TEACHER PARTICIPATION IN ONLINE PROFESSIONAL DEVELOPMENT:
EXPLORING ACADEMIC YEAR CLASSROOM IMPACTS

by

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Doctor of Philosophy at George Mason University

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Dedication

I dedicate this to my parents, Betty and George Opfer, who have taught me love, support, and faith. Through their dedication, they modeled for me the value of hard work and the appreciation of a good education.

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I am thankful for all who have supported me on this journey. In the summer of 2012, when I made the decision to apply to the GMU Ph.D. program, my dear friend Beth Roach encouraged me and wrote a letter of recommendation. She was a dedicated, talented, and loving educational administrator. May she rest in peace.

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Most importantly, I am forever grateful to my chairperson, Dr. Debra Sprague. I originally met Dr. Sprague in 2001 when she was assigned as my advisor when I started my first Master's Degree. When I started my Ph.D. program in 2013 and asked her to serve as my chairperson, she immediately said yes. She has taught me patience with the research process, the need for quality online teacher professional development, the importance of quality technology integration in schools, and the role of kindness in education. I will always be grateful for her support and ongoing guidance. I am a better teacher because of her presence in my career.

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Abstract

TEACHER PARTICIPATION IN ONLINE PROFESSIONAL DEVELOPMENT: EXPLORING ACADEMIC YEAR CLASSROOM IMPACTS

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George Mason University, 2017

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The purpose of this mixed methods case study research was to investigate the reasons teachers chose online professional development (OPD) focusing on technology integration and how this OPD impacted teachers' classroom practices over a six month period. Previous research identified that OPD provides flexibility beyond what traditional face-to-face professional development provides for teachers. Catholic school, K-12 teachers participated in this study. Data was collected from surveys, interviews, and classroom observations. Survey data came from a pre-survey, post-survey, and follow-up survey. Survey data was analyzed quantitatively using dependent sample t-tests and a one-way ANOVA test. The case study data was collected throughout six months after OPD and came from interviews and three classroom observations of each of the two participating teachers. Five themes emerged from qualitatively analyzing the observation and interview data: (1) OPD provides hands-on opportunities, (2) OPD is

practical for classroom implementation, (3) technology supports instruction, (4) classrooms are flexible and focus on student engagement, and (5) strong classroom management and organization. Quantitative data analysis results indicated that participants believe OPD is beneficial to professional growth, believe OPD provides and enhances their skills, feel comfortable transferring the OPD content knowledge into instructional practices, and believe OPD is as beneficial as or more beneficial than traditional professional development. This research study has implications for those who design teacher OPD and encourage participation in OPD as well as classroom technology integration.

Keywords: case study, Catholic schools, mixed methods research, online professional development, technology integration

Chapter One

This chapter introduces the concept of teacher professional development before

discussing the goal of this research along with the background of the problem and the

significance of the problem. After the specific statement of the problem is addressed, the

research questions are introduced along with definitions of important key terms in this

study. The researchers' story is also presented.

Research Goal

The goal of this research was to understand the impacts of online professional

development on teachers' technology integration in the classroom. What did teachers

learn and what impacts did online professional development (OPD) have on classroom

teaching practices? This study explored why teachers participated in OPD. In addition,

this study investigated how teachers implemented strategies in their classroom based on

what they learned in OPD. Since many schools wish to provide quality OPD for

teachers, results of this research study are helpful to school administrators influencing the

design of future OPD for teachers.

There are a variety of options available with online learning. Synchronous online

learning takes places when everyone enrolled is online at the same time whereas

asynchronous online learning does not require all participants to be online at the same

time. Some online learning uses online discussion boards to provide chances for

participants to collaborate and participate in discussion with fellow classmates.

Multimedia is often used to enhance learning by providing videos for participants as well

as voice tools for participation. Text-based online learning primarily focuses on written

information and provides text and readings for participants to assist in the learning

process.

Many teachers throughout the country participate in professional development.

Furthermore, many teachers integrate technology and use technology to support literacy

skills in their classrooms. This study explored how teachers integrated technology and

what impacts online professional development had on classroom teaching practices. By

studying the impacts of online professional development, this research explored if what

teachers learned in online professional development effected what they did in the

classroom long-term, over a six month period in the school year.

Background of the Problem

Traditional face-to-face professional development provides opportunities for

growth and development in certain specific concepts and topics (Petrie & McGee, 2012;

Sicker, 2006; Wells, 2007). Participants must travel to a specific physical location to

participate. Topics are usually clearly defined and everyone present for the professional

development is introduced to the same material in the same sequence, regardless of

individual knowledge of the topic.

With the added benefits of Internet accessibility and increased technology tools

for delivering video, voice, and the use of cameras, OPD provides opportunities for

learning from one's own home or work location, at a time that is convenient for the

teacher. Participants need a computer with Internet access and may need a built-in camera and speaker to participate in OPD. In addition, OPD often provides options for participants to make selections for areas to study based on those provided. As OPD becomes more accessible, more teachers may choose to participate. What reasons do teachers give for selecting OPD instead of face-to-face options? This study investigated the reasons teachers participated in OPD.

As the twenty-first century, technology-driven world around us continues to provide more and more opportunities for online collaboration and learning, OPD will increase in availability and accessibility. Researching the reasons teachers participate in OPD will assist in quality OPD design. As a result, this research assisted in sharing teachers' needs for future design and development of online teacher professional development.

After participating in professional development, we know that changes can occur in the classroom since teachers often implement strategies for teaching and learning as well as technology in the classroom (Duran, Brunvand, Ellsworth, & Sendag, 2012; Holland, 2001; Kazemi & Hubbard, 2008; Niess, 2005; Rentie, 2008). These changes occur soon after the professional development while the information is fresh in the minds of the teachers. However, what happens throughout the academic year, over a six month period, in the classroom? Does online professional development sustain and encourage teaching practices throughout the six months? This research study investigated these questions.

Significance of the Problem

In today's classrooms, teachers often integrate technology in order to encourage student engagement with technology tools for thinking and interacting with classroom content knowledge (Henriksen, Keenan, Richardson, & Mishra, 2015; Wachira & Keengwe, 2011). Mounting evidence shows that effective technology integration practices require school-wide implementation, encourage student engagement, and provide teacher support (Chapman, Masters, & Pedulla, 2010; Ketelhut, McCloskey, Dede, Breit & Whitehouse, 2006; Means, 2010; Shapley, Sheehan, Maloney, & Caranikas-Walker, 2011; Wilson, 2002). Technology has stimulated the development of new digital literacy skills that are necessary for all students (Alvermann, 2008; Zeig & Ronzetti, 2015). According to Rowsell and Burke (2009) teachers need professional development in order to learn strategies for teaching literacy skills with technology. This research study provided OPD to assist teachers with technology and literacy integration.

Traditional teacher professional development offers face-to-face opportunities for teachers to learn how to integrate technology and literacy in the classroom (Holland, 2001; Plair, 2008). Research has shown that teachers need hands-on experiences with technology in order to learn content-specific ways to teach with technology (Lucilio, 2013; Niess, 2005; Wachira & Keengwe, 2011). A large and growing body of research demonstrates that successful technology integration requires teacher professional development (Clark, 2006; Gunn & Hollingsworth, 2013; Li, Lemieux, Vandermeiden, & Nathoo, 2013; Marable, 2011; Pope, Hare, & Howard, 2002; Rentie, 2008). Teacher professional development must take into account the learning needs of the teacher (Brody

& Hadar, 2011; Petrie & McGee, 2012) and provide follow-up for collaboration and ongoing engagement with colleagues (Duran, Brunvand, Ellsworth, & Sendag, 2012; Stephens & Hartmann, 2004; Towndrow & Wan, 2012).

Since teachers are busy, flexibility is required in addition to offering a variety of professional development choices (Wells, 2007). OPD offers flexibility in addition to in-time, on-demand professional development (Arney, 2015; Duffy et al., 2006). Hybrid professional development combines the benefits of online learning and face-to-face learning and focuses on the needs of the learner, providing for practice and growth (Caulfield, 2011; Lock, 2006).

Specific Statement of the Problem

After professional development, teachers return to classrooms with ideas and suggestions for classroom instructional practice based on what they learned during the professional development (Duffy et al., 2006; Husby, 2005; Kazemi & Hubbard, 2008; Sadaf, Newby, & Ertmer, 2012). Implementing classroom practices show the short term benefits that exist from professional development. However, what are not as well-known are the long-term impacts on teacher practice from OPD. This research studied the long-term impacts of OPD on classroom teaching practices over six months.

Ideally, OPD should provide training and support for teachers to implement classroom practices long-term, throughout the academic year. Research (which will be described in Chapter 2) has not addressed the issue of long term impacts of online professional development on classroom teaching practices. Although immediate impacts of professional development are often observed, this research attempted to determine if

there were any long-term impacts on classroom instruction, over a six month period, as a result of OPD. This research study investigated the effects of OPD on teacher technology integration practices. In addition, this study explored the reasons teachers participated in OPD and what they appreciated in OPD.

Research Questions

The purpose of this study was to investigate OPD and classroom impacts guided by the following research questions:

(1) Why do teachers participate in OPD?

(2) How does OPD focusing on technology integration impact classroom teaching practices over six months?

Definition of Terms

- Online professional development (OPD) – learning that does not take place in traditional face-to-face settings, but instead utilizes the Internet for the majority of the information presented

- Technology integration – the use of technology tools in the classroom to support student engagement and learning

- Classroom teaching practices – methods of delivering instruction, modeling, and engaging students

Researcher's Story

The researcher is a white male in his late thirties with fourteen years of experience as both a high school teacher and administrator with a background in computer science and classroom technology integration education. As an advocate for technology

integration in the classroom, the researcher understands the need for classroom technology and ongoing professional development to assist teachers in learning how to use technology and how to integrate technology into the ongoing teaching and learning processes.

The researcher's job as a school administrator places him in a professional development leadership role in the school. From a professional standpoint, the researcher understands that teachers need ongoing professional development so they can learn how to use technology, how to teach with technology, and how to model the technology in their classrooms. As an administrator, the researcher believes it is his role to support and encourage teachers' professional development.

Summary

This chapter introduced the goal of this research: understanding the impacts that online professional development has on teachers' classroom practices. Online professional development provides flexibility beyond what traditional face-to-face professional development provides for teachers. This research study investigated the reasons teachers participated in online professional development and how it impacted classroom teaching practices over a six month period. By sharing the researcher's story, it is evident that the researcher has a genuine interest in technology integration classroom practices.

Chapter Two

This literature review starts with a discussion on technology integration in the classroom and looks at effective technology integration, student engagement, as well as challenges and barriers to technology integration. In light of technology and literacy integration needs in today's classrooms, how technology helps literacy formation and the importance of integrating technology in literacy instruction is then discussed. The TPACK (technology, pedagogy, content knowledge) framework is introduced as a necessary component of successful technology integration. Traditional professional development is presented focusing on technology professional development, the need to link professional development to classroom practice, the need for follow-up support, the importance of teacher preparation, and the value of ongoing teacher professional development. Four models of professional development are introduced: coaching and mentoring, professional learning communities, deep-play, and design-based. Online professional development (OPD) is explained as well as the on-demand benefits that OPD provides. The literature review concludes with a discussion of hybrid teacher professional development highlighting how flexibility, access, and both in-time and on-demand learning is available to assist teachers in meeting their professional development needs through hybrid learning.

