EFFECTIVE IPAD INTEGRATION IN THE KINDERGARTEN LITERACY

CURRICULUM THROUGH CREATION-BASED LITERACY TASKS:

AN ACTION RESEARCH STUDY

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In the current educational landscape where the use of technology is prominent, the present study was designed to examine how to effectively integrate iPads and open-content applications into early literacy instruction through the use of creation-based tasks: digital experiences where students have the opportunity to be creators of content and demonstrate knowledge in a multimodal way. To this end, the central research question is as follows: *In a 1:1iPad classroom environment, how are creation-based learning tasks that utilize the iPad and related open-content iPad applications effectively integrated into literacy pedagogy to facilitate literacy learning in the kindergarten classroom?* Through the process of teacher-action research, these questions were also explored: *How do creation-based literacy tasks engage kindergarten students in digital literacy practices? How do these literacy tasks foster the development of students' agency and promote engagement? How has my teaching practice been impacted by these experiences?*

A technology integration framework was developed to guide effective iPad integration in the kindergarten literacy curriculum, specifically related to using open-content applications for creation-based tasks. Aligned to this framework, a series of lessons and creation-based tasks

(guided, independent, collaborative) were designed, purposefully linked to learning goals, then incorporated into small group instruction. Through observations, focus-group interviews, collection of digital artifacts, a reflective journal and audio-recordings, this action research study examined how creation-based literacy tasks impact three key aspects of early years learning: digital literacy practices, agency, and engagement.

Findings indicate that integrating iPads in these specific ways into a coherent framework not only provided kindergarten students with expanded opportunities to interact with literacy learning and transform understandings into a creation using a digital pathway – but it promoted engagement with digital literacy practices, provided a foundation for student agency, and fostered student engagement and collaboration. Furthermore, findings point to the importance of an active teacher role in facilitating and scaffolding these learning experiences. These findings have significant implications for the understanding of how to improve the quality of iPad integration and capitalize on its pedagogical potential to facilitate early literacy learning. Continued efforts are needed to translate this research into accessible, high-quality professional development opportunities.

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PREFACE

"Life is a journey, not a destination."

Ralph Waldo Emerson

The journey to attaining my doctorate degree has been a truly rewarding experience for which I am truly grateful. To my parents, Edward and Joanne Fink, thank you for always believing in me and being there for me every step of the way. Without your loving support and constant encouragement, I would not be where I am today. You have helped me to realize what I am capable of and I am honored and blessed to have you as my parents. To my loyal and loving companion, Dr. Samuel Beans, thank you for your unconditional love, your gentleness and acceptance, and for being the most wonderful pet in the world for the past fifteen and a half years. You have made my life complete and I carry you with me always. To my committee chair and advisor, Dr. Patricia Crawford, thank you for your mentorship, guidance, feedback, continuous encouragement and kindness in reaching this milestone in my career. To my committee members, Dr. Byeong-Young Cho and Dr. Maria Genest, thank you for your part in my dissertation journey. Your discussion and feedback have been invaluable.

"It is good to have an end to journey toward; but it is the journey that matters, in the end."

Ernest Hemingway

1.0   INTRODUCTION

As times have changed, so too have our understandings of literacy. Where literacy was once considered bound by paper and pencil, definitions have broadened within the digital world - making it increasingly difficult to discuss literacy and literacy practices without reference to new and emerging technologies (Leu, Kinzer, Coiro & Cammack, 2004; Merchant, 2015). Technology has greatly expanded access to content and communication possibilities. Information is presented not only as words printed on paper but as digital images, sounds, animations, and texts. The growing ubiquity of technology has transformed the ways in which people interact, communicate, and interpret information (Leu et al., 2004; Phillip & Garcia, 2013), and has impacted how information is accessed, represented, and shared. In today's 21st-century classroom, new and multiple forms of texts and images challenge our understandings of literacy. As a result, the definition of literacy and literacy instruction is undergoing a transformation. New and emerging technologies have ushered in innovative possibilities for teaching and learning and new literacies skills are required to effectively exploit their potential (Leu et al., 2004).

Rather than assuming a singular, standardized, print-based model of literacy practice, numerous scholars have suggested that literacy be regarded as plural, multiple, and diverse (Cope & Kalantzis, 2009; Forzani & Leu, 2012; Gee, 1996, 2008; Lankshear & Knobel, 2003; Leu et al., 2004; Kress & van Leeuwen, 2001; Street, 1995, 2013; Vygotsky, 1978). Terms such

as "new literacies" (Lankshear & Knobel, 2003; Leu et al., 2004), "multimodality" (Kress & van Leeuwen, 2001; Serafini, 2012), "multiliteracies" (Cope & Kalantzis, 2009), "social literacies" (Gee, 1996; Street, 1995) and "digital literacies" (Glister, 1997; Merchant, 2007) have been used to conceptualize the way that literacy practices are evolving under contemporary conditions and how literacy is embodied in social practices, mediated by digital technologies, and directly influenced by social contexts. Collectively, these theories seek to understand how students acquire, manage, and process information accessed through digital media and recognize that readers and writers are critically thinking and constructing meaning through a variety of modalities. Therefore, educating students to meet traditional literacy standards is insufficient if they are going to succeed in a culture that is continually being made, remade, reshaped, and recreated by new and emerging technologies. With new and multiple forms of texts and images challenging our understandings of how information is represented and shared, literacy is expanding to include the skills needed for a wide range of reading and writing practices in the digital age. In this respect, a literate person today needs to possess a wide range of abilities and competencies that encompass new and digital literacies – a repertoire that includes, yet also extends beyond traditional literacy pillars. Research to date supports the notion that the development of these skills can be supported through the use of technology – but in response, literacy instruction must change to include the use of technology to address reading and writing beyond the use of traditional means. It is critical that educators learn to engage with new technologies and the literacy practices that surround them and effectively integrate technology into their instruction.

Since their emergence in 2010, iPads are entering into the educational sphere at an increasingly rapid rate. With federal and local initiatives promoting technology integration in

classrooms, programs like 1:1 implementation of iPads and BYOD (bring your own device) have become widespread across schools in the United States. Apple (2017) reports over 2,300 school districts are using iPads in the classroom. The interactive nature of such mobile technologies is especially suited to the learning styles of young learners (Flewitt, Messer, & Kucirkova, 2015; Forzani & Leu, 2012). Touchscreen devices eliminate the need for separate input devices (like a mouse or keyboard) and offer children accessible, engaging platforms that enable intuitive and easy manipulation (Hutchison, Beschorner, Schmidt-Crawford, 2012; Rowe & Miller, 2015). Much research to date supports mobile devices, namely iPads, as tools that enhance learner engagement, independence and personalization (Falloon, 2013b; Flewitt et al., 2015; Noorhidawati, Ghalebandi & Hajar, 2015). Moreover, the unique capabilities of iPads have changed learning possibilities - promoting anytime, anywhere learning in schools and beyond (Hutchison et al., 2012). Many scholars maintain that effective technology use can support early literacy development, mediate literacy learning, and transform literacy instruction (Belo, McKenny, Voogt, & Bradley, 2016; Cubelic & Larwin, 2013; Hutchison & Reinking, 2011; Kucirkova, Messer, Sheehy, & Fernández Panadero, 2014; McKenney & Voogt, 2009; Merchant, 2015; Neumann & Neumann, 2014; Prieto, Villagra-Sobrino, Jorrin-Abellan, & Martinez-Mones, 2011; Shenton & Paggett, 2007). Many also agree that building fundamental literacy skills in early childhood is critical if young learners are to develop more sophisticated literacy skills that they will need as adults (Forzani & Leu, 2012; Hopkins et al., 2013).

In spite of these foundations, there is a need to better understand the role that digital experiences play in early literacy instruction and learning and to consider how digital tools can foster the development of emergent digital literacy skills alongside conventional early literacy skills. Digital literacies encompass a wide range of knowledge and skills necessary when using

digital devices to communicate, create, and collaborate (Ng, 2012). For the purposes of this research, digital literacies refer to the multiple literacies associated with using digital tools – namely iPads and related applications. These literacies include the technical skills to use the device and applications, particularly the elements within an app's toolbar like the functions of image buttons and text options. Digital literacies also encompass the cognitive skills needed to understand and use visual representations, navigate digital screens and texts, and use digital tools to independently and collaboratively create multimodal products (combining graphics, video, audio, and text) that demonstrate understanding and share new knowledge (Ng, 2012). There is limited empirical research to date regarding the emergence or promotion of digital literacy skills in young children (Neumann, Finger, & Neumann, 2017). Additionally, the ever-changing nature of digital technologies makes it difficult to establish a well-agreed upon definition or framework for integration and it is a challenging task for curriculum writers to contend with accelerating technological developments. iPads have not been extensively studied as a literacy-teaching tool. Moreover, the effective integration of iPads and open-content applications through the use of creation-based literacy tasks – digital experiences where students have the opportunity to be creators of content and demonstrate knowledge and understanding in a multimodal way – in the primary classroom is not well-established in the literature. Many studies have focused on older students (e.g. Marsh, 2011) or explored the uses of mobile devices for particular purposes, such as e-book usage in children's literacy development (e.g. Hutchison et al., 2012; Larson, 2013) and its effect on enhancing emergent literacy skills (Ihmeideh, 2014), or using related iPad apps for fluency practice (e.g. Musti-Rao, Lo, & Plati, 2015; Ness, 2017), letter recognition (e.g. D'Agostino, Rodgers, Harmey & Brownfield, 2016), or reading interventions (e.g. Larabee, Burns, & McComas, 2014). Other studies illustrate iPad use in

different learning contexts such as students with intellectual disabilities in special education (e.g. Chmiliar, 2017; Cumming, Strnadová & Singh, 2014), education and behavior management of children with autism spectrum disorders (e.g. Schuck, Emmerson, Ziv, Collins, Arastoo, Warschauer, Crinella, & Lakes, 2016; Sng, Carter & Stephenson, 2017), or using iPad apps to teach various skills, such as phonemic awareness, to students with learning disabilities (e.g. Chai, 2017). Many studies have been descriptive in nature and beyond these qualitative accounts exploring factors like engagement, motivation, and learning convenience, the research is not at all clear that iPads are being used in pedagogically optimal ways, with limited evidence of improved learning outcomes from their use (Falloon, 2013b; Pegrum, Howitt, & Striepe, 2013).

Although digital technology use is not universal, its access is increasingly pervasive. According to Pew Research Center (Olmstead, 2017), 90% of American households have at least one of the following devices – smartphone, desktop/laptop computer, tablet or streaming media device – and the typical American household has five. In October 2017, Common Sense Media reported that 42% of children age 0 to 8 have their own tablet device. With so many young children immersed in digital environments long before they enter school, they are increasingly developing skills in navigating and retrieving information at a young age (Neumann, 2016; Northrop & Killeen, 2013). Children are interacting with digital texts, including eBooks and digital games, and are making meaning from digital print, such as app icons and symbols (Wohlwend, 2010). Through exploration, they intuitively learn to use the device and apps (Hutchison et al., 2012; Rowe & Miller, 2015) and use digital tools to create information and digital products. Although these children bring a significant amount of knowledge about current technologies to school (Neumann, 2016; Wohlwend, 2015), this does not mean they know how to effectively use the device or the information for their own learning (Hopkins, Green, &

Brookes, 2013). By carefully selecting technology to support learning goals, educators can optimize learning opportunities for young children's literacy development.

Harnessing new technologies for the purposes of teaching and learning practices is vital to adequately prepare students for their future. But teachers face a significant challenge of mediating traditional established notions of what it means to be literate with new and emerging digital literacy skills. The multimodal nature of digital information requires teachers to rethink their approach to teaching and how to effectively engage students in learning with new technologies (Hopkins et al., 2013), and evidence from research demonstrates that teachers can effectively combine students' print-based literacy learning with digital technologies (Walsh, 2010). With many schools adopting a 1:1 iPad environment, an even greater challenge arises – effectively integrating mobile devices into instruction. Academic literature has discussed many opportunities and constraints related to using iPads for teaching and learning, but in terms of empirical research – teachers have had limited guidance. The transition to systematic technology integration for teachers is not as simple as placing devices in the hands of students, as the use of mobile devices does not guarantee an improvement of students' learning experiences unless it is also accompanied by effective integration of technology into pedagogy (Belo, et al., 2016; Mishra & Koehler, 2006; Prieto et al., 2011; Reinking, Labbo, & McKenna, 2000).

1.1   PROBLEM OF PRACTICE

I am a kindergarten teacher in a small, suburban public school district in Southwestern Pennsylvania, where significant amounts of funding have been invested in educational technologies and in the development and maintenance of a robust infrastructure capable of

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providing ubiquitous access to educational technology tools. Technology assumes a central role in district efforts to personalize and differentiate learning experiences, but the effective implementation and use of educational technology is a complicated task. Understanding how technology can be effectively used in the teaching and learning process is a central topic I wish to explore.

In 2013, the district adopted a 1:1 iPad initiative – thus beginning the shift from a 20th century learning environment to a 21st century learning environment. This digital transition not only provided each child with a device, but each teacher as well – along with the expectation that teachers would harness the technology for the betterment of the students, integrate it into classroom practice in educationally significant ways, meet diverse learning needs and provide flexible learning experiences. With the large amount of resources allocated for educational technology tools and infrastructure to support access to digital learning, it is clear the district recognizes the critical role that digital technologies can play in differentiating instruction, developing children's identities as effective learners in the classroom, and creating more personalized learning experiences. However, the iPad reform was initially introduced without any recommendations or guidance on how they might best be integrated into classroom practice and curriculum – so teachers simply trialed different applications and activities. Some teachers remained stagnant in regards to their technology integration. In other elementary classrooms, the iPads served as a delivery tool. Students used the iPads for drill and practice activities or they were used as interactive whiteboards, which could be projected and used for demonstration and class discussion. Yet a few teachers reinvented their craft and became more creative in their lesson planning, for example using augmented reality apps to connect multiple learning environments and deepen understandings of content. As a result, learning tasks became more

student-centered and creation-based. Regardless of the teacher, the pedagogic challenge that accompanied this initiative was significant and was reflected in the varying degrees of integration. This reform engendered not just putting the latest policy into place, but changing a fundamental approach to teaching and learning.

The degree to which teachers in my building appropriated iPads into their pedagogical practices and integrated iPads into instruction was both dictated and impacted by many factors. These include the district-mandated curriculum, a traditional print-based reading program and exclusively print-based approach to literacy (versus multiliteracies) in elementary grades, specific time requirements for content coverage, building and classroom schedules, and a lack of collaboration and mentorship from the technology-integration specialist due to role ambiguity and frequent, unfilled absences from scheduled classroom times. Furthermore, professional development opportunities were very limited and offered little guidance for teachers, as they were divorced from actual teaching practice. Instead, they concentrated mainly on the mechanics and functionality of the device and the capabilities of various iPad applications. Each of these factors contributed in some way to the level of success of this iPad reform, ultimately affecting the ways that teachers teach and students learn.

Using iPads in the classroom commands a different way of thinking about lesson planning and instructional delivery. There are many ways that technology can become an integral part of the teaching and learning process, but it is a complex task for teachers to integrate technology in meaningful, effective ways. Not only do teachers need the right approach in terms of their willingness and beliefs, (Blackwell et al., 2013; Blackwell, Lauricella, & Wartella, 2014, 2016; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012), they also need to be experts in the teaching and learning process with an understanding of technology-based

pedagogy and purposeful technology integration in connection with content appropriate instruction (Hineman, Boury, & Semich, 2015; Mishra & Koehler, 2006). Without this knowledge and understanding, attempts at successfully integrating technology into practice are limited (Koehler, Mishra, Kereluik, Shin, & Graham, 2014).

In order to facilitate such a shift in practice, teachers need to receive ongoing, targeted professional development and opportunities for collaboration (Chou, Block, & Jesness, 2014; Karsenti & Fievev, 2013; Steeg, Costley, Engelman, Gonzalez, Knutson & Maroni, 2013; Vaughan & Beers, 2017). With this level of support, the teachers in my building would have been given the tools to manage the expectation of this reform initiative and better navigate a new cultural terrain where technology and pedagogy now intersected. Teachers could then approach integrating technology in a systematic manner to ensure that it focuses on learning goals and enhances student learning.

The administrative district leaders and policymakers have a critical stake in this problem, particularly in terms of managing organizational resources, establishing policies, and providing their educators with ongoing professional development. While the district leaders can make recommendations on how teachers should be using the iPads and direct teachers to use specific applications and programs for certain amounts of time, teachers cannot bear the sole responsibility for increasing technology integration into instruction (Hutchison & Reinking, 2011). District leaders must also provide support. Teachers need access to continued educational technology professional development to aptly deliver on these recommendations and directives. Technology investments should include investments in the devices and investments in professional development. District leaders play a key role in rethinking these investments and developing new initiatives and funding models that can support educators' professional growth.

It is evident that the major drawback of this reform approach is that it did not enable the teachers in my district to effectively integrate iPads into their existing pedagogical practice. If technology is to enhance learning, students need the knowledge to apply the resources and teachers need the training to support student learning and knowledge advancement. Although fellow teachers have found ways to incorporate technology into their classrooms, its effective use for teaching and learning remains a challenging issue. It takes time and training to develop the knowledge required to integrate technology in the classroom and then connect this knowledge to effective teaching practices to ensure that technology is, in fact, adding learning value. Combined with a lack of planning time and expertise, it has been difficult for teachers to develop quality lessons that integrate technology-based activities that truly enhance and extend learning experiences. In response to these challenges lies the motivation for my study.

I am deeply interested in understanding how I can engage students in meaningful learning experiences through purposeful integration of mobile devices – experiences where students have the opportunities to be creators of digital content and demonstrate knowledge and understanding in a multimodal way. My problem of practice seeks to investigate how creation-based learning tasks that utilize iPads and related open-content iPad applications are effectively integrated into early literacy instruction to facilitate students' literacy learning in the kindergarten classroom, as well as how early literacy instruction can be expanded to incorporate digital literacy practices alongside the traditional, print-based literacies. I am also interested in examining how integrating mobile technology in this way scaffolds students' literacy learning, provides a foundation for student agency, and promotes student engagement. These interests are based on the belief that it is not the iPad that makes teaching and learning happen in the classroom, but the way that the iPad is used in authentic, contextualized settings. Furthermore, technology does not

have the inherent power to change teaching and learning practices (Blackwell, Lauricella, Wartella, Robb & Schomburg, 2013; Ertmer & Ottenbreit-Leftwich, 2013), so the tendency to focus on technology for technology's sake does not ensure that it is being used in productive ways. Likewise, using technology for its convenience further isolate it from the pedagogical processes that is intended to support and enhance. It is my firm belief that technology should first and foremost be utilized to support learning goals, not the other way around (Ertner & Ottenbreit-Leftwich, 2013). Through engagement in self-study research, the present study will chronicle my experiences as a teacher-researcher and explore the impact of technology integration on teaching and literacy learning practices.

In a district with a 1:1 iPad program (K-12), I am in a unique position to explore this in my classroom. Given the impact that early childhood education has on children's future academic success and the importance of developing literacy skills beginning in early childhood, I believe kindergarten students to be an ideal audience with whom to explore this topic. By exploring developmentally appropriate ways that iPads can be effectively integrated into content and pedagogical practice to enhance early literacy learning goals and curricular objectives, I aim to better understand how to improve the quality of technology integration and capitalize on its pedagogical potential to facilitate early literacy learning.

1.2   INQUIRY QUESTIONS

The central research question that will guide this study is: *In a 1:1iPad classroom environment, how are creation-based learning tasks that utilize the iPad and related open-content iPad applications effectively integrated into literacy pedagogy to facilitate literacy learning in the*

kindergarten classroom? Using a combination of qualitative methods, the succeeding sub-questions will also be explored: *How do creation-based literacy tasks engage kindergarten students in digital literacy practices? How do these literacy tasks foster the development of students' agency and promote engagement?* and *How has my teaching practice been impacted by these experiences?*

1.3   INQUIRY APPROACH

As a classroom teacher and a teacher-researcher, I am interested in an inquiry approach that allows me to blend my pedagogical knowledge and contextual knowledge of my classroom with my professional knowledge of theories and research in order to make meaningful changes related to my workplace-situated problem of practice: effective iPad integration in the kindergarten literacy curriculum, more specifically how creation-based learning tasks that utilize iPads and related open-content iPad applications are effectively integrated into the kindergarten literacy curriculum. Practitioner inquiry through research designs of action research and self-study aligns well with this motivation.

Practitioner inquiry encompasses many different genres of action research (Cochran-Smith & Lytle, 2009), and many traditions of action research have emerged from various research approaches (Herr & Anderson, 2004). For the purposes of this dissertation, the term *action research* will be used to describe this approach to practitioner inquiry. Action research will provide me with the opportunity to engage in meaningful professional learning. Through this process, I will be able to conceptualize and create knowledge regarding how to effectively integrate iPads into the literacy curriculum, interact with this knowledge and transform it, and

then apply this new knowledge to purposefully take action in my classroom to improve teaching and learning. Action research will enable me to reflect on my practice, articulate knowledge about my craft, recognize my expertise, and use this inquiry process to develop a more dynamic environment for teaching and learning.

This inquiry will adopt multiple qualitative methods to investigate: (a) how creation-based tasks that utilize iPads and open-content applications are effectively integrated into pedagogy to engagingly teach literacy skills and are appropriately scaffolded to support literacy learning; (b) how creation-based tasks that utilize iPads and open-content applications engage young learners in digital literacy practices and foster the development of digital literacy skills, including understanding and utilizing digital apps and touchscreen interfaces, navigating symbols (such as "X" or "OK"), image buttons and text options, collaborating and communicating with others to complete a shared task, and the creative design of digital artifacts (Kazakoff, 2014); and (c) how engagement in creation-based literacy tasks and digital literacy practices foster students' engagement and agency; and (d) how my teaching practice has been impacted by the experiences with integrating creation-based literacy tasks that utilize iPads and open-content applications. The participants in this inquiry will include my classroom of kindergarten students, as well as myself as the classroom teacher. As is the case in an average primary classroom, there is a great deal of heterogeneity among students. Students are of varying achievement and ability levels, learning styles and cognitive abilities, personality traits and demeanors.

Over the course of fifteen weeks, I will integrate a series of lessons and creation-based literacy activities that have been designed specifically for this action research study. These activities are aligned to a technology integration framework, also developed for this study, and

will be incorporated into small group instruction. To address my inquiry questions, students will be observed as they participate and interact during these instructional activities and digital artifacts will be collected. Focus-group interviews will be conducted with small groups of students to inquire about the role of iPads in literacy learning and determine how creation-based activities have fostered the development of digital literacy skills, student agency and engagement.

2.0   LITERATURE REVIEW

Technology and digital media are changing our understandings of literacy and what it means to be literate. As technology alters how information is presented and meaning is constructed, it creates new challenges for teaching and learning. With accelerated advancements in technology and the rapid adoption of technology by schools, the scope of this challenge increases as educators grapple with how to effectively integrate technology to prepare students for these new literacy demands. Addressing the problem of effectively integrating iPads into instruction will not only improve understanding of how to maximize the potential of these devices and integrate into a strong instructional design, but it will also transform ways that teachers are teaching and students are learning. It will promote deeper understanding, meaningful engagement, and inform new best practices for teaching using technology.

In this chapter, I will review the professional literature related to my inquiry questions. Specifically, I will present information related to: (a) how educators can effectively integrate technology, namely iPads and related apps, into their teaching, (b) how iPads can be utilized to expand opportunities for early years literacy learning, (c) how iPads can facilitate the emergence of early literacy skills, and (d) how iPads and related applications can be integrated as tools to support early literacy learning.

2.1   EFFECTIVE IPAD INTEGRATION

Designing and delivering instruction to incorporate forms of literacy beyond the traditional print-based curriculum, with the explicit use of iPads and all that they enable, is a significant problem in practice. When planning instruction, scholars of technology integration advocate for the use of one of two different educational technology integration models: the SAMR model developed by Dr. Ruben Puentadura (2014) or the TPACK framework created by Mishra and Koehler (2006). Both SAMR and TPACK provide guidance for the ways that teachers can think specifically about how to effectively use technology to maximize learning opportunities for students. The SAMR (substitution, augmentation, modification, redefinition) model is a four-level approach to categorizing technology integration, visually represented in a hierarchy (Figure 1). According to Puentadura (2014), it is designed to encourage teachers to move upwards to 'higher', more transformative, levels of teaching with technology. However, despite its growing popularity and use by practitioners and Apple's endorsement as a framework to improve technology integration, there is not a theoretical representation of the SAMR model in peer-reviewed literature (Hamilton, Rosenburg & Akcaoglu, 2016).

The TPACK (technological pedagogical and content knowledge) framework is visually represented as a circle with seven areas, or bodies of knowledge. TPACK was developed to assist teachers in bringing together their knowledge of content, pedagogy, and technology as a way to effectively teach with technology (Mishra & Koehler, 2006). Grounded in the theoretical work of Lee Shulman (1986) who conceptualized effective teaching as a strategic combination of

pedagogical and content knowledge (PCK), Mishra and Koehler (2006) extend this work to include knowledge required by teachers to integrate technology. Figure 1 below is a common representation of TPACK, created by Mishra and Koehler. The three domains of knowledge – pedagogy, content, and technology – function independently and TPACK lies in the intersection. This model encourages effective teaching with technology through a developing understanding of the relationships between content, technology, and pedagogy. As teachers use that understanding to develop quality lessons and activities, they are progressing towards a transformative learning environment (Mishra & Koehler, 2006). The TPACK literature suggests that effective technology integration aligns with student-centered pedagogies (Mishra & Koehler, 2006).

Educational Technology Integration Models	
SAMR Model	**TPACK Framework**
The creation of Dr. Ruben Puentedura, Ph.D. http://www.hippasus.com/rrpweblog/	Reproduced by permission of the publisher (Mishra and Koehler), © 2012 by www.tpack.org

Figure 1. Educational Technology Integration Models

2.2   EXPANDED OPPORTUNITIES FOR LITERACY LEARNING

iPads provide many useful opportunities for the literacy classroom. iPads offer applications that can target specific literacy skills in engaging ways. iPads also offer digital books that extend beyond basic print texts, allowing readers to interact with images, animations, music, and text (Hutchison et al., 2012; Walsh, 2010).   These new modes of reading and writing are changing the ways that students learn about literacy, which now includes many different multiliteracies skills. Advancements in technology continually extend communication abilities and vary the presentation of information. This influences how we understand literature and how literature, in its many formats, is interpreted. So developing new literacy skills and strategies is necessary to wield these new technologies effectively (Leu et al., 2004). Preparing students to adjust to the literacy demands of the digital age is critical (International Reading Association, 2009).

