and multifaceted ways. The significance of this research lies in the critical ways the pre-service teachers create learning opportunities that are culturally responsive and engaging for their students after receiving direct instruction on implementing CRT while enrolled in a literacy methods course. Learning experiences provided around literacy and technology integration not only enhances student engagement but improves learning and acquisition. This finding was observed in both the pre-service teachers while taking the literacy methods course and the students they implemented their newly learned approach to teaching and learning. When classrooms consistently send engaging messages about the importance of learning, shared community, and a valuing of the students' voices, student abilities are enhanced. This research identified that technology integration into CRT is not a matter of simply choosing a selection of strategies. Instead, it is a pedagogical commitment to aligning student learning experiences with their culture, beliefs, interests, experiences, and background knowledge through asset-based lenses.

**Conclusion**

This case study of 20 pre-service teachers examined how candidates contextualized their understanding of CRT through technology integration after classroom instruction. Findings provide evidence that as candidates experience authentic, engaging, learning experiences within a supportive space, they emerge equipped to teach in culturally responsive ways that support student learning and level of engagement.

Pre-service teachers integrated culturally relevant instruction and technology within literacy lessons by thinking about their students' interests. Students' interests were used to choose books and technology tools when teaching literacy lessons.

A variety of technology tools and devices were used by the pre-service teachers in this study. Teachers who wish to implement both CRT and technology when teaching literacy should consider the availability of technology devices they have in their classrooms. If the implementation involves more than one device, is it possible to check out a cart of tablets or laptops for students to work with? Is there a computer lab on-site, and is it available for the lesson? They should also consider the amount of comfort they have in using Web 2.0 tools and apps. Teachers can seek out professional development in their district or search ISTE online for an up-to-date list of the latest technology tools and apps to use in the classroom.

## References

Alderman, M. K. (2013). Motivation for achievement: Possibilities for teaching and learning

 (3rd edn.). New York: Routledge.

Alvermann, D.E. (2004). Media, Information Communication Technologies, and Youth

 Literacies: A Cultural Studies Perspective. *American Behavioral Scientist, 48*(1),78-83.

 https://doi-org.proxy.kennesaw.edu/10.1177/0002764204267271


Au, K. (2007). Culturally responsive instruction: Application to multiethnic classrooms.

 Pedagogies, 2, 1-18.

Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't

 happening. Journal of Technology and Teacher Education, 13(4), 519.

Bennett, S. V., Gunn, A. A., & Leung, C. (2016). Promoting social justice pedagogy while

 teaching comprehension strategies with multicultural literature. Journal of Literacy

 Practice & Research, 42(1), 26–33.

Bussert-Webb, K., & Henry, L. (2016). Latino/a children's digital literacy access and online

 reading skills. Journal of literacy and technology, 17(3) 2-40.

Campuzano, L., Dynaski, M., Agodini, R., & Rall, K. (2009). Effectiveness of reading and

 mathematics software products: Findings from two cohorts. Washington, DC.U.S.

 Department of Education. Retrieved from http://ies.ed.gov/ncee/pubs/20094041/

 pdf/20094042.pdf

Chen, C. Y., & Chung, W. L. (2011). Research on the learning effects of multimedia assisted

 instruction on Mandarin vocabulary for Vietnamese students: A preliminary study

 involving e-learning system. Educational Research and Reviews, 6(17), 919-927

Chuang, H. (2016). Leveraging CRT Awareness in Creating Web-Based Projects through Use of

    Online Collaborative Learning for Pre-Service Teachers. Educational Technology

    Research and Development, 64 (4), 857–76. doi:10.1007/s11423-016-9438-5.

Chuang, H., Shih, C., & Cheng, M. (2020). Teachers' perceptions of culturally responsive

    teaching in technology-supported learning environments. British Journal of Educational

    Technology, 51(6), 2442–2460. https://doi-org.proxy.kennesaw.edu/10.1111/bjet.12921

Christ,T., Arya, P., & Liu, Y. (2019) Technology integration in literacy lessons:

    Challenges and successes, Literacy Research and Instruction, 58(1), 49-66, DOI:

    10.1080/19388071.2018.1554732

Delgado, A., Wardlow, L., Mcknight, K., & O'Malley, K. (2015). Educational technology: A

    review of the integration, resources, and effectiveness of technology in K-12 classrooms.

    Journal of Information Technology Education Research, 14, 397-416. 10.28945/2298.

Fougler, T. S., Buss, R. R., Wetzel, K., & Lindsey, L. (2012). Pre-service teacher education

    benchmarking a stand-alone ed tech course in preparation for change. Journal of Digital

    Learning in Teacher Education, 2(29), 48-58.

Gay, G. (2010). Culturally responsive teaching: Theory, research, and practice (2nd ed.). New

    York, NY: Teachers College Press.

Heinich, R. Molenda, M. Russel, J.D. & Smaldino, S.E. (1996). Instructional media and

    technologies for learning. Fifth Edition, New Jersey: PrinticeHall, Inc., 1996.

Herrera, H. (1983). *Frida, a biography of Frida Kahlo*. New York: Harper & Row.