Technology Integration

What is technology integration? Some believe technology integration is just the presence of computers and technology in the classroom, but technology integration is much more than classroom technology presence. "Technology integration means incorporating technology and technology-based practices into all aspects of teaching and learning specifically, incorporating appropriate technology in objectives, lessons, and assessment of learning outcomes" (Wachira & Keengwe, 2011, p. 17). Through a focus on integration, teachers incorporate technology into student learning through lesson planning, instruction, and assessment. Technology integration in the classroom creates opportunities for students to use technology, engages students in active learning, and provides hands-on opportunities for learning.

Technology integration is not determined by the amount of time technology is used, but instead "integration is better determined by observing the extent to which technology is used to facilitate teaching and learning" (Ertmer, 1999, p. 50). With an emphasis on the teaching and learning aspects, technology is a tool for student learning. Teachers must "emphasize the integration of technology and utilize teaching practices in ways that help students become better problem solvers and more analytical in their approaches to learning" (Reinhart, Thomas, & Toriskie, 2011, p. 192). Thus, with an emphasis on students' learning and problem solving skills, technology integration helps to shape teaching and learning in today's classrooms.

Lynch proposes an important research question: "not, how does technology effect

learning? but, how does learning effect technology?" (2006, p. 40). This is pivotal to the

creation of classroom technologies and integration of technology into classrooms.

Student learning through exploration and technology use in the classroom assists in the

development of future technologies. "If we see technology as a process, as continually

being produced, then users are positioned as producers who have qualitative effects on

the nature of the technology" (Lynch, 2006, p. 41). These upcoming technologies will be

developed by today's students; it is necessary for all classrooms to create a generation of

thinkers and producers of knowledge. This is possible through technology-rich

classrooms that integrate technology into the classroom teaching and student learning.

Technology integration takes time for planning. Successful planning only takes

place when teachers have received effective and efficient professional development.

Teachers must strive to use technology on a consistent basis for instructional

activities. However, without the right technology tools to practice on as well as

the appropriate training on how to appropriately use technology, they will fail in

meeting the technology objectives required to effectively prepare their students

for the workplace. (Wachira & Keengwe, 2011, p. 25)

As evident from Wachira and Keengwe, it is necessary to integrate technology into

today's classrooms so that students build thinking skills that are necessary in the real-

world. This real-world, the world our students will one day have jobs and occupations in,

is a world that is driven by increased technology use. Future technology that has not yet

even been designed or created will be available to our students to use when they get

older. New challenges arise with the development of new technologies and teachers must

have the confidence to learn new technologies and create lessons for integrating new technologies in their classrooms (Williams, Foulger, & Wetzel, 2009).

In their 2011 study, Wentworth and Monroe studied the integration of technology through inquiry-based learning opportunities for elementary classrooms. These researchers required the teachers to use four criteria when creating the lessons. These criteria are (1) students must actively use the technology in the classroom, (2) technology use is a focus and integral to the lesson, (3) the content is the main focus of the lesson, not the technology in use, and (4) technology helps students to increase learning by providing simpler ways to understand difficult tasks (Wentworth & Monroe). In their study they found that pre-service teachers had difficulty with criterion two whereas in-service teachers had the most challenges with criterion four. This study is powerful in assisting teachers as they plan classroom lessons and activities. Knowing these powerful four criteria is helpful in the design process. Teachers are often seeking ways to integrate technology but do not know how to effectively and efficiently integrate technology into the classroom. Knowing these four criteria will assist in starting the technology integration planning process.

Effective technology integration. In order to have successful technology integration in schools, school-wide practices are necessary. According to Means (2010), these school-wide practices include (1) a shared vision among the educators, (2) support from the administrators in the school, (3) collaboration among teachers to share practices, and (4) on-site technology encouragement and support. A shared vision requires that all teachers in the school recognize the importance of technology integration and support one

another with their teaching through collaboration. Support from administration must include professional development assistance and guidance as well as encouragement to integrate technology. On-site technology support is convenient for teachers to communicate directly with someone in their building, a member of their school community.

Effective technology integration helps to create student-centered classrooms. Research has found that students benefit from using computers in classrooms (Jackson, Brummel, Pollet, & Greer, 2013). Technology integration can also assist teachers in differentiating instruction (Ross, Sibbald, & Bruce, 2009). Differentiation is an important concept in today's classrooms since it challenges educators to provide instruction and learning opportunities for the needs of each individual student in front of them. With technology use in the classroom and differentiation requiring a variety of activities at the same time in the classroom, classroom management is also necessary for effective technology-integrated classrooms (Means, 2010).

Since technology integration is more than the presence of technology in the classroom, appropriate technology tools must be selected by teachers. Appropriate not only refers to age and grade level but also level of difficulty and ease of use. Technology integrated classrooms can help students continue to form their thinking and analytical skills. It must be a goal of all teachers to engage students "in activities in which they use a variety of technological resources to explore a variety of problems and topics relevant to the level taught" (Hardy, 2008, p. 234). In the classroom, exploration activities help students engage with technology as students explore and develop thinking skills.

Technology access contributes to student learning and influences student collaboration (Larkin, 2011). Technology can provide more learning opportunities that help students' learning as well as increase students' learning attitudes (Yang & Tsai, 2010). It is often necessary to communicate with other teachers in the school and share a common vision for technology integration. Shapley, Sheehan, Maloney, and Caranikas-Walker (2011) found that when teachers shared and communicated a vision of the common student achievement goals school-wide, technology integration in the school was more effective.

It is important to recognize that technology must be integrated into the classroom. Sometimes at first teachers who are reluctant to use technology start by using technology for students to complete electronic worksheets. This is not transformative teaching with technology. Other teachers may just start by using technology to demonstrate. These teachers must change their approach in order to encourage student participation and active learning (Linder, 2012).

Student engagement. The role of technology in the classroom is to enhance student learning and engagement through active learning. In many ways, technology reshapes education. "As technology takes the focus off the teacher and places it on the learner, the learner is allowed to experience, rather than just receive, information" (Wilson, 2002, p. 23). Therefore, technology provides hands-on opportunities for students to learn actively in the classroom. It is important to look beyond what the technology is and how to use it; teachers must look at how technology helps the learning (Mishra & Koehler, 2006). This is a goal of successful technology integration.

Technology must enhance the content lesson and be integrated into the planning of the curriculum so that students have an opportunity to practice content and enhance their learning opportunities. Recent studies have found that student achievement increases when students use technology in the classrooms and at home since at home use also encourages student engagement in the classroom curriculum (Bebell & Kay, 2010). Recent software developments include technology that seeks to engage students in their learning. "When students learn, mistakes and misconceptions are inevitable. Technology provides a vehicle by which students can receive feedback without risking embarrassment" (Kuhn & Dempsey, 2011, p. 19). This is important since it encourages students to take risks and possibly make mistakes as part of the growth and learning process. Feedback is excellent since it is individualized and not public to all classmates.

Integration of technology into teaching and learning is at the heart of technology integration; it is important that students are engaged in the lesson and actively use technology to help in the learning process. Kuhn and Dempsey (2011) argue that students must be engaged in the lesson in order for technology integration to work; technology should not just be used for drills and practice. Integration remains the key to successful teaching with technology. "Teachers must understand that students should actively engage with technology to solve problems. Technology should enhance instruction and not simply be used by teachers as a tool to create lesson materials" (Wentworth & Monroe, 2011, pp. 263-264). Technology use in the classroom cannot be designed just to take time or be an add-on to the students' classroom experience; technology must always enhance learning.

Engagement through interactivity is a necessary and integral part of technology integration. Students must have hands-on opportunities to use the technology in the classroom. Interactive whiteboards are an example of technology that can provide opportunities for hands-on student learning as long as activities are designed for students to use the whiteboard and curriculum lessons are created to include time for student use in the classroom. Linder (2012) encourages the use of interactive whiteboards (IWB) in primary classrooms as long as teachers know strategies for effective integration and implementation.

> The best way to use an IWB is either before or after a small-group task in which children use concrete materials, such as plastic cubes that children can link together and pull apart. Use the IWB to introduce a topic, to stimulate discussion, or to connect math concepts to real-world situations. Avoid using the IWB to show children how to complete the task.
>
> (Linder, 2012, p. 28)

This is valuable advice for elementary school teachers since it stresses the need to integrate technology in helping young children make connections between a hands-on activity just completed and the use of the interactive whiteboard. It is necessary for students to have opportunities to make connections between a small group activity completed with concrete materials and the technology activity created in the classroom. This stresses the technology integration aspect that technology is integrated into current lessons and classroom content; technology is not an additional time-wasting, busy-work, add-on to keep students occupied in the classroom.

Software programs have also been designed for engaging students in classroom exploration of subject-area concepts. Kasten and Sinclair (2009) studied 118 middle school teachers who used Geometer's Sketchpad software in the mathematics classroom. The purpose of their study was to investigate what motivated teachers to select certain classroom technologies and identify when they chose to use technology in the classroom. Kasten and Sinclair provided teachers with fifteen classroom Geometer's Sketchpad learning activities to teach in the classroom. Data was collected through an online questionnaire containing eleven questions designed to understand teacher perceptions. Teachers completed the questionnaire after each activity was completed in the teacher's classroom. The researchers found that the software can help teachers teach material that students often struggle with in the classroom. Additionally, Kasten and Sinclair found that teachers in this study preferred technology lessons that were closely related to classroom curriculum so that the technology activities were integrated into teaching.

Technology integration in classrooms provides opportunities for increasing student learning, positive attitudes, achievement, and quest for exploration. Proper technology integration will help create student-centered classrooms that excite students to learn. "The underlying principle is simple: students learn math by doing math, not by listening to someone talk about doing math" (Twigg, 2011, p. 26). Technology provides opportunities to practice the subject material; technology provides a way of knowing for our students.

Challenges and barriers to technology integration. Challenges and barriers to technology integration include proper professional development, school culture, and

negative teacher attitudes toward change (Wachira & Keengwe, 2011). Often teachers do not have experience using the technology and need time to practice and have hands-on professional development. In order to eliminate negative attitudes, teachers must also recognize the value in technology integration. Some teachers often feel they will lose teaching time when time is spent using technology in the classroom (Pierce & Ball, 2009). There must be a transformation in thinking and recognizing that time spent using technology is part of the learning process and is valuable. Teachers need to be supported and encouraged to integrate technology. The world around us is driven by technology and many classrooms are increasing the technology that is accessible to students. Teachers must have technology skills yet many still lack the skills needed to integrate technology (Chapman, Masters, & Pedulla, 2010).

Change is also a barrier in some schools; technology integration is a change from traditional ways of teaching. Technology integration requires change and necessitates using new teaching tools and methods (Harris & Sullivan, 2000). Traditional classrooms often have maximized the use of the chalkboard (Harris & Sullivan, 2000) whereas technology-driven classrooms are using the chalkboard less and using technology more in teaching. This transition from the traditional classroom "to one where technology is used as an integral part of teaching requires teachers to be prepared to change and to make a commitment to learning to use the technology in an effective manner" (Pierce & Ball, 2009, p. 315). Thus, effective professional development is necessary as well as a desire to want to change the classroom. Although barriers exist, it is evident from these studies

discussed that strong communication and planning is necessary for effective technology integration.