In an exploratory study, Javorsky and Trainin (2014) examined the most common features of digital stories, mobile reading applications, and the book handling skills readers must acquire to make use of them.   Findings indicated the differences between digital story applications and paper-based texts were presented to readers in multiple, sometimes unpredictable ways. Therefore, young readers need to master text features and navigational tasks that are not present in paper books. Such mastery is difficult because the digital story elements have high levels of variability between applications. Of all the variable text features noted in the texts in this study, none was more ambiguous than icon usage. What a particularly styled icon signifies in one digital story does not necessarily signify the same thing in another story. Evidence suggests that young readers need to develop a cognitive flexibility and persistence to be able to transfer skills between reading environments and navigate digital texts successfully. Although digital stories offer affordances beyond the four walls of the traditional classrooms and

create new modes of reading and writing, they are a large departure from paper-based texts. Young readers' cognitive flexibility is essential to interacting with the mobile world of digital stories (Javorsky & Trainin, 2014).

The work of Javorsky and Trainin (2014) intensifies the need for educators to integrate digital technology effectively into literacy instruction and equip students with new digital literacies skills needed to read, write, and communicate (McKenna, 2012; Leu et al., 2004; Hutchison et al., 2012). However, with the changing nature of technology and unreliable support, there are conflicting ideas about the value of technology and contradictory advice about how it should be integrated (McKenna, 2012). Furthermore, with expanding understandings of literacy, it is also a struggle for teachers to effectively integrate and teach new literacies skills within the confines of curriculum standards, schedules, and high-stakes assessments, particularly if teachers are committed to conventional literacy standards (Hutchison & Reinking, 2011). As educators explore the possibilities of integrating iPads in the classroom, it will be important to recognize how such obstacles can enhance and inhibit integration and critically examine how the affordances and constraints of using technology can influence student learning (Hutchison et al., 2012).

To better understand how education can benefit from the continuous improvements in technology, McKenna (2012) analyzed how the use of an iPad in two elementary classrooms enhanced student learning and increased student achievement. Through observations and comparisons of both iPad and non-iPad (traditional) lessons, McKenna (2012) found that the teacher's positive attitude towards the use of iPads in the classroom carried over to the attitudes of the students. In both classrooms, students were more engaged during iPad lessons versus non-iPad lessons and were also engaged more often in iPad lessons than in non-iPad lessons.

Continual use promoted students' self-regulated exploration and collaboration. Findings also indicated that the average number of minutes of engagement increased during reading and math when students used the iPads compared to when they did not. Furthermore, the average reading fluency in first grade increased significantly at a rate considered normal for that same period of time. During the three-month study, it was also determined that with continual advances in technology, new opportunities arose for a wider range of student engagement. The evidence suggests engagement with iPads can play a positive role in the classroom. McKenna (2012) cautions that enhancing students' engagement and avoiding potential distractions involves careful, strategic planning to use the iPad effectively.

On the basis of these same notions, Hutchison et al. (2012) explored how one fourth-grade teacher integrated iPads into the literacy curriculum and how the students utilized this technology. In this exploratory study, Hutchison et al. (2012) used the technological pedagogical content knowledge (TPACK) framework to conceptualize and plan to utilize iPads to support and enhance literacy instruction. TPACK (Figure 1) is a framework designed to support teachers in effectively integrating digital technology into their teaching. A grounded approach to technology integration that is based in content, pedagogy, and instructional planning, TPACK focuses on learning goals and students' learning needs, rather than the specific features of technology. Hutchison et al. (2012) found that teachers can meet print-based literacy goals while using the iPad as a tool to simultaneously introduce some of the new literacy skills associated with 21st century technologies. When instruction was designed with the components of the TPACK framework – beginning first by determining the learning goal, then making pedagogical decisions to establish parameters of an activity, selecting the activity, and finally selecting apps (Harris & Hofer, 2009) – the iPad supported student learning and enhanced instruction

(Hutchison et al., 2012). Not only did using iPads support student learning, but students were highly engaged and were able to demonstrate unique ways of responding to a text.

When integrating iPads into instruction, teachers should carefully examine how the tool can help meet curricular goals and question whether using it enhances and promotes progress toward a literacy-learning goal or is only an add-on to instruction (Hutchison et al., 2012). For example, the iPad has many unique features that allow students to read with audio, word-by-word tracking, and picture animation. iPads allow children to interact with the text by using their own voice recordings and offer apps that facilitate responses to texts. Additionally, the many available forms of electronic books provide an added advantage over printed texts as they provide students with expanded opportunities to physically interact with and manipulate texts, thereby transforming a text to meet their needs and interests (Hutchison et al., 2012). Careful consideration of these affordances can position technology as integral to meeting curricular goals, thus achieving curricular integration (Hutchison & Reinking, 2011). Through this exploration, Hutchison et al. (2012) provides a foundation for teachers and leaders to make decisions about using mobile devices as tools for literacy learning.

As new and emerging technologies continue to become available, it is increasingly difficult to determine how to most effectively incorporate them into the classroom (Hutchison et al., 2012; Larabee et al., 2014; McKenna, 2012). The iPad has expanded mobile learning possibilities for students and teachers, as exemplified in the research discussed in this review. However, the increased acquisition of iPads in schools raises important questions, specifically about the role of mobile technology and digital media in the learning experiences of young children (Roswell & Harwood, 2015). There are also important questions that need answered

regarding how iPads fit into classroom life and what impact they have on the way children think, interact, and interpret the world around them (Roswell & Harwood, 2015).

Larabee et al. (2014) caution that most schools have not integrated mobile devices in ways that maximize their potential. Instead of layering expensive technologies on top of the traditional curriculum to deliver digitized worksheets or teacher-directed content to students, it is important for educators to ensure that technologies are used to enhance curricular goals and expectations and use it to position learning authentically, rather than simply serving as an instructional additive (Harris & Hofer, 2009; Larabee et al., 2014; Richardson, 2013). Addressing the needs of modern learners in entirely new ways prompts questions like: What exactly do we mean by learning? What does it mean to be literate in an interconnected world? How can mobile devices be used to enhance learning? Framing learning in this way changes the conversation around such questions to better inform decisions about technology and change (Richardson, 2013).

Evidence from exploratory case studies indicates that the use of iPad apps targeting specific reading skills increases task engagement and improves reading skills (Larabee et al., 2014). Although integrating technology can increase engagement and motivation, it does not automatically lead to increased achievement (Northrop & Kileen, 2013). As previously discussed, the TPACK framework is a grounded approach to technology integration that is based in content, pedagogy, and instructional planning. It focuses on learning goals and students' learning needs, rather than the specific features of technology. Therefore, when using mobile devices to facilitate reading interventions, selected apps should align with the student's instructional needs (Larabee et al., 2014). With these assertions in mind, Larabee et al. (2014) studied the effects of an iPad-supported word-box reading intervention (an application called

Build A Word) in comparison to the standard reading intervention using an experimental approach. These researchers also examined the extent to which the iPad supported word-box intervention improved decoding performance, retention, and promoted task engagement in comparison to the standard approach. The standard word-box approach is an empirically supported reading intervention for explicit, systematic support in phonics (Larabee et al., 2014). It targets alphabetic principle, the association of individual letters, and the application of letter-sound correspondences to whole word reading. The word boxes involve sliding a manipulative across sections of connected boxes as the student articulates letter sounds in words. *Build A Word*, although not designed for reading intervention, functions in a similar way to that of a standard word box, except instead of a physical token, the student drags and drops letters into the appropriate boxes.

The participants were three first-grade students who lacked basic decoding skills, two of whom were English language learners. The iPad integration in this study utilized the gradual release of responsibility framework, as proposed by Northrop and Kileen (2013) who assert that when using technology in the classroom, it is important to ensure that it enhances the curriculum and supports learning goals. The *gradual release of responsibility model* is a way to situate technology in a student's "zone of proximal development", thereby ensuring that students are working at their development learning level. This framework consists of four steps: 1) teach targeted literacy skill without the app; 2) explain and model the app; 3) guided practice with the app; 4) independent practice with the app. Using iPads in the classroom can be both motivational and instructional, but Northrop and Kileen (2013) strongly recommend that the use of technology be coupled with effective instruction to ensure student learning.

The results of this study did not reveal a clear, consistent pattern on measures of students' decoding performance when compared with instructional conditions, and therefore contributing factors to differentiation in decoding performance could not be confidently identified (Larabee et al., 2014). Additionally, this study had significant limitations. The iPad app randomly generated distractor letters, (but letters in standard materials were predetermined by a specific list, thus repeated practice and targeted instruction could not be ensured). The iPad app also contained features that were not adjustable, so the app automatically did the work for the student (isolated sounds, said words, immediately advanced). The interventions were given in English to three students who were receiving language services. The results did, however, provide preliminary evidence supporting the use of mobile applications for reading interventions (Larabee et al., 2014). Findings suggest that technology-supported versions of existing evidence-based research may increase task-engagement and support improvements in academic skill development (Larabee et al., 2014). The unique pattern of results for each student highlights the need to differentiate instruction when utilizing technology for reading interventions (Larabee et al., 2014). This study reveals the need for further investigation into how technology can be utilized as a reading intervention.

2.3   LITERACY DEVELOPMENT AND NEW LITERACIES

The research undertaken by Beschorner and Hutchison (2013) emphasizes that the process of children's literacy development is influenced by many factors. Children's experiences at home and in classrooms form their knowledge about literate behaviors like reading and writing, and children come to know literacy by exploring and interacting with their environment (Beschorner

& Hutchison, 2013).   Through this, children develop what Goodman (1986) calls the roots of literacy – or an understanding that written language makes sense, otherwise referred to as emergent literacy. The roots of literacy include the development of print awareness (making sense of print) in situational contexts, print awareness in connected discourse based on written language, functions and forms of writing, the use of oral language to talk about written language, and metacognitive and metalinguistic awareness about written language (talking about how written language works) (Goodman, 1986).

Considering the increased influence of digital technologies on daily life and young children's increased use of technology, it is possible that the roots of literacy also include knowledge about digital forms of reading and writing (Beschorner & Hutchison, 2013). Technology influences literacy practices and impacts children's understandings about literacy and conceptions of print (Leu & Kinzer, 2000). The types of literacy that children use to read, write, and communicate go beyond the traditional and print-based. With this changing nature of literacy, Beschorner and Hutchison (2013) argue that a more inclusive definition of literacy needs to be adopted – one that considers the potential impact of technology on children's emerging conceptions of literacy and understands the types of literacy that children in the 21st century use to read, write, and communicate beyond traditional print-based text, as well as the new literacies skills required when reading and writing using information and communication technologies (Leu et al., 2004).   To be fully literature in the 21st century means that children must be proficient in the new literacies of 21st century technologies (International Reading Association, 2009).

The case study conducted by Beschorner and Hutchison (2013) explored how the iPad was used as an instructional tool to facilitate emergent literacy (or roots of literacy as defined by

Goodman, 1986) for digital texts in two preschool classrooms of four and five-year olds. The results confirmed that the features of the iPad provided a platform to support children's emerging understandings of literacy, and suggest that the iPad can be used in multiple ways as an instructional tool to support the teaching of emergent literacy in an early childhood classroom (Beschorner & Hutchison, 2013). The interactive touchable interface of the iPad made it a developmentally appropriate tool for young children because it allowed for discovery and creativity, and the digital print environment (including the design of the iPad and the interactive layout of the apps) allowed the children to develop an awareness of digital print as they interacted with, organized, and acquired understandings of the meanings for the images on the screen (Beschorner & Hutchison, 2013; Goodman, 1986). Children also viewed themselves as writers as they engaged with the iPad apps and created varying forms of writing. Although some could not form the letters by hand, all children were able to use the on-screen keyboard and could identify the letter and touch it on the screen (Beschorner & Hutchison, 2013).

Children used the *StoryKit* app to independently create digital books. As the children engaged with this app, it furthered their knowledge of spelling and writing as they had the availability of the keyboard to add text to the on-screen drawings. Using iPads in this way expanded the opportunities to develop emergent literacy skills (Beschorner & Hutchison, 2013). Additionally, children gained an understanding of the function of writing and were excited about writing because it was able to be electronically shared with parents via e-mail. This activity is a vast departure from a paper-based activity of the same kind.

One key benefit of the iPad is that many apps naturally connected reading, writing, listening and speaking within one app, primarily evident in digital book and story creation apps. In addition to being able to listen and record a digital story, such apps provided an opportunity

for students to change text and photographs, create their own stories using familiar words and images, and record themselves reading the text. Because of this, children were able to create meaningful connections between the words they typed, images they used, and the story that each represented. Furthermore, as children worked on their own digital books there were many opportunities to collaborate with others in a meaningful work environment.

This case study illustrates that children can develop emerging knowledge about print in digital contexts using the iPad. iPads offers unique affordances to children in that these mobile devices employ reading, writing, listening, and speaking within one context and allow for the use of multiple communicative processes simultaneously. In light of this, the iPad could be a promising instructional tool for early literacy teaching and learning (Beschorner & Hutchison, 2013). This case study adds to the growing body of knowledge regarding how the iPad can be used in multiple ways for reading, writing, listening and speaking, and further confirms the importance of effectively integrating new and emerging technologies to enhance literacy learning and instruction. Evidence suggests that meaningful integration of technology can transform literacy instruction (Hutchison & Reinking, 2011) and using iPads can facilitate the emergence of the roots of literacy in a digital environment (Beschorner & Hutchison, 2013).

Young children are actively interpreting their world on a daily basis through touch, movement, gesture, texts, and audio (Roswell & Harwood, 2015). As they learn to become literate, children meaningfully interpret signs in a particular representational modality (print, image, video, audio, etc.). There are unique affordances inherent to the iPad that can be leveraged for greater multimodal meaning-making in literacy learning and for 'productive consumption' of media texts (Roswell & Harwood, 2015). Rather than serving as a passive recipient of a text, 'productive consumption' describes the reader as a producer – one who

interacts with a text and combines fragments of texts with other lived experiences to invent something different than the text or reading may have originally intended. Using the lens of 'productive consumption', Roswell and Harwood (2015) analyzed young children's naturalistic, real-life experiences as they imagined, collaborated, and constructed understandings of their literate world using iPads across five distinct inquiry-based early-childhood education classrooms.

Several key themes emerged in the findings. Within this research, the introduction of iPads into the classroom setting offered exponentially more options for the blending of the material (physical objects that occupy children in the world) and immaterial (the digitized objects and virtual world on the iPad). As children make meaning, they have a natural inclination to use a variety of resources to work with different forms or modes of representation and communication. Across these settings, children productively consumed and made meaning from the resources on hand in the classroom – blending and transforming texts while using multiple modes of communication that are available on the iPad. Children gravitated towards a hybrid inquiry model and moved fluidly in and out of material and immaterial objects and spaces. One moment using the iPad to access a building block application (*Lego*) and in the next moment engaging with a more classic early childhood activity with the material blocks (Legos), before moving back into the classroom space to engage in a schooling practice, like collaborative play and conversation. Meaning-making moments were enacted during this multimodal inquiry, as children shifted from passive recipients of texts to one who produces meanings as they 'consume'. There were many instances when a child 'consumed' a text multimodally (through animations, visual images, and spoken words in an app), crossed modes and mediums, and ultimately transformed the text in the process of making meaning (Roswell & Harwood, 2015).

To that end, Roswell and Harwood (2015) argue that the presence of the iPads invited more diverse sense-making. Additionally, iPads offer new, more excessive affordances and forms of production that are both material and virtual in nature (like video recording of dramatic play or a collaborative creation of a story using an app like *StoryBook Maker*). Children transition to a different way of being and knowledge-making when they have a tablet in their hands. When children are engaged in unmitigated creativity with iPads and the things that generally consume them, it is clear that something different is happening as children think across material and immaterial texts. This should prompt educators to think about how children are making meaning. With iPads, children were engrossed in a kind of sense-making that showed remarkable originality and productive power. This study recognizes that harnessing the potential of iPads for literacy learning can foster children's creative digital transformations of texts as multiple modes converge (Roswell & Harwood, 2015).

2.4   LEARNING VALUE

The iPad is changing the way that teachers teach and students learn (Apple, 2017). With thousands of apps, educational content, and books, the iPad creates seemingly endless possibilities for learning. However, with the high level of hype and rhetoric surround iPads' transformational potential, some scholars argue that decisions to adopt such technology could be influenced by factors other than theory-based understandings of how the device can enhance student learning – suggesting instead that trendiness could be a much stronger influence (Falloon, 2013b). In an effort to provide insight into how iPads might offer actual learning value, Falloon (2013b) explored eighteen five-year old students' physical interactions with a

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small selection of iPad applications. An experienced teacher selected forty-five apps related to literacy, numeracy, and problem-solving capabilities to use in the classroom. The goal of this study was two-fold: to understand how the design and content features of individual apps influenced the learning of young students and gain insight into specific factors that influenced the effectiveness and quality of their "learning pathways". Learning pathways are defined as choices and responses made when students use iPad apps as part of their learning experience (Falloon, 2013b). To do this, the research team developed an innovative recording methodology using the *Display Recorder* app, which – when downloaded – ran "in the background" while students were using other applications. It recorded students' finger placements and selections on the touchscreen and recorded audio through an integrated microphone, thereby capturing students' natural interactions with all apps (Falloon, 2013b).

Analysis of students' natural interactions with a selection of math and reading apps revealed that certain app designs and content features do support student learning. Apps that contain features that systematically scaffold students' interactions with content generated more evidence of responses that indicated learning versus those apps that were primarily game-based. The most effective examples were apps designed to resemble a traditional teacher model. These apps provided learning scaffolds through organized steps, a clear learning goal, structure, and guidance, and often had a 'real' person teaching the content. This model was very effectively supported by app design features that included interaction parameters such as a 'pause' screen and 'timed' questions. When apps strategically combined embedded pedagogy with a design that understands the learning characteristics of young children and balanced an entertaining but focused presentation, including game elements, findings indicated that students generally maintained a high level of engagement (Falloon, 2013b).

Other noteworthy app features that promoted student engagement included the ability to check responses before submission (combined with corrective feedback), and ones that effectively communicated learning purpose, instructions, and content. The most valuable app feature that allowed students to learn on a relatively independent basis was the "text-to-speech" feature. There were common impediments to learning, including app features with embedded external web links and pop-up banners/advertisements and those that stalled without Internet access. Findings revealed that there were many instances of restriction in learning derived from the app itself – by incorporating culture-specific accents that caused confusion with phonics, by limiting the physical workspace on the screen, restricting access to certain content, or by truncating student interaction and forcing them to close the app and start again (Falloon, 2013b).

In order for students to maintain focus, learning apps need to provide strong guidance and structure through "thoughtfully designed embedded parameters", which Falloon (2013b) defined as embedded constraints within apps that place a level of structure around students' interaction with content. Findings strongly indicate the value of apps providing a clear learning goal, structure, guidance, and well-defined interaction parameters, if focus on the learning purpose is to be maintained (Falloon, 2013b). Apps that provided the greatest indication of productive learning displayed a solid understanding of appropriate pedagogy. With this in mind, app design parameters should seek to emulate the learning structures and boundaries implemented by a classroom teacher – otherwise, findings indicate a lack of self-management and learning independence that results in unproductive, divergent interactions (Falloon, 2013b).

Using iPads and related apps for instruction creates many learning opportunities. But if students' simple motivation surrounding technology is to be transformed into thoughtful engagement and productive learning, educators need to carefully evaluate an app's design and

content features to determine if it supports learning goals and fosters effective learning (Falloon, 2013b).   Findings that emerged also offer a compelling call to action to researchers and app developers – when designing software and applications for student learning, these stakeholders need to work together to improve app designs for learning, which will ultimately enhance and improve the educational value for the students (Falloon, 2013b).

Kucirkova, Messer, Sheehy, and Fernández Panadero (2014) agree with Falloon's premise, especially in light of the wide availability and popularity of iPads and the ongoing call for teachers to integrate technology into the curriculum. As of May 2017, there were 2.2 million apps available in the app store (Wikipedia.com). According to Apple (2017), over 80,000 apps are advertised as educational, but these are largely unregulated and untested. Any app developer can tag an app as educational – apps are not evaluated as they enter the market and only a small number are designed using research-based understandings of how children actually learn (Hirsh-Pasek, Zosh, Golinkoff, Gray, Robb, & Kaufman, 2015). Kucirkova et al. (2014) took an explanatory approach to investigate the educational value and impact of iPad apps advertised as 'educational'. Much of their research focused on children's experiences with one specific app, *Our Story*, which was intentionally designed to support children's engagement in story-making activities.   Kucirkova et al. (2014) also analyzed children's natural engagement and peer dynamics during unstructured times with other teacher selected apps (construction and drawing apps). This study was located in a Spanish school context in Madrid, and focused on two classrooms of four and five-year old children.

Children's engagement was analyzed using an adaptation of Bangert-Drowns and Pyke's (2001) taxonomy, a tool that categorizes children's literate engagement with educational software hierarchically into seven distinct levels. These levels define different qualities of

student engagement in terms of its complexity, relationship with intrinsic motivation, and degree to which literate thinking is approximated. Because some iPad apps are designed to support both individual and collaborative engagement, children's engagement was also characterized in relation to their exploratory talk, which is indicative of effective classroom discourse. Kucirkova et al. (2014) explored whether different iPad apps, and the activities they mediated, facilitated collaborative talk to varied extents. According to the adaptation of Bangert-Drowns and Pykes' taxonomy, findings revealed that when tasked with story writing using *Our Story*, children showed signs of self-regulated interest and critical engagement. This was evidenced as children extended knowledge of letters using text-box features and developed digital expertise by interacting with the audio-recording and imaging features (Kucirkova et al., 2014). Contrastingly, with construction and drawing apps, finding revealed that children showed structure-dependent engagement and unsystematic engagement, evidenced as children complied with the apps' design characteristics and interacted with only the features they perceived.

Implications from the findings suggest that it is likely the intuitive and easy manipulation of the iPads (Hutchison et al., 2012) largely facilitated children's collaborative talk, rather than them focusing on how the tool operates, and specific features of *Our Story* facilitated students' independent use. Children could switch on the audio-recording button, start/stop the recording, select pictures, and use the text feature to annotate. When using *Our Story*, children may have initially engaged in structure-dependent ways, but the design of the app and learning task led to self-regulated engagement, in which the children created personal goals to interact with the task.

Key findings from this study underscore the importance of apps having features that are easy to use, but also scaffold children's learning. Open-ended apps, such as *Our Story*, fostered higher educational and collaborative engagement and exploratory talk, versus those apps with

closed content and pre-established success criteria (Kucirkova et al., 2014). This research contends that there are certain content and design features that support student learning and influence the extent to which children's engagement is of educational value (Kucirkova et al., 2014) – thus concurring with Falloon (2013b). Based on research from Science of Learning, Hirsh-Pasek, et al. (2015) posit that true educational apps are those that target the ways children actually learn and instantiate four principles of learning – active "minds-on" involvement, engagement with learning materials, meaningful experiences, and quality social interactions – within the context of scaffolded exploration towards a learning goal.

As described in Chapter 1, contemporary literacy practices of young children are characterized by the everyday use of an array of technologies (Beschorner & Hutchison, 2013; Flewitt et al., 2014; Hutchison et al., 2012; Lynch & Redpath, 2014; Wohlwend, 2012). New technologies continually expand information and communication possibilities, and new literacies skills are required to effectively exploit their potentials (Leu et al., 2004). Mobile devices, in particular, have become integral to young children's early experiences of literacy. iPads are dominant among the many cultural tools with the potential to influence young children's identity and views of learning (Kucirkova et al., 2014). For these young learners, technology is more than just playing an app or watching a video on the Internet. The iPad plays a major role in shaping their identities. Among its many uses, the iPad creates personalized learning contexts, enables the creation of multimedia content, encourages collaboration and exploration, and provides a digital platform for multimodal communication and documentation. However research has shown there is widespread ambivalence towards integrating new technology into early literacy education (Flewitt et al., 2014). Literacy and literacy instruction today are being defined by the continual emergence of technologies (Leu et al., 2004), but there are significant

challenges when integrating these into the early literacy classroom, most prominently a curriculum that focuses on literacy as primarily paper-based (Lynch & Redpath, 2014). Furthermore, when technology is used, there is a tendency to replicate existing pedagogical approaches instead of devising new approaches to maximize its potential to transform teaching and learning (Flewitt et al., 2014). The disconnect between students' technology experiences inside and outside of school parallels a similar disconnect within the school environment and how educators approach and instruct literacy.

The aim of Flewitt et al.'s research (2014) was to explore the potential of iPads for early literacy teaching and learning. Reflecting a sociocultural approach to literacy and learning, Flewitt et al. (2014) investigated how children's literacy learning is mediated through the use of the iPad and related apps across three different educational settings (nursery, early primary, and special education). Although iPads and iPad applications can be used during instruction to practice skills for mastery, many apps position the children as passive recipients of narrowly defined literacy knowledge rather than producers of original material (Flewitt et al., 2014; Lynch & Redpath, 2012). In the literature, these apps are characterized as closed-content apps. Closed-content apps have 'closed' content, meaning the content cannot be changed or extended by a user. These assume a transmission model of learning, where learning is acquired through interactive, yet repetitive game formats. This closely resembles the drill and skill teaching method. A student can practice isolated skills, for example, basic alphabetic principle, phonics, or high-frequency words, and is rewarded with tokens for accomplishments.

By contrast, open-content applications assume a collaborative, interactive model of teaching and learning. Open-content apps, including storytelling apps, narrated slideshow apps, and book creation apps, are dynamic iPad applications that turn students into creators of original

content. Creating a digital story, building a presentation, or collaborating to write, act out, and record work are examples of creation-based tasks that utilize open-content applications and multiple media (photos, voice recordings, text) and produce flexible opportunities for both collaboration and individual work. If students are using creation apps to demonstrate a concept, they are not simply consuming content – they are creating it. These opportunities give students the choice, positioning them as active in the learning process. Creating and sharing learning using technology deepens understanding and encourages ownership. Combined with thoughtful planning and rigorous tasks, students can create valuable products to demonstrate their learning.

Findings from this exploratory study indicated that when well-planned iPad-based literacy activities are integrated into classroom practices, they offer rich experiences for collaboration and independent learning. Innovative and intriguing opportunities created by the iPad stimulated concentration and creativity. This study further evidenced that the use of open and closed apps allowed the practitioners to shape teaching and learning opportunities and provide differentiated instruction.

Closed apps were used most effectively when strategically introduced as a way for children to master certain skills, like letter recognition. Open apps allowed students a more personalized, flexible learning experience that engaged them more deeply and creatively in tasks, for example collaboratively creating a multimodal digital story using multiple media (photos, voice recordings, text). Across the three settings, the flexibility offered by open content apps provided the children and adults with an opportunity to develop digital expertise while engaging in multimedia digital story creation. In some cases, children's motivation to successfully complete an iPad activity led them to display more advanced literacy skills than in a non-iPad activity. The combination of the iPad's mobility, immediate teacher feedback, and a satisfying

end product enabled children's independence, motivated their commitment, and sustained their engagement. Additionally, using iPads offers scope for adults and children to be regarded as experts in the classroom, empowering children while simultaneously increasing their knowledge with the device (Flewitt et al., 2014).

As this study demonstrates, the affordances of iPads created promising opportunities for early literacy education. Mobile devices enriched communication, facilitated collaboration, and fostered independent learning, while allowing children the flexibility to work across multiple modes and media to create their own content. Flewitt et al. (2014) caution that unless iPads are seamlessly woven into the fabric of classroom practice, their potential could all too easily be reduced to being no more than a device for delivering repetitive curriculum content – only with a multimedia appeal.