Honan, E. (2008). Barriers to teachers using digital texts in literacy classrooms. Literacy, 42(1),

    36–43. doi:10.1111/j.1467-9345.2008.00480.x

Hutchison, A., & Reinking, D. (2010). A national survey of barriers to integrating information

and communication technologies into literacy instruction. In Fifty-ninth yearbook of the

National Reading Conference (pp. 230–243). Milwaukee, WI: National Reading Conference.

doi: 10.1177/1753193410391361

Hutchison, A., & Reinking, D. (2011). Teachers' perceptions of integrating information and

communication technologies into literacy instruction: A national survey in the United

States. Reading Research Quarterly, 46(4), 312–333. doi:10.1002/rrq.2011.46.issue-4

International Literacy Association. (2017). Position statements. Retrieved from

https://www.literacyworldwide.org/get-resources/position-statements

Israelson, M. H. (2014). A study of teachers' integration of app affordances and early literacy

best practices (Unpublished doctoral dissertation). University of Minnesota,

Minneapolis.

Joo, Y. J., Park, S., & Lim, E. (2018). Factors influencing preservice teachers' intention to use

technology: TPACK, teacher self-efficacy, and technology acceptance model. Journal of

Educational Technology & Society, 21(3), 48–59.


Kana'iaupuni, S. M., Ledward, B., & Malone, N. (2017). Mohala i ka wai: Cultural advantage

as a framework for indigenous culture-based education and student outcomes.

American Educational Research Journal, 54(1_suppl), 311S-339S.

https://doi.org/10.3102/0002831216664779

Keehne, C. N. K., Sarsona, M., Wai'ale' ale, Kawakami, A. J., & Au, K. H. (2018). Culturally

responsive instruction and literacy learning. Journal of Literacy Research, 50(2), 141-

160.

Ladson-Billings, G. (1992). Reading between the lines and beyond the pages: A culturally

relevant approach to literacy teaching, Theory into Practice, 31(4), 312-320.

Ladson-Billings, G. (1995). But that's just good teaching! The case for culturally relevant

pedagogy. Theory into Practice, 34(3) 159-165.

Ladson-Billings, G. (2014). Culturally relevant pedagogy 2.0: a.k.a the remix. Harvard

Educational Review, 84(1), 74–84.

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology

into teaching and learning: Knowns, unknowns, and ways to pursue better

questions and answers. Review of Educational Research, 77(4), 575–614.

doi:10.3102/0034654307309921

Liu, R. (2020). Cultivating cosmopolitans: Culturally relevant pedagogy in an age of

instrumentalism. Anthropology & Education Quarterly, 51(1), 90–111. https://doi-

org.proxy.kennesaw.edu/10.1111/aeq.12321

Llosa, L., & Slayton, J. (2009). Using program evaluation to inform and improve the

education of young english language learners in U.S. schools. Language Teaching

Research, 13(1), 35–54.

Moll, L., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using

a qualitative approach to connect homes and classrooms. Theory Into practice, 31(2),

132-141. Retrieved from www.jstor.org/stable/1476399

Morosan, C., Dawson, M., & Whalen, E. A. (2017). Using active learning activities to increase

student outcomes in an information technology course. Journal of Hospitality &

Tourism Education, 29(4), 147–157. https://doi.org/10.1080/10963758.2017.1382369

National Council of Teachers of English. (2009). Position statement. Retrieved from

http://www2.ncte.org/ statement/2009legisplatform

Palacio, R. J. (2012). *Wonder*. Random House.

Pena, M. de la. (2017). *Last stop on market street*. Puffin.

Pittman, T., & Gaines, T. (2015). Technology integration in third, fourth, and fifth grade

    classrooms in Florida. Education Tech Research Development, 63, 539-554.

Ranellucci, J., Rosenberg, J. M., & Poitras, E. G. (2020). Exploring pre-service teachers' use of

    technology: The technology acceptance model and expectancy–value theory. Journal of

    Computer Assisted Learning. https://doi-org.proxy.kennesaw.edu/10.1111/jcal.12459

Sadaf, A., Newby, T. J., & Ertmer, P. A. (2016). An investigation of the factors that influence

    pre-service teachers' intentions and integration of Web 2.0 tools. Educational Technology

    Research and Development, 64(1), 37–64. doi:10.1007/s11423-015-9410-9

Shagoury, R., & Power, B. (2012). Living the questions (Second Edition) [electronic resource]:

    A guide for teacher researchers. Stenhouse Publishers. Retrieved from

    http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=cat06545a&

    AN=ken.997623512502954&site=eds-live&scope=site

United States. National Commission on Excellence in Education. (1983). A nation at risk: the

    imperative for educational reform: a report to the Nation and the Secretary of Education,

    United States Department of Education. Washington, D.C.: National Commission on

    Excellence in Education: [Superintendent of Documents, U.S. Government Printing

    Office distributor]

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse.

    (2016). Adolescent literacy intervention report: READ 180 Retrieved from

    http://whatworks.ed.gov

U.S. Department of Education (2017). Reimagining the role of technology in education.

    Retrieved from https://tech.ed.gov/files/2017/01/NETP17.pdf

Viswanath Venkatesh, Fred D. Davis, (2000) A Theoretical Extension of the Technology

Acceptance Model: Four Longitudinal Field Studies. Management Science 46(2):186-

204. http://dx.doi.org/10.1287/mnsc.46.2.186.11926

Watulak, S. L. (2016). Reflection in action: Using inquiry groups to explore critical digital

literacy with pre-service teachers. Educational Action Research, 24(4), 503–518.

https://doi-org.proxy.kennesaw.edu/10.1080/09650792.2015.1106957

Yin, R. K. (2002). Case study research: Design and methods. Thousand Oaks, CA: SAGE

Publications.

Zoch, M., Belcher, J., & Myers, J. K. (2014). Beyond access: The challenges of implementing

technology in the English/Language arts classroom. Paper presented at the annual

conference of the Literacy Research Association, Marco Island, FL.