Many researchers have studied technology integration. For example, Koehler and Mishra (2009) as well as Wilson (2002) found technology integration exists in schools today and the frameworks and standards for technology integration provide structure, support, and rationales for technology integration in the classroom. According to Brzycki and Dudt (2005), ongoing professional development is necessary in order to overcome barriers to technology integration and increase teacher support for technology integration. "We must collaborate, create, and refine instructional techniques that assist students in becoming learners who are prepared for success in a global environment" (Drew, 2014, p. 93). Therefore, it is necessary that instructional design with technology integration encourage student engagement and inquiry (Ketelhut, McCloskey, Dede, Breit & Whitehouse, 2006). In addition to understanding the need for technology integration in today's classrooms, educators must also understand how integrating technology with literacy instruction enhances student literacy formation.

Technology and Literacy

Although so many students in today's world have easy access to a variety of technology, it is important to teach literacy skills with technology since "there is no evidence indicating that unlimited access to technology equates to deep understanding of how to read and write effectively with digital texts" (Karchmer-Klein, Shinas & Wise, 2015, p. 18). Today's digital tools require teachers to teach interactive digital skills that

allow students opportunities to read, write, and comprehend using these digital tools (Colwell & Hutchison, 2015; Johnson, 2014).

According to Fetters (2014), "to help students transfer information from multiple expository text resources-and apply that information in their daily lives-educators must integrate instruction with technology" (p. 29). Thus, technology in today's classrooms plays an important role in digital literacy and writing instruction. Students need to have the skills to utilize digital literacies since the world around them is technology-driven with access to digital literacies (Nash-Ditzel & Brown, 2014). In addition, writing is at the heart of digital communication, a skill expected in today's workforce (Drew, 2014). Writing today is usually audience-centered instead of teacher-centered (Johnson, 2014); students write to please or address a specific audience instead of writing to please the teacher. With the growth of the Internet over recent years, technology is more accessible and the connection between literacy and technology is evident since "the Internet is this generation's defining technology for literacy and learning within our global community" (Leu, Kinzer, Coiro, Castek, & Henry, 2013, p. 1158). In other words, technology and literacy integration is essential for student learning and as a result teachers play a pivotal role in technology and literacy formation through digital literacies.

Technology helps literacy formation. In light of the impact of technology on writing instruction, it is easy to see how technology also impacts reading instruction. "The demands of 21st century literacy necessitate collecting and synthesizing information from multiple print, digital, and video sources" (Zeig & Ronzetti, 2015, p. 207). Digital texts are increasingly more accessible and teachers should instruct on the characteristics

and capabilities of digital texts including the multimodality incorporating text, images, and sounds in classroom reading instruction (Karchmer-Klein, Shinas & Wise, 2015; O'Byrne & McVerry, 2015).

In their research of online literacy teaching and learning, Rowsell and Burke (2009) studied two middle school students. Data was collected through interviews and observations. Using a multimodal lense to analyze the data, the researchers found that digital texts create opportunities for students to comprehend the material using complex and intricate meaning-making literacy skills. Consequently, Rowsell and Burke argue that teachers must have hands-on experience with the differences in reading traditional print texts from digital texts in order to better understand how to teach digital literacy skills. Pursuing this further, since most teachers are using traditional print texts, it is imperative that teacher education, workshops, professional development, and training include hands-on opportunities for teachers to read and experience digital texts to better understand the digital experiences of their students (Rowsell & Burke).

Wells (2012) studied reading comprehension and motivational levels of students using electronic books and students using traditional print books. Wells studied 140 middle and high school students; data was collected through a reading comprehension test and completion of a survey. Wells' study found no significant differences between the reading comprehension of students with e-textbooks and the students with traditional paper textbooks. Thus, as an application for teachers, Wells' study indicates that reading comprehension strategies used for traditional textbooks should still be implemented in classrooms with e-textbooks.

Alvermann (2008) proposes that there is a unique adolescent digital literacy culture with many implications for teachers and classroom practices. Moreover, Alvermann believes that students' online access has created a participatory culture in which online literacies exist due to the availability of digital texts. Following this further, Alvermann believes that the shift from linear processing of print books to multi-dimensions of digital texts has important implications for teachers and their classroom instruction. In light of these online literacies with electronic texts, online activities as well as digital books are forming new literacies that are still being shaped today (Alvermann).

Integrating technology in literacy instruction. Technology can be integrated into classroom practices to enhance literacy instruction. Electronic note taking is an example of technology use to support literacy instruction. Students must engage in the process in order to effectively take notes electronically which leads to increased learning and information processing (Igo, Riccomini, Bruning, & Pope, 2006). In the same way, it is important for students to construct notes and think about the text in order to process and later retain the information (Katayama, Shambaugh, & Doctor, 2005). Igo and Kiewra (2007) studied 46 high-achieving high school students and 43 high-achieving college students and how they approached electronic copy and paste notetaking. Through three test scores and observations, researchers collected data and found that the students who were more selective in deciding which notes to take electronically were overall more successful in assessments. Consequently, these studies show the need for student

involvement in deciding which notes are the most important from the text and classroom discussions instead of copying and pasting everything.

There are many instructional strategies that support reading through classroom technology integration. Podcasts can be used in classrooms to include a reader's theater that provides opportunities for students to listen and re-listen to their own recordings while critiquing themselves and their work (Richardson, 2010; Sprague & Pixley, 2008; Vasinda & McLeod, 2015). Teachers can create a digital learning hub that provides resources that encourage students to read and reflect on informational texts (O'Byrne & McVerry, 2015). Teachers can use digital apps to provide feedback and assessment (Zeig & Ronzetti, 2015). Students can use multimedia products and Web 2.0 tools to represent their learning of literacy skills (Zeig, 2015). Reciprocal teaching provides opportunities for students to share their reading comprehension (Johnson, 2014). Blogs are also a great tool to enhance student reading and provide an opportunity for teachers to assess student reading comprehension. "Blogs allow users to post content on the web for a wider audience and can enhance students' motivation and engagement in reading and writing practices" (Stover & Yearta, 2015, p. 224). With a clear purpose and focus, blogs can easily be integrated into classrooms today.

There are also many instructional strategies that support writing through classroom technology integration. Digital reading logs support collaborative writing and promote engaged reading while think-alouds encourage verbalizing thoughts while reading texts (Nash-Ditzel & Brown, 2014). Expository writing with technology can be encouraged through the use of e-versions of graphic organizers (Fetters, 2014). Writing

workshops with blogs provide an opportunity for an "interactive online writing environment connected to content-area learning" so that students can write about topics related to classroom study (Drew, 2014, p. 91). Blogs can also provide opportunities for students to use technology in the classroom and to share their writing with readers beyond their classmates (Johnson, 2014; McGrail & McGrail, 2014; Richardson, 2010).

Larson (2010) encourages teachers to create school-wide learning environments that support digital reading and increased digital literacy skills. Following this further, Larson insists that it is necessary to create school literacy and technology goals and he encourages all schools to create uninterrupted quality reading time to provide students with time and access to electronic books. Furthermore, teachers must regularly review the students' electronic notes in order to encourage deeper meaning-making with the text (Larson, 2010). In light of these concepts, these suggestions may be beneficial for taking action in schools by creating and sustaining reading time and effective development of digital literacy skills in the students.

Professional development and teacher education must include opportunities for teachers to learn and experience digital texts and the necessary digital literacy skills. Coiro (2003) believes that ongoing technical support for teachers as well as more influence in school technology planning is necessary for successful literacy education. As an example, Larson (2008) uses an electronic reading workshop in her methods courses to help teachers understand new technologies and the digital literacies associated with the technology and digital formats of books. These electronic reading workshops provide opportunities to read and reflect using response journals and online discussions;

Larson has found that these workshops provide opportunities for teachers to experience other technologies they can integrate into their classrooms.

Technology and literacy integration are necessary to help students' ongoing literacy formation. In addition to technology and literacy integration assisting student digital literacy skills, technology and literacy integration assists teachers in developing pedagogy and content knowledge.

TPACK Framework

In order to successfully integrate technology into the curriculum, teachers must be aware of the need to focus on TPACK (technology, pedagogy, content knowledge). TPACK is a framework of knowledge for all teachers that focuses on integrating content, knowledge, and technology (Koehler & Mishra, 2009). The content knowledge component focuses on teachers' subject area knowledge of the content. Pedagogical knowledge refers to the methods of teaching. Technology knowledge focuses on the developmental aspects of current technology as well as how teaching and learning change with technology use.

The interactions of technology, pedagogy, and content knowledge form the TPACK framework. According to Koehler and Mishra (2009), there are

> three key components of teacher knowledge: understanding of content, understanding of teaching, and understanding of technology. The complexity of technology integration comes from an appreciation of the rich connections of knowledge among these three components and the complex ways in which these are applied in multifaceted and dynamic classroom contexts (p. 7).

In other words, the TPACK framework is all about integration and understanding of content, teaching, and technology. Helping educators understand these interactions, the International Society for Technology in Education (ISTE) has developed national technology standards for each of these five groups: students, teachers, administrators, coaches, and computer science educators. Together with ISTE standards, the TPACK framework shapes teachers' conceptual knowledge on the importance of technology integration. The TPACK framework along with the technology standards helps inform teachers of the important qualities of classroom technology integration.

Professional development "has been deemed the necessary approach to improving teacher quality, meaning teachers' pedagogical content knowledge and pedagogical practices" (Dash, Kramer, O'Dwyer, Masters, & Russell, 2012, p. 2). Thus, professional development on TPACK is necessary for teachers. This focus on professional development will assist teachers with integrating technology, literacy, and the TPACK framework into classroom practice.

Traditional Professional Development

Ongoing teacher professional development is beneficial for all teachers; it is important for school administrators to take an active role in promoting and facilitating teacher professional development (Postholm, 2012). Self-reflection, collaboration, and feedback are important ways to collect data and assist in the design and plan of future teacher professional development opportunities (Patti, Holzer, Stern, & Brackett, 2012). It is important to review data collected after teacher professional development activities in order to analyze the effects of teacher professional development on student outcomes

(Martin, Strother, Beglau, Bates, Reitzes, & Culp, 2010). As a part of ongoing support for professional development, administrators must be willing to review data and listen to input from the teachers.

Well-designed professional development for teachers must "support teachers' development as professionals involved in decision-making, inquiry, and leadership in their classroom teaching. In order to develop as professionals, teachers specifically need help and support in integrating new knowledge and skills into their classroom practice" (Holland, 2001, p. 245). Opfer, Pedder, and Lavicza (2011) studied teachers' beliefs and practices and their influence on teacher professional development by collecting survey data from 1126 British primary and secondary school teachers. These researchers found that "teachers' orientations to learning impact what and how they learn. Beyond individual influences, teachers' learning is also influenced by organizational conditions" (p. 451). Teacher professional development must take into account the individual needs and differences of the teachers (Brody & Hadar, 2011). Following this further, just as planning and design is important to professional development, so is the need to link relevant professional development into providing practical tools and suggestions for teachers to use and integrate into the classrooms.

Wells (2007) proposes the need for focusing on five key areas when designing effective teacher professional development: duration, learner-centered, engagement, collaboration, and support. There must be a variety in duration of professional learning activities provided for teachers; these activities can range from in-school professional development to workshops to courses and to many other possibilities (Postholm, 2012).

When planning professional development, it is important to take into account the diverse learning needs of the teachers (Bakkenes, Vermunt, & Wubbels, 2010; Brody & Hadar, 2011; Petrie & McGee, 2012). Since teachers are humans with a variety of learning needs just like students, a focus on learner-centered professional development takes into account the learning needs of the teachers involved in professional development activities. When considering collaboration and support needs for teachers, it is important to remember the role of qualitative and action research in promoting teacher growth and development. "Teachers should be encouraged to articulate, record, and reflect on their perceptions about the impact of their professional development and related changes in classroom practices on their student learning" (DeVries, Jansen, & Van de Grift, 2013, p. 87). Teachers' reflections help to design and improve professional development opportunities for the future.