Much research to date supports the premise that iPads provide unprecedented opportunities for children to engage in dynamic learning contexts (Kucirkova et al., 2014). Researchers also argue that intentional, seamless integration of iPads into the curriculum will maximize their potential (Flewitt et al., 2014). In spite of the educational affordances and the emerging evidence that iPad use can support and extend literacy learning opportunities for young children, Lynch and Redpath (2014) point out that broader educational policies, curricular contexts of early years education, and dominant institutionalized literacy practices can be at odds with teachers' intentions to utilize technology in transformative ways. In their research, Lynch and Redpath (2014) investigated one first-year teacher and her class of prep year students (children at this age are between the ages of five and seven). Practices that dominated early years literacy curriculum in this school were heavily focused on traditionally conceived print-based skills, and these connect with strict accountability policies and practices by government

departments.   Although the state government supports digital learning and integrating technology, this is overshadowed by an accountability system that is based on traditional encoding and decoding views of literacy and mastery of print-based skills.   While literacy is constantly being redefined and broadened, classroom practices continue to position technology narrowly (Lynch & Redpath, 2014).   For this reason, the early literacy curriculum and policy stipulated classroom practices conflict with contemporary understandings of new literacies (Leu et al., 2004), multiliteracies (Cope & Kalantzis, 2000) and what Fleer (2011) defines as 'technologically constructed childhoods' – a term used to reflect the profound impact that technology expansion is having on children's experiences of their world.   A mono-modal print-based literacy curriculum is not conducive the new literacies and skills that emerge from technological innovation (Fleer, 2011) and is therefore inadequate to equip students to participate in contemporary societies (Lynch & Redpath, 2014).   This highlights the need to reconceptualize curriculum to include an expansion and fusion of modes and consider the technological imperatives in children's lives (Fleer, 2011; Lynch & Redpath, 2014).

The teacher in this study attempted to navigate a path between bringing her vision for an innovative, technology-infused classroom to fruition, complying with established practice, and adhering to the conservative curriculum.   Evidence shows that it was difficult for her to integrate technology while complying with the print-based curricular demands and the centrally mandated traditional view of literacy in the school culture.   However, findings that emerged also indicated that within this context, iPads can be used by very young learners as tools for representing their understandings, producing their own knowledge and communicating learning.   Young students were highly competent iPad users, demonstrated a high level of motivation and enthusiasm, and could work relatively independently to navigate and troubleshoot (Lynch & Redpath, 2014).

Lynch and Redpath (2014) assert the true impact of iPads and apps depends greatly on how they are utilized. This study proved that iPads are particularly attractive for early years learning – their portability, touchscreen interface, simple navigation system – and can support independent use by very young learners. Like Falloon (2013b), Lynch and Redpath (2014) also discuss different usages of the iPads in terms of the 'openness' and 'closedness' of certain apps. Initially, the iPad was used with a focus on gamified apps that contained traditional early literacy content in an interactive, digital form – which was in line with the dominant practices of print-based literacy teaching. These apps direct students through content – although students could choose a level of interactivity, the geography of the app is closed. Technology was an already formed product to be consumed rather than a learning tool to be inscribed through the learning process (Lynch & Redpath, 2014).

The teacher's vision for her classroom was one where technology was an opportunity for innovation and empowerment – students could become active, self-directed learners with a strong sense of agency. It was this vision for a student-centered critical pedagogy that emerged in later findings of this study, where the students utilized iPad apps to create a multimodal alphabet book, which included drawings, text, and audio recordings, and were shared via social media (Twitter and YouTube). Such apps are characterized as open-content. The alphabet book activity supported the strategic movement between apps, driven by a production process where students were designing a final product. These apps can support any number of learning activities where students could produce and communicate knowledge. Open-content apps position the student as a producer of information and use is self-directed as students move seamlessly between apps using digital content to create a multimodal text that can be disseminated to a wider audience. Students using apps of this type illustrated a high degree of

digital fluency that is not necessarily evident in the use of closed applications (Lynch & Redpath, 2014).

Historically, it is the technologies that are a good fit with existing practices that are most easily implemented into current practices, evidenced in this study by the closed apps and the traditional literacy curriculum (Lynch & Redpath, 2014). However, when those technologies that afford different types of teacher/learner roles and relations are adapted to institutionalized ways of teaching and learning, there is an increased risk that iPads will emerge as tools to service the dominant literacy practices (with some added interactive multimedia appeal) (Lynch & Redpath, 2014). As exemplified in this research, transformative technology integration is possible and the iPad can be used to bridge the gap between emerging home literacy practices and the technology infused literacy practices in early childhood classrooms (Lynch & Redpath, 2014).

As evidenced by the research discussed in this review of supporting scholarship, one of the many educational affordances of digital tools is that they provide expanded learning opportunities. Additionally, the increasing importance of digital devices for communication and text production in the 21st century places increasing emphasis on the development of digital literacy skills – the wide range of interrelated skills, knowledge, and behaviors associated with using digital technology (networked devices) to produce and communicate information – beginning in early childhood. Touchscreen devices, namely iPads, offer an accessible and engaging platform suitable for young children (Flewitt et al., 2014), and many schools have launched 1:1 iPad initiatives that provide students the tools for learning, communicating, and multimodal composing (Rowe & Miller, 2015). In early childhood classrooms, multimodal composing has always been an important learning activity. But the increase in technology begs

the question – what can iPad apps do for multimodal composing? Rowe and Miller (2015) support Falloon's (2013b) premise that if iPads are to be integrated into early childhood classrooms, educators need to understand how children respond to the app designs and content features. But Rowe and Miller (2015) take this argument a step further and assert that educators also need to understand how children can use these technologies as tools for producing their own content.

As indicated previously, the observational studies of Flewitt et al. (2014) and Falloon (2013b) found that teachers most often used closed-content iPad apps. Although these apps offered visually engaging opportunities for practice and mastery of print-based literacy skills, their formats are repetitive. In both studies, researchers noted how these apps positioned children as consumers of already constructed content rather than producers of their own knowledge. The use of open-content composing apps as a constructive, student-centered activity may provide a supportive environment for young children's multimodal composing. Rowe and Miller (2015) aim to add to this knowledge base by designing eBook activities and exploring how the affordances of iPads, composing apps, and digital cameras might be used to support the learning of young emergent bilinguals.

Due to the prevalence of mobile devices in both 21st century communication and in classrooms, all students deserve the opportunities to become proficient using technology – but this is problematic because of the inequity in schools (Rowe & Miller, 2015). While the emphasis to integrate technology into early childhood classrooms increases, the student population is simultaneously becoming more multilingual and culturally diverse, with the majority of emergent bilinguals attending low-income schools (as cited by Rowe & Miller, 2015). Although these children have considerable experience using digital tools in their homes,

they may have fewer opportunities to use new technologies at school. This suggests that children's home experiences with technology can become a resource for learning and connect home and school language and literacy practices. However, in schools where instruction is conducted in English, early childhood educators of young emergent bilingual students face challenges in helping these students build English language and literacy skills, in supporting children's use of heritage languages that they may not speak, and in planning culturally relevant instruction (Rowe & Miller, 2015).

One way to use digital technologies in the early childhood classroom is to design eBook activities that provide young children with composing opportunities that are multimodal, multilingual, and multiply-sponsored. Through a two-year design-based research study, Rowe and Miller (2015) explored conditions that supported these learning opportunities. Four-year olds were invited to use open-content apps, iPads, and digital cameras as tools to create their own eBooks and compose in both their languages. Digital tools provided expanded opportunities for multimodal composing. Digital composing apps made it easy for children to integrate multiple modes of representation (writing, photos, voice recordings) and offered easy access to a wide array of multimodal tools (for example, digital color palettes and stamps). iPads and composing apps encouraged students' academic language proficiency through translanguaging – using one's complete language repertoire to be understood and create meaning – by providing oral recording tools that supported young children's multilingual composing. Using the iPad's voice recording tool to make multilingual digital recordings created opportunities for children to incorporate their heritage language into classroom learning activities. iPads and digital cameras afforded new possibilities to share content between home and school and enabled the creation of culturally relevant content. Because children's families are sources of knowledge and skills that can enrich

instruction, digital photography made these funds of knowledge visible and available as legitimate resources for learning.

The eBook activities incorporated the use of three apps: *Drawing Pad* (offering an array of digital tools for freehand drawing and writing that could also be combined with color stock images or photos), *Book Creator* (offering the opportunity to create multi-page eBooks using digital photos or drawings, voice recordings made with the app's sound recording feature and text created freehand or with the app's digital keyboard), and *iBooks* (a library where children could access and read or listen to their own and peer's books). eBook composing events were also designed to incorporate Brian Cambourne's (2009) conditions of language and literacy learning. The following paragraph offers a brief description of these conditions.

Children were *immersed* in the eBook genre individually and in a whole group several times per week. The classroom teacher and researchers composed a *demonstration* eBook that provided multimodal and multilingual *demonstrations* using photos and voice recordings. The *expectation* that children would engage as composers was communicated through invitations to use the digital tools and engage in conversation about their writing. Children *engaged* in digital photography and composing and were responsible for creating the content of their eBooks, deciding which aspects of digital tools were most appropriate. *Approximations* created through emergent writing and invented spelling were valued. Researchers were present during the eBook events to *respond* to texts and support the composing process in different modalities and languages (Rowe & Miller, 2015).

The instructional conditions employed in the eBook activities successfully supported children's multimodal composing – particularly when teachers incorporated language-specific demonstrations to scaffold understandings and supported young, emergent bilinguals' use of both

their languages as resources for creating digital eBooks. Additionally, young children are able to use digital tools to compose eBooks and children interacted with digital tools in both product-focused ways (naming and narrating events and pictures) and process-focused ways (through dramatic and exploratory play, experimenting with visual affordances of the iPad to construct a scene and take on roles). Children easily transferred writing skills between page and screen. In general, page-based and digital-based writing skills were similar, suggesting that there may be no particular advantage to a touchscreen environment. Findings do show that eBook activities provided supportive conditions for young children's emergent writing and provided meaningful and motivating writing contexts. Furthermore, the iPad offers a kind of multimodal composing that can extend the learning opportunities available in paper-based activities.

Visual images, in particular personalized photos taken at home, served as anchors for composing and conversation that included both English and the child's heritage language. Having home photos available for composing was an important home-school connection and positioned the children – rather than the adults – as experts in the conversation. Using digital cameras and iPads increased the two-way travel of culturally relevant content and in this way successfully supported multiply-sponsored composing (by children, family members, teachers). This exchange is particularly important for schools serving students from culturally and linguistically diverse backgrounds (Rowe & Miller, 2015).

2.5   ADDRESSING THE GAP

It is well-established in the literature to date that iPads can be effectively integrated into instruction with the use of an educational technology integration model. Additionally iPads can be utilized to expand learning opportunities in early childhood contexts, as well as facilitate the emergence of early literacy skills and support early literacy learning. However, there is a need to better understand the role that digital experiences play in early literacy instruction and learning, and to consider how digital tools can foster the development of emergent digital literacy skills alongside conventional early literacy skills. iPads have not been extensively studied as a literacy teaching tool. Furthermore, there is a paucity of literature related to the effective integration of creation-based learning tasks – where students use iPads and related open-content applications to create demonstrations of knowledge and understanding in a multimodal way. By examining how creation-based tasks can be effectively integrated into early literacy instruction to facilitate students' literacy learning, this dissertation research aims to address this gap.

3.0   METHODOLOGY

The purpose of this action research study was to examine how to effectively integrate iPads and related open-content applications through creation-based literacy activities into my instruction to teach literacy skills and appropriately scaffold students' literacy learning in an engaging manner. This study employed action research methods to specifically examine three key aspects of learning: (1) how creation-based tasks that utilize iPads and open-content applications engage young learners in *digital literacy practices* and foster the development of digital literacy skills, including understanding and utilizing digital apps and touchscreen interfaces, navigating symbols (such as "X" or "OK"), image buttons and text options, collaborating and communicating with others to complete a shared task, and the creative design of digital artifacts (Kazakoff, 2014); and (2) how engagement in creation-based literacy tasks and digital literacy practices foster the development of students' *agency* and promotes *engagement*. Additionally, the integration of an action research study into my classroom setting has provided significant insight into my teaching practice, specifically related to how it has been impacted by the experiences of integrating creation-based literacy tasks that utilize iPads and open-content applications during small group instruction. For practitioners, like myself, the findings from this study contributed to understandings of effective technology integration and also demonstrated how effective technology integration can be achieved.

3.1   RESEARCH QUESTIONS

The central research question that has guided my study is: *In a 1:1iPad classroom environment, how are creation-based learning tasks that utilize the iPad and related open-content iPad applications effectively integrated into literacy pedagogy to facilitate literacy learning in the kindergarten classroom?* The following sub-questions were also explored: *How do creation-based literacy tasks engage kindergarten students in digital literacy practices? How do these literacy tasks foster the development of students' agency and promote engagement?* and *How has my teaching practice been impacted by these experiences?* The research method I have determined to be most effective in attaining the answers to these research questions was a multi-method qualitative research design. The qualitative methods that my inquiry has adopted combined the ethos of teacher action research with the descriptive nature of case study research.

Given my research questions and my situation as a classroom teacher, whose research interests stemmed from my experiences with the 1:1 iPad reform initiative in my school district, action research was the appropriate methodology. Teacher-action research is grounded in the reality of the school and classroom settings, and through the process of inquiry, it leads to new understandings and changes that make a difference in my teaching and learning (Pine, 2009). McNiff and Whitehead (2006) discuss action research as practitioners developing new ideas, creating new knowledge, and generating theories about improving their work. This model of action research best represents what I wanted to do within my classroom.

As a classroom teacher and teacher-researcher, action research has allowed me to blend my pedagogical knowledge and contextual knowledge of my classroom with my professional knowledge of theories and research in order to make meaningful changes related to my problem of practice: effective iPad integration in the kindergarten literacy curriculum, more specifically

how creation-based learning tasks that utilize iPads and related open-content iPad applications could be effectively integrated into the kindergarten literacy curriculum. Through the process of action research and inquiry, I was able to conceptualize and create knowledge regarding how to effectively integrate iPads into the literacy curriculum, interact with this knowledge, transform it through reflective practice, and then apply the new knowledge to purposefully take action in my classroom to improve teaching and learning. Action research has enabled me to reflect upon my instructional experiences, articulate knowledge about my craft, recognize my expertise, and use this inquiry process to develop a more dynamic environment for teaching and learning.

3.2   CONTEXT AND PARTICIPANTS

This action research study was conducted with my classroom of kindergarten students. As their classroom teacher, and as the teacher-researcher, I was also a participant. As is the case in the average primary classroom, there was a great deal of heterogeneity among my students. Students were of varying achievement and ability levels, learning styles and cognitive abilities, personality traits and demeanors. There were also significant amounts of variance in students' motivation levels, maturity levels, emotional readiness, and chronological age. Differentiated instructional strategies were used to accommodate these diverse learning needs, such as readiness and learning styles, and involved a variety of instructional methods.

Flexible grouping is one such method that has been incorporated into classrooms district-wide to differentiate instruction and personalize learning. As a strategy, flexible grouping employs several different organizational patterns for instruction, including various forms of teacher-led and student-led groups (Radencich & McKay, 1995). Students are grouped and

regrouped according to individual instructional needs, learning styles, targeted skills, and specific activities. During this study, I have worked with and observed small groups of students during a daily, one half-hour block of reading instruction called *flexible reading groups*. In my classroom, students work in small collaborative groups at a *learning station* or *center*. These *learning stations* take three forms: groups that work directly with the teacher, independent groups with structured engagement and supervision by the teacher, and groups facilitated by a paraprofessional or classroom aide. At each *learning station*, students are provided with systematic practice, reinforcement, and explicit instruction in targeted reading skills, respectively, as well as the opportunity to engage in creative activities, learning games, and projects designed to extend literacy learning. Student groupings vary between homogenous groups (based on similar abilities and readiness) and heterogeneous groups (based on differing ability levels and learning styles, used to encourage an understanding of different perspectives and facilitate teamwork). Students rotate to a different *learning station* each day. Students also have the opportunity to move among the groups that best correspond with learning needs and overall learning objectives.

Over the course of fifteen weeks, I had worked directly with small groups of students at one *learning station*. At this station, students were engaged in a series of creation-based literacy activities aligned to a technology integration framework – both have been designed specifically for this inquiry. In these activities, students utilized the iPad and related applications to create a variety of digital products (including an interactive presentation, talking picture, and digital comic book story) that demonstrated their literacy learning. The process by which these activities were developed is described in detail later on in this chapter, and the activities themselves are presented in lesson plan format in Table 7.

3.3   DATA SOURCES

Data was collected using three qualitative methods: focus group interviews, observations, and artifact collection/review (digitally created artifacts). Data was also be obtained from a reflective journal/field notes and audio recordings. All data was analyzed using a standard content analysis and was coded and categorized according to three aspects of learning: digital literacy practices, agency, and engagement.   Key characteristics that distinguish each of these aspects are detailed in Table 1.

Table 1. Aspects of Learning: Key Characteristics

Aspects of Learning: Key Characteristics		
Digital Literacy Practices	**Student Agency**	**Engagement**
Students are: • utilizing digital apps and touchscreen interfaces • correctly using various buttons on the app's toolbar (image or text buttons) and navigation symbols (such as "x", "cancel", or "ok") and showing proficiency while working within an app to create a digital product • taking photos/ editing photos • designing digital artifacts utilizing one or more open-content creation-based apps with teacher guidance • independently creating a digital artifact • collaborating and communicating with others to create a digital artifact that utilizes one or more open-content creation-based app	Student agency is about the student having an active role in their learning. Students are learning how to develop a growth mindset to govern how and what they learn. Students are showing signs of agency when they: • take ownership of work by making decisions regarding how their knowledge of targeted literacy skills is demonstrated (for example, chooses what to take a picture of, what to draw, what to say) • pose questions about the task and their literacy learning and then actively looking for the answers – whether consulting with peers or asking the teacher • communicate their thinking, their choices and reasoning, to peers and/or to the teacher	Student engagement entails sustained connection to learning. Students are emotionally engaged: • enthusiastic • optimistic/positive • curious and interested Students are behaviorally engaged: • concentrating: involved with task • participating in working on task • asking questions (of each other or of the teacher) • helpful to other students (offering suggestions or help)

Student focus group interviews were conducted at three intervals during the course of the study. Two or three students participated in each focus group. The purpose of conducting these student interviews was to gain insight into how creation-based literacy tasks promoted digital literacy practices and impacted student agency and engagement.   Student responses were analyzed using a standard content analysis and were coded and categorized according to three

aspects of learning – digital literacy practices, agency, and engagement – characterized in Table 1. A focus group interview protocol can be located in Appendix A. Although questions had been pre-determined, student responses affected the order by which these questions were asked and had also prompted follow-up questions. Additionally, due to the flexibility of this study design, particular interview questions were added, excluded, or worded differently than what had been initially outlined on the protocol.

Digital artifacts produced by the students to demonstrate learning were also collected as sources of evidence. The design of these artifacts was examined using the characteristics outlined in Table 2.

Table 2. Digital Artifacts: Examination Checklist

Digital Artifacts: Examination Checklist
Digital artifacts created to demonstrate learning will be analyzed based on evidence of the following characteristics: 1. Visual representations (drawings, photographs)   2. Verbal representations (narrations, audio-recordings)   3. Independent and/or collaborative creation of multimodal products that combine graphics, photographs, audio, and/or text (as noted according to each phase of the inquiry)   As evidenced by the creation of a digital artifact and as noted in my reflective journal, students will have also shown evidence of: 4. Correct use of device and app functions   5. Successful navigation of digital screens

Observations were used to compliment these methods and provided insights into how students are engaging in digital literacy practices and how these experiences fostered agency and engagement. Two types of observational methods were utilized: participant observations and non-participant observations.

As the practitioner action researcher, I kept a reflective journal. This journal included notes related to my observations during flexible reading group time and reflections regarding my teaching practice – with the primary focus on how these creation-based literacy tasks that utilized iPads and related applications were integrated in the context of flexible reading groups. The intention of this reflective journal was to assist in building a holistic picture of my experiences during this study. This reflective approach assisted in discerning the effectiveness of teaching strategies related to three aspects of learning: (1) how teaching and learning experiences were scaffolded in order to promote student *engagement*, and guided students in a shift towards higher-order thinking capabilities and understandings; (2) how these experiences laid the foundation for student *agency*; how children were encouraged to be agents in their own learning; and (3) how the implementation of creation-based literacy tasks supported children in the development of *digital literacy practices*. Table 1 outlines key characteristics that distinguish these aspects of learning for this inquiry.

Audio-recordings were also used to capture students' interactions (with one another and myself). These recordings provided insights and valuable data regarding four key aspects of this inquiry:

1) how integrating technology impacted my teaching practice, specifically regarding key elements of effective instruction (the learning environment, methods of instruction, classroom management, and ways that students are guided to integrate new ideas and apply new knowledge) and how my role as the teacher changed from the traditional information giver to one who also shares authority with the students (mediating students' learning through facilitation, modeling, and

coaching to maximize their ability to engage with the learning experiences and

take responsibility for their learning)

2) how students developed a growth mindset to govern how they learn (agency)

3) how students articulated their own engagement

4) how students engaged in digital literacy practices.

Non-participant observations were conducted by a research assistant. These observations took place on average once a week.   The research assistant conducted time sampling using a coded observation protocol. The key characteristics of the three aspects of learning detailed in Table 1 were pre-specified coding categories. The research assistant recorded which of these predetermined indicators were present for an individual student in a small group during a defined time interval of five minutes. The size of small groups did vary, but was often two or three students. The observation protocol can be located in Appendix B.

3.4   DATA ANALYSIS

Three research-based frameworks were systematically used to categorize, summarize, analyze, and discuss the qualitative data gathered during this study for each key aspect of learning: digital literacy practices, agency, and engagement.

To analyze the development of early digital literacy practices and skills, data collected from observations and focus-group interviews, as well as interactions captured with audio-recordings, was discussed in terms of an adapted digital literacy framework based on the work of Walsh, Asha, and Sprainger (2007). Their research focused on the digital literacy skills primary school children needed to become proficient website readers.   In Table 3, an adapted framework

to categorize the key characteristics of digital literacy practices (outlined in Table 1) with which children engaged during a creation-based literacy task utilizing the iPad and related open-content applications is presented.

Table 3. A Framework for Categorizing Emerging/Early Digital Literacy Practices During Creation-Based Literacy Tasks

A Framework for Categorizing Emerging/Early Digital Literacy Practices During Creation-Based Literacy Tasks *adapted from the work of Walsh et al. (2007)	
	Digital Literacy Practices: Key Characteristics

Coding Skills	Operational Skills
	▪ using various buttons on the app's toolbar (image or text buttons) and navigation symbols (such as "x" or an arrow) and key words (such as "cancel", "ok", "save", "next")
	▪ knowledge and use of icon functions and home button
	▪ utilizing the touchscreen interface
	   o tapping
	   o scrolling
	   o swiping

Semantic Skills	Communication Skills
	▪ talks about thinking and ideas to peer or teacher
	▪ asks questions
	
	*Note: The communications skills overlap with key characteristics previously identified (Table 1) to indicate student agency.
	
	Collaboration Skills
	▪ Collaborating and communicating with others to create a digital artifact using an open-content application
	   o sharing individual ideas
	   o listening to others' ideas
	   o valuing others' ideas
	   o defending or rejecting an idea (not the student who contributed the idea)
	   o making decisions together
	   o using everyone's ideas to create something meaningful

Pragmatic Skills	Creation Skills ▪ using iPads and related applications for a given task ▪ creating new texts: digital artifacts (presentation, talking picture, digital story) using an open-content/open-format application ▪ taking/editing photos
Critical Skills	Critical Practices ▪ critically evaluating digital artifacts to detect underlying biases, points of view, and ideologies ▪ understanding how choices of color, images, etc. construct meaning

To provide insight into how the learning experiences during the course of this inquiry provided a foundation for student agency, data collected from observations and focus-group interviews, as well as interactions captured with audio-recordings, was viewed through the lens of the sociocultural theory. From the perspective, agency is understood as grounded in social interactions, mediated by the teacher, (Vygotsky, 1978) and related to the learning activity as

much as to the individual student (Lehtonen, 2015; Rainio, 2008). Data was discussed using a framework developed by Anna Pauliino Rainio (2008), whose ethnographic research examined student agency in an early education setting. According to Rainio (2008), agency can be categorized into three types: passive, responsive, or initiative. These types of agency are characterized in Table 4.

Table 4. A Framework for Categorizing Student Agency During Creation-Based Literacy Tasks

A Framework for Categorizing Student Agency (Rainio, 2008)	
	Student Agency: Key Characteristics
Passive	-no sign of participation
Responsive	-answering a question -following a direction -participating
Initiative	❖ Supportive: -supporting another's idea or suggestions with one's own idea or suggestion, or supporting with a gesture (nod, thumbs up) ❖ Constructive: -developing a new suggestion, asking a new question (or follow-up question) or contributing to an activity *supportive and constructive initiatives are directed towards creating, sustaining, or sharing in something that the class or small group is doing ❖ Deconstructive: -distracting oneself from the task ❖ Resistant: -refusal -testing power positions (traditional teacher/student roles) -being oppositional *deconstructive and resistant initiatives are opposite of supportive and constructive, however can redefine traditional power relations in the classroom setting

To provide insight into students' engagement during this study, children's engagement patterns, as evident in observations and focus group interviews, were characterized based on the work of Kucirkova et al.'s (2014), whose research analyzed children's hands-on engagement with a variety of iPad apps, among them a story-making app purposefully designed by the research team to support children's engagement in story-making activities.   Individual engagement was categorized using Bangert-Drowns and Pyke's taxonomy (Figure 2). Bangert-

Drowns and Pyke (2001) studied elementary children's engagement with computer-based educational software and developed a seven-level taxonomy to analyze various aspects of children's literate engagement.   The taxonomy is arranged hierarchically, and defines different qualities of student engagement in terms of its complexity, relationship with intrinsic motivation, and degree to which *literate thinking* is approximated. *Literate thinking*, according to Bangert-Drowns and Pyke (2001), entails the ability to evaluate the content of texts, interpret texts from a meaningful perspective, and then reflect on one's personal values and experiences.

For this inquiry analysis, I have further adapted the framework used in the research of Kucirkova et al.'s (2014) by redefining terms and concepts within each level to align with the use of mobile devices and related open-content applications for the purposes of a creation-based task (Table 5).   The conception of literacy in this study has added a new, unique set of possibilities to the notion of engagement.