Teacher professional development helps teachers experience new ways to change classroom instructional practices and improve teacher quality (Wenglinsky, 2005; Whitehouse, Breit, McCloskeu, Ketelhut & Dede, 2006). It is important for teachers to have a community of practice at school that encourages collaboration, reflection, and sharing of ideas (Duffy et al., 2006). Finding time for busy teachers to participate in ongoing, long-term professional development is certainly a challenge, but worth it since research has found that short, single session professional development, although numerous in availability, is not very effective (Duffy et al., 2006). Professional development designed for teachers should allow teachers opportunities to examine their

own teaching, reflect on their practices, and consider new approaches and changes to their teaching (Sicker, 2006).

Sicker (2006) encourages teacher professional development module design based on five key steps: invitation, exploration, explanation, application, and putting it into practice. The invitation step provides a vision for the topic whereas exploration provides time to experience and use the features of the topic. Explanation provides opportunities for teachers to discuss, communicate, and seek clarification. Application provides an opportunity for teachers to apply what they learned and see what other teachers have created through their knowledge of the concept. The putting it into practice step provides opportunities to review strategies and create meaningful classroom lessons.

Similar to their students, teachers are learners and need to learn how to use the technology and be taught the technology skills (Ertmer, 1999; Rentie, 2008; Wilson, 2002). Professional development is essential to successful technology integration (Swain & Pearson, 2003); "the training that teachers receive on the integration of technology has a significant impact on the level of comfort that they possess when it comes to technology in the classroom" (Wilson, 2002, p. 3). It is important to have flexible professional development that provides a comfortable setting which encourages asking questions, seeking clarification, and participating in opportunities to make one feel confident in technology use (Swain & Pearson, 2003, p. 330).

Technology professional development. Since technology is present in today's twenty-first century classrooms and teachers are encouraged to use technology in the classrooms, technology professional development must be provided for all teachers. "As

technology changes the ways that schools themselves are structured, efforts to meld innovation in instructional technology with best practices in teachers' professional development catalyzes other elements of school reform" (Holland, 2001, p. 246). Thus, technology professional development with best teaching practices is necessary to help teachers understand how to integrate technology into the classroom. Teachers often struggle to find ways to integrate technology into their classroom and this is often the case due to a lack of knowledge and professional development (Plair, 2008). The technology, pedagogy, content knowledge (TPACK) framework can assist teachers in providing support and a pedagogical framework for the need to integrate technology into the curriculum.

Planning technology professional development must start with a focus on making sure teachers understand the power of technology in education and the benefits to student growth, learning, and achievement. "Changes in beliefs, not additional access or improvement in technical skills, are required for advancing into the higher levels of technology integration" (Hixon & Buckenmeyer, 2009, p. 141). When planning teacher technology professional development, it should focus on three areas: include content with technology, provide time for hands-on opportunity with the technology, and address the needs of the teachers (Hew & Brush, 2007). Therefore, once teachers understand the need for technology integration, then they can move into hands-on, personalized professional development.

Engagement in teacher technology professional development is necessary in order to provide opportunities for teachers to experience technology use. In their self-study

research, Fransson and Holmberg (2012) studied one of their initial teacher licensure courses designed around the TPACK framework to provide teachers with opportunities to design lessons integrating Web 2.0 technologies in the classroom. The researchers found that "because the less technologically knowledgeable teacher was not familiar with all the digital tools used in the course, he did not always know what could be achieved with them and how they might best be used" (p. 201). Therefore, it is necessary to provide time for teachers to learn the technology first before they teach with technology in the classrooms. Lucilio (2013) researched high school teachers' professional development needs and delivery preferences. Through this study of 14 Catholic high schools, 169 teachers and administrators submitted surveys. The researcher found that teachers want professional development that provides "context-specific experiences and how to use them in the classroom to improve student achievement" (p. 70). Professional development must provide practical tools and resources for solid instructional practices.

All teacher professional development in instructional technology reminds us that technology is constantly changing and updating. Thus, it is important to help teachers understand the importance of ongoing professional development as lifelong learners (Twining, Raffaghelli, Albion, & Knezek, 2013). Teacher professional development must always focus on student learning and student success while providing opportunities for teachers to learn how to teach with technology in the classroom (Niess, 2005).

Effective professional development must always support teachers in their mission to educate students by providing practical tools and resources for solid instructional practices. Proper planning of teacher professional development requires collaboration

among administration, faculty, and staff (Meltzer, 2009). It is beneficial for school administrators to model support and encouragement for teachers' technology professional development and technology use in the classroom (Adamy & Heinecke, 2005). The support needs to be long-term, with the vision of helping teachers create a learning community among themselves for their own development and sharing of resources (Wells, 2007). School administrators play an important role in the support and encouragement of quality teacher technology professional development.

Opfer and Pedder (2011) propose that teacher professional development must take into account the interaction of the teacher, the school, and the learner activity. Effective teacher professional development can positively impact teacher's attitudes and teachers should be included in the planning of professional development (Lucilio, 2013). In their 2008 study, Heck, Banilower, Weiss, and Rosenberg studied professional development of mathematics teachers. Through questionnaires completed over a four year period, data from almost 18,000 K-12 teachers was collected. Through their study, these researchers concluded that professional development can positively change "teachers' attitudes, preparedness to teach mathematics, and practice itself, but that a professional development program that is designed and coordinated to address all of these goals in concert is more likely to have the desired effects on practice" (Heck, Banilower, Weiss, & Rosenberg, 2008, p.146). Petrie and McGee (2012) studied in-service teachers and found that it is difficult to recognize the learning needs of teachers when professional development is not flexible and when only one model is used for all teachers. In their study, Petrie and McGee found that diverse needs of teachers were overlooked; "there

appeared to be little recognition of the diverse learning needs of the teachers, who had different past experiences" (Petrie & McGee, 2012, p. 65). Although professional development in this study focused on quality teaching approaches, only limited opportunities were provided for teachers to extend their knowledge.

Linking professional development to classroom practice. Teachers are often looking for ways to integrate technology into their classrooms. Professional development that focuses on technology in the classroom must include classroom-based activities and suggestions for teachers on how to integrate technology into the classrooms (Clark, 2006). Hands-on experiences during technology professional development activities allow teachers to experience how to use the technology and improve their own technology skills (Duran, Brunvand, Ellsworth, & Sendag, 2012). The research of DeVries, Jansen, and Van de Grift (2013) found that teachers more actively participated in collaborative professional development activities instead of reflective ones. Thus, practical hands-on technology professional development offers opportunities for growth that teachers are looking for to assist them in their classrooms and teaching.

Another important aspect of professional development is helping teachers understand the role of technology in student learning. "Most of the teachers said that the technology training they had so far had been generic and did not help them learn content-specific ways of technology integration" (Wachira & Keengwe, 2011, p. 21). Thus, it is imperative that those designing professional development must provide opportunities for teachers to practice and learn content-specific technology tools. Professional development cannot be generic in just providing reasons for integrating technology;

efficient professional development opportunities must provide what the teachers need: content-specific, easily-usable tools for success in the classroom.

It is not always easy to integrate technology into lessons so content-specific help with technology exercises is necessary as a resource for teachers. "Professional development that is content-specific may provide a clear vision for appropriate technology use thus helping address teachers questions and misconceptions on whether and how technology-based activities address educational objectives" (Wachira & Keengwe, 2011, p. 24). In their 2012 study, Duran, Brunvand, Ellsworth, and Sendag studied a district wide approach to professional development that had support from the teachers in the district. The researchers collected data from 207 teachers and administrators through surveys, questionnaires, and a content analysis of teacher wikis. The researchers found the teachers wanted support for professional development participation from the district level. The researchers concluded that ongoing district-level support is necessary for effective teachers' technology professional development; "ongoing support from the district made it easier to take on the task of learning a new technology and provided the necessary motivation and guidance to continue using wikis in the classroom" (Duran, Brunvand, Ellsworth, & Sendag, 2012, p. 328). Following the need for professional development to classroom practice, it is also necessary to provide teachers with follow-up support as well as time for reflection.

Follow-up support. Effective professional development is ongoing and must include follow-up opportunities to address the needs of the teachers (Green and Cifuentes, 2011). Follow-up after professional development is necessary in order to see

if teachers need additional help or support in implementing the ideas presented during professional development (Meltzer, 2009). Green and Cifuentes (2008) studied follow-up and peer interaction that was online instead of face-to-face. These researchers studied 450 school librarians and collected data through surveys. Researchers found online follow-up provided flexibility in communication with other participants. "Follow-up to professional development, with and without peer interaction, led to more positive attitudes by the treatment groups toward the professional development experience" (Green & Cifuentes, 2008, p. 300). This study supports the inclusion of opportunities for online follow-up to face-to-face professional development. Ongoing support is necessary for continued success in any technology integration professional development (Duran, Brunvand, Ellsworth, & Sendag, 2012; Towndrow & Wan, 2012).

Although online follow-up provides opportunities to continue discussion, it is necessary to train and model the online tools so teachers know how to use them. Stephens and Hartmann (2004) studied the difficulties of using online discussions after teacher professional development. These researchers studied 28 secondary, grades 6-12, mathematics teachers from two cohorts who participated in educational technology professional development. Data was collected through a content analysis of discussion board posts as well as from interviews. From their research, Stephens and Hartmann (2004) studied why teachers who valued the "positive engagement with colleagues in face-to-face meetings" (p. 70) and who used email regularly did not participate frequently in online collaboration after the professional development. Stephens and Hartmann proposed an excellent question for further research; "we might ask whether asking

teachers to learn to use one new form of technology (e.g., graphing calculators), and discuss it on another (e.g., *First Class*) is too much to ask of practicing teachers" (p. 70). As a result of this study, the researchers concluded that teachers need to be trained to use online tools for effective follow-up, online discussion.

Follow-up also includes recognizing changes in the classroom after professional development. The research of Kazemi and Hubbard (2008) studied "what teachers are learning during and after PD, looking at the coevolution of participation between classroom practice and PD" (p. 428). Kazemi and Hubbard's (2008) study challenges future researchers to study and discover the importance of and the coevolving nature of teacher's participation in the professional development activities and what they do with their knowledge in their classrooms after the professional development is completed.

Teacher preparation. In the same way follow-up support is important for professional development, teachers must be prepared to teach with technology. Bai and Ertmer (2008) propose that it is also necessary for teacher educators to include technology into their courses. There is still a concern that pre-service teachers do not receive enough instruction or guidance on how to properly integrate technology into the curriculum (Mitchell & Laski, 2013; Williams, Foulger, & Wetzel, 2009). Education technology courses are necessary to introduce pre-service teachers to the variety of educational technology available as well as introduce pre-service teachers to methods of integrating technology (Bai & Ertmer, 2008). In order to use technology in the classroom, teachers need to recognize why technology integration is important and reflect on how it helps students (Pope, Hare, & Howard, 2002; Towndrow & Wan, 2012).

Reflection time is an important part of professional development activities so that teachers can collaborate, share ideas and experiences, and grow from one another (Orrill, 2001). Orrill proposes that reflection time through professional development will lead to classrooms that encourage student reflection and growth. Lambert, Gong, and Cuper (2008) studied 62 pre-service teachers' perceived technology abilities and attitudes. Data was collected through questionnaires and surveys. The researchers found that course instruction for pre-service teachers can positively influence their understanding of the importance of technology integration in classrooms.