Level 1	Literate thinking	Student interprets software content from multiple and personally meaningful perspectives. Student manipulates software features to explore alternative interpretations as an opportunity to reflect on personal values or experiences.
Level 2	Critical engagement	Student investigates operational and content-related limitations of the software. Student manipulates software features to test personal understandings or limitations of the software presentations.
Level 3	Self-regulated interest	Student creates personal goals within the software to make the software as personally interesting as possible. Student adjusts software features to sustain deeply involved, interesting, or challenging interactions. Student adapts software for personally defined purposes.
Level 4	Structure dependent engagement	Student is sensitive to and competent with software operation and navigation. Student pursues goals communicated by the software and responds to operational, navigational, or content organization.
Level 5	Frustrated engagement	Student possesses clear goals when working with the software but is unsuccessful in accomplishing them. Student knows what the software can do, but cannot accomplish it. Student may manifest stress or frustration in negative comments, confusion, aggression, erratic behavior, agitation, distress, or anxiety.
Level 6	Unsystematic engagement	Student has unclear goals when working with the software. Student moves from one incomplete activity to another without apparent reason. Student successfully completes simple tasks within the software but does not link tasks for higher-order goals.
Level 7	Disengagement	Student avoids working with the software or discontinues use prematurely. Student may tinker with software in a seemingly purposeless and unresponsive way. Or, student may in fact turn away from the software or resist using it at all.

Figure 2. Bangert-Drowns & Pyke's Taxonomy (as used by Kucirkova et al., 2014)

Table 5. A Framework for Categorizing Student Engagement During Creation-Based Literacy Tasks

Framework for Categorizing Student Engagement **The framework used in the research by Kucirkova et al.'s (2014) has been further adapted in order to encompass the use of mobile devices and open-content applications (used for creation-based literacy tasks).**	
	Student Engagement: Key Characteristics
Level 1: **Literate Thinking**	• Student interprets content created from multiple and personally meaningful perspectives. • Student manipulates application features to explore alternative interpretations as an opportunity to reflect on personal values or experiences.
Level 2: **Critical Engagement**	• Student investigates operational and content-related limitations of the application. • Student manipulates features of the application to test personal understandings or limitations of the application itself.

Level 3:
Self-regulated Interest
	• Student creates personal goals within the application to make the process of creating a digital product as personally interesting as possible.
	• Student adjusts features of the application to sustain deep involvement, remain interested, and/or challenge interactions with the application.
	• Student adapts features of the application for a personally defined purpose.
	• Student meets targeted learning objectives and demonstrates understanding through the creation of a digital artifact.
	   o Student applies understanding of letter/sound correspondence and manipulates an open-content/open-format application in the manner of their choice to create a talking picture and/or narrated presentation.
	   o Student applies understanding of key story components (beginning, middle, and end), and manipulates an open-content/open-format application in the manner of their choice to design and narrate (or retell) a digital story.

Level 4: **Structure Dependent Engagement**	• Student is sensitive to and competent with the operation of an application and the mobile device (iPad). • Student pursues overall learning goals and goals communicated by the application and responds to operational features, navigational features, or content organization within the app.
Level 5: **Frustrated Engagement**	• Student possesses clear learning goals when working within the application but is unsuccessful in accomplishing them. • Student knows what the application can do, but cannot figure out how to accomplish it. • Student may manifest stress or frustration in negative comments, confusion, aggression, erratic behavior, agitation, distress, or anxiety.
Level 6: **Unsystematic Engagement**	• Student has unclear goals when working with the application. • Student moves from one step in creating a digital product to the next without any apparent reason or understanding of plan. • Student moves aimlessly through various features and toolbars within an application, but does not appear to show any understanding what could be created to demonstrate learning. • Student successfully completes the task of creating a digital product, but does not link the task to higher-order/ overall learning goals.
Level 7: **Disengagement**	• Student avoids working with the application completely. • Student closes application prematurely. • Student may tinker with the application in a seemingly purposeless and unresponsive way. • Student may resist using the application.

The combination of methodological approaches has provided valuable data related to how iPads can be used to promote fundamental and digital literacies, expand literacy learning opportunities, foster students' engagement and agency, and impact teaching and learning. Using the aforementioned frameworks as tools to organize and interpret data has facilitated a

systematic and comprehensive analysis, and this has promoted rich discussions regarding the findings. It is my hope that this research will serve as a useful knowledge base for integrating iPads in early years literacy instruction and contribute to understandings about the role that digital experiences play in literacy development and proficiency.

3.5   DESIGN OF LESSONS AND INSTRUCTIONAL ACTIVITIES

The *gradual release of responsibility model* is an instructional framework designed to guide teachers in shifting their instruction from teacher-centered to student-centered, thereby enabling teachers to scaffold students' learning (Pearson & Gallagher, 1983). Research supports this model as an effective tool for developing reading skills and comprehension. Northrop and Killeen (2013) adapted this framework for tablet use in the classroom, offering the following guidelines: 1) teach targeted literacy skills without the app; 2) explain and model the app; 3) guided practice with the app; 4) independent practice with the app, checking to make sure that students know how to use both the app and the literacy content in the app. Following this framework, the technology is situated within the students' "zone of proximal development" (Vygotsky, 1978). For the purposes of my inquiry, and to ensure that students are working at an appropriate instructional level and effectively working with targeted literacy skills and content, I have further adapted the *gradual release of responsibility model* to scaffold children's literacy learning and encompass the integration of both independent and collaborative creation-based literacy tasks that utilize open-content iPad applications. This adapted model, *A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks*, comprises three phases: Introductory Creation-Based Tasks, Independent Creation-Based Tasks, and

Collaborative Creation-Based Tasks. Phases were designed to integrate sequentially; integrating one phase means integrating all previous phases as each one has been developed based on the preceding. The individual components within each phase have also been strategically planned to teach students efficiently by scaffolding both literacy instruction and iPad integration.   This framework is based on my research and knowledge of content and pedagogy, with the primary focus on first identifying literacy learning goals and instructional objectives before selecting the technology. To that end, technology serves as the tool used to support the learning goals and enable the creation of digital artifacts to demonstrate literacy learning.   This framework is presented in Table 6.

Table 6. A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks

A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks *adapted from the work of Northrop and Killeen (2013) and Pearson and Gallagher (1983)		
INTRODUCTORY CREATION-BASED TASKS	Step 1: Select learning goal, determine objectives and assessments; select app that aligns with goals	
	Step 2: Use direct instruction to teach targeted literacy skills without the app	
	Step 3: Explain and model one open-content app. Give explicit instructions on technology aspects of the app (key functions).	
	Step 4: Guided practice with the app and a targeted literacy skill: use the selected app to complete a literacy-related task, wherein the student would create a digital artifact to demonstrate literacy learning. • Check to ensure that students know how to use the app and can demonstrate learned literacy skill.	
	Step 5: Supervised independent practice with the app: use the selected app to complete a literacy-related task, wherein the student would create a digital artifact to demonstrate literacy learning *repeat steps 1-5 for each individual app that corresponds with a creation-based literacy task	
INDEPENDENT CREATION-BASED TASKS	Step 6: Select learning goal, determine objectives and assessments; select app(s) that align with learning goals	
	Step 7: Use direct instruction to teach targeted literacy skills without the app	
	Step 8: Explain and (re)model one app at a time. Give (or review) explicit instructions on technology aspects of the app (key functions).	
	Step 9: Guided practice choosing one or more multiple open-content applications to create a digital artifact to demonstrate literacy learning. • Check to ensure that students know how to use the app and can demonstrate learned literacy skill.	
	Step 10: Supervised independent practice choosing one or more open-content applications to create a digital artifact to demonstrate literacy learning. *repeat steps 6-10 for each individual app that corresponds with a creation-based literacy task	
COLLABORATIVE CREATION-BASED TASKS	Step 11: Select learning goal, determine objectives and assessments; select app(s) that align with goals	
	Step 12: Use direct instruction to teach targeted literacy skills without the app	
	Step 13: Explain and (re)model one app at a time. Give (or review) explicit instructions on technology aspects of the app (key functions).	
	Step 14: Structured collaborative learning: Guided practice collaborating to create a digital artifact to demonstrate understanding of a certain literacy skill(s). Provide students with direct instruction, demonstrations, think-alouds, and opportunities for practice with collaborative and communication skills. • Check to ensure that students know how to use the app and can demonstrate learned literacy skill.	
	Step 15: Supervised collaborative learning: Independent practice in small groups, collaborating to create a digital artifact to demonstrate understanding of a certain literacy skill(s) *repeat steps 13-15 for each individual app that corresponds with a creation-based literacy task	

My vision for teaching and learning is a classroom where each child has opportunities for active and thoughtful engagement, where students learn to take ownership of their learning and feel competent in achieving goals, and where critical thinking skills are fostered through

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collaborative work – a classroom where every child is challenged on a daily basis and where each one is educated with respect to his/her individual learning style, learning needs, and individual interests. One way to differentiate learning and cultivate a dynamic classroom atmosphere is to create transformative learning opportunities for teaching and student-led learning by integrating mobile technology (iPads) in meaningful ways. Utilizing the adapted gradual release of responsibility model, *A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks* (as presented in Table 6), I systematically planned and designed a series of lessons and creation-based literacy activities that utilize open-content iPad applications to be integrated into small group instruction. These activities are directly aligned to this framework.

During the design and planning processes, I had considered both the SAMR and TPACK technology integration models. Initially, I began planning through the lenses of modification and redefinition (the transformation level of SAMR) while continually reflecting on my knowledge of content, pedagogy, and technology. First, I reviewed the literacy standards for kindergarten and selected literacy learning goals and objectives for each phase of the framework:

- Phase 1: *Introductory Creation-Based Tasks*:
  - <u>Foundational Skills</u>: The students will demonstrate knowledge of letter/sound correspondence.
- Phase 2: *Independent Creation-Based Tasks*:
  - <u>Response to Literature</u>: The students will understand a story and talk about a story as an ordered series of events (beginning, middle, end).
- Phase 3: *Collaborative Creation-Based Tasks*:

o <u>Response to Literature</u>: The students will understand a story and talk about a story as an ordered series of events; the students will apply this understanding and collaborate to create their own story.

Then I considered what applications would best support these goals, which were appropriate and available, and could be used for authentic demonstrations of learning through the creation of digital artifacts. What I have developed is a series of lesson plans and creation-based literacy activities that blend knowledge bases together and align with the technology integration framework, *A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks* (Table 6). The lesson plans and creation-based activities are described in detail in Table 7. The technology integration framework is presented on the left side of the table and the corresponding lessons and activities are presented on the right side. All lessons and activities are aligned to Pennsylvania Common Core Standards and broad literacy learning goals, outlined in Table 8.

Table 7. Effective Teaching and iPad Integration in Small Group Instruction: Creation-Based Literacy Tasks

Effective Teaching and iPad Integration in Small Group Instruction: Creation-Based Literacy Tasks			
A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks *adapted from the work of Northrop and Killeen (2013) and Pearson and Gallagher (1983)*		**Creation-Based Literacy Tasks: PHASE 1** **FOUNDATIONAL SKILLS: Letter/Sound Correspondence** Anticipated Time Frame: ➢ Planning and Instruction of Targeted Literacy Skill(s): Steps 1 and 2: will vary based on curriculum, schedule, pacing guide, classroom environment ➢ Creation-Based Literacy Tasks: Steps 3 through 5: 5 weeks *based on one (at times two) 30-minute small group lesson(s) per week		
INTRODUCTORY CREATION-BASED TASKS	Step 1: Select learning goal, determine objectives and assessments; select app that aligns with goals	Standard: CC.1.1 Learning Objective: The students will demonstrate knowledge of letter/sound correspondence. Target Letters: M, R, S, T, N, P, C, A Students will: • use correct letter formation to write letter(s) • identify correct sound(s) for each letter • say the letter sound(s) correctly • apply knowledge of letter/sound correspondence to identify an object that begins with a given letter/sound		
	Step 2: Use direct instruction to teach targeted literacy skills without the app	Use core curriculum (Storytown) to teach skills.		
	Step 3: Explain and model one app at a time. Give explicit instructions on technology aspects of the app (key functions/ toolbars). Then proceed directly to the corresponding guided task.	***ShowMe*** *ShowMe* is an interactive whiteboard application that allows students to create presentations using images, drawings, and text, while at the same time recording their voices.	***ChatterPix Kids*** ***by Duck Duck Moose*** *ChatterPix Kids* is a photo-editing application that allows students to turn still images into talking images using audio-recording.	

Table 7 (continued)

		GUIDED TASK 1:	GUIDED TASK 2:
	Step 4: Guided practice with the app and a targeted literacy skill: use the selected app to complete a literacy-related task, wherein the student would create a digital artifact to demonstrate literacy learning. • Check to ensure that students know how to use the app and can demonstrate learned literacy skill. Complete Tasks 1 & 2 for the following target letters: M, R, S, T, N, P, C	**GUIDED TASK 1:** Using the *ShowMe* app, students will create a digital presentation that demonstrates their knowledge of targeted letter sounds. PROCEDURES: 1. Brainstorm - using things around the classroom – that begin with the targeted letter sound. Students will then decide which they would like to use in their presentation. 2. In *ShowMe*, students will create a new presentation, and use the insert picture tool / take photo option to take a picture of an object that begins with the targeted letter. 3. Resize picture on screen. 4. Use the drawing tool to draw the upper and lowercase letter correctly on the interactive white board. 5. Have students practice what they will say about the targeted letter. 6. During the practice, students will tell where they will markup different places on the screen to focus the viewer's attention. The sample script for students is as follows: *"I am going to tell you all about the letter ___.* *(Markup: underline the letter written on the screen when stating this)* *The letter ____ says ___.* *I took a picture of a ____ (state object name).* *(Markup: circle the picture on the screen when introducing it)* *____ (object name) starts with ___.* *____ (isolate the beginning letter sound), ____ (say the name of the object in the picture)."* *(Example: /m/ /m/ monster)* 7. Make the recording. Be sure to have students mark the screen to focus the viewer's attention. 8. Playback the recording and evaluate. Questions to prompt student's self-evaluation: ○ *Did you tell the correct letter sound?* ○ *Did you markup the screen appropriately during your recording?* ○ *Did you speak loudly and clearly?* ○ *Can you understand what you're saying?* 9. Save the recording as a 'draft' in *ShowMe*. *Please note: The district in which I work provides access to the basic version of the *ShowMe* app (not premium). Students do NOT have their own accounts, therefore there are no sharing or posting capabilities. Students' creations/recordings are saved as 'drafts' and stored on the app's home screen for revisiting on individual iPads.	**GUIDED TASK 2:** Using the *ChatterPix Kids* app, students will create a talking picture (digital artifact) that demonstrates their knowledge of targeted letter sounds. PROCEDURES: 1. Brainstorm - using things around the classroom – that begin with the targeted letter sound. Students will then decide which they would like to use in their creation. 2. In *ChatterPix Kids*, students will then use the take photo option to take a picture of an object that begins with the targeted letter sound. 3. Have students select the placement of the "mouth". 4. Students will then use the app's voice recording tool to personify the object – state what the object is and what the beginning sound is. 5. Students will have to take on the role of the object they have taken a picture of. The sample script for students is as follows: *"Hello, I am a _____ (state object name).* *____ begins with ____ (letter name).* *____ (isolate the beginning letter sound), ____ (say the name of the object in the picture)."* *(Example: /m/ /m/ monster)* 6. Have students playback the recording and evaluate. Questions to prompt student's self-evaluation: ○ *Does the recording tell the correct letter sound?* ○ *Did you speak loudly and clearly?* ○ *Can you understand what you're saying?* 7. Add background and stickers to the digital artifact. 8. Save this artifact to the Camera roll and to the *ChatterPix* Gallery.

Table 7 (continued)

	Step 5: Supervised independent practice with the creation apps: use selected apps to complete a literacy-related task, wherein the student would create a digital artifact to demonstrate literacy learning	**INDEPENDENT TASK** Directions for students: Use the app of your choice (either *ShowMe* or *ChatterPix*) to create a recording about a targeted letter. If the letter is a vowel or a consonant that makes a hard/soft sound (C, G, X), make two separate recordings to demonstrate your understanding.

A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks ***adapted from the work of Northrop and Killeen (2013) and Pearson and Gallagher (1983)**		**Creation-Based Literacy Tasks: PHASE 2** **RESPONSE TO LITERATURE: Story Retell** Anticipated Time Frame: ➢ Planning and Instruction of Targeted Literacy Skill(s): Steps 6 and 7: will vary based on curriculum, schedule, pacing guide, classroom environment ➢ Creation-Based Literacy Tasks: Steps 8 through 10: 5 weeks *based on one (at times two) 30-minute small group lesson(s) per week
INDEPENDENT CREATION-BASED LITERACY TASKS	Step 6: Select learning goal, determine objectives and assessments; select app(s) that align with learning goals	Standard: CC 1.2, 1.3, 1.4, 1.5 Learning Objective: The students will understand a story and talk about a story as an ordered series of events. Students will: • sequence - identify components of a story (the beginning, middle, and end of a story) • illustrate these components using a graphic organizer • with guidance and support, use digital tools to independently create a digital presentation that retells the story, focusing on these three key components • apply knowledge of concepts of print when creating a digital story/slideshow
	Step 7: Use direct instruction to teach targeted literacy skills without the app	Use core curriculum (Storytown) to teach skills.
	Step 8: Explain and (re)model one app at a time. Give (or review) explicit instructions on technology aspects of the app (key functions).	*ShowMe*

Table 7 (continued)

| Step 9: Guided practice choosing one or more multiple open-content applications to create a digital artifact to demonstrate literacy learning | **GUIDED TASK**

Using ONE of the stories from either the "Friends at School" theme (in the Storytown reading curriculum) or from recent class read alouds, students will:
• retell the selected story - identifying the key components: beginning, middle, end
• illustrate these components using a graphic organizer
• create a digital presentation/recording that retells the key components of the selected story

PROCEDURES:

1. Reread selected story.
2. During story, identify the key components – beginning, middle, end.

Planning Phase:
3. Students will then illustrate the key story components using a beginning, middle, end graphic organizer (using either paper/pencil method or dry erase boards).
*see Figure 3 for sample graphic organizer using paper/pencil method

Creation Phase: Create a Digital Presentation:
4. Students will create a *ShowMe* presentation for the story that incorporates multiple slides:

  o Slide 1: Title Slide
  o Slide 2: Beginning of the Story
  o Slide 3: Middle of the Story
  o Slide 4: End of the Story
  o Slide 5: The End Slide (culminating slide of presentation)

5. Students will illustrate each part of the story as it corresponds to their writing plan (and slide organization as detailed above); students will also create a title and ending slide.
6. Students will practice what they will say when making their recording. As they practice, have students also indicate where they will mark up (annotate) their presentation to focus their viewer's attention.

The sample script for students is as follows:
This is the story of_____(slide 1 – state name of book).
In the beginning of the story,_____(slide 2)
Markup where appropriate.
In the middle of the story,_____(slide 3)
Markup where appropriate.
At the end of the story,_____(slide 4)
The End! (slide 5)

7. Students will record themselves retelling the selected story: focusing on the key components of beginning, middle, and end.

8. Playback recording and evaluate it.

Questions to prompt self-evaluation:
• *Did you correctly tell about the key components of the story?*
• *Did you markup the screen appropriately during your recording?*
• *Did you speak loudly and clearly?*
• *Can you understand what you're saying?*

9. Save the presentation as a 'draft' in *ShowMe*. |

Table 7 (continued)

	Step 10: Supervised independent practice choosing one or more open-content applications to create a digital artifact to demonstrate literacy learning	**INDEPENDENT TASK:** Directions for students: Your task is to create a presentation in *ShowMe* about a story of your choice that shows the beginning, middle, and end. (I will provide students will a selection of books from which they can choose.) 1. First, create a writing plan. Illustrate each part of the story on the graphic organizer. Talk about the parts of the story with your teacher. 2. Next, create a title slide, draw illustrations for the story components, and create an ending slide. 3. You can also add pictures from the book that corresponds to your illustrations. Be sure to resize your pictures so that they do not cover up your writing and drawings/illustrations. 4. Practice what you will say in your recording. Be sure to tell where you will mark up your presentation to focus my attention. 5. Create your recording. 6. Playback your recording and evaluate it. 7. Save the presentation as a 'draft'.

A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks ***adapted from the work of Northrop and Killeen (2013) and Pearson and Gallagher (1983)**		**Creation-Based Literacy Tasks: PHASE 3** **RESPONSE TO LITERATURE: Story Creation** Anticipated Time Frame: ➤ Planning and Instruction of Targeted Literacy Skill(s): Steps 11 and 12: will vary based on curriculum, schedule, pacing guide, classroom environment ➤ Creation-Based Literacy Tasks: Steps 13 through 15: 5 weeks *based on one (at times two) 30-minute small group lesson(s) per week
	Step 11: Select learning goal, determine objectives and assessments; select app(s) that align with goals	Standard: CC 1.2, 1.3, 1.4, 1.5 Learning Objective: The students will understand a story and talk about a story as an ordered series of events. The students will apply this understanding and collaborate to create their own story. Students will: • sequence - identify components of a story (the beginning, middle, and end of a story) • illustrate these components using a graphic organizer • with guidance and support, use digital tools to independently create a digital story that identifies these three key components • apply knowledge of concepts of print when creating a digital story/slideshow
	Step 12: Use direct instruction to teach targeted literacy skills without the app	Use core curriculum (Storytown) to teach skills.
COLLABORATIVE CREATION-BASED LITERACY TASKS	Step 13: Explain and (re)model one app at a time. Give explicit instructions on technology aspects of the app (key functions).	***Superhero Comic Book Maker*** *– by Duck Duck Moose* *Superhero Comic Book Maker* is storytelling application that allows students to create an animated comic book with monsters and superhero characters. This app also allows students to put multiple scenes together and record the story using an audio voice-recording feature.

Table 7 (continued)

| Step 14: Structured collaborative learning: Guided practice collaborating to create a digital artifact to demonstrate understanding of a certain literacy skill(s)

*Provide students with direct instruction, demonstrations, think-alouds, and opportunities for practice with collaboration and communication skills. | **GUIDED TASK:**
Using the *Superhero Comic Book Maker* app, students will:
• create their own story – identifying key components: beginning, middle, end
• illustrate these key components using a graphic organizer
• create a digital artifact

PROCEDURES:
Brainstorming Phase:
1. Students will use the built-in scenes and characters (monsters, superheroes, other built-in images) in the *Superhero Comic Book Maker* to brainstorm ideas for their story.

Questions to prompt student thinking:
▪ *You are making a story about a superhero(s) – what is the job of a superhero?*
▪ *Where would the story begin? (using the scenes in Superhero Comic Book Maker app for ideas)*
▪ *What could your superhero do in this story?*
▪ *Where would your story end?*

This is a collaborative learning activity.
During this phase, students will be given explicit instruction and guided practice in working collaboratively. Teacher will model these skills using demonstrations and "think-alouds" to promote meaningful collaboration and conversation.
✓ Personal Responsibility Skills:
  o seeing oneself as having a stake in the task and having responsibility for working as a group member to achieve a goal and/or create a product
✓ Interpersonal Skills:
  o active listening: listening to others' ideas
  o asking questions
  o taking turns
  o giving feedback respectively
  o keeping an open mind and valuing others' ideas
✓ Teamwork Skills:
  o negotiating and compromising: defending or rejecting an idea (**not** the student who contributed the idea)
  o participating
  o how to ask for help and when to ask for help
  o making decisions together
  o using everyone's ideas to create something meaningful

2. Students will determine setting(s) and action(s) that will take place during each component of the story. Students will also have the option to name the main character(s).

Planning Phase:
1. After students agree upon key story components (and character names), students will illustrate and illustrate the story components using a graphic organizer (using either paper/pencil or dry erase boards).
*see Figure 2 for sample graphic organizer using paper/pencil method

Creation Phase: Digital Story
1. Students will create a story that incorporates multiple scenes:

  o Scene 1: Beginning of the Story
  o Scene 2: Middle of the Story
  o Scene 3: End of the Story

Note: Each student will create this collaborative story on his/her own iPad.

2. Students select scenes and characters for each part of the story as it corresponds to their plan (and scene organization as detailed above). Save each scene when finished.

3. Students will then group scenes together: drag finished scenes on top of each other in order for the app to link them together and prepare the sequence to be recorded as a story.

4. Students will practice what they will say when making their recording. As they practice, students will practice moving the characters on the screen to focus their viewer's attention. (These movements will be recorded in their final presentation.) Students will be encouraged to take turns telling the story and moving the characters around on the screen. |

Table 7 (continued)

		The sample script for students is as follows:
		This is the story of _____ (first scene – tell audience the name(s) of your superhero(s)).
		In the beginning, _____ (first scene – tell what is happening here)
		Move characters around the screen when appropriate
		Next – or – In the middle, _____ (second scene – tell what the superhero(s) are doing here)
		Move characters around the screen when appropriate
		Finally – or – At the end, _____ (final scene – tell how the superhero story ends)
		The End! (final scene)
		1. Students will record themselves telling their story (record on one student's iPad at a time).
		2. Playback recording and evaluate it.
		Questions to prompt self-evaluation:
		o *Did you correctly tell about the key components of the story (according to the plan?*
		o *Did you move the characters appropriately during your recording?*
		o *Did you and your partner (or group members) take turns telling the story?*
		o *Did each of you speak loudly and clearly?*
		o *Can you understand what was said?*
		3. Save the story in *Superhero Comic Book Maker*.
	Step 15: Supervised collaborative learning: Practice in small groups, collaborating to create a digital artifact to demonstrate understanding of a certain literacy skill(s)	**COLLABORATIVE TASK:** Directions for students: Your task is to work together to create a story about a superhero using *Superhero Comic Book Maker*. Your story should include three scenes (one for the beginning, one for the middle, and one for the end) and at least one superhero. The scenes and superheroes should be different than those used in your last story. 1. Use the scenes and characters in *Superhero Comic Book Maker* to brainstorm ideas for your story. Decide on your story components (beginning, middle, end) and character names. 2. Create a plan. Illustrate each part of your story using a graphic organizer. Talk about the parts of the story with your teacher. 3. Next, select scenes and characters for each part of the story as it corresponds to your plan (and scene organization as detailed above). 4. Save each scene when finished. 5. Group scenes together: drag finished scenes on top of each other in order for the app to link them together and prepare the sequence to be recorded as a story. 6. Practice what you will say in your recording. Be sure to tell where you will mark up your presentation to focus my attention. 7. Create your recording. 8. Playback your recording and evaluate it. 9. Save the story in *Superhero Comic Book Maker*.

Table 8. Pennsylvania Common Core Standards

Pennsylvania Common Core Standards

1.1 Foundational Skills
Students gain a working knowledge of concepts of print, alphabetic principle, and other basic conventions.
- CC.1.1.K.D Demonstrate basic knowledge of one-to-one letter-sound correspondence. Associate the long and short sounds with common spellings for the five major vowels.

1.2: Reading Informational Text
Students read, understand, and respond to informational text—with an emphasis on comprehension, vocabulary acquisition, and making connections among ideas and between texts with a focus on textual evidence.
- CC.1.2.K.A With prompting and support, identify the main idea and retell key details of text.
- CC.1.2.K.B With prompting and support, answer questions about key details in a text.
- CC.1.2.K.J Use words and phrases acquired through conversations, reading, and being read to, and responding to texts.
- CC.1.2.K.L Actively engage in group reading activities with purpose and understanding

1.3: Reading Literature
Students read and respond to works of literature—with emphasis on comprehension, vocabulary acquisition, and making connections among ideas and between texts with focus on textual evidence.
- CC.1.3.K.A With prompting and support, retell familiar stories including key details.
- CC.1.3.K.C With prompting and support, identify characters, settings, and major events in a story.
- CC.1.3.K.J Use words and phrases acquired through conversations, reading, and being read to, and responding to texts.
- CC.1.3.K.K Actively engage in group reading activities with purpose and understanding.