Pre-service teachers' confidence in technology integration is increased with course work that focuses on how to integrate technology (Pope, Hare, & Howard, 2002). Building confidence is necessary in order for pre-service teachers to desire to want to use technology in the classroom (Williams, Foulger, & Wetzel, 2009). Awareness of technology is a first step but according to Williams, Foulger, and Wetzel's (2009) study, understanding the usefulness of technology integration is evident when pre-service teachers' methodology class experience provides opportunities for pre-service teachers to practice with technology. Thus, teacher educators play an important role in training and providing opportunities for pre-service teachers to grow comfortable in integrating technology.

Where do we go from here? Strong professional development is necessary in order to encourage teachers to integrate technology in the classroom (Brzycki & Dudt, 2005; Clark, 2006; Duran, Brunvand, Ellsworth, & Sendag, 2012). Many teachers in classrooms today had their formal education training prior to the emergence of

instructional technology. Ongoing technology professional development is necessary.

When planning professional development, it is necessary to consider the interactions

between the school, the teachers, and the students (Opfer & Pedder, 2011). "Teachers

must be included in the design, development, implementation, and delivery of

professional development" (Lucilio, 2013, p. 73). Since teachers are in the classrooms

and know their students as well as their strengths and weaknesses, it is essential that

teachers are involved in their own professional development planning.

Professional development must provide hands-on opportunities for teachers to use

the technology and experience the challenges in addition to time for teachers to

collaborate and share ideas with other teachers (DeVries, Jansen, & Van de Grift, 2013;

Patti, Holzer, Stern, & Brackett, 2012). "Along with new technology standards, studies

support the idea that teachers who are well trained in technology use are more likely to

provide technology-rich lessons for students" (Rentie, 2008, p. 104). Professional

development opportunities for teachers should provide hands-on opportunities that

address teachers' technology needs with time for reflection and encouragement of sharing

among teachers (O'Hara, Pritchard, Huang, & Pella, 2013). Technology is the core of

today's education and plays a vital role in encouraging positive changes in schools as

well as encouraging ongoing, well-received professional development in best practices.

Learning about new instructional technologies is important for ongoing

professional development and growth. Teachers are individuals and have individual

needs; professional development must be flexible and provide for the individual needs of

teachers (Wells, 2007). It is important to design technology professional development for the specific individual technology learning needs of teachers.

Ongoing professional development. As new technologies are created and available in classrooms, ongoing professional development for teachers is important in order to introduce teachers to the technologies. Following this further, research-based professional development can help increase teacher learning of technology and skills (Duran, Brunvand, Ellsworth, & Sendag, 2012; Towndrow & Wan, 2012). Marable (2011) studied 28 teachers' technology integration professional development in relational to their attitudes toward technology in their classrooms. Data was collected through multiple surveys and Marable's research questions focused on studying teachers' perceptions of technology use, their available resources, and the ongoing professional development for teachers. Marable found that teachers wanted more time for more professional development, more examples of how their colleagues use technology in the classroom, and more technology support. Marable concluded that in order for teachers to implement changes in the classroom, more time for ongoing, practical technology integration professional development must be scheduled.

Gunn and Hollingsworth (2013) conducted a three-year study of a district-wide approach to long-term ongoing teacher professional development in the areas of technology integration, differentiation, and assessment. Data was collected through surveys taken three times (once each year) by 236 K-12 teachers. The researchers found that increased, ongoing professional development significantly led to the creation of more student-centered classrooms that utilized more technology, integration of technology, and

differentiation in classrooms. The researchers concluded that ongoing professional development is beneficial for teacher learning and growth and as a result encourages student success.

Throughout teacher professional development, it is necessary to provide ongoing opportunities for collaboration, reflection, and discussion with other teachers. "Technology does require a purposeful focus and strategy to support the thoughtful integration into teaching for engagement and achievement" (Schrum & Levin, 2012, p. 72). Providing planning time and collaboration time is both essential and beneficial for planning technology integration lessons.

At a minimum, school administrators must have a vision that encourages technology integration (Wilson, 2002). Providing ongoing professional development opportunities for teachers to learn and have time to play with the technology is important in addition to providing a resource person who can answer questions when they arise during the school day (Pickett, 2009). Follow-up opportunities after professional development can assist in checking for areas that need additional assistance and where teachers feel they need additional support (Howland & Wedman, 2004). Teachers need individualized support for technology integration, so school administrators need to provide resources that allow sharing of ideas, instructional coaching, and teacher mentoring in technology integration. These resources for individual support are often lacking in traditional professional development. The individual needs of teachers are not always met and opportunities to play with technology and try out new resources with support are not always present in traditional professional development. Thus, different

models for professional development need to be considered including OPD, where it is possible to differentiate and meet individual needs.

Models for Professional Development

There are similarities and differences among the current models for teacher professional development. For many years, the traditional model for teacher professional development is a model centered around outside resources that are brought to the school to conduct a workshop or deliver a presentation on a determined topic providing mostly time for teachers to sit, listen, and be passive in their learning (Husby, 2005; Kennedy, 2005). Through this face-to-face professional development, teachers often do not interact with the speaker, but instead sit and listen to a lecture-based format that is often not interactive or hands-on (Caulfield, 2011). Although traditional professional development provides opportunities for teacher learning, other models of professional development may be more effective and should be considered.

Coaching and mentoring. In their research, Patti, Holzer, Stern, and Brackett (2012) studied a professional development coaching model: "personal, professional coaching is grounded in reflective practices that cultivate self-awareness, emotion management, social awareness, and relationship management" (Patti, Holzer, Stern, & Brackett, 2012, p. 263). Through a focus on self-reflection, collaboration, and feedback, this professional development model focuses on the development of teachers in areas such as leadership, colleague relationships, and instruction quality (Patti, Holzer, Stern, & Brackett). Coaching focuses on the needs of the individual teachers and assists in developing knowledge, providing feedback, and empowering the teachers (Zepeda,

2012). Coaching is a non-evaluative form of professional development that encourages growth through a relationship between teacher and coach while focusing on instructional strategies that encourage support and collaboration (Lowenhaupt, McKinney, & Reeves, 2013). Peer coaching provides opportunities for teachers to support and learn from each another (Showers & Joyce, 1996).

Mentoring along with coaching provides opportunities for supporting teachers' professional growth. The mentoring model assigns a teacher to a mentor so that the mentoring program assists the teacher over time in formation from survival to maintenance to enhancement to redevelopment (Joyce & Calhoun, 2010). The focus of this model of professional development is on building one-to-one relationships to support teacher development and growth (Kennedy, 2005). Linn (2006) found that when a teacher respects the mentor, greater professional growth occurs through this form of professional development.

Professional learning communities. Strong school leadership is essential in nurturing and modeling the importance of professional growth, but all members of a learning community must be willing to provide leadership, build the community of growth, work for teacher development, and focus on enhancing student learning (Zepeda, 2012). With collaboration and cooperation among teachers at the heart of this model, learning communities focusing on collaboration among group members participate in action research through inquiry with the focus determined by the group needs (Joyce & Calhoun, 2010). This model usually focuses on helping small groups achieve their goals in research and professional growth.

Focusing on individual needs, this model places teachers at the center of learning with their determination of content and delivery methods. Thus, the teachers are the decision makers; the teachers determine where, when, and how often to meet, they choose a facilitator and collaboratively create a learning plan (Husby, 2005). Some forms of this model include book study groups on a selected book or teacher study groups on a selected topic of interest; these topics are selected from the members of the group based on their desire for professional development focus (Zepeda, 2012).

Deep-play model. During technology integration professional development, teachers need to be taught how to use the technology, must practice applying the use of technology, and the technology must be modeled by the professional development presenter (Pope, Hare, & Howard, 2002). Taking time to play with the technology and to learn how to use it is an important aspect of well-designed professional development (Duran, Brunvand, Ellsworth, & Sendag, 2012). Koehler et al. (2011) developed a deep-play professional development model that focuses on designing lessons.

> By deep-play we mean an engagement with rich problems of pedagogy,
> technology and content and their inter-relationships. Deep-play is creative,
> seeking to construct new ways of seeing the world, and new approaches to using
> technology, in order to develop creative pedagogical solutions (p. 154).

The deep-play model provides opportunities for teachers to engage in hands-on experiences with the technology and encourages reflection and thinking about how technology use in the classroom encourages student learning (Koehler et al., 2011). By

focusing on the relationship between technology and pedagogy, deep-play supports the TPACK framework and provides constructivist use of technology (Wenglinsky, 2005).

Teachers must also consider adding deep-play time in the classroom. Henriksen, Keenan, Richardson, and Mishra (2015) believe

> In a society that requires innovative and imaginative thinkers to deal with complex issues, play is needed for students to learn, grow and see new possibilities and opportunities. Without creativity, we stagnate, and without play we cannot create (p. 9).

Thus, deep play time is not only necessary for teacher professional development but it is also necessary for teachers to provide deep-play time in the classroom so that students experience new technologies and learn from using technology.

Professional development must provide assistance to teachers with the integration process (Clark, 2006; Marable, 2011). Li, Lemieux, Vandermeiden, and Nathoo (2013) studied digital game design experience for pre-service teachers while providing deep-play time to experience digital game design. Through their study of 21 pre-service teachers, data was collected through surveys, interviews, and the games designed by the teachers. The researchers found that hands-on experience provided opportunities for pre-service teachers to struggle while learning the technology just like some of their future students will struggle when they are first introduced to new technologies. The researchers concluded that "providing teachers with experiences of exercising 21st century skills may help them better facilitate these skills in their future classrooms" (Li, Lemieux, Vandermeiden, & Nathoo, 2013, p.328). Thus, professional development that provides

practical hands-on technology experience offers deep-play opportunities for growth of teachers.

Design-based model. Through a design-based model of professional development, O'Hara, Pritchard, Huang, and Pella (2013) created professional development based on strong pedagogy and structured teaching. Through their "Teaching Using Technology Studio" O'Hara et al. focused on teachers' knowledge of technology integration and provided examples for teachers to integrate technology in the classroom based on teachers' interests and classroom needs. By focusing on the interests of the teachers, professional development can be customized to provide appropriate and practical classroom training.

Teacher educators must continue to study the research and best practices in technology integration in order to encourage teachers to use and integrate technology into the classrooms. Sadaf, Newby, and Ertmer's (2012) research found that positive perceptions and beliefs in the effectiveness of technology directly increased the use of technology in the classroom. Traditional professional development is often provided at times and locations that are not convenient for those interested. Online professional development provides availability, access, and ongoing support opportunities that are not always available in traditional models of professional development.

Online Professional Development (OPD)

There are many practical characteristics of OPD for teachers.

The value of online learning is in meeting the practical needs of cost and access, not in any inherent pedagogical advantage or disadvantage. The pedagogical

advantage of any course, online or face-to-face, lies in the quality of the learning

experience and architecture. This means modeling and supporting learners in

engaging in learner-centered practices (Duffy et al., 2006, p. 180).

Thus, well-designed OPD must provide quality instruction. Addressing the need for

TPACK professional development, OPD "can be an effective strategy to improve

teachers' pedagogical content knowledge and pedagogical practices" (Dash, Kramer,

O'Dwyer, Masters, & Russell, 2012, p. 23). OPD opportunities allow scheduling

flexibility and often address individual teacher needs.

Online teacher professional development is important because it can provide in-

time training when teachers need specific professional development topics and often

allows teachers to work at their own pace when they have the time (Duffy et al., 2006).