1.4: Writing
Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.
- CC.1.4.K.J Make logical connections between drawing and writing.
- CC.1.4.K.P Recount a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.
- CC.1.4.K.U With guidance and support, explore a variety of digital tools to produce and publish writing or in collaboration with peers.

1.5 Speaking and Listening
Students present appropriately in formal speaking situations, listen critically, and respond intelligently as individuals or in group discussions.
- CC.1.5.K.A Participate in collaborative conversations with peers and adults in small and larger groups.
- CC.1.5.K.B Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CC.1.5.K.E Speak audibly and express thoughts, feelings, and ideas clearly

Figure 3. Sample Graphic Organizer for Story Retell Plan and Story Creation

3.6   ETHICS

As my study involves research on human subjects (students), permission was needed from the Institutional Review Board (IRB) to conduct my study. Additionally, the parents and guardians of the kindergarten students in my classroom were provided with detailed information regarding the nature of this action research study including its purpose, duration, procedures, and the risks and benefits of participation. Parents and guardians were also informed about their right to decline or withdraw their child's participation in this study at any time. An IRB approval notification can be located in Appendix C. An informed consent document can be located in Appendix D.

4.0   FINDINGS

4.1   KEY ASPECTS OF LEARNING

The central question that has guided my research interests and inquiry is: *In a 1:1iPad classroom environment, how are creation-based learning tasks that utilize the iPad and related open-content iPad applications effectively integrated into literacy pedagogy to facilitate literacy learning in the kindergarten classroom?* The succeeding sub-questions have also been explored: *How do creation-based literacy tasks engage kindergarten students in **digital literacy practices**? How do these literacy tasks foster the development of students' **agency** and promote **engagement**?* and *How has my teaching practice been impacted by these experiences?* In this chapter, I will present the principal findings from the current investigation and discuss three key aspects of learning as they relate to effective technology integration and pedagogy: (1) how creation-based tasks that utilize iPads and open-content applications engage young learners in ***digital literacy practices*** and foster the development of digital literacy skills, including understanding and utilizing digital apps and touchscreen interfaces, navigation symbols, image buttons and text options, collaborating and communicating with others to complete a shared task, and the creative design of digital artifacts (Kazakoff, 2014); and (2) how engagement in creation-based literacy tasks and digital literacy practices foster students' ***agency*** and ***engagement***.

4.2   DATA COLLECTION

Data has been collected using three qualitative methods: focus group interviews, observations, and digital artifact collection/review. Data was also obtained from my reflective journal/field notes and audio recordings captured during flexible group time. All data has been analyzed using a standard content analysis, coded, and categorized according to three aspects of learning: digital literacy practices, agency, and engagement.   The key characteristics that distinguish each of these aspects, as detailed in Table 1 (Chapter 3), were the pre-specified coding categories for all methods of data collection.

As is the case in any average primary classroom, there is a great deal of heterogeneity among my students. Students are of varying achievement and ability levels, learning styles and cognitive abilities, personality traits and demeanors. There are also significant amounts of variance in students' motivation levels, maturity levels, emotional readiness, and chronological age. Thirteen students participated in flexible group time within my classroom over the course of the study, and each student was observed at least once. Students were observed on a weekly basis by a research assistant (non-participant observer), who conducted time sampling using a coded observation protocol (Appendix B). The research assistant recorded which predetermined indicators were present for an individual student in a small group during a defined time interval of five minutes. The size of small groups was either two or three students.

Interviews were conducted with six different students during the course of the study. The interview protocol can be located in Appendix A. Transcripts of interviews were dual-coded. First, interview transcripts were coded according to which key aspects of learning (digital literacy practices, agency, engagement) were indicated. These coded aspects of learning (digital literacy practices, agency, engagement) were then coded again according to the pre-specified

categories and characterizations based on each aspect's corresponding framework for analysis (Tables 3, 4, 5 respectively).

Digital artifacts created by students as demonstrations of learning were collected and analyzed based on predetermined characteristics outlined in Table 2. Data was obtained from my reflective journal and audio recordings. Audio recordings were collected an average of three times per week. Audio recordings were transcribed. Three audio recordings for each phase of the study were analyzed using a standard content analysis and were coded and categorized according to three aspects of learning: digital literacy practices, agency, and engagement.

In the remainder of this chapter, I present findings from observations, focus group interviews, and digital artifact collection as they relate to students' ***agency, engagement***, and engagement with ***digital literacy practices***. Findings from the qualitative data gathered during this study related to each aspect of learning will be categorized and summarized in narrative form. Following each narrative account, the aspects of learning will be visually represented using a corresponding research-based framework (as described in Chapter 3). Each framework has been previously adapted to encompass the use of mobile devices and related open-content applications in early literacy instruction for the purposes of a creation-based task.

4.3   DIGITAL LITERACY PRACTICES

In this section, findings and evidence will be presented as related to the research question, *How do creation-based literacy tasks engage kindergarten students in **digital literacy practices**?* To answer this question, observations of students' engagement in digital literacy practices were analyzed and digital artifacts created by the students' were collected and analyzed.

Across the fifteen weeks of this study, findings from observations and interviews indicated that all students – regardless of individual differences in learning and development – consistently demonstrated engagement in digital literacy practices. Findings suggest that students are engaging in digital literacy practices in three specific ways – with regard to coding skills, semantic skills, and pragmatic skills.

Coding skills, more specifically operational skills, refer to the use of various buttons on the applications' toolbar (image or text buttons), navigation symbols (such as "X", "cancel", "next" or arrows), icon functions (app buttons), home button, and utilizing elements of the touch screen interface (tapping, scrolling, and swiping). Evidence from observations and transcripts from focus group interviews and audio-recordings indicates that students are highly capable when using the touchscreen interface. Students fluently tapped, scrolled, and swiped as was necessary during each flexible group session. Students recognized the home button on the iPad and icons (app buttons) of those apps that were utilized - *ShowMe, ChatterPix Kids,* and *Superhero Comic Book Maker*. Findings also demonstrate that students are proficient when using various buttons and images on the toolbar within each of these applications. In *ShowMe*, students knew what buttons to push in order to take a picture, write and illustrate, change colors, erase, and make a recording. Additionally, students knew that in a presentation with multiple slides, they could touch the arrow buttons to take them back and forth within the presentation. In *ChatterPix Kids*, students recognized the buttons to push to insert/take a picture, record their voice, add decorations, and they knew how to use the touchscreen to personify their image by drawing a mouth. Students consistently and independently took photos and inserted them onto the screen in both *ShowMe* and *ChatterPix Kids*. In *ShowMe*, students edited their photos with ease - resizing them and repositioning them on the screen. In *Superhero Comic Book Maker*,

students understood how to select a scene, add characters, and record themselves telling about their story.

Semantic skills refer to two sets of skills: communication and collaboration skills. Communication skills include asking questions and talking about thinking and ideas to one's peers or the teacher. Across each phase of this study, students regularly asked questions of the teacher and talked about their thinking and creation processes for the different digital artifacts. Students talked about what they were doing within each application, whether it was making a recording about a letter, creating a talking picture, telling a story, or creating a comic book story. Students also talked specifically about applying understandings of various operational skills as they progressed towards completion of the overall task.

Collaboration include three sets of skills: (1) personal responsibility skills: seeing oneself as having a stake in the task and having responsibility for working as a group member to achieve a goal and/or create a product; (2) interpersonal skills: active listening: listening to others' ideas, asking questions, taking turns, giving feedback respectfully, keeping an open mind and valuing others' ideas; (3) teamwork skills: negotiating and compromising, defending or rejecting an idea (and not the student who contributed the idea), participating, how and when to ask for help, making decisions together, using everyone's ideas to create something meaningful.

Common Core State Standards call for students to develop skills for collaboration. Students were taught these skills explicitly during Phase 3 of the study. In this phase, students worked in a small group to create their own story about a superhero and were to apply their collective understandings about key story elements to design this story. Using *Superhero Comic Book Maker* app, the students collaborated to create a story with key story elements (a beginning, middle, and ending scene), characters, and a story script. Students collaborated to create the

story on the iPads of each group member, sharing the jobs of selecting each scene, putting in the characters and other clip art images onto the scenes, and using the operational buttons within the app to complete and record the story.

Non-participant observations indicate that students were engaged in collaboration during the creation of a digital story. These observations did not indicate specific sets of collaboration skills (personal responsibility, interpersonal, teamwork) as previously defined. As the classroom teacher, I had provided students with explicit instruction in collaboration skills, modeled appropriate participation, and created opportunities for meaningful collaboration. Data from participant observations (as evident in my reflective journal) and transcripts from audio-recordings indicate that these sets of skills were taught explicitly to the students in order to promote their collaborative learning. It should be noted that teaching students to actively collaborative and interact positively is not limited to the activities completed during the course of this inquiry. Students regularly work in small collaborative groups, with guided practice in applying these essential skills. Findings from participant observations that indicate the explicit instruction of key collaborative skills and are presented in Table 11.

Pragmatic skills, specifically creation skills, include using iPads and related applications for a given task, creating digital artifacts using open-content applications that included taking/editing photographs and making recordings. As evidenced by observations and transcripts from focus group interviews and audio-recordings, students had shown a high degree of proficiency in creating digital products using each of these apps. All students designed and created digital products with direct instruction, as well as created digital artifacts both independently and collaboratively with teacher guidance. When creating each digital artifact, students incorporated visual representations by taking and editing photographs. Additionally,

students easily created these digital artifacts by adding verbal representations with recordings. The creation of digital artifacts was facilitated by students' knowledge of operational skills, as previously described.

Findings from non-participant observations of students' engagement in digital literacy practices are presented in Tables 9, 10, and 11 for each phase of this inquiry. Excerpts taken from interview and audio-recording transcripts were also included to provide classroom context and have been color-coded to represent how students were engaging with specific digital literacy practices.

Table 9. Digital Literacy Practices: Introductory Creation-Based Tasks

Digital Literacy Practices
Phase 1 – Introductory Creation-Based Tasks
Focus: *Foundational Skills*: *Letter/Sound Correspondence*

Note: The original framework designed to organize this data (Table 3) was developed by Walsh et al. (2007).

	Digital Literacy Practices Observed	**Example Student Comments: Excerpts taken from interview transcripts**

Coding Skills	Operational Skills
	• using various buttons on the app's toolbar (image or text buttons) and navigation symbols (such as "x", "cancel", "ok", "save", "next")
	• knowledge and use of icon functions and home button
	• utilizing the touchscreen interface
	   o tapping
	   o scrolling
	   o swiping
		Phase 1: Introductory Creation-Based Tasks
		Focus: *Foundational Skills*
		Students are using *ChatterPix* to make a talking picture that demonstrates knowledge of letter/sound correspondence.
		
		T: **Can you tell me what app you're using right now?**
		S: *ChatterPix*
		T: **So what are you doing in this app? Are you making something?**
		S: I'm um…making the pictures, like making it here (student points to the screen) and then they talk, and we do like make them like they're really talking.
		T: **So how do you make the pictures talk?**
		S: The mouth, I have to um… draw a mouth on the like picture.
		T: **How do you do that?**
		S: I just draw (student moves finger across the screen in the motion of drawing a mouth).

Semantic Skills	Communication Skills • talks about thinking and ideas to peer or teacher • asks questions	T: **And then what do you do?** S: Push a microphone and then it like records me and I have to tell like I'm the picture. (student is pointing to the screen while talking) T: **The microphone? What does that button look like?** S: It's red and it's got a microphone and I push it and it says go in 3, 2, 1, go and then I go and say my recording. (student holds up iPad to his mouth, which prompts my next question)
Pragmatic Skills	Creation Skills • using iPads and related applications for a given task • creating new texts: digital artifacts (presentation, talking picture, digital story) using an open-content/open-format application • taking/editing photos	T: **I see you're holding your iPad close to your mouth, why do you do that?** S: cause this is here (student points to the speakers) and I have to like talk like there or my mouth (meaning the mouth drawn on the screen) doesn't do anything like really talking and I'm trying to make it talk like me T: **Is there something you can do well in this app?** S: I'm good at everything. T: **You're good at everything! Wow! Can you tell me certain things?** S: The recordings. And, the … like … when we decorate the pictures. And, um…. when we take the pictures. T: **You mean you know how to do all of that without any help?** S: Ya! (with a huge smile!) And I can like make the letters to say what it is. (student is referring to inserting text onto the picture on the 'decorating' screen) and I can put hats and guitars and stuff on the picture and it like makes it like look good. T: **Is there anything you were having trouble doing today?** S: Um, no. T: **You said you were taking a picture, how did you know how to do that?** S: I pushed the button and it was my camera and I choosed a thing that I wanted to take pictures of and then I … and then I taked a picture. T: **How did you know which button was the camera?** S: I know cause it's orange and it has a camera on and then I pushed it and my iPad is like the camera and I taked like, I taked my picture.
Critical Skills	None observed	

Table 10. Digital Literacy Practices: Independent Creation-Based Tasks

Digital Literacy Practices
Phase 2 – Independent Creation-Based Literacy Tasks
Focus: *Response to Literature: Story Retell*

*Note: The original framework designed to organize this data (Table 3) was developed by Walsh et al. (2007).

	Digital Literacy Practices Observed	**Example Student Comments: Excerpts taken from interview transcripts**
Coding Skills	Operational Skills ▪ using various buttons on the app's toolbar (image or text buttons) and navigation symbols (such as "x", "cancel", "ok", "save", "next") ▪ knowledge and use of icon functions and home button ▪ utilizing the touchscreen interface ○ tapping ○ scrolling ○ swiping	*Phase 2: Independent Creation-Based Tasks* *Focus: Response to Literature: Story Retell* Students are using *ShowMe* to make a presentation that retells key components of a familiar story. T: Can you tell me what app you're using right now? S: *ShowMe* T: *ShowMe*? Oh, okay, and what are you doing in this app? Are you making something? S: Ya, I'm doing, I'm um… drawing of Sneezy the Snowman…. He um…he melted from drinking hot chocolate (student points to the screen on which she is illustrating this part from the story). T: Who is Sneezy the Snowman? S: Him (student points to the illustration on the iPad). He's in that book (points to a copy of the book sitting on the table) and he keeps melting after he does stuff (student giggles). T: Oh! So you're just making a drawing of Sneezy or is your drawing part of something else you're making?
Semantic Skills	Communication Skills ▪ talks about thinking and ideas to peer or teacher ▪ asks questions	S: No, um… it's part of…it's with this (student changes the slide in the presentation – Sneezy drinking hot chocolate is on slide 2, slide 1 has the title of the story "Sneezy the Snowman") T: Can you tell me what that is (meaning the title slide)? S: It says Sneezy the Snowman (student points to each word) T: Is that a name of something? S: Oh ya it's the story. And first Sneezy is cold (student changes the slide back to slide 2)
Pragmatic Skills	Creation Skills ▪ using iPads and related applications for a given task ▪ creating new texts: digital artifacts (presentation, talking picture, digital story) using an open-content/open-format application ▪ taking/editing photos	T: First? That sounds like a word you use when you are telling about the parts of story you know. Are you making something in this app that tells about this story? S: Mmm, hmm. This. (student points to the graphic organizer with the beginning, middle, and end of the story – this plan was made before she started building the presentation in *ShowMe*) T: Does it just have this part? Or do other parts happen too? S: No this is first. (student points to the graphic organizer) Then Sneezy is cold again but he goes and gets in the hot tub and then he like melts because the water is too hot (student giggles and points to this part on the graphic organizer). And then last Sneezy gets ice cream seven scoops high from the ice cream store so he doesn't um…melt anymore the kids get it for him and he doesn't melt. T: So those other parts in your plan (graphic organizer), are you going to make drawings in *ShowMe* for those too? S: Yeah and then I'm going to put in a picture like this from the story (student changes back to slide 1 where the title is written and a small picture is on the screen of the front cover of the story book) T: A picture? How did you put that on the screen? S: I go and pushed that (student points to the mountain on the toolbar) T: So after you push that you can take a picture? S: yeah T: Can you show me? S: Ya … (student pushes the mountain and then a drop down menu appears – student looks at me)…I…

Table 10 (continued)

		T: **Hmmm, that doesn't look like you can take a picture yet.** (student shakes head no) **Do you have to push something else?** S: oh yeah I have to … I forget…can you help me? T: **Certainly, you have to find the words that say take – /t/ /t/ take – photo** (as I point **to the words for the student).** (student needs to touch the words 'take photo' and then it changes to the camera S: Yeah, I touch that … that take picture – (student touches and it changes to the camera) T: **Right! Okay, let's touch "cancel". Can you tell me how do you do the drawings on your screen?** S: I just do this (student moves finger across the screen). T: **I see that when you drew Sneezy the Snowman you used several different colors. How do you make things different colors, like his carrot nose and eyes?** S: Oh, I just push this (student pushes a color on the color palette) and then this one (student points to the one with a white box outlining it) is the color that it is. Oh! Or I know that this (student pushes the plus sign) makes this! (the plus sign brings up sets of color palettes to choose from) And I could do this one too! (meaning change the color palette to a different set of colors). T: **So would you say this is something you know how to do well when you're in this app?** S: Yeah, I can draw good and write letters and I can um…make other colors. T: **Wow! But what if you make a mistake when you're doing that? What would you do then?** S: (student giggles) I can erase it. Like this (student draws something else on her screen and pushes the eraser tool and erases it with her finger). T: **So you know how to do all of that without any help?** S: Yeah! (smiling!) T: **Wow! That is really impressive! Is there anything you are having trouble doing today?** S: Nope. T: **In this app you are going to make a recording and you're going to talk about your drawings and pictures for each part of the story. While you talk about each part, you're going to get to change the slide. That way, whatever you say will go with the picture you see. Do you know how to make a recording on this app? Do you remember what button to push?** S: Umm, I um… I push um… this red button. T: **The red button, that's right! When you're finished with all of your drawings, we will practice what you want to say for your recording and then you will get to make it!**
Critical Skills	None observed	

Table 11. Digital Literacy Practices: Collaborative Creation-Based Tasks

Digital Literacy Practices
Phase 3 – Collaborative Creation–Based Literacy Tasks
Focus: *Response to Literature: Story Creation*

*Note: The original framework designed to organize this data (Table 3) was developed by Walsh et al. (2007).

	Digital Literacy Practices Observed	**Example Student Comments: Excerpts taken from interview transcripts**

Coding Skills	Operational Skills
	▪ using various buttons on the app's toolbar (image or text buttons) and navigation symbols (such as "x", "cancel", "ok", "save", "next")
	▪ knowledge and use of icon functions and home button
	▪ utilizing the touchscreen interface
	  ○ tapping
	  ○ scrolling
	  ○ swiping
		Phase 3: Collaborative Creation-Based Tasks
		Focus: *Response to Literature: Story Creation*
		Students are using *Superhero Comic Book Maker* to create a story, applying understanding of key story components.
		
		T: Can you tell me what app you're using right now?
		S2: The Superhero app
		T: *Superhero Comic Book Maker*! What are you working on in this app? Are you making something?
		S1: We're um…making a story about a superhero
		T: You're making the story? You mean YOU made up all the parts?
		S1 & S2: yeah!
		T: How did you do that?
		S1: Well we um…we like looked at the pictures (student is referring to the background scenes already available in the app that can be chosen to use) and then we … we…
		S2: We picked them for the ones in the story.

Semantic Skills	Communication Skills
	▪ talks about thinking and ideas to peer or teacher
	▪ asks questions
	
	Collaboration Skills
	Collaborating and communicating with others to create a digital artifact using an open-content application
	
	The following sets of skills were evidenced in my reflective journal and in audio-recordings.
	▪ Personal Responsibility Skills:
	  ○ seeing oneself as having a stake in the task and having responsibility for working as a group member to achieve a goal and/or create a product
	▪ Interpersonal Skills:
	  ○ active listening: listening to others' ideas
	  ○ asking questions
	  ○ taking turns
	  ○ giving feedback respectively
	  ○ keeping an open mind and valuing others' ideas
	▪ Teamwork Skills:
	  ○ negotiating and compromising: defending or rejecting an idea
	  ○ participating
	  ○ how to ask for help and when to ask for help
	  ○ making decisions together
	  ○ using everyone's ideas to create something meaningful
		T: Oh that's right! I see that you have your plan here (I'm referring to the graphic organizer that students completed together before designing the story using the app). So you used the pictures, the scenes, in the app and picked the ones you wanted for your superheroes?
		S1 & S2: Ya!
		
		T: Were there certain things … certain parts … that you had to put in your story so that it made sense?
		S1: Um… ya, we um… had to have a first and a middle and an end.
		T: Can you decide together who would like to tell me about the first part?
		(students look at each other and one does eenie meenie miney mo)
		S2: In the beginning Superhero Diamond and Superdog Brownie are under the sea.
		S1: Then they go and fight the bad guys.
		S2: and then when they're done they go home and change.
		
		T: (pointing to the scene on one student's iPad) How did you put this scene in the background for this part of your story? Were there certain buttons you had to push?
		S2: Um…um… (student is looking at her own iPad screen, but they are in the middle of putting this scene together and not at the home screen of the app where they would have chosen certain buttons to advance to this point)
		
		T: Would it help you remember if we looked at the app on my iPad and started from the beginning?
		S1: (nods – takes my iPad, swipes to find the *Superhero Comic Book Maker* app and presses the button)
		S2: Oh I forgot … I know … I …you have to do the purple button (it says 'comic maker') and then …we like we picked the one for this (pointing to the one that matches her partner's iPad screen)

Table 11 (continued)

Pragmatic Skills	Creation Skills • using iPads and related applications for a given task • creating new texts: digital artifacts (presentation, talking picture, digital story) using an open-content/open-format application • taking/editing photos	T: **Why this one and not that one? (I pointed to another scene on the screen)** S2: (giggles) That's not what happened! T: **Right! So you are making your story just like what you planned!** T: **Who decided what was going to happen in your story and who the superheroes were going to be?** S1 & S2: (look at each other) we… we…us T: **Remember back when we were making your story plan, you had to decide together what would happen and who your superheroes were going to be. But I also remember that for the middle of the story you had one idea (to student 1) and you had another idea (to student 2). How did you figure out what was going to happened?** S1 & S2: (pause….thinking….) T: **Maybe you don't remember, that's okay. What could you do to help you decide on your story ideas together?** S1: eenie meenie miney mo S2: rock paper scissors T: **Those are great ideas!** T: **Is there anything you know how to do really well in this app?** S1: put Superdog and other stuff in S2: pick the pictures T: **If I wanted to make the scene on my iPad look like yours, how would I put Superdog and the other pictures on?** S1: you would like push this (student is pointing to a small blue square at the top of my screen) and then find the dog T: **Can you do it for me?** S1: (student pushes the blue button and a toolbar appears at the bottom of the screen; student then swipes back and forth and points to the dog for me) T: **So I should push the dog here? (on the toolbar)** S2: uh-huh T: **(I push the dog) Mmmm…nothing happened, he's not in my scene yet…is there something else I have to do?** S2: just do this (student touches the center of the screen and the dog appears, student then touches the double arrow in the corner of the box outlining the dog – and then enlarges the picture) T: **Oh, wow! You really do know how to do this well!**
Critical Skills	None observed	

4.4   DIGITAL ARTIFACTS

Four different types of digital artifacts were collected and analyzed.

- Phase 1: *Introductory Creation-Based Tasks*: Foundational Skills
  (two artifacts)
  - a *ShowMe* presentation in which students demonstrated knowledge of letter sounds by creating an interactive slide
  - a talking picture created in *ChatterPix Kids* in which students demonstrated knowledge of letter sound correspondence.
    - Figures 4 and 5 display examples of these artifacts and include the students' narrations.

- Phase 2: *Independent Creation-Based* Tasks: Response to Literature
  (one artifact)
  - a *ShowMe* presentation consisting of five slides – in which students retold (narrated) the key components (beginning, middle, and end) of a familiar story of their choice
    - Figure 6 displays an example of this artifact and includes the student's narration.

- Phase 3: *Collaborative Creation-Based Tasks*: Response to Literature
  (one artifact)
  - a comic-book themed digital story consisting of three scenes created in *Superhero Comic Book Maker* in which students demonstrated understanding of sequence and story components by creating their own story about a superhero.
    - Figure 7 displays an example of this artifact and also includes the students' narration.

Artifacts were collected from eleven different students, for a total of forty-four artifacts. Each artifact was examined and assessed based on the predetermined checklist (Table 2). Every artifact, regardless of the student, creation-based task, or the application utilized, contained both visual and verbal representations. Every artifact was a multimodal creation, done either independently or collaboratively. Each student had shown evidence of correct use of the device and application functions, and successfully navigated various digital screens. This determination

was made based on notes from my reflective journal and viewing the final digital products. Digital artifacts suggest that students are engaging in digital literacy practices. Table 12 delineates these findings.

Phase 1 Digital Artifact
• Students created a talking picture using *ChatterPix Kids,* in which they demonstrated knowledge of letter sound correspondence.   • The students determined the mouth placement, recorded their voice, decorated the image with built-in stickers, and then evaluated their work.

Student Narration	Screenshot
Hi! I am a six. *Six starts with S.* */s/ /s/ six, /s/ /s/ six.*	

Figure 4. Phase 1 Digital Artifact: *ChatterPix Kids*

Phase 1 Digital Artifact

- Students created a one-slide presentation using *Show Me,* in which they demonstrated knowledge of letter sound correspondence and correct letter formation.
- The students made markings on the screen while recording to focus the viewer's attention.
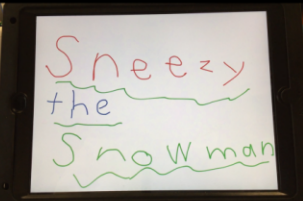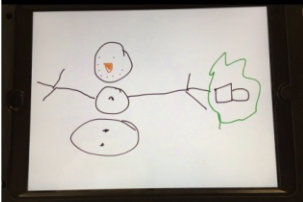- The students evaluated the creation upon completion of the recording.

Student Narration	Screenshot
I took a picture of the letter S. *S...* *Santa starts with S.* */s/ /s/ Santa, /s/ /s/ Santa.*	

Figure 5. Phase 1 Digital Artifact: *ShowMe*
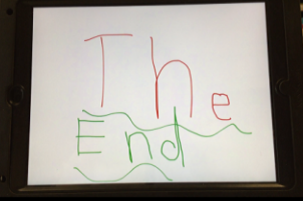
Student Narration	Screenshot
I'm telling you the story of Sneezy the Snowman.	
In the beginning, he was feeling cold and the kids gave him hot chocolate. He melted!	
Then he was feeling cold again. He got into a hot tub and then he melted! There's the hot tub. And this is the middle of the story.	
This is at the end. Sneezy was feeling hot. He ate some ice cream. Then he said he felt just right. There's his ice cream.	
The end.	