Many OPD opportunities use a mentorship model. "A mentor is one who establishes an

engaged and trusting relationship for the purpose of professional development and

guidance" (Duffy et al., 2006, p. 178). Thus, the online mentor supports and guides the

teacher through the learning process.

OPD opportunities allow in-time training when teachers need it and often provide

a variety of modules that help address individual teacher needs. Considering the needs of

the teachers and their motivation to engage in professional development are important

considerations in planning OPD (Sprague, 2006). Therefore, flexibility in professional

development design is important to meet the diverse needs of today's teachers and online

teacher professional development certainly provides flexibility in time and scope that

school administrators should consider when planning professional development.

Online courses provide professional development opportunities that cannot be reached in face-to-face opportunities. "One critical affordance of the online environment is that the intended curriculum becomes the enacted curriculum, something that cannot be fully accomplished in face-to-face environments" (Doubler & Paget, 2006, p. 119). Online courses provide resources online in addition to discussions and interactions with other participants through the online environment. Asynchronous online courses do not require all participants to be online at the same time and the self-paced nature of online courses allows participants to work at their pace when convenient throughout the week. Massive open online courses (MOOCs) provide free online professional learning for a large number of interested participants.

Virtual learning communities are designed to provide opportunities for professional development among teachers with similar learning interests and needs. Understanding that technology is a tool for learning, teachers who participate in virtual learning communities learn from each other, participate in self-directed learning, and engage in professional collaboration through a learner-learner model where all who participate are members of the learning community (Hollins-Alexander, 2013). Although there are many benefits to online learning, compared to traditional professional development, face-to-face interactions with others is missing from online learning.

Hybrid Professional Development

Hybrid professional development combines many of the features of traditional professional development with OPD. Hybrid learning has both a face-to-face component as well as an online component. With less time spent in the traditional face-to-face

meetings, hybrid professional development allows time spent online outside the classroom providing students opportunities to use technology to learn online and collaborate with classmates. "Hybrid courses place the primary responsibility of learning on the learner, thus making it the teacher's primary responsibility to create learning opportunities and foster environments that encourage student learning, rather than simply telling students what they need to know" (Caulfield, 2011, p. 4). With an emphasis on a collaboration environment, hybrid professional development provides opportunities for participants to communicate electronically during online sessions and communicate in person during face-to-face sessions.

Designing hybrid learning must have a clear plan that focuses on what the participants need to demonstrate in order to share knowledge acquired as well as providing quality face-to-face and online collaboration and learning time through an online community (Caulfield, 2011; Lock, 2006). Utilizing in-house expertise is important in the process of designing hybrid learning. Hybrid professional development is beneficial for providing "just-in-time" training for teachers on specific topics they need at specific, sometimes critical, times (Arney, 2015). Thus, hybrid professional development fulfills many important needs for today's teacher professional development.

Hybrid professional development opportunities are excellent for long term technology integration professional development since they can provide ongoing opportunities for learning and collaboration with face-to-face meetings for collaboration followed by online time for deep-play in technology. These can also provide opportunities for reflection as practices are implemented in the classroom and then

discussed both face-to-face and online with other participants in the professional development hybrid learning. Chen and Chiou (2014) studied how hybrid learning effects students' growth, sense of community, and course learning satisfaction. The researchers studied 140 undergraduate students and collected data through a learning style inventory, questionnaire, course final exam, and survey for sense of community. They found that students often have a greater sense of community in hybrid learning compared to traditional face-to-face learning. The researchers concluded that hybrid learning provides students with opportunities to log in and access material at any moment and encourages connecting electronically with classmates outside of face-to-face class meetings.

Well-designed hybrid professional development encourages active learning from the participants both online and in the classroom. "The foundation of hybrid teaching is built upon creating student-centered learning environments whereby the teacher's primary role is encouraging students to become active knowledge-seekers versus spoon-fed learners" (Caulfield, 2011, p. 7). This student-centered approach to education places the student at the center of learning. In a hybrid teacher professional development model, the teacher is the student and the teacher's learning needs are a priority. Teachers can have play time with technology and then collaborate and communicate both online and face-to-face on what they learned and struggled with during the experience. Through participation in communication and collaboration both online and face-to-face, the characteristics of both traditional and online high-quality professional development are experienced in hybrid professional development. The online community of learning

provides opportunities for the collaboration among professionals to continue well after the conclusion of a hybrid designed learning opportunity.

Summary

In summary, professional development is an important part of ongoing teacher education. Technology integration is important in today's 21st century classrooms and professional development must provide opportunities for teachers to learn how to use and how to teach with technology. Utilizing the TPACK framework, teachers can design classroom lessons that use technology and engage students in their learning. Through the use of technology, all teachers can support and motivate student literacy through digital technologies available for reading and writing. Through a hybrid model of professional development, flexibility, access, and both in-time and on-demand learning is available to assist teachers in meeting their professional development needs.

Chapter Three

This study was designed to investigate online professional development (OPD) and classroom impacts guided by the following research questions:

(1) Why do teachers participate in OPD?

(2) How does OPD focusing on technology integration impact classroom teaching practices over six months?

This chapter discusses the research design by starting with a discussion of the selection of participants, setting, and data sources. This mixed methods case study research design is discussed along with the research study and data analysis procedures. Limitations of this research are identified along with how the researcher addressed threats to validity, ending with a discussion on the importance of this research.

Participants/Subjects and Setting

The participants in this study were Catholic school K-12 teachers in a diocese with over 50 schools and 1,400 K-12 teachers who educate over 17,000 students. The participants enrolled in an OPD workshop for integrating technology and using technology-based literacy tools in the classroom. Details about the OPD workshop are explained below. A flyer for the OPD workshop was distributed electronically by the Diocese's Office of Catholic Schools to all teachers inviting them to participate. It was estimated that 25-30 teachers with varying ages, diversities, and gender would

participate. The workshop maximum capacity was 30 participants, so the first 30

teachers who responded to the flyer and wished to participate were enrolled. The

workshop was open to all K-12 teachers who were current Catholic school teachers and

were planning to teach during the 2017-2018 school year.

The researcher taught the OPD workshop. The researcher is a white male in his

late-thirties, with fourteen years of experience as both a high school teacher and

administrator at a Catholic high school in the Mid-Atlantic region. The eight-week OPD

workshop was organized around eight online modules, or units of study, that participants

completed. The first two modules introduced the concept of technology integration while

the remaining modules introduced a technology that could be used to support literacy,

provided direction for playing and using the technology (play time), provided ideas for

successful classroom integration, and required teachers to create a lesson plan for

classroom integration. Using an asynchronous model of online learning, it was estimated

that each module would take approximately two to three hours to complete. This

workshop was previously taught by the researcher in the fall of 2015 to high school

teachers at the researcher's school.

The initial plan for the module topics included: (1) technology and literacy

integration basics, (2) TPACK and ISTE standards, (3) digital stories, (4) Google tools,

(5) fan fiction and literacy with technology, (6) Web 2.0 tools, (7) blogs, wikis, podcasts,

and collaborative tools, and (8) infographics and online timelines. These tools were

selected because they promoted traditional print and digital literacy skills. An overview

of the online modules was included in Appendix B. Additional details for one module,

the digital story module, are also found in Appendix B. The enrollment survey was strictly used to gather information on the tools and technology that the participants were interested in learning about during the OPD workshop. This data were used to design the OPD modules.

From those participants enrolled in the online professional development, three teachers were sought after for participation in the case study. After three distinct communication attempts with all the teachers who participated in the OPD, only two teachers consented to participate in the case study. Neither of these two participants worked at the researcher's school and, therefore, neither was supervised by the researcher as part of their employment. The two teachers were experienced teachers with at least three years of teaching experience. Jones, Youngs, and Frank (2013) suggest that teachers with less than three years' experience are still considered beginners since they may not have yet begun to question their own teaching practices.

Data Sources

As shown in Table 1, the data sources included surveys, observations, and interviews.

Table 1

Data Sources and Timeline

Data Source	Timeline
Flyer for participation in OPD workshop	April 2016

distributed	
Enrollment Survey	June 2016
OPD workshop	July and August 2016
Pre-Survey	First week of July 2016
Post-Survey	End of August 2016
Classroom Observations and Interviews	October 2016
Follow-Up Survey	December 2016
Classroom Observations and Interviews	December 2016
Classroom Observations and Interviews	February 2017

All teachers who registered for the OPD completed an enrollment survey
(Appendix C) designed to see what technology and integration tools the teachers were
interested in learning about. The results of this survey were used to design some of the
online learning modules for the professional development workshop.

All teachers who participated in the OPD and provided informed consent
completed a pre-survey before the first module, a post-survey at the conclusion of the last
module, and a follow-up survey in December. The same survey (Appendix D) was used
each of these three times. The only difference in the surveys was the inclusion of an
additional question in the follow-up survey. This additional question asked teachers to
identify the frequency of using certain technology tools in the classroom. The survey
was designed to collect data on the reasons teachers participated in the OPD and how
they planned to use what they learned in their classrooms.

The survey (Appendix D), developed and validated by Crockett (2010), was used to collect data on (1) participants' online and traditional professional development practices, (2) participants' attitudes, beliefs, and perceived benefits of OPD, and (3) participants' use of technology and OPD knowledge transfer into classroom instructional practices. Content validity was established by Crockett through a pilot study and face validity was established through the review of the survey by five online and traditional professional development researchers. Internal consistency (using Cronbach's Alpha) was measured for each of the four sections of the survey: the attitudes toward and beliefs about OPD section was .138, perceived benefits of OPD section was .776, integration of technology section was .950, and the transfer of OPD content knowledge section was .778. With a low reliability coefficient, .138, for the attitudes toward and beliefs about OPD section, these items do not measure teachers' attitudes toward and beliefs about OPD. With high scores above .70 for the other three sections, these three sections were internally consistent.

In order to select teachers to participate in the case study, the researcher reviewed the lesson plans posted during the OPD as well as the participants' responses to the online discussion board. The lesson plans and online posts were reviewed for technology integration as well as literacy integration topics. Through reviewing these data, it was anticipated that the researcher would be able to identify three teachers: (1) a teacher who experienced some challenges with the technology integration module lesson plans, (2) a teacher who was moderately successful with creating the lesson plans, and (3) a teacher who was highly successful at creating technology integration lesson plans. However,

after three distinct communication attempts with all the teachers who participated in the OPD, only two teachers consented to participate in the case study. These two teachers met criteria (2) a teacher who was moderately successful with creating the lesson plans, and (3) a teacher who was highly successful at creating technology integration lesson plans. Lesson plan success was determined by the researcher using a rubric (Appendix E), designed by Harris, Grandgenett, and Hofer (2010). Interrater reliability was determined using both Intraclass Correlation (.857) and a percent score agreement procedure (84.1%). Internal consistency using Cronbach's Alpha was .911. Test-retest reliability (percent score agreement) was 87.0%.

For each of the two teachers selected for the case study, three separate observations were conducted in the classrooms of each teacher for a total of six observations. The purpose of these observations was to determine how the teachers integrate technology in the classroom and how the OPD impacted their teaching with technology. These were designed to observe the effects throughout the school year on how teachers integrated technology from their OPD experiences. The dates and times for these observations were arranged between the researcher and the teacher. These observations were planned for and conducted in October, December, and February. The teachers completed a researcher created questionnaire (Appendix F) prior to the classroom observations. The purpose of this questionnaire was to collect information about the technology the teachers intended to integrate in the classroom during the observation.