Figure 6. Phase 2 Digital Artifact: *ShowMe*

Phase 3 Digital Artifact

- Students created a comic-book themed digital story consisting of three scenes created in *Superhero Comic Book Maker* in which they demonstrated understanding of sequence and story components by creating their own story about a superhero.
- This comic book played in sequence after students recorded their story. During the recording, students moved the characters around the screen to show various actions.
- Upon completion, students evaluated their creation.

Student Narration	Screenshot
In the beginning of the story, Superhero Doggie and Superhero Diamond were swimming in the ocean.	
Then, sea monsters came and attacked them – a octopus and a unicorn – and Superhero Doggie and Superhero Diamond had to fight them. Ka-Pow! Bif!	
At the end, after Superhero Diamond and Superhero Doggie fought the bad guys they came back home to their hideout and got changed.	

Figure 7. Phase 3 Digital Artifact: *Superhero Comic Book Maker*

Table 12. Examination of Digital Artifacts: Creation-Based Literacy Tasks

Examination of Digital Artifacts: Creation-Based Literacy Tasks				
Characteristics (from Table 2)	**Phase 1:** *ShowMe* -One Slide Presentation	**Phase 1:** *ChatterPix* -Talking picture	**Phase 2:** *ShowMe* -Five Slide Presentation (story retell)	**Phase 3:** *Superhero Comic Book Maker* -Comic Book/ Story (three scenes) (story creation)
Visual Representations	Photograph, handwritten letters (upper and lowercase) using the app's dry erase tools	Photograph, letter (typed from the keyboard), decorations/ stickers (available from the app clip art gallery)	Photographs from a storybook, handwritten title (using dry erase tools), illustrations of key story components	Scenes (from the app's gallery) and characters (from the app's clip art gallery)
Verbal Representations	Audio-Recording	Audio-Recording	Audio-Recording	Audio-Recording
Creation of multimodal products	Created a digital product that integrated: photographs, audio, drawings	Created a digital product that integrated: photographs, text, audio, stickers (clip art)	Created a digital product that integrated: photographs, text, drawings/illustrations, audio	Created a digital product that integrated: characters (clip art stickers), audio
Correct use of device and app function	As evidenced by the creation of each digital artifact and as noted in my reflective journal, students have also shown evidence of correct device/app use.			
Successful navigation of digital screens	As evidenced by the creation of each digital artifact and as noted in my reflective journal, students have also shown evidence of successful navigation.			

In the following two sections, findings and evidence will be presented as related to the research question: *How do creation-based literacy tasks foster the development of student's agency and promote engagement?* To answer this question, observations of students' agency and engagement were analyzed.

4.5   AGENCY

Findings suggest that through explicit instruction of strategies and collaboration skills, scaffolded learning experiences, guided thinking and ongoing feedback, immersion in the creation-based literacy tasks using the iPad and creation-based apps fostered student agency in important ways. Students consistently and continuously demonstrated a growing ability to take agency throughout each phase of the study.   Observational patterns revealed that students presented specific formulations of agency: responsive and initiative.

Based on the work of Rainio (2008), responsive agency will be interpreted as students asking questions, following directions, and participating. Initiative agency was presented in two ways: supportive – students supporting another's idea or suggestion with one's own idea or suggestion; and constructive – developing a new suggestion, asking a new question, contributing to an activity, and making decisions about work (Rainio, 2008). Throughout the course of the study, students were encouraged to make choices and extend their own learning in meaningful ways. Incorporating choice into the lesson design and integrating creation-based literacy tasks fostered students agency, as they were encouraged to take control of how they wanted to demonstrate a literacy concept and what their digital artifact would look like. Every student observed was encouraged to participate, ask questions, talk about thinking, take ownership for the creation, and make decisions about aspects of the digital products and work – this included choosing what to illustrate or take a picture of, what to say during an audio-recording, and what details to include in their story. In this way, students' agency was manifested in their choice of learning content and knowledge demonstration.

While students engaged in various creation-based literacy tasks, particularly during phase 3 when they collaborated to design a story that demonstrated their understanding of key story

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components (beginning, middle, and end), it not only fostered a collaborative relationship among the students in the small group and support their ability to take agency, the substance of the work they were doing was grounded in digital literacy practices as well. These creation-based tasks positioned the students as competent users of technology and capable learners who were developing a growth mindset that would enable them to take ownership of their learning. Using iPads for the purposes of creation-based tasks to demonstrate literacy learning promotes the development of student agency.

Findings from non-participant observations of students' growing ability to take agency as are presented in Tables 13, 14, and 15 for each phase of this inquiry. Excerpts taken from interview and audio-recording transcripts were also included to provide classroom context. Students' comments have been color-coded to represent specific characteristics of agency.

Table 13. Student Agency: Phase 1 – Introductory Creation-Based Tasks

Student Agency
Phase 1: Introductory Creation-Based Tasks
Focus: *Foundational Skills*

*Note: The original framework to characterize student agency (Table 4) was developed by Rainio (2008).

	Student Agency: Key Characteristics Observed	Example Student Comments: Excerpts taken from interview transcripts or audio–recording transcripts
Passive	-no sign of participation	None recorded
Responsive	-answering a question -following a direction -participating	Students are using *ShowMe* to make a presentation that demonstrates knowledge of letter/sound correspondence. T: …Did you think of something you could take a picture of that begins with T? S: Ya! Um…turtle? T: Oh! Turtle! Where do you see a turtle? S: There …(student points up on the wall at the front of the classroom, above the board, to the alphabet letters – each one accompanied by a picture)… T: Oh! Yes! S: I can zoom in and get my picture! T: Way up there on the alphabet! Okay! Turtle! S: But I might want to think of something else…that might be hard to picture.. to get a picture of… T: That is entirely up to you! Whatever you decide is okay, as long as it begins with the letter T.
Initiative	❖ Supportive: -supporting another's idea or suggestions with one's own idea or suggestion, or supporting with a gesture (nod, thumbs up) ❖ Constructive: -developing a new suggestion, asking a new question (or follow-up question) or contributing to an activity -making decisions about work (for example: choosing what to take a picture of, what to say, what to draw, how to mark-up presentation) *collaboratively or independently *supportive and constructive initiatives are directed towards creating, sustaining, or sharing in something that the class or small group is doing	Students are using *ChatterPix* to make a talking picture that demonstrates knowledge of letter/sound correspondence. T: Is there something you can do well in this app? S: I'm good at everything. T: You're good at everything! Wow! Can you tell me certain things? S: The recordings. And, the … like … when we decorate the pictures. And, um…. when we take the pictures. T: You mean you know how to do all of that without any help? S: Ya! (with a huge smile!) And I can like make the letters to say what it is. (student is referring to inserting text onto the picture on the 'decorating' screen) and I can put hats and guitars and stuff on the picture and it like makes it like look good. T: So the part where you put guitars and hats on your picture, do you have to put just those things? S: No, I can put whatever thing I want. But I have to put the um letter to say what it is. T: The letter, is there a certain letter that goes with your picture? S: Mmm, hmm. C. T: Why the letter C? S: /k/ /k/ cat (student is identifying the first sound). T: Oh! That makes sense! So the other things on your picture, they are just things you wanted to put there? S: Yeah, I wanted it to look like this. But sometimes I use other stuff, I just like it.
	❖ Deconstructive: -distracting oneself from the task	None observed
	❖ Resistant: -refusal -testing power positions -being oppositional	None observed

Table 14. Student Agency: Phase 2 – Independent Creation-Based Tasks

Student Agency
Phase 2: Independent Creation-Based Tasks
Focus: *Response to Literature: Story Retell*

*Note: The original framework to characterize student agency (Table 4) was developed by Rainio (2008).

	Student Agency: Key Characteristics Observed	Example Student Comments: Excerpts taken from interview transcripts or audio-recording transcripts
Passive	-no sign of participation	None recorded
Responsive	-answering a question -following a direction -participating	Students are using *ShowMe* to make a presentation that retells key components of a familiar story, "Sneezy the Snowman". Each student has a graphic organizer (paper copy) to plan what they will illustrate and narrate in their slideshow. T: So, we need to figure out in your story, "Snowmen at Night", what happens at the beginning, what happens in the middle, and what happened at the end of the story. Let's start at the beginning – you can use the book and you need to draw something…about the beginning part of the story. What do you think you'll draw?
Initiative	❖ Supportive: -supporting another's idea or suggestions with one's own idea or suggestion, or supporting with a gesture (nod, thumbs up) ❖ Constructive: -developing a new suggestion, asking a new question (or follow-up question) or contributing to an activity -making decisions about work (for example: choosing what to take a picture of, what to say, what to draw, how to mark-up presentation) *collaboratively or independently *supportive and constructive initiatives are directed towards creating, sustaining, or sharing in something that the class or small group is doing	S1: I think that I'll draw when the kid tried the snowman and he was wondering that what do snowmen do (student is looking in the book) T: So this part where it's like it melted? S1: Ya. T: Okay! You're ready for the next part (to S1). So in the beginning the little boy finds a melted snowman and thinks – what in the world do they do at nighttime? S1: Ya! T: In the middle of the story (as I use the book and turn the pages), what's going on? S1: He's drinking cold cocoa…and…um… T: Ya, there's some other things happening here in the middle as well. S1: And …um… T: What do the snowmen do at night? (using the story book) S1: Um…he …um…bumps into each other and falls down. T: And they're playing …. S1: It's snowball fight! T: Ya, it looks like they're doing a lot of fun activities. Okay, so which one would you like to illustrate for the middle of the story? You can look through and decide which one (fun activity) you want to choose. S1: they're ice skating T: Oh, the one where they're skating! S1: Mmm, hmm. (giggles) like that (student points to one of the snowman ice skating on his belly in the book) T: So, one of the things they do at night is they…. S1: skate! (student then starts to illustrate the middle of the story on her graphic organizer).
	❖ Deconstructive: -distracting oneself from the task	None observed
	❖ Resistant: -refusal -testing power positions -being oppositional	None observed

Table 15. Student Agency: Phase 3 – Collaborative Creation-Based Tasks

Student Agency
Phase 3: Collaborative Creation-Based Tasks
Focus: *Response to Literature: Story Creation*

*Note: The original framework to characterize student agency (Table 4) was developed by Rainio (2008).

	Student Agency: Key Characteristics Observed	**Example Student Comments: Excerpts taken from interview transcripts or audio-recording transcripts**
Passive	-no sign of participation	None recorded
Responsive	-answering a question -following a direction -participating	Students are using *Superhero Comic Book Maker* to create a story, applying understanding of key story components. Students are illustrating key components in a graphic organizer (paper copy) before building the story using the app. T: …you're going to be coming up with your very own story about a superhero, but the thing about this job is you have to do it together, and that means the parts of the story that you come up, you have to agree on them.
Initiative	Supportive: -supporting another's idea or suggestions with one's own idea or suggestion, or supporting with a gesture (nod, thumbs up) Constructive: -developing a new suggestion, asking a new question (or follow-up question) or contributing to an activity -making decisions about work (for example: choosing what to take a picture of, what to say, what to draw, how to mark-up presentation) *collaboratively or independently *supportive and constructive initiatives are directed towards creating, sustaining, or sharing in something that the class or small group is doing	We've talked about how stories have a part that happens in the beginning, and then they have a part that happens next – in the middle – and then they have a part at the end. And when these go in order, the story makes sense! Otherwise… the story doesn't make any sense. So to help you come up with your story, we're going to use some of the pictures and characters in the app. Do you remember what the app looks like? S1 & S2: Ya! T: Okay, go ahead and find it! And if your volume is up, go ahead and turn it down once you touch the app. (both students swipe to find the app and turn the volume down on their individual device) …When you touch the app, this is the screen that comes up, and you have three choices that you could make. To be able to make parts of the story and pictures for the story, we're going to touch 'comic maker' (as I point to this button). It's at the very top. Now, what you see in front of you are places that we could be at in our story. Now your story is going to be about a superhero, so you – together – need to decide where would you like your superhero to begin in the story? (students are looking at the screen and giggling). …we talked the last time that a superhero has a certain job, right? What's a job of a superhero? S1: Um…to like save people T: To save people! S1: and fight villains! T: fight villains, fight bad guys, okay! Would you agree with that (to S2)? S2: Uh-huh. T: Okay, where you would like your superhero to begin in your story? And we'll think, too, about what do we want to have that superhero doing in the story. (students are thinking…) What's your idea? (to student 2) Which picture (referring to the predesigned scenes in the app) would you like him to start at? S2: Um…in the sea! T: Oh! Under the sea! (student is giggling) Okay, touch it (on the screen – student touches), and we can get a better look at it. And what's your idea? (to student 1) S1: Um…the sea, too. T: Oh! This is good! … It's easier to work together because now you've already agreed on something! If you touch it, there's your scenery! (both students touch the sea on their individual iPads) S2: If there are sea monsters, he will probably fight them! (student 1 is now drawing this scene on the graphic organizer) T: Now the only thing missing is our superhero in this picture! So, what we need to do is figure out who…what you want your superhero to look like…who you want that to be. So before we continue, let's … look at your app. And you swipe along the bottom…there are all kind of different characters and things that you can add onto your scene for this part. Do you have a superhero in mind that you like? S2: I like the girl with purple hair. T: Oh! A girl with purple hair? S2: Ya! T: (to student 1) do you see that girl with purple hair and do you like it? S1: oh um…I like the um..dog. T: Okay, so I hear we have two different ideas in mind. But this is only one story, so we've got to agree on whose going to be in it. You have a couple of choices. You could pick one - we could either have the girl OR the dog. Or … the girl and the dog could be a team. S2: Yeah! S1: Ooooh!

Table 15 (continued)

		T: And whatever you're going to think of in your story, they could do it together. S2: Ya! S1: Mmm, hmm. T: So which one sounds like what you want? S1: Um, they can be together and like a team. S2: Mmm, hmm….ya the team T: Like a team? Okay. So we have a superhero girl and a superhero dog and they're in the ocean and what are they going to do? S2: They're going to fight the sea monsters. T: (to student 1) Do you like that idea or do you have a different idea? S1: Um…(thinks for a few seconds)…I like that idea!
	Deconstructive: -distracting oneself from the task	None observed
	Resistant: -refusal -testing power positions -being oppositional	None observed

4.6   ENGAGEMENT

Across the fifteen weeks of this study, all students observed – regardless of individual differences in learning styles and development – were behaviorally engaged, as evidenced by concentration and involvement with each task, regularly asking and answering questions, and on many occasions offering help to other students in the small group. Students were also emotionally engaged – as evidenced by enthusiasm, optimism/positivity, curiosity, and involvement with the task. Students' literacy engagement patterns will be characterized according my adaptation of Bangert-Drowns and Pykes' (2001) taxonomy (detailed in Table 5). Bangert-Drowns and Pyke (2001) organized children's literate engagement with educational software hierarchically into seven distinct levels (Figure 2). In keeping with this hierarchy, my adaptation describes children's engagement with creation-based literacy tasks that integrate iPads and open- content applications. Findings from this study (presented in table 16) suggest that students are engaging with mobile devices and open-content applications in four specific ways:

through structure-dependent engagement, self-regulated engagement, critical engagement, and literate thinking.

Findings revealed that in many instances, children's engagement could be characterized as structure-dependent. Structure-dependent engagement occurred when students showed competency with the operation of an application and of the mobile device (iPad), and when students responded to the operational features, navigational features, or content organization within the app in order to pursue overall creation goals. This type of engagement was frequently evidenced, as students were creating a digital artifact using various open-content applications in a way that complied with both the established parameters of each creation-based learning task and with the app's operational and functional characteristics. Students were tasked with the job of creating a presentation, a talking picture, and a digital story that demonstrated their knowledge of literacy skills including letter identification, sound correspondence, and key story components. As such, there were certain functions and tools within each of the apps that were necessary to utilize in creating a digital artifact. Students consistently utilized these tools as they were presented.

Based on observations, most student engagement patterns can be categorized as self-regulated interest. During the course of this study, self-regulated interest occurred as students adjusted features of the different applications to sustain their own involvement and interest. Students also adapted the features of the application for their own purposes and used an application to create a digital artifact that demonstrated their understanding of a targeted learning objective. This was evidenced as the students were using the app to make a demonstration of their learning and choosing ways to display and design certain features. While using *ShowMe*, students were taking pictures of objects of their choice, resizing and positioning pictures on the

screen, using colors of their choice to write letters on the screen, placing visual representations on the screen in a manner of their choosing, illustrating events in a story, making audio-recordings, and evaluating their digital product with guidance from the teacher. While using *ChatterPix Kids*, engagement in self-regulated interest was evidenced as student took pictures, determined mouth placement, added decorations and letters in a manner of their choosing, and evaluated their digital product with guidance from the teacher. While using *Superhero Comic Book Maker*, engagement in self-regulated interest was apparent as students chose the background scene for each part of their story, added characters and other built-in clip art images to each scene, and made an audio recording. During each creation-based task, students were regularly adjusting applications' features for their own purposes to meet the overall learning goal as determined by the teacher.

Critical engagement was observed as students manipulated features of different applications to test personal understandings or limitations of the application itself. This was evident in Phase 1 as students manipulated various features of *ChatterPix Kids*: choosing a placement for the mouth, and adding/deleting decorations on their talking picture. In Phase 2, this was evident as students used *ShowMe* to retell a familiar story and decided how the presentation and corresponding illustrations would be designed. Various features were manipulated in the design of this presentation, including taking/inserting photographs, adding/editing illustrations, and recording the narration. In Phase 3, there was evidence of critical engagement as students collaborated to create a digital story using *Superhero Comic Book Maker*: selecting a scene that would appropriately capture the desired setting for each story component, manipulating various built-in stickers (characters and clip art images), adding these onto each scene of their digital story, and making the recording. Students also resized and placed

digital images on each scene in a manner of their choice. Critical engagement was also evidenced as the students developed digital expertise and experimented with various features within both of these applications. In all apps utilized, children experimented enthusiastically with the various decorative options and colors.

During Phase 3 of the study, findings suggest that children's engagement patterns showed early signs of literate thinking. Literate thinking is reached when students interpret content from multiple and personally meaningful perspectives (Kucirkova et al., 2014). In this phase, children worked collaboratively to create a digital story using *Superhero Comic Book Maker*. Students engaged in collaborative learning experiences and activities (chosen with teacher guidance), communicated their own thinking to peers, worked together to make decisions that incorporated different perspectives, applied understanding of key story components (beginning, middle, and ending), and manipulated an open-content application in the manner of their choice to design and narrate a digital story. Using *Superhero Comic Book Maker*, children were able to manipulate the application to select settings, characters, and various other built-in stickers (clip-art images) to decorate each component (scene) of their story. As students created their own stories, they included content from their own personal perspectives and made decisions about the components of their story based on what was important and meaningful to them.

An analysis of children's overall engagement patterns, as represented in Table 16, revealed that children's literate engagement was scaffolded throughout the study in the same way that children's literacy learning was scaffolded in the strategic design of the creation-based activities integrated into flexible reading groups. Because the phases of the study were designed to scaffold students' literacy learning experiences and the individual components within each phase were also strategically planned to scaffold both literacy instruction and iPad integration,

children's engagement with literacy activities were also scaffolded. As each phase of the study progressed, children demonstrated engagement patterns at higher, more critical levels according to Bangert-Drowns & Pyke's taxonomy. Table 17 presents this correlation. In conclusion, depending on the targeted learning goals, the design and parameters of the creation-based literacy task, the open-content application, and the scaffolding provided by the teacher, students are engaging with mobile devices and open-content applications in specific ways: through structure-dependent engagement, self-regulated engagement, critical engagement, and literate thinking. Findings from this study add a new, unique set of possibilities to the notion of engagement.

Table 16. Framework for Categorizing Student Engagement

Framework for Categorizing Student Engagement		
The framework used in the research of Kucirkova et al. (2014) has been further adapted in order to encompass the use of mobile devices and open-content applications (used for creation-based literacy tasks).		
	Student Engagement: Key Characteristics Observed	**Contextual Examples**
Level 1: Literate Thinking	• Student interprets content created from multiple and personally meaningful perspectives.	*Phase 3: Collaborative Creation-Based Literacy Tasks* Learning Goal: Students will: • create their own story that demonstrates an understanding of key story components • use digital tools and open-content applications (*Superhero Comic Book Maker*) to create a digital story There was evidence of literate thinking when students: -communicated their own thinking to peers -worked together to make decisions that incorporated different perspectives -applied understanding of key story components -manipulated an open-content/open-format application in the manner of their choice to design and narrate a digital story -selected settings, characters, and various other "stickers" (pictures in clip art gallery) to decorate each component (scene) of their story. -included content from their own personal perspectives and made decisions about the components of their story based on what was important and meaningful to them
Level 2: Critical Engagement	• Student investigates operational and content-related limitations of the application. • Student manipulates features of the application to test personal understandings or limitations of the application itself.	*Phase 2: Independent Creation-Based Literacy Tasks* Learning Goal: Students will: • choose a familiar story and retell, identify key story components • use digital tools and open content applications (*ShowMe*) to create a digital presentation that retells the story of their choice. There was evidence of critical engagement when students: -manipulated various features in *ShowMe* to create a presentation that retells a familiar story -utilized various operational features including: inserting pictures, drawing illustrations, adding text, and making a recording

Level 3: Self-regulated Interest	• Student creates personal goals within the application to make the process of creating a digital product as personally interesting as possible.
	• Student adjusts features of the application to sustain deep involvement, remain interested, and/or challenge interactions with the application.
	• Student adapts features of the application for a personally defined purpose.
	• Student meets targeted learning objectives and demonstrates understanding through the creation of a digital artifact.
	  o Student applies understanding of letter/sound correspondence and manipulates an open-content/open-format application in the manner of their choice to create a talking picture and/or narrated presentation.
	  o Student applies understanding of key story components (beginning, middle, and end), and manipulates an open-content/open-format application in the manner of their choice to design and narrate (or retell) a digital story.
		Phase 1: Introductory Creation-Based Literacy Tasks
		
		Learning Goal:
		Students will:
		• identify correct letter/sound correspondence
		• identify beginning sounds of a selected object
		• use digital tools and open-content applications (*ShowMe*) to create a digital presentation that demonstrates knowledge of a targeted letter/sound
		
		There was evidence of self-regulated interest when students: (*ShowMe*)
		-took pictures of objects of their choice; resized and positioned pictures on their screen
		-used the colors of their choice to write letters on the screen
		-placed these components on the screen in a manner of their choosing
		-made an audio-recording
		-evaluated their digital product with guidance from the teacher

Table 16 (continued)

Level 4: Structure Dependent Engagement	• Student is sensitive to and competent with the operation of an application and the mobile device (iPad). • Student pursues overall learning goals and goals communicated by the application and responds to operational features, navigational features, or content organization within the app.	*Phase 1: Introductory Creation-Based Literacy Tasks* Learning Goal: Students will: • identify correct letter/sound correspondence • identify beginning sounds of a selected object • use digital tools and open-content applications (*ChatterPix*) to create a talking picture that demonstrates knowledge of a targeted letter/sound There was evidence of structure-dependent engagement when students: -used the camera button to take a picture -used the touchscreen to draw a mouth -pressed the microphone button to make a recording -used the clip art toolbar to insert decorations -pressed the iPad button to save artifact
Level 5: Frustrated Engagement	None observed	
Level 6: Unsystematic Engagement	None observed	
Level 7: Disengagement	None observed	

Table 17. Scaffolded Literate Engagement with Creation-Based Tasks

Scaffolded Literate Engagement with Creation-Based Tasks	
Creation-Based Literacy Task	**Engagement Levels**
Phase 1: Introductory Creation-Based Literacy Tasks **Part 1:** **Learning Goals:** Students will: • identify correct letter/sound correspondence • identify beginning sounds of a selected object • use digital tools and open-content applications (*ShowMe*) to create a presentation that demonstrates knowledge of a targeted letter/sound	-structure-dependent -self-regulated interest
Phase 1: Introductory Creation-Based Literacy Tasks **Part 2:** **Learning Goals:** Students will: • identify correct letter/sound correspondence • identify beginning sounds of a selected object • use digital tools and open-content applications to create a talking picture (*ChatterPix*) that demonstrates knowledge of a targeted letter/sound	-structure-dependent -self-regulated interest -critical engagement
Phase 2: Independent Creation-Based Literacy Tasks **Learning Goals:** Students will: • choose a familiar story and retell, identify key story components • use digital tools and open-content applications to create a digital presentation using *ShowMe* that retells the story of their choice.	-structure-dependent -self-regulated interest -critical engagement
Phase 3: Collaborative Creation-Based Literacy Tasks **Learning Goals:** Students will: • create their own story that demonstrates an understanding of key story components • use digital tools and open-content applications to create a digital artifact using *Superhero Comic Book Maker*	-structure-dependent -self-regulated interest -critical engagement -literate thinking

4.7   ASPECTS OF LEARNING

Thinking across the three key aspects of learning that were the focus in this inquiry – *digital literacy practices*, *agency*, and *engagement* – as well the elements that underpinned the effective implementation of iPads into my classroom, including my conceptions of literacy and learning and the development of a technology integration framework, findings support the notion that in this intentionally designed technology-enabled learning environment, in which creation-based

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literacy tasks utilizing the iPad and open-content applications are integrated, these three aspects of learning are interdependent. When children are engaged in thinking and creating, with opportunities for independent and collaborative learning, layered with the space for exploration and guidance in making choices regarding demonstrations of learning, students' engagement in digital literacy practices, development of agency and engagement are consistently evident.

5.0   CONCLUSIONS AND IMPLICATIONS

Teaching is a complex, multifaceted process, marked by a constant juggle for balance of educational demands. My personal ethos of striving for continuous improvement and my conceptions of teaching and learning, combined with aspirations to cultivate new knowledge needed to make important, ongoing changes to my practice led me to pursue a doctorate degree. The doctoral program provided me with the opportunity to enhance my knowledge of learning and instructional techniques and engage in meaningful action research and professional learning related to a significant problem in my practice: effective integration of mobile devices (iPads) in the kindergarten literacy curriculum. In the current educational landscape where the use of technology is prominent, the present study was designed to examine a specific use for iPads and open-content applications in teaching and learning: creation-based tasks. The main goal of this study was to determine how creation-based learning tasks could be effectively integrated into early literacy instruction to facilitate students' literacy learning in the kindergarten classroom. Additionally, this research investigated how integrating technology in this specific way scaffolded students' literacy learning, provided a foundation for student agency, promoted student engagement, and expanded early literacy instruction to incorporate digital literacy practices alongside the traditional, print-based literacies.

The principal theoretical implication of this study is that the integration of creation-based literacy tasks into a coherent framework expands **opportunities** for literacy learning, promotes

engagement with **digital literacy practices**, provides a foundation for **student agency**, and fosters student **engagement**. Embedded with learning scaffolds, explicit instruction in collaboration, and space for exploration, creation-based literacy tasks provide students with the opportunity to engage in independent and collaborative content creation using iPads and related open-content applications in a supported classroom environment. The most significant takeaway from these major findings and my overall research process is that effectively integrating iPads ***is*** ***not*** about the technology. It ***is*** about developing *effective instructional practices* and the continuous process of becoming an effective educator. It ***is*** about unlocking *potential* and *opportunity*. It ***is*** about fostering *essential life skills*, like collaboration and communication, and helping students to connect experiences and solve problems, as well as helping students develop a growth mindset, find a sense of self, set goals, and make decisions. It ***is*** about *teaching, learning,* and *change*. In the following sections, the most salient themes that have emerged from my findings will be discussed.

5.1   DISCUSSION OF FINDINGS

5.1.1   Effective Instructional Practices

New technology and digital media continue to emerge and influence the learning environment, challenging understandings of literacy, the literacy process, and what literacy involves. Once considered bound by paper and pencil, definitions of literacy have broadened within the digital world - making it increasingly difficult to discuss literacy and literacy practices without reference to new and emerging technologies (Fink & Crawford, 2018; Leu et al., 2004;

Merchant, 2015). Technology has greatly expanded access to content and use of communication possibilities, and has transformed the ways in which people interact, communicate, and interpret information (Leu et al., 2004; Phillip & Garcia, 2013). New and multiple forms of texts and images alter how meaning is constructed and how language is used. The definition of literacy has changed – new and emerging technologies, in particular mobile devices, have ushered in innovative possibilities for teaching and learning. New literacies skills are required to effectively exploit their potential (Leu et al., 2004). To adjust to these demands, literacy instruction must respond in ways that effectively address reading and writing beyond conventional means (Fink & Crawford, 2018). The process through which I engaged to adapt to this new, dynamic definition of literacy laid the foundation for a most critical aspect of this research: how creation-based literacy tasks that utilize iPads and open-content applications are effectively integrated into literacy pedagogy and appropriately scaffolded to facilitate early literacy learning.

Teaching students to engage with new technologies, specifically the iPad, and building the skillset needed to effectively engage with new literacies skills, while adapting to make the most effective use of iPads for teaching and learning is a struggle for many educators, myself included. As iPads have become commonplace in classrooms – evidenced by a growing number of 1:1 environments – designing and delivering instruction to incorporate forms of literacy beyond the traditional, print-based curriculum, with the explicit use of iPads and all they enable commands a different way of thinking about lesson planning and student learning. There are many ways that technology can become an integral part of the teaching and learning process, but for many teachers – restructuring educational approaches is an overwhelming task. Not only do teachers need the right approach in terms of their willingness and beliefs, (Blackwell et al., 2013; Blackwell et al., 2014, 2016; Ertmer et al., 2012), they also need to be experts in the teaching and

learning process with an understanding of technology-based pedagogy and purposeful technology integration in connection with content appropriate instruction (Hineman et al., 2015; Mishra & Koehler, 2006).

As presented in the review of literature, there are many factors involved when making such significant pedagogical changes. Inadequate professional development opportunities, limited understandings of methods to effectively incorporate technology into pedagogy, time constraints, increased pressure to teach academic standards, and the frantic pace of the school day are among the major obstacles making it incredibly difficult to focus on systematic planning to use iPads meaningfully in the classroom. Unless teachers engage in professional learning and development outside of their classrooms – for example, by pursuing a doctorate of education degree where a comprehensive curriculum connects theory and practice through in-depth research and analysis – it would be extremely difficult to find sufficient time to develop the knowledge base and fully immerse in the reflective practice necessary to make significant pedagogical changes to effectively integrate technology. Without this knowledge and understanding, attempts at successfully integrating technology into practice are often limited (Koehler et.al, 2014).

My vision for teaching and learning is a classroom where each child has opportunities for active and thoughtful engagement, where students learn to collaborate and work with others, take ownership of their learning, feel competent in achieving goals, and where critical thinking skills are constantly being developed – a classroom where every child is provided with learning experiences that are challenging yet supportive and where each one is educated with respect to his/her individual learning style, learning needs, and individual interests, thereby encouraging and advancing their early literacy and math development. I am also deeply interested in

understanding how I can meaningfully integrate iPads to create this classroom environment – one where students exercise their knowledge and skills through digital creations using open-content applications.   Creatively weaving these convictions and goals into my instructional practices meant that I needed to rethink my pedagogical approach in order to effectively engage students in literacy learning with new technologies.   But making this significant shift in practice required a more complex pedagogical reasoning in my planning process (Webb & Cox, 2004) as it related to three key aspects: (1) knowledge of specific affordances of using iPads in the classroom; (2) understandings of how these affordances can support learning objectives and standards, and (3) practical, contextual knowledge and expertise regarding how children learn.

Taking these aspects into account, and after an extensive review of research related to iPad integration, utilization in early years literacy instruction, and how iPads and related applications can support early literacy learning, I was able to conceptualize a technology integration framework that could guide effective iPad integration in the kindergarten literacy curriculum, specifically related to using open-content applications for creation-based literacy tasks. Adapted from the work of Northrop and Kileen (2014), this framework, *A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Task* (presented in Table 6) was designed to scaffold children's literacy learning, encompass the integration of both independent and collaborative experiences with creation-based literacy tasks utilizing open-content iPad applications, and ensure that students are working at an appropriate instructional level.   This framework is comprised of three phases: *Introductory Creation-Based Tasks*, *Independent Creation-Based Tasks*, and *Collaborative Creation-Based Tasks*, designed to integrate sequentially; integrating one phase means integrating all previous phases as each one has been developed based on the preceding. The individual components within each phase have

also been strategically planned to teach students efficiently by scaffolding both literacy instruction and iPad integration.   This framework was based on my research and knowledge of content and pedagogy, with the primary focus on first identifying learning goals and instructional objectives ***before*** selecting the technology.   To that end, iPads were simply the tool used to support the learning goals and enable the creation of digital artifacts to demonstrate literacy learning.

Using this framework, I then began systematically planning lessons to incorporate creation-based activities into flexible reading groups (small group instruction).   First, I reviewed the literacy standards for kindergarten and selected literacy learning goals and objectives for each phase of the framework:

- Phase 1: *Introductory Creation-Based Tasks*:

  o <u>Foundational Skills</u>: The students will demonstrate knowledge of letter/sound correspondence.

- Phase 2: *Independent Creation-Based Tasks*:

  o <u>Response to Literature</u>: The students will understand a story and talk about a story as an ordered series of events (beginning, middle, end).

- Phase 3: *Collaborative Creation-Based Tasks*:

  o <u>Response to Literature</u>: The students will understand a story and talk about a story as an ordered series of events; the students will apply this understanding and collaborate to create their own story.

Envisioning the learning that I wanted to occur during the course of this inquiry, I then decided on strategies and methods that I would employ during each phase of the study, and considered how these would systematically move students towards the literacy goals and the

creation of a digital artifact to demonstrate their learning. Next, I established the parameters of each activity and developed a series of tasks (guided, independent, and collaborative) through which creation-based literacy activities that utilized open-content iPad applications would be integrated during small group instruction. Finally, I considered what open-content applications would best support these goals, which were developmentally appropriate and available for download, and which would be best used for authentic demonstrations of learning. After researching many different creation-based applications, and evaluating each for certain design and content features, several were carefully selected and purposefully linked to the early literacy learning goals. A range of theoretical positions underpinned my planning and design process, most prominently the work of Hutchison et al. (2012) which utilized the TPACK framework to conceptualize and plan the integration of iPads in literacy instruction. The product of this process is what will now be referred to as a *New Literacies Unit*: the series of lesson plans and creation-based literacy activities for kindergarten that blend the elements of content, pedagogy and technology together and align with *A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks* (Table 6). These lessons and activities were presented in Table 7 and are aligned to Pennsylvania Common Core Standards and broad literacy learning goals, as outlined in Table 8.

Findings from this study indicate that in a 1:1 iPad classroom environment, creation-based learning tasks that utilize the iPad and related open-content applications **can** be effectively integrated into pedagogy to facilitate literacy learning in the kindergarten classroom. A key explanation for these findings can be attributed to myself, as the classroom teacher. My willingness, excitement, and commitment, as well as my self-efficacy, positive attitude and beliefs about integrating technology were instrumental in not only creating an engaging

atmosphere that expanded opportunities for literacy learning, but in promoting students' engagement with digital literacy practices, providing a foundation for student agency, and fostering student engagement. Similar studies (i.e. Falloon, 2013a) point to the importance of an active teacher role in designing and scaffolding students' learning experiences with iPad applications and facilitating collaborative learning. Although technology itself is not the central focus, it is important to recognize that a component of this active teacher role is having a certain amount of technical skill in order to be able to teach the students to use the device and application(s) successfully and troubleshoot some common problems that may occur.

Both *A Framework for Effective Teaching and iPad Integration: Creation-Based Literacy Tasks* (Table 6) and the *New Literacies Unit* (lessons and activities presented in Table 7) were designed to provide guidance for the ways that kindergarten teachers can think specifically about using iPads to maximize early literacy learning opportunities for their students. Because the small group lessons and activities in this unit are aligned directly to state standards and broad literacy learning goals, they are easily transferable to other learning contexts, including (but not limited to) preschool and first grade classrooms, as well as learning support classrooms. Three open-content applications were used during this inquiry, but there are many dynamic applications that students can use to demonstrate their learning and create products. Additionally, the lessons and creation-based activities that were integrated into my literacy instruction in the kindergarten classroom are among the <u>many</u> possible activities that could be implemented to enhance students' literacy learning experiences and engage students in digital literacy practices.

5.1.2 Potential and Opportunity

Great strides have been taken during the course of this research to strategically design and scaffold learning experiences in order to effectively integrate iPads and open-content applications. Findings from this study support extant research in the field (i.e. Beschorner & Hutchison, 2013; Hutchison et al., 2012; Roswell & Harwood, 2015; Walsh, 2010) by indicating that iPads and related applications can be used to expand opportunities for early years literacy learning. Findings further extend previous research to encompass the integration of creation-based literacy tasks that utilize iPads and open-content applications. Integrating iPads in these specific ways into a coherent framework not only provided students expanded **opportunities** to interact with literacy learning and transform their understandings into a creation using a digital pathway – but promoted engagement with **digital literacy practices**, provided a foundation for **student agency**, and fostered student **engagement** and collaboration.

In the 1:1 iPad environment within my classroom, every child has access to a mobile device and applications that the district makes available, to an environment that fosters learner autonomy, and to experiences that promote the development of new and digital literacies skills. It would be remiss of me, however, not to acknowledge the ongoing challenge of digital inequalities in schools. A significant gap does exist between students like mine who have equitable access to various dimensions of digital experiences and use various technologies daily, and those students who do not. Further studies, which take these dimensions and variables into account, will need to be undertaken.

The pedagogical strengths of a 1:1 iPad atmosphere lie in its potential to expand learning and create a space that is more conducive to collaborative, differentiated experiences, as well as in the opportunity to facilitate my best teaching practices and strategies. The processes by which

I had designed and integrated creation-based literacy tasks, utilizing iPads and open content-applications, demonstrated a myriad of teaching and learning opportunities and enabled me to create unique, individualized learning experiences in a flexible and supported environment. Implementing technology in this specific way made it possible for students to approach learning using a variety of modalities and allowed them to transform their knowledge and understandings into a digital creation. For children who prefer the use of images, clear and vibrant photographs, pictures, and built-in stickers/images captured their attention, as did the opportunity to create visual representations through taking photographs, doodling and drawing illustrations, and adding stickers to express themselves artistically. For other children, the auditory features on the iPad and embedded in various applications catered to their listening abilities. There were opportunities for these learners to make audio recordings and listen to the playback, as well as engage with apps that included different sounds and music. The importance of hands-on learning for all children in kindergarten cannot be overstated, but the opportunity to interact directly with the touchscreen and physically manipulate images and texts, was especially beneficial for children who best understand through tactile representations. Physical actions, like swiping, tapping, and resizing pictures, as well as marking the screen and moving images while making audio recordings are among the touchable features that allowed children to engage in rich, hands-on learning experiences.

iPads and related applications offer unique affordances to children in that they naturally connect reading, writing, listening, and speaking within one context and allow for the use of multiple communicative process simultaneously (Beschorner & Hutchison, 2013). Consistent with the findings of other studies, the use of applications during the course of this study provided children with an opportunity to create meaningful connections between the words they stated, the

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images they used, and the product that each artifact represented. Integrating creation-based literacy tasks that utilize the iPad and open content-applications not only allowed me to differentiate my instruction to make learning more meaningful for children with different styles and abilities, it also allowed me to differentiate the learning environment and the means through which students could produce evidence of their learning. The design and delivery of these activities created the conditions for autonomous and collaborative learning experiences and fostered a safe and supportive learning environment.

With the expanding definition of literacy, many scholars (i.e. Javorsky & Trainin, 2014) maintain that it is essential for young readers to master features and navigational tasks not present in paper books to order to meaningfully interact with digital information. Scholars also encourage educators to integrate digital technology effectively and expand their instruction to include digital story elements, thereby equipping students with the new literacies skills needed to read, write and communicate (McKenna, 2012; Leu et al., 2004; Hutchison et al., 2012, Javorsky & Trainin, 2014). Evidence from previous research suggests that young readers need to develop a *cognitive flexibility* to be able to transfer skills between paper-based and digital reading environments and navigate digital texts successfully (Javorsky & Trainin, 2014). Digital stories are often presented to readers in multiple, sometimes unpredictable ways – what a particularly styled icon represented in one digital story does not necessarily signify the same thing in another story, therefore students need to connect an icon's appearance to the function with which it assists. Findings from this research study further support the notion that children should develop a *cognitive flexibility* to interact with digital information, and extend this understanding beyond digital stories to include open-content, creation-based applications and the process of creating a digital artifact when using these kinds of apps. Consistent with the work of Javorsky and Trainin
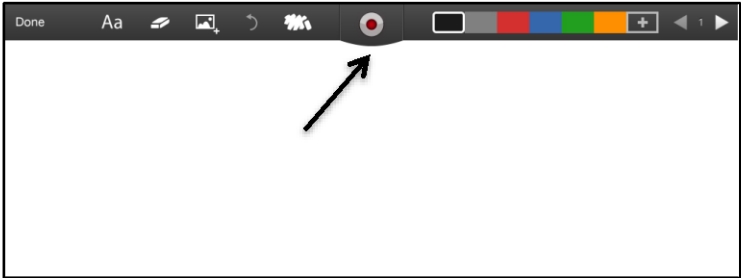
(2014), there was a high degree of variability and unpredictability in the ways that certain functions and processes within these applications were presented, particularly when it included text-heavy interfaces and a series of steps in order to advance and complete the task.

Three open-content applications were utilized during the course of this study - *ShowMe, ChatterPix Kids, Superhero Comic Book Maker*. Common features and capabilities were present among these apps and included: verbal representations (audio recordings/narrations), visual representations (photographs, illustrations, built-in stickers), and advancement prompts (to facilitate progression and product evaluation including playback/ review buttons). In spite of these common components, there was a high degree of variability in the way these features were presented. To perform a function in one application, for example making an audio recording, a specific button or image would be used. But to perform the same function in another application, the button or image would be represented differently. Often, one application allowed a function to be performed in one step, while other applications required the user to engage in a series of multiple steps, which frequently included text-heavy interfaces. A brief explanation of the differences in verbal representations, visual representations, and advancement prompts is offered below.

Each open-content application offered students an opportunity to incorporate verbal representations in their digital product through audio recordings and narrations. In *ShowMe*, students can add a voice-over feature in their presentation by touching a small red button, top-center in the toolbar. My students immediately recognized this as the "record" button, because another application that they use daily presents a recording option with a similar looking button. To make a recording for a talking picture in *ChatterPix Kids*, there was a large red button with a microphone – resembling a radio microphone – at the bottom-center of the screen. After making

an initial recording and listening to the playback, this same button appeared as a smaller size for students to rerecord after evaluating the quality of their initial recording. To record a digital story/comic book using *Superhero Comic Book Maker*, there was a small red microphone – resembling a stage microphone – at the top-center of the screen.   Table 18 displays screenshots from each application to illustrate the variations in creating verbal representations.

Table 18. Variations in Verbal Representations

Variations in Verbal Representations	
Application	**Screenshots**
ShowMe	
ChatterPix Kids	
Superhero Comic Book Maker	

Each open-content application also offered opportunities to incorporate visual representations including photographs, illustrations/drawings, and built-in stickers/graphics. In *ShowMe*, students can add a photograph to their presentation by touching a small button of a landscape (mountain) located at the top of the screen in the toolbar. This then gives students several text-based options, including taking a photo or selecting one from the camera roll. Drawings can also be added using the color palette found at the top of the screen on the toolbar. In *ChatterPix Kids*, students can take photograph by pressing a button that shows a picture of a camera with the words "take a picture". This button is located at the bottom of the app's home screen. A similar button, only showing the camera icon, can be located at the bottom of the screen in the gallery. Students also had the option to add built-in stickers and text as visual representations. In *Superhero Comic Book Maker*, adding a visual representation was a multi-step process. Students would first select the purple button that says "Comic Maker". From there, students selected a premade background scene from a group of scenes. Students could then add characters and other images from a set of built-in graphics, located at the bottom of the screen on a sliding toolbar. Although there are multiple options in this app to add different visual representations, only these were used during the course of this inquiry. Table 19 displays screenshots from each application to illustrate variations in creating visual representations.

Table 19. Variations in Visual Representations

Variations in Visual Representations	
App	Screenshots
ShowMe	
ChatterPix Kids	
Superhero Comic Book Maker	

All apps included advancement prompts to facilitate progression towards the completion of a digital product and evaluation of work including playback and review buttons. In *ShowMe*,

to advance to the next slide (or return to a previous slide) when creating a multi-slide presentation, there was a pair of small white arrows in the top right corner of the toolbar. In between these arrows was a small white number that indicated placement within the presentation. As students advanced to the next slide or receded to the previous slide, the number would increase or decrease, respectively. In *ChatterPix Kids*, students advanced through the process to create their talking picture using a "next" button. Students immediately recognized this button, because it appeared in another learning application with which the students have had experience using. To create another scene in *Superhero Comic Book Maker* was a multi-step process. From the current scene, there was a blue arrow in the top left corner, which saved that scene and then redirected to the app's home screen. From there, students then had to begin again and choose the purple "Comic Maker" button, and select a premade scene from the following screen.

Using open-content applications provided my young learners an opportunity to interact with literacy learning in creative, creation-focused ways. It is interesting to note that similar to previous research (i.e. Roswell & Harwood, 2015), the incorporation of these creation-based literacy tasks offered exponentially more options for children to blend digital and physical materials to create a demonstration of their learning. The students utilized a variety of digital objects – the iPad, the three targeted applications, the onscreen camera and microphone – and material objects – story books, physical objects (beginning with targeted letter sounds), paper graphic organizers and pencils (to organize a story retell and story creation), and dry-erase table and markers used to make a graphic organizer (to organize a story retell and story creation). Students moved fluidly in and out of material and digital objects and spaces. In support one of the main arguments of Roswell and Harwood (2015), the presence of digital experiences invited more diverse sense-making, making meaning through multimodal representations, and

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transforming their learning into a digital format. The children in this study showed remarkable originality in their creations and productive power as they were highly engaged and were taking ownership of their learning.

The integration of these specific activities promoted students' engagement with **digital literacy practices**, provided a foundation for **student agency**, and fostered student **engagement** and collaboration. However, it is critical to recognize that the students needed to learn about the functions of these tools, as well gain an understanding of the graphics that appeared on various buttons in order to make use of them. Therefore, teaching the students to engage in *cognitive flexibility* while using these applications, familiarizing them with the role of different icons, buttons, and processes, and providing opportunities to foster their sense of self-efficacy by encouraging them to explore and persist in the face of app-related design challenges were essential components of effectively implementing iPads into my literacy instruction. As I assumed an active teacher role and guided students to develop this flexible understanding, they could then take an active role to create a product that successfully demonstrated their literacy learning without any interference caused by unnecessary confusion regarding the functions and capabilities with the application. As the possibilities of integrating iPads in the classroom are continually explored, this information further supports the importance of critically examine how an app's affordances and constraints can influence student learning and understanding (Falloon, 2013b; Hutchison et al., 2012).

5.1.3 Call to Action

This discussion is a call-to-action to app developers to create applications that are developmentally appropriate for young children. There is a need to think critically about how

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the development of an application can facilitate young learners' interactions with digital content and use in early childhood contexts. Designing applications with text-heavy interfaces for young children in preschool and kindergarten is not appropriate, because optimal use of these types of applications (open or closed-format) depends solely on the kind of scaffolding provided by the teacher (Neumann & Neumann, 2013). Aligning the design of applications with known process of children's learning and development, as recommended in the research of Hirsh-Pasek et al. (2015), can set the stage for effective learning. A simple, tactile interface and a format that includes learning scaffolds like visually engaging graphics, tools, and buttons that children can interpret relatively independently will encourage meaningful interactions. This is also a call-to-action to educators to carefully evaluate apps and select the most effective ones that not only support learning goals, but align with children's natural development. Hirsh-Pasek et al. (2015), researchers in education and psychology, suggest evaluating an app for active learning, engagement in the learning process, meaningful learning experiences, and guidance by specific learning goals. These conditions offer a promising framework to facilitate app selection (Fink & Crawford, 2018).

5.1.4   Essential Life Skills

The combination of findings provides support for the conceptual premise that integrating iPads purposefully during literacy stations brings new dimensions to children's literacy experiences, not just regarding the format and presentation of content and materials but in how they can be integrated in different learning contexts (Heider, Renck Jalongo, & SpringerLink, 2015) and utilized for creation-based demonstrations of learning. However, the experiences of participating in this study were about much more than the integration of technology. These

experiences were about exposing children to a new way of learning, a new way of thinking about how they learn, and what their role is in the learning experience. Throughout the course of this study, quality teacher-student interactions facilitated and encouraged students' sense of personal responsibility: seeing themselves as valuable to the learning experience, having a stake in the task and having responsibility for working as an individual or as a group member to achieve a goal and create a product. Students gained experience with interpersonal skills: learning how to be an active listener and listening to other's ideas, asking questions, taking turns, giving feedback respectively, keeping an open mind, and finding value in others' ideas. Students also gained an understanding of teamwork skills: negotiating and compromising, using words appropriately to defend or reject an idea, participating, learning how and when to ask for help, making decisions together, and using everyone's ideas to create something meaningful. Furthermore, I was focused on creating and maintaining a positive learning atmosphere that promoted diligence, patience, perseverance, and self-control – a focus that extends well beyond the walls of this study. Fostering these essential skills was not only the most important aspect of integrating technology effectively, but of teaching effectively.

5.1.5   Limitations

Although this study offers an implementation model and a new set of possibilities for effectively integrated iPads into literacy instruction to enhance learning goals and curricular objectives, it has limitations. The district in which I work is fortunate to be able to offer all children access to mobile devices and technology-embedded learning experiences in a 1:1 iPad environment. However, digital technology use and iPad-based learning experiences in the classroom are not universal. One of the issues that emerge here is that while the framework and unit developed to

guide technology integration in this study are transferable to certain contexts, their use in many classrooms is limited. Investigating the digital divide and digital inequalities with regard to disparities in knowledge and digital skills among teachers and students in different demographics would be worthwhile research.

In addition, as the teacher-researcher, my willingness, excitement, and commitment to this work greatly contributed to taking an active role in designing and scaffolding instructional experiences and facilitating collaborative learning. Also, my self-efficacy, positive attitude and beliefs about integrating technology were instrumental in creating an engaging atmosphere that expanded opportunities for literacy learning, promoted students' engagement with digital literacy practices, provided a foundation for student agency, and fostered student engagement and collaborative learning experiences. Although there are many factors in the classroom and school that can impact student learning, research suggests that effective teachers have the most influence – and it can therefore be assumed that my role as the teacher greatly impacted the findings of this inquiry.

5.1.6   Teaching, Learning, and Change: Moving Towards the Future

As a classroom teacher and teacher-researcher, the experience of this inquiry has brought a new dimension to my practice: it has enabled me to develop a synergistic relationship between scholarship and teaching. The research process enhanced my knowledge and understandings of effective planning, teaching, and iPad integration. It allowed me to focus on connecting theoretical, research-based knowledge with real-world techniques to make important pedagogical changes to my practice, better understand how to improve the quality of iPad integration, and capitalize on its pedagogical potential to facilitate early literacy learning. My students had the

opportunity to engage in unique literacy learning experiences and learn essential life skills, while meaningfully using technology to transform their understandings into a creation using a digital pathway. By exploring ways that iPads could be effectively integrated into content and pedagogical practice to enhance literacy learning goals and curricular objectives, I had the opportunity to advance my research and produce new knowledge to inform teaching and learning practices. Systematically planning and implementing these activities into teaching sharpened my thinking, improved my learning and effectiveness as an educator, and this allowed me to make important connections that I can now bring back to my scholarship.

A natural progression of this work is to research and analyze the links between emerging digital literacy skills, proficient digital literacy skills, and advanced digital literacy skills. With this knowledge, a predictive relationship could be established and contribute to a larger discussion regarding how to create learning experiences that foster the development of these skills beginning in early childhood. Future research could also examine young students' interactions with open-content applications in order to gain insight into specific cognitive strategies that they are applying when engaged in a creation-based experience to demonstrate their literacy learning, as well as elements within the app's design (i.e. learning scaffolds and corrective feedback) that impact students' learning experiences (positively or negatively). This research might also examine the active teacher role in fostering effective digital learning experiences through creation-based tasks in early childhood contexts. Most importantly, continued efforts are needed to translate this research into accessible, high-quality professional opportunities for educators before, during, and after the introduction of new technologies and resources.

6.0   EPILOGUE

"The only source of knowledge is experience."

-Albert Einstein

A Day in the Life of a Kindergarten Teacher: My Reflections from the Field

It is a scenario that plays out in classrooms every day – teachers, regardless of their experience or grade level, facing increased pressure to focus on academic content. Educational policies and Common Core State Standards are pushing academic goals downward, and high-stakes accountability tests are placing increased pressures on teachers in early elementary grades, particularly kindergarten. With rigorous content standards, kindergarten today is characterized by a heightened focus on early literacy and math skills (Bassok, Latham & Rorem, 2016) and a shift towards formal academics through a more scripted, direct instruction-based model and heavy usage of worksheets and workbook materials.   Research consistently supports what early childhood educators know: active, exploratory play is a catalyst for young children's development. In a kindergarten classroom, with students of all ability levels, varying ages, maturity levels, and learning styles, teachers are challenged to find ways to differentiate instruction, incorporate different modalities and intentionally integrate activities – such as movement, singing, and play – to accommodate diverse learning needs and prepare students for the academic rigor of kindergarten. It is important to recognize that the usual complications of quality teaching and classroom management are compounded by the fact that these are

enthusiastic and energetic five- and six-year old children – some who have never attended preschool – and they all need explicit instructions on classroom routines, basic procedures, and rules. A holistic, yet entirely academic learning environment can be created. Through careful discernment, teachers can find a balance between academic-based and play-based classrooms to provide learning experiences that are both rigorous and developmentally appropriate.