A classroom observation instrument (Appendix G) was used by the researcher to collect field notes during the classroom observations. This classroom observation instrument was created by Hofer, Grandgenett, Harris, and Swan (2011) based on their Technology Integration Assessment Rubric. These researchers conducted a pilot-study and worked with seven TPACK researchers to establish face validity. Reliability was measured by using twelve experienced teachers and teacher educators who each used the instrument to assess six pre-service and six in-service teachers. Interrater reliability was determined using both Intraclass Correlation (.802) and a percent score agreement procedure (90.8%). Internal consistency using Cronbach's Alpha was .914. Test-retest reliability (score agreement) was 93.9%.

Both of the teachers participated in interviews after each classroom observation. Informal, semi-structured interviews were conducted after the October and February classroom observations. Formal interviews were conducted at the teachers' schools in December after the December observation. The formal interview questions (Appendix H) were written by the researcher and focused on collecting data on teacher perspectives and reasons for participating in OPD and for teaching with technology. Interviews were audio recorded and transcribed. Member checks took place during the week after each interview through email.

Since October was only two months after completing the OPD workshop, it may have been too soon for teachers to reflect on their classroom practices based on the online professional development (Sprague, 2006). December was four months after completing the OPD and provided time to integrate technology in the classroom and time for teachers

to reflect on their teaching practices. Informal interviews in February were used to check to see if classroom practices were sustained.

Research Design

This was an exploratory mixed methods case study. Exploratory case study research seeks to answer how- and why-type research questions through interviews and observations (Yin, 1984). Mixed methods research integrates qualitative and quantitative methods with an interactive relationship model of research design (Maxwell & Loomis, 2003). The design map (Appendix I) illustrates the relationships among the critical parts of this research design (goals, framework, research questions, methods, and validity). The design map helped the researcher visualize the relationships between the goals, conceptual framework, research questions, methods, and validity; the research questions were at the center of the design map because they relate to all the parts of the design.

The OPD for technology integration was announced by the Diocesan e-newsletter in April 2016. This newsletter was sent to all teachers in the Diocese. Teachers interested in participating in the OPD workshop registered online through email. This OPD opportunity was optional; teachers were not required to participate. There was no monetary compensation for participating; however, teachers earned professional development points for recertification. The OPD contained eight modules that focused on technology integration skills with suggestions for classroom implementation.

The OPD workshop was designed by the researcher and approved by the chair of the dissertation committee. All eight modules, with the exception of the first two, introduced a technology that can be used to support literacy, provided direction for

"playing with" the technology (play time), provided ideas for successful classroom integration, and required teachers to create a lesson plan for classroom integration. The focus of the OPD workshop was on technology integration in the classroom. The initial plan for the module topics included: (1) technology and literacy integration basics, (2) TPACK and ISTE standards, (3) digital stories and online storybooks, (4) Google tools, (5) fan fiction and literacy with technology, (6) Web 2.0 tools, (7) blogs, wikis, podcasts, and collaborative tools, and (8) infographics and online timelines. These tools were selected because they promoted traditional print and digital literacy skills. Each module was designed to take approximately two to three hours to complete. Every Saturday morning during the eight week program the next module was made available for the participants. The online workshop contained eight modules since the workshop took place during the eight weeks of July and August.

This research study was approved by the George Mason University Office of Research Integrity and Assurance Institutional Review Board (Appendix A). Participants were recruited (Appendix J) and those who provided informed consent (Appendix K) completed a pre-survey at the start of the first module (Appendix D). After completing the final module, participants completed the same survey as a post-survey (Appendix D). In December, participants completed the same survey as a follow-up survey (Appendix D).

All teachers were asked to participate in the case study (Appendix L). This required that the researcher observe the teachers' classrooms three times (October, December, and February), interview them after each observation, and have them assist

with a member check process. These teachers were selected from those who participated

in the OPD workshop. Before inviting three teachers to participate in the case study, the

researcher reviewed the lesson plans posted during the OPD as well as their responses to

the online discussion board. Through reviewing these data, it was anticipated that the

researcher would be able to identify three teachers: (1) a teacher who experienced some

challenges with the technology integration module lesson plans, (2) a teacher who was

moderately successful with creating the lesson plans, and (3) a teacher who was highly

successful at creating technology integration lesson plans. After three distinct

communication attempts with all the teachers who participated in the OPD, only two

teachers consented to participate in the case study. These two teachers met criteria (2) a

teacher who was moderately successful with creating the lesson plans and (3) a teacher

who was highly successful at creating technology integration lesson plans. The

classroom observations and interviews were designed to collect data on how technology

integration practices were used in the classroom throughout the year.

Procedures

The data for this study were collected over a period of nine months from June

2016 to February 2017. In early June, all teachers who registered for the OPD received

an email with an enrollment survey (Appendix C). All participants were provided a

consent form (Appendix K) for their survey data to be used in this study. The researcher

explained any aspect of the form or answered any questions if necessary before acquiring

their signatures. Those who gave consent completed a pre-survey (Appendix D) at the

start of the OPD before starting the first module in early July. The OPD workshop took

place for eight weeks starting at the beginning of July and concluding at the end of

August. At the conclusion of the last module, all participants who gave consent

completed a post-survey (Appendix D). In December, the participants completed a

follow-up survey (Appendix D) in order to assess the impact of the OPD on classroom

practice. Those who choose not to provide consent did not complete the surveys.

Multiple teachers were invited to participate in the case study (Appendix L) but

only two agreed to participate. For the two who agreed to participate, the researcher

provided a consent form (Appendix M) and explained any aspect of the form or answered

any questions if necessary before acquiring their signatures. The two teachers were

expected to (1) be observed teaching in their classroom three times during the year in

October, December, and February, (2) participate in an interview after each observation,

and (3) assist with a member check process after each interview. The three classroom

observations gathered throughout the academic year were designed to gather data on how

teachers integrate technology from their OPD experiences. The researcher made

arrangements with each teacher for the date and time of the classroom observations. The

researcher went to their school to observe a one-hour session in the classroom. The

teachers were asked to complete a short pre-observation questionnaire (Appendix D) a

few days prior to each classroom observation. Data were collected during classroom

observations using the Technology Integration Observation Instrument (Appendix G)

(Hofer, et al., 2011).

Interviews were conducted to collect multiple views, descriptions, and

interpretations of participants in the case study (Stake, 1995). Interviews focused on

collecting data on teacher perspectives and reasons for participating in OPD and for

teaching with technology (Appendix H). Face-to-face, semi-structured interviews were

conducted at the teachers' schools in October and February after the observations. A

formal, face-to-face interview was conducted in December. Interviews were audio

recorded and transcribed.

Data Analysis

Quantitative data from the pre-, post-, and follow-up surveys were analyzed using

descriptive statistics to describe the variables and indicate general tendencies in the data

(Crewsell, 2008). A set of dependent sample t-tests was used to compare survey response

data collected from the pre- and post-surveys. Another set of dependent sample t-tests

was used to compare survey response data collected from the post- and follow-up

surveys. A third set of dependent sample t-tests was used to compare survey response

data collected from the pre- and follow-up surveys. A one-way ANOVA was conducted

to determine if the mean scores from the survey questions differed by group (pre-survey

group, post-survey group, and follow-up survey group). Frequency distributions were

used with technology use data from the enrollment survey and demographic data from the

pre-survey, in addition to data collected from the pre-, post-, and follow-up surveys.

A content analysis using coding was completed to examine trends and patterns in

the data (Krippendorff, 1980; Stemler, 2001). Qualitative data from the surveys,

interviews, and observations was coded following the process of an initial read through,

labeling data with codes, reducing overlap, and collapsing codes into themes (Creswell,

2008). Initial coding was then reviewed another time for recoding so that the codes were more refined (Saldaña, 2009).

Data collected during observations was written in memo format to create notes from observations and facilitate reflection (Maxwell, 2013; Yin, 2011). The Technology Integration Observation Instrument (Appendix G) was used during classroom observations. Data collected during interviews was transcribed while listening to the audio recording. The audio recording was played again to check for accuracy in the transcribing process. This process allowed the researcher to hear the data three times. The first time was during the interview, the second time while the researcher transcribed the data, and the third time as the researcher listened and checked for accuracy.

For the interview and observation data, the researcher read the transcribed data twice before beginning the coding process. Using a print out, the researcher began the coding process on paper. After reading the data, the researcher used chunks to start the coding process. After reviewing all the codes, the researcher created categories to organize all the code data. This process helped the researcher organize the data. These steps were all validity processes gained through triangulation (Saldaña, 2009).

Critical friend work was designed to provide alternative perspectives through critique and support with the goal of improving research quality (Breslin et al., 2008; Samaras, 2011). The researcher worked with a critical friend who earned a Ph.D. in Education and had experience in research methods. The critical friend code-checked the observation and interview data and the researcher reviewed her coding to make sure he agreed with her codes. After looking at her coding, the researcher updated any codes as

needed. After the classroom observations and interviews, the teachers participated in a

member check process during the following week through email. Codes and themes were

revised based on member checking. The use of critical friend code checking and member

checks were a process of establishing validity of qualitative findings.

Limitations

The location of this study was a limitation to the generalizability of this research.

This study was conducted with Catholic school teachers in an upper-middle class region

of the country. Technology was readily available and accessible to students and teachers.

Thus, these results may not be as useful to others with limited resources for classroom

technology and Internet access.

This exploratory mixed methods case study was informative but haslimited

generalizability. This research was designed to understand the individual cases of

participants and their human experiences in OPD. Narratives were used to explore and

inform others of the case study (Stake, 1995).

Addressing Threats to Validity

It is important that the research was valid and correct (Maxwell, 2013). The first

validity threat concerned the question of whether the researcher was collecting and

interpreting the interview data carefully and in accord with standard practices. The

researcher put multiple strategies in place to address this validity threat. The researcher

used member checks from interview data to verify that the data as well as his

interpretations of these data were accurate based on the perspectives of the teachers. For

the interviews, the researcher took an audio recording of the interview. After the

interview, the researcher used the recording to transcribe the data. After transcription, the researcher played the recording again to check for accuracy in the transcribing process (Yin, 2011). Another important strategy the researcher used was triangulation. This was accomplished through multiple sources of data collection. The researcher collected data from surveys, multiple classroom observations, and interviews. By collecting data from a range of settings using multiple data collection methods, the researcher was triangulating in light of validity threats (Fielding & Fielding, 1986; Maxwell, 2013).

The second validity threat was concerned with researcher bias. Researcher bias cannot be eliminated, but it was important to examine the researcher's bias and his integrity to deal with it (Maxwell, 2013; Yin, 2011). As an experienced teacher and administrator, the researcher strongly believed in technology integration and its benefits for student learning, and he wanted to see technology integration work in classrooms. The researcher has experience in teaching technology integration professional development workshops for teachers. The researcher also believed OPD would be helpful for teacher learning. Since the researcher had this bias before he even started collecting any data, the researcher implemented member checks from observations and the interviews as a strategy to address this validity threat. This was a helpful strategy because it assisted the researcher in verifying the data and his interpretations of these data to make sure they were accurate based on the perspectives of the two teachers observed. Member checks involved the teachers in the process and helped reduce this validity threat. Another strategy reducing the effects of the researcher bias validity threat was for the researcher to review his memos and field notes to check for divergence from his

initial expectations before starting the research. This allowed the researcher to pay

attention to data that did not fit his preconceptions. This strategy also allowed the

researcher to possibly identify any topics that he anticipated collecting data from and see

why they were not present in the coding of the interview and observation data.