As educators, we have a huge opportunity to make a lasting impact on students, but with that opportunity comes a great many challenges. There is no doubt that expectations are high – between balancing different learning needs of students and helping each to meet learning goals, building quality relationships, and respecting expectations from administration. For kindergarten teachers in particular, it can be incredibly difficult to navigate the classroom environment and address the challenges that occur during the course of a typical school day. Aside from the increased pressures for academic rigor and testing, kindergarten teachers also teach social skills, fine motor skills, language and conversation skills, and classroom routines. With all that has to be accomplished, the challenge increases exponentially when managing a classroom filled with children who struggle with behavior issues, adequate social skills, gross motor movement, self-control problems, learning disabilities, developmental disorders, and emotional issues. There are children who qualify for services and support in kindergarten: some work with paraprofessionals and instructional aides in the classroom, others receive Title I services and work with the reading specialist outside of the classroom, still there are other children who leave the classroom to work with the special education teacher or the special education instructional aide, receive speech services and occupational therapy, or meet with the school social worker. All of these services are managed with a schedule, but under many conditions that schedule is often changed or modified with limited notice.

In addition to typical classroom challenges, there are plenty of other distractions that can be equally problematic for a teacher – particularly the kind that teachers cannot plan around in a lesson. Between intercom announcements, last-minute building scheduling changes including the cancellation of Title reading classes or specials classes (library, art, gym, and music), phone calls from the office for early dismissals, late busses, student tardiness, crying children, unexpected student illnesses, custodial staff cleaning and disinfecting the classroom, to school lockdowns, fire drills, and two-hour delays, interruptions from substitute teachers in neighboring classrooms, phone calls from the school nurse, and questions from classroom aides regarding planned activities ---- keeping the students focused and engaged with learning can be a most difficult task. Moreover, in a 1:1 iPad classroom environment, technology can also be the source of many distractions – from applications not working correctly, the wireless network being "down", iPads that are not charged, and applications that will not install properly to ensuring that iPads are used effectively as tools to enrich instruction and not further distract students from engaging in learning.

Beyond these challenges are many additional responsibilities that a teacher has to take on during a typical day. If a teacher is fortunate enough to have an aide assigned to the classroom for the day – as is the case in my classroom – strategic plans need developed and activities need designed and prepared in order for the students to work with the aide to receive reinforcement, practice, and enrichment. A classroom aide is a very helpful resource, but properly preparing and best utilizing the person in this position adds another layer of complexity to the day. Not to mention, communicating, consulting, and collaborating with teacher colleagues and other members of the school staff, and regular communication with parents/ guardians requires a substantial amount of time. Furthermore, in my classroom and other

elementary classrooms of my building, there are undergraduate students from a local university who participate in an extensive weekly field experience. The opportunity to be a mentor and offer practical advice to these students interested in the field of education is truly rewarding. However, collaboration with the field students and participation in their field experience requires additional time for planning, guidance, and evaluation on the part of the classroom teacher.

My classroom is a complex, yet dynamic learning environment – where the management of these challenge, distractions, and responsibilities are inextricably interwoven into instruction to promote a safe and supportive learning climate and create meaningful learning experiences for the children. It was these factors and variables that became the catalysts in driving important change in my classroom. Engaging in action research – implementing creation-based literacy tasks using iPads and related open-content applications into flexible reading groups (small group instruction) – added another dimension to this learning environment. The research process presented a unique set of challenges and opportunities that enabled me to work towards making pedagogical changes and utilizing iPads effectively to enhance literacy learning. This experience has caused me to recalibrate my teaching skills and provided clear direction in my continual pursuit of excellent teaching. However it is impossible to fully understand the scope of this inquiry and the implications of the findings without recognizing the many responsibilities, demands, interruptions, and distractions that are dealt with during the course of a typical school day. Teaching is a complex and multifaceted process – a constant juggle for balance of educational demands. This is the professional world that I live in – this is my daily life as a kindergarten teacher.

APPENDIX A

FOCUS GROUP INTERVIEW PROTOCOL

Focus Group Interview Protocol

Conversational Interview Questions:

During learning task/product creation, questions may include:
- What are you working on?
- What is something you can do well?
- What is something you are struggling with (or had struggled with)?
    - If you are no longer struggling, how did you figure it out?
- How are you using given features of a given app to create a certain digital product?
- How are you collaborating with another student?
- How do you decide who is doing what aspect of a given task?
- Can you tell me how you are creating this digital product?

Other questions may arise and will be asked depending on my interactions with the students.

Standardized Open-Ended Interview Questions:

After the creation of digital artifacts, questions will include:
- What did you learn?
- What did you like the most?
- Were you stuck at any point during this task? How did you figure it out?
- How did you and your partner (or group members) think about and figure out what to do to create this digital artifact?
- Why did you choose to demonstrate your learning in this way and not that way?

APPENDIX B

NON-PARTICIPANT OBSERVATION PROTOCOL

Observation Date:		Creation-Based Task: **Foundational Skills RTL Independent RTL Collaborative**	Teaching Strategy: **Guided Independent Collaborative**	Apps used:	
	9:55	10:00	10:05	10:10	10:15
Student **A**					
Student **B**					
Student **C**					

Engagement	Agency	Digital Literacy Practices
1 – is enthusiastic 2 – is optimistic/positive 3 – curious/interested 4 – concentrates; involved in task 5 – participates in the task 6 – asks questions 7 – is helpful to other students (offers suggestions; helps to answer a peer's question) 8 – uninvolved/disengaged	9 – asks teacher for help 10 – asks peer for help 11 – talks about thinking to a peer 12 – talks about thinking to teacher 13 – makes decisions about work (for example: chooses what to take a picture of, what app to use, what to say, what to draw, where to put visual representations on the screen)	14 – uses the touchscreen 15 – uses various buttons on the app's toolbar (image or text buttons) 16 – takes/edits a photo 17 – designs/creates something with teacher guidance 18 – designs/creates something independently 19 – designs/creates something with others 20 – uses more than one app to create something

APPENDIX C

IRB APPROVAL

University of Pittsburgh
Institutional Review Board

3500 Fifth Avenue
Pittsburgh, PA 15213
(412) 383-1480
(412) 383-1508 (fax)
http://www.irb.pitt.edu

Memorandum

To: Melissa Fink
From: IRB Office
Date: 11/7/2017
IRB#:   PRO17080611
Subject: Integrating iPads in the Kindergarten Literacy Curriculum

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The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section

45 CFR 46.101(b)(1)

Please note the following information:

- Investigators should consult with the IRB whenever questions arise about whether planned changes to an exempt study might alter the exempt status. Use the "**Send Comments to IRB Staff**" link displayed on study workspace to request a review to ensure it continues to meet the exempt category.
- It is important to close your study when finished by using the "**Study Completed**" link displayed on the study workspace.
- Exempt studies will be archived after 3 years unless you choose to extend the study. If your study is archived, you can continue conducting research activities as the IRB has made the determination that your project met one of the required exempt categories. The only caveat is that no changes can be made to the application. If a change is needed, you will need to submit a NEW Exempt application.

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

APPENDIX D

DOCUMENT OF INFORMED CONSENT

Dear parents and guardians,   October 21, 2017

I am writing this letter to inform you of a research study that I will be conducting in the classroom this fall and winter. Currently, I am in my third year of doctoral studies and research at the University of Pittsburgh. The focus of my research and the purpose of this research study are to determine effective ways to integrate iPads into the kindergarten literacy (reading) curriculum and to determine how learning tasks that utilize the iPads engage children in developing early literacy skills.

As a part of my research, I have developed a series of literacy-related lessons and tasks that integrate iPads and iPad applications. As a product of these lessons, the children will be creating digital artifacts to demonstrate their understanding of literacy skills (such as alphabet letters and sounds and parts of a story). Examples of digital artifacts that will be created include an interactive digital alphabet book and an interactive digital story.

These activities will be implemented during our flexible reading group time over the course of 15 weeks. Flexible reading group time occurs in our classroom each day. During this time, children are grouped in small groups based on their skills and learning needs. Children are given instruction on targeted reading skills as well as opportunities for practice and collaboration with other children. These groups are flexible and change based on the skills we are learning and those that the children need to practice.

There are no risks associated with this research study. Each child will have the chance to chance to learn how to use various iPad apps. Each child will also have the opportunity to work with me during this time and will receive instruction on both the reading skills and how to use apps to create their own digital products. Additionally, the children will have the opportunity to collaborate with one another to complete these tasks.

During these activities, I will be using audio recording to capture conversations: the children's interactions with one another and with myself. I will also be asking the children questions about their engagement with these activities and will be writing their responses verbatim. Their responses will not be identifiable in any way. No names will be recorded at any point in time during this study. The children's responses are confidential and will be kept under lock and key.

Participation is voluntary and you can contact me if you do not wish for your child to participate in these reading activities during flexible group time. This study is being conducted by myself, Melissa Fink, and I can be reached at (412) 896-2330 x 7603 if you have any questions.

Thank you very much for your time.

Melissa Fink
Kindergarten Teacher
William Penn Elementary School
Elizabeth Forward School District

BIBLIOGRAPHY

Apple (2017). *Education*. Retrieved from https://www.apple.com/education/products/#learningwith-ipad

Bangert-Drowns, R. L., & Pyke, C. (2002). Teacher ratings of student engagement with educational software : An exploratory study. *Educational Technology Research and Development*, *50*(2), 23–37.

Bassok, D., Latham, S., & Rorem, A. (2016). Is kindergarten the new first grade? *AERA Open*, *2*(1), 1–31. http://doi.org/10.1177/2332858415616358

Beschorner, B., & Hutchison, A. (2013). iPads as a literacy teaching tool in early childhood. *International Journal of Education in Mathematics, Science and Technology*, *1*(1), 16–24.

Belo, N., Mckenney, S., Voogt, J., & Bradley, B. (2016). Teacher knowledge for using technology to foster early literacy : A literature review. *Computers in Human Behavior*, *60*, 372–383. http://doi.org/10.1016/j.chb.2016.02.053

Blackwell, C. K., Lauricella, A. R., & Wartella, E. (2014). Factors influencing digital technology use in early childhood education. *Computers & Education*, *77*, 82–90. http://doi.org/10.1016/j.compedu.2014.04.013

Blackwell, C. K., Lauricella, A. R., & Wartella, E. (2016). The influence of TPACK contextual factors on early childhood educators' tablet computer use. *Computers & Education*, *98*, 57–69. http://doi.org/10.1016/j.compedu.2016.02.010

Blackwell, C. K., Lauricella, A. R., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. *Computers and Education*, *69*, 310–319.

Cambourne, B. (2009). Revising the concept of "natural learning". In Hoffman, J. and Goodman, Y. (Eds.), *Changing literacies for changing times. An historical perspective on the future of reading research, public policy, and classroom practices* (125-145). New York: Routledge.

Chai, Z. (2017). Improving early reading skills in young children through an iPad app: Small-group instruction and observational learning. *Rural Special Education Quarterly*, *36*(2), 101–111. http://doi.org/10.1177/8756870517712491

Chmiliar, L. (2017). Improving Learning Outcomes : The iPad and Preschool Children with Disabilities. *Frontiers in Psychology*, *8*(May), 1–11. http://doi.org/10.3389/fpsyg.2017.00660

Chou, C., Block, L., Jesness, R. (March, 2014). *Strategies and challenges in iPad initiative*. Paper presented at 10th International Conference on Mobile Learning, Madrid, Spain.

Cochran-Smith, M. & Lytle, S. (2009). *Inquiry as stance: Practitioner research for the next generation.* London; New York. Teachers College Press.

Cohen, E. G. (1994). *Designing groupwork: Strategies for the heterogeneous classroom*. New York, NY: Teachers College Press.

Cope, B., & Kalantzis, M., (2009). "Multiliteracies": New literacies, new learning. *Pedagogies: An International Journal, 4,* 164-195.

Cubelic, C., & Larwin, K. (2013). The Use of iPad Technology in the Kindergarten Classroom: A Quasi-Experimental Investigation of the Impact on Early Literacy Skills. *Comprehensive Journal of Educational Research*, *2*(4), 47–59. Retrieved from http://www.knowledgebasepublishers.org/cjerpdf/2014/JAN/Cathleen and Karen.pdf

Cumming, T. M., Strndadová, I., & Singh, S. (2014). iPads as instructional tools to enhance learning opportunities for students with developmental disabilities: An action research project. *Action Research*, *12*(2), 151–176. http://doi.org/10.1177/1476750314525480

D'Agostino, J. V, Rodgers, E., Harmey, S., & Brownfield, K. (2015). Introducing an iPad app into literacy instruction for struggling readers : Teacher perceptions and student outcomes. *Journal of Early Childhood Literacy*, *0*(0), 1–27. http://doi.org/10.1177/1468798415616853

Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. *Computers & Education*, *64*, 175–182. http://doi.org/10.1016/j.compedu.2012.10.008

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices : A critical relationship. *Computers & Education*, *59*(2), 423–435. http://doi.org/10.1016/j.compedu.2012.02.001

Fink, M. A. & Crawford, P. A. (Spring 2018). *Learning and literacy with iPads*, Early Years Bulletin, 5(3), 7-11.

Falloon, G. (2013). Creating content: Building literacy skills in year 1 students using open format apps. *Computers in New Zealand Schools: Learning, Teaching, Technology*, *25*(1-3), 77–95.

Falloon, G. (2013). Young students using iPads: App design and content influences on their learning pathways. *Computers and Education*, *68*, 505-521. http://doi.org/10.1016/j.compedu.2013.06.006

Fleer, M. (2011). Technologically constructed childhoods: Moving beyond a reproductive to a productive view of curriculum development. *Australian Journal of Early Childhood. 36*(1), 16-24.

Flewitt, R., Messer, D., & Kucirkova, N. (2014). New directions for early literacy in digital age: The iPad. *Journal of Early Childhood Literacy*, 15(3) 289-310. http://doi.org/10.1177/1468798414533560

Forzani, E., & Leu, D. J. (2012). New literacies for new learners : The need for digital technologies in primary classrooms. *The Educational Forum*, *76*(4), 421–424. http://doi.org/10.1080/00131725.2012.708623

Gee, J. P. (1996). *Sociolinguistics and literacies: Ideologies in discourses (2ⁿᵈ ed.).* New york: Falmer.

Gee, J. P. (2008). *Are video games good for learning?* In S. de Castell & J. Jenson (Eds.), Worlds in play: International perspectives on digital games research (pp. 323-332). New York: Peter Lang.

Glister, P. (1997). *Digital literacy: Personal preparation for the internet age.* New York: John Wiley & Sons.

Goodman, Y (1986). Coming to know literacy. In W. Teale & E. Sulzby (Eds.) *Emergent literacy: Writing and reading* (pp. 1-14). Norwood, NJ: Ablex.

Hamilton, E. R., Rosenberg, J. M., & Akcaoglu, M. (2016). The substitution augmentation modification redefinition (SAMR) model: A critical review and suggestions for its use. *TechTrends*, *60*, 433–441. http://doi.org/10.1007/s11528-016-0091-y

Harris, J. & Hofer, M. (2009). Grounded tech integration. *Learning and leading with technology, 37*(2), 22-25.

Heider, K.L., Renck Jalongo, M., & SpringerLink (Online service). (2015; 2014). *Young children and families in the information age: Applications of technology in early* childhood (2015ᵗʰ ed.). Dordrecht: Springer Netherlands. http://doi.org/10.1007/978-94-017-9184-7

Herr, K., & Anderson, G. (2005). *The action research dissertation*. Thousand Oaks, CA: Sage.

Hilton, J. T. (2017). A case study of the application of SAMR and TPACK for reflection on technology integration into two social studies classrooms integration. *The Social Studies*, *107*(2), 68–73. http://doi.org/10.1080/00377996.2015.1124376

Hineman, J. M., Boury, T. T., & Semich, G. W. (2015). Technology-literate school leaders in a 1:1 iPad program and teachers' technology self-efficacy. *International Journal of Information and Communication Technology Education*, *11*(2), 68–79.

Hirsh-Pasek, K., Zosh, J. M., Michnick, R., Gray, J. H., & Robb, M. B. (2015). Putting education in "educational" apps: Lessons from the science of learning. *Psychological Science in the Public Interest*, *16*(1), 3–34. http://doi.org/10.1177/1529100615569721

Hopkins, L., Green, J., & Brookes, F. (2013). Book, bytes, and brains: The implications of new knowledge for children's early literacy learning. *Australasian Journal of Early Childhood*, *38*(1), 23–28.

Hutchison, A., Beschorner, B., & Schmidt-Crawford, D. (2012). Exploring the use of the iPad for literacy learning. *Reading Teacher*, *66*(1), 15–23. http://doi.org/10.1002/TRTR.01090

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.

Ihmeideh, F. M. (2014). The effect of electronic books on enhancing emergent literacy skills of pre-school children. *Computers & Education*, *79*, 40–48. http://doi.org/10.1016/j.compedu.2014.07.008

International Reading Association, Position Statement on New literacies and 21ˢᵗ Century Technologies. Retrieved from https://www.literacyworldwide.org/docs/default-source/where-we-stand/new-literacies-21st-century-position-statement.pdf?sfvrsn=6

Javorsky, K., & Trainin, G. (2014). Teaching young readers to navigate a digital story when the rules keep changing. *The Reading Teacher*, *67*(8), 606–618. http://doi.org/10.1002/trtr.1259

Karsenti, T., & Fievez, A. (2013). *The iPad in education: uses, benefits, and challenges – A survey of 6,057 students and 302 teachers in Quebec, Canada*. Montreal, QC: CRIFPE.

Kazakoff, E. R. (2014). Toward a theory-predicated definition of digital literacy for early childhood. *Journal of Youth Development*, *9*(1), 1–18.

Koehler, M., Mishra, P., Kereluik, K., Shin, T., & Graham, C. (2014). The technological pedagogical content knowledge framework. In J. M. Spector, M. D. Merrill, J. Elen & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 101-111). New York: Springer. http://dx.doi.org/10.1007/978-1-4614-3185-5_9

Kress, G (2003). *Literacy in the new media age.* New York: Routledge.

Kress, G. & Van Leeuwen, T. (2001). *Multimodal discourse.* London: Routledge.

Knobel, M., & Lankshear, C. (2014). Studying New Literacies. *Journal of Adolescent and Adult Literacy*, *58*(October), 97–101. http://doi.org/10.1002/jaal.314

Kucirkova, N., Messer, D., Sheehy, K., & Fernández Panadero, C. (2014). Children's engagement with educational iPad apps: Insights from a Spanish classroom. *Computers & Education*, *71*, 175–184. http://doi.org/10.1016/j.compedu.2013.10.003

Lankshear, C. & Knobel, M. (2003). *New literacies: Changing knowledge and classroom learning.* Philadelphia: Open University Press.

Larabee, K. M., Burns, M. K., & McComas, J. J. (2014). Effects of an iPad-supported phonics intervention on decoding performance and time on-task. *Journal of Behavioral Education*, *23*(4), 449–469. http://doi.org/10.1007/s10864-014-9214-8

Larson, L. (2010). Digital readers: The next chapter in e-book reading and response. *The Reading Teacher*, *64*(1), 15–22. http://doi.org/http://doi.org/10.1598/RT.64.1.2

Lehtonen, A. E. A. (2015). Evaluating students ' agency and development of ownership in a collaborative playmaking project. *The European Journal of Social and Behavioural Sciences*, *XIV*, 1885–1900. http://dx.doi.org/10.15405/ejsbs.171

Leu, D. J. Jr., Kinzer, C. K., Coiro, J. L., & Cammack, D. W. (2004). Toward a theory of new literacies emerging from the Internet and other information and communication technologies. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1570-1613). Newark, DE: International Reading Association.

Marsh, J. (2011). Young children's literacy practices in a virtual world: establishing an online interaction order. *Reading Research Quarterly*, *46*(2), 101–118.

Mckenna, C. (2012). There's an app for that: How two elementary classrooms used iPads to enhance student learning and achievement. *Education*, *2*(5), 136–142. http://doi.org/10.5923/j.edu.20120205.05

Mckenney, S., & Voogt, J. (2009). Computers & Education Designing technology for emergent literacy : The PictoPal initiative. *Computers & Education*, *52*(4), 719–729. http://doi.org/10.1016/j.compedu.2008.11.013

McNiff, J. & Whitehead, J. (2006). *Action research for teachers: A practical guide.* Milton Park, Abingdon, Oxon; New York: David Fulton Publishers. http://doi:10.4324/9780203462393

Merchant, G. (2007). Writing the future in the digital age. *Literacy*, *41*(3), 118–128.

Merchant, G. (2015). Keep taking the tablets: iPads, story apps and early literacy. *Australian Journal of Language and Literacy*, *38*(1), 3–11.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teacher's College Record*, *108*(6), 1017–1054. National Education Association. (2008). Technology in schools: The ongoing challenge of access, adequacy, and equity. Policy Brief # 19. Washington DC: NEA Policy and Practice Department. www.nea.org/assets/docs/PB19_Technology08.pdf.

Ness, M. (2016). " Is that how I really sound?": Using iPads for fluency practice. *The Reading Teacher*, *70*(5), 611–615. http://doi.org/10.1002/trtr.1554

Neumann, M. M. (2016). Young children's use of touch screen tablets for writing and reading at home: Relationships with emergent literacy. *Computers & Education*, *97*, 61–68. http://doi.org/10.1016/j.compedu.2016.02.013

Neumann, M. M., Finger, G., & Neumann, D. L. (2017). A conceptual framework for emergent digital literacy. *Early Childhood Education Journal*, *45*(4), 471–479. http://doi.org/10.1007/s10643-016-0792-z

Neumann, M. M., & Neumann, D. L. (2014). Touch screen tablets and emergent literacy. *Early Childhood Education Journal*, *42*(4), 231–239. http://doi.org/10.1007/s10643-013-0608-3

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, *59*(3), 1065–1078. http://doi.org/10.1016/j.compedu.2012.04.016

Northrop, L., & Killeen, E. (2013). A framework for using iPads to build early literacy skills. *The Reading Teacher*, *66*(7), 531–537. http://doi.org/10.1002/TRTR.1155

Olmstead, K. A. (2017, May 25). A third of Americans live in households with three or more smartphones. Pew Research Center. Retrieved from http://www.pewresearch.org/fact-tank/2017/05/25/a-third-of-americans-live-in-a-household-with-three-or-more-smartphones/

Pearson, P. D., & Gallagher, M. C. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology*, *344*(8), 317–344.

Pegrum, M., Howitt, C., & Striepe, M. (2013). Learning to take the tablet: How pre-service teachers use iPads to facilitate their learning. *Australasian Journal of Educational Technology*, *29*(4), 464–479.

Pennsylvania Department of Education. (2017). PA Core Standards Implementation. Retrieved from https://www.pdesas.org/Standard/PACore.

Philip, T., & Garcia, A. (2013). The importance of still teaching the iGeneration: New technologies and the centrality of pedagogy. *Harvard Educational Review*, *83*(2), 300–320.

Pine, G. J. (2009). *Teacher action research: Building knowledge democracies*. Los Angeles: Sage.

Prieto, L. P., Villagrá-Sobrino, S., Jorrín-Abellán, I. M., & Martínez-Monés, A. (2011). Recurrent routines: Analyzing and supporting orchestration in technology-enhanced primary classrooms. *Computers & Education*, *57*(1), 1214–1227. http://doi.org/10.1016/j.compedu.2011.01.001

Puentedura, R. (2014). Building transformation: An introduction to the SAMR model [Blog post]. Retrieved from http://www.hippasus.440TechTrends(2016)60:433–441.com/rrpweblog/archives/2014/08/22/BuildingTransformation_AnIntroductionToSAMR.pdf.

Puentedura, R. (2014). Learning, technology, and the SAMR model: Goals, processes, and practice [Blog post]. Retrieved from http://www.hippasus.com/rrpweblog/archives/2014/06/29/LearningTechnologySAMRModel.pdf

Rainio, A. P. (2008). From resistance to involvement: Examining agency and control in a playworld activity. *Mind, Culture, and Activity*, *15*(2), 115–140. http://doi.org/10.1080/10749030801970494

Radencich, M. C. & McKay, L. J. (1995). *Flexible grouping for literacy in the elementary grades*. Boston, MA: Allyn and Bacon.

Reinking, D., Labbo, L. D., & Mckenna, M. C. (2000). From assimilation to accommodation: A developmental framework for integrating digital technologies into literacy research and instruction. *Journal of Research in Reading, 23*(2), 110–122.

Richardson, W. (2013). Students first, not stuff. *Educational Leadership, 70*(6), 10-14.

Rowsell, J., & Harwood, D. (2015). "Let it go": Exploring the image of the child as a producer, consumer, and inventor. *Theory into Practice*, *54*(2), 136–146. http://doi.org/10.1080/00405841.2015.1010847

Rowe, D. W., & Miller, M. E. (2015). Designing for diverse classrooms: Using iPads and digital cameras to compose eBooks with emergent bilingual/biliterate four-year-olds. *Journal of Early Childhood Literacy*. http://doi.org/10.1177/1468798415593622

Schuck, S., Emmerson, N., Ziv, H., Collins, P., Arastoo, S., Warschauer, M., Lakes, K. (2016). Designing an iPad app to monitor and improve classroom behavior for children with ADHD: iSelfControl feasibility and pilot studies. *PLoS ONE*, *11*(10), 1–13. http://doi.org/10.1371/journal.pone.0164229

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, *15*(2), 4–14.

Serafini, F. (2012). Expanding the four resources model: Reading visual and multi-modal texts. *Pedagogies: An International Journal*, *7*(2), 37–41.

Shenton, A., & Pagett, L. (2007). From " bored " to screen : the use of the interactive whiteboard for literacy in six primary classrooms in England. *Literacy*, *41*(3), 129–136.

Sng, C. Y., Carter, M., & Stephenson, J. (2017). Teaching a student with autism spectrum disorder on-topic conversational responses with an iPad: A pilot study. *Australasian Journal of Special Education*, *41*(1), 18–34. http://doi.org/10.1017/jse.2016.6

Steeg, S. M., Costley, K., Engelman, K., Gonzalez, D., Knutson, V., & Maroni, K. (2013). Changing teachers, changing students: Exploring iPads in inquiry-based learning. *Research in the Schools, 20*(2), 57-72. Retrieved from http://pitt.idm.oclc.org/login?url=http://search.proquest.com/docview/1663613519?accountid=14709

Street, B. V. (1995). *Social literacies: Critical approaches to literacy in development, ethnography, and education.* London: Longman.

Street, B. (2013). Literacy in theory and practice : Challenges and debates over. *Theory into Practice*, *52*(1), 52–62. http://doi.org/10.1080/00405841.2013.795442

Vaughan, M., & Beers, C. (2017). Using an exploratory professional development initiative to introduce iPads in the early childhood education classroom. *Early Childhood Education Journal*, *45*(3), 321–331. http://doi.org/10.1007/s10643-016-0772-3

Vygotsky, LS (1978) *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice? *Australian Journal of Language and Literacy*, *33*(3), 211–239.

Walsh, M., Asha, J., & Sprainger, N. (2007). Reading digital texts. *Australian Journal of Language and Literacy*, *30*(1), 40–53.

Webb, M., & Cox, M. (2004). A review of pedagogy related to information and communications technology. *Technology, Pedagogy, and Education*, *13*(3), 235–286.

Wohlwend, K. E. (2015). One screen, many fingers: Young children's collaborative literacy play with digital puppetry apps and touchscreen technologies. *Theory into Practice*, *54*(2), 154–162. http://doi.org/10.1080/00405841.2015.1010837