The third validity threat deals with the researcher's presence. The researcher was

concerned about the effect of his presence in the classroom on the observations. Even

though multiple observations allowed the researcher to see the same classroom three

times throughout the school year, it was still important to ask: was what he was

observing only happening that day because he was there? What happened the next day

and what happened on a daily basis when he was not present? What happened between

his observations? This threat was important because the researcher was studying long-

term, six month implications in the classroom, not just the implications on the three days

that he observed, the three days selected by the teacher. To address this, the researcher

included questions in the interview that asked what was happening between observations.

In addition, the pre-observation questionnaire asked the teacher to identify how this day

he was observing was different from what usually happened in the classroom. The

researcher also asked to see artifacts of student technology work that had been completed

between the observations. This provided opportunities for seeing concrete examples of

technology integration artifacts created by students.

As a mixed methods study primarily focusing on qualitative methods, a limitation

was that this study was not generalizable. This case study provided an opportunity to

research two Catholic school teachers' use of technology in the classroom and the impact of OPD on technology integration practices in their classrooms.

Importance

Life-long learning implies ongoing professional development for teachers. OPD provides in-time, on-demand, flexible learning opportunities in the comfort of one's home. OPD is available on a variety of topics to meet the needs of the learner. Knowing why teachers select OPD is important in future development of teacher online professional development. This is an important study that focuses on teachers' needs for technology integration and the impacts of OPD on their classroom teaching practices. The results can be shared with those who plan OPD for teachers.

The results of this research highlighted the importance of OPD and its role in long-term classroom instructional practices. This research addressed gaps in the existing literature by discussing long term impacts of OPD on classroom teaching practices. In addition, this research helped scholars understand the reasons that teachers participate in OPD answering what makes them select OPD and what they appreciated in OPD.

Summary

This chapter discussed the research through the selection of Catholic school, K-12 teachers as participants. The data for this research study came from surveys as well as interviews and classroom observations throughout six months after OPD. As a mixed methods case study, this study was designed to collect both qualitative and quantitative data. Limitations of this research identify that this study has limited generalizability. Threats to validity included: collection concerns, researcher bias, and researcher

presence. The importance of this research in OPD design and classroom technology

integration was identified in light of the design and planning of future OPD.

Chapter Four

This study was designed to investigate online professional development (OPD) and classroom impacts guided by the following research questions:

(1) Why do teachers participate in OPD?

(2) How does OPD focusing on technology integration impact classroom teaching practices over six months?

This chapter discusses the results of the data collected through surveys, observations, and interviews. The surveys included an enrolment survey, pre-survey, post-survey, and follow-up survey. Classroom observations were completed three times for each of the two teachers participating in the case study. Interviews were conducted with each teacher after each classroom observation.

Enrollment Survey Results

Eighteen participants completed the enrollment survey (Appendix C). This survey was designed to collect data on what technology and integration tools the teachers were interested in learning about in the OPD workshop. The results of this survey were used to design some of the online learning modules for the professional development workshop.

When asked what the participants hoped to learn from the workshop, all 18 respondents wanted to learn how to use technology more effectively in the classroom.

One commented, "I hope to learn ways to maximize the use of technology in learning. I would like to put my ActivBoard to better use." Another participant responded, "I hope to learn strategies for using technology meaningfully in my religion and language arts classes. I also hope to decrease the time it takes for me to prepare for lessons using new technology (or new to me)."

When asked why the participants enrolled in the online workshop, two dominant themes emerged: teaching practices and technology integration. Teaching practices data focused on improving teaching quality and effectiveness. One participant commented, "I want to become the best teacher I can become" and another stated "I am constantly looking for ways to improve and enhance teaching, and technology is a great tool for this goal." Technology integration was identified by participants as a reason for enrolling. "I have enrolled to push myself in the use of technology in the classroom" commented one participant while another stated "I heard the instructor was the go to person for technology."

The teachers were asked to indicate how often they used each of the technology tools identified. Table 2 indicates their responses to this question. The most common technology used on a weekly basis by these teachers is interactive whiteboards.

Table 2

Use of Technology Tools throughout the School Year

Technology	Never	Once a	Once a Quarter/	Once a	Weekly

		Year	Semester	Month	
Interactive Whiteboards	2	0	3	0	13
Google Tools	12	0	1	1	3
Blogs	17	0	1	0	0
Wikis	16	1	1	0	0
Podcasts	14	1	2	0	0
Digital Story or Video Creation Tools	12	2	3	1	0
Reading a book or story online	8	2	3	2	3
Fan Fiction	18	0	0	0	0
Literacy Games	10	0	2	3	3
Infographics	17	0	1	0	0
Web 2.0 Tools	16	1	0	1	0

Google tools was the most frequent response when participants were asked to share what classroom technologies they had heard about and were interested in learning more about. When asked to list other technologies students use in their classrooms,

participants responded with Quizlet, Google Docs, math websites, and Edmodo. Another response indicated that students use Fitbits.

The teachers were asked to share what classroom technology is available and how often it is available to their students. Seven participants indicated that laptops were available for student use and eight participants indicated that Chrome Books were available. Chrome Books and laptops are similar technologies. Five participants indicated that iPads were available for student use. Eight participants indicated that the technology was available to their students when the teacher reserved the cart with the technology devices. Six participants indicted that technology was available at any time, any school day for classroom use while three participants indicated that they needed to reserve a lab to bring the students to in order to use technology.

From the enrollment survey data, it is evident that the teachers interested in this OPD want to learn better ways to use technology more effectively in their classrooms in order to improve their teaching practice. Since no one is earning a grade or course credit, these teachers have freely chosen to enroll and participate in the OPD. Their survey responses indicate that technology is readily available for student use. Many of these participants never use most of the tools identified in Table 2.

Pre-Survey Results

Thirteen of the 18 participants in the OPD provided consent and completed the pre-survey. All 13 responders (94.1%) were female. Twelve teachers (92.31%) indicated their ethnicity is White and one teacher (7.69%) identified as Asian. Eight teachers (61.54%) identified their age as 46+ years old. One teacher (7.69%) is between 26-30

years old, two teachers (15.38%) are between 31-35 years old, and two teachers (15.38%) are between 41-45 years old.

Four teachers' (30.77%) highest degree is a Bachelors, seven (53.85%) hold a Masters, and two (15.38%) have a Doctorate. Four teachers (30.77%) indicated they had between 7-9 years of teaching experience and four teachers (30.77%) indicated they had 16-19 years of teaching experience. Three teachers (23.08%) had 10-12 years of experience. One teacher (7.69%) had 4-6 years of experience and one teacher (7.69%) had 13-15 years of experience.

Nine teachers (69.23%) have a current teaching license. One teacher (7.69%) responded she had no license and three teachers (23.08%) indicated they are working toward certification. Seven teachers (58.33%) have or are working toward certification in elementary grades, three teachers (25.00%) in middle grades, and four teachers (33.33%) in high school. When asked to select all answers that apply, teachers indicated the subjects they taught. Six teachers (46.15%) indicated that they teach English, five teachers (38.46%) teach religion, five teachers (38.46%) teach reading, and five teachers (38.46%) teach science. Five teachers (38.46%) teach mathematics, four teachers (30.77%) teach social studies, and one teacher (7.69%) teaches world languages. One teacher (7.69%) teaches fine arts and one teacher (7.69%) teaches library.

Technology and professional development. The technology and professional development section was intended to obtain information about teachers' use of technology and experience with traditional and online professional development.

Teachers were instructed that in the context of this study, technology referred to computers, software, and other electronic apps used in the educational technology setting.

When asked how participants would describe their level of proficiency with using the computer, three teachers (23.08%) responded they have expert level of proficiency, six teachers (46.15%) responded they have a good level, and four teachers (30.77%) responded they have a fair level. No one responded that their level was novice.

Twelve teachers (92.31%) when asked how many OPD trainings they participated in from 2014-2016 responded they participated in 1-3 OPD trainings. One teacher (7.69%) responded with 4-6 OPD trainings. No one responded with seven or more OPD trainings. When asked how many traditional (face-to-face) professional development (TPD) trainings the teachers participated in from 2014-2016, six teachers (46.15%) responded they participated in 1-3 TPD trainings, four teachers (30.77%) participated in 4-6 TPD trainings, and two teachers (15.38%) participated in 7-9 TPD trainings. One teacher (7.69%) participated in more than 12 TPD trainings from 2014-2016.

When asked to describe personal motivation to participate in additional online professional development trainings, nine teachers (69.23%) described themselves as highly motivated while four teachers (30.77%) described themselves as somewhat motivated. No one responded that they were barely motivated or not motivated.

The teachers were asked on a weekly basis how often do they integrate technology into their instructional practices. Four (30.77%) responded that they integrate technology 1-2 days a week while five teachers (38.46%) responded that they integrate technology 3-4 days a week. Four teachers (30.77%) responded that they integrate

technology five days a week. No one responded that they do not integrate technology on a weekly basis.

Three teachers (23.08%) when asked to describe their level of comfort with technology responded "very comfortable." Ten teachers (76.92%) responded that they are "somewhat comfortable." No one responded "not comfortable." When asked about their level of experience with technology, nine teachers (69.23%) responded they have "limited experience" while four teachers (30.77%) responded they were "very experienced." No one responded that they have "no experience."

When asked to describe their level of comfort in integrating technology into their instructional practices, 11 teachers (84.62%) responded "somewhat comfortable" while two teachers (15.38%) responded "very comfortable." No one responded "not comfortable." When asked to describe the amount of experience integrating technology into their instructional practices, 11 teachers (84.62%) responded "limited experience" while two teachers (15.38%) responded "very experienced." No one responded "no experience."

Teachers were then asked about transferring OPD content knowledge into instructional practices. When asked to describe the level of comfort in transferring OPD into instructional practices, seven teachers (58.33%) responded "somewhat comfortable," five teachers (41.67%) responded "very comfortable" and no one responded "not comfortable." When asked to describe the amount of experience in transferring OPD into instructional practices, 10 teachers (76.92%) responded "limited experience" while three teachers (23.08%) responded "very experienced" and no one responded "no experience."

Teachers were then asked about evaluating the OPD content knowledge integrated into their instructional practices. When asked to describe the level of comfort of evaluating OPD content knowledge integrated into their instructional practices, nine teachers (69.23%) responded "somewhat comfortable," three teachers (23.08%) responded "very comfortable," and one teacher (7.69%) responded "not comfortable." Then, when asked to describe the amount of experience of evaluating OPD content knowledge integrated into their instructional practices, nine teachers (69.23%) responded "limited experience," two teachers (15.38%) responded "very experienced," and two teachers (15.38%) responded "no experience."

Teachers' attitudes toward, beliefs about, and perceived benefits of participating in OPD. The next sections of the survey were intended to understand teachers' attitudes toward, beliefs about, and perceived benefits of participating in OPD. Teachers indicated the extent to which they agreed or disagreed with each statement regarding each construct. The results of teachers' attitude toward and beliefs about OPD are in Table 3.

Table 3

Teachers' Attitude toward and Belief about OPD

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is of little benefit to me.	7	5	1	0

Statement				
OPD opportunities should always be available.	0	0	7	6
OPD is not relevant to my success as a teacher.	8	4	1	0
One session of OPD training will not positively impact my instructional practices.	3	10	0	0
I have not had adequate time to properly evaluate the OPD content knowledge integrated into my instructional practices.	0	3	10	0
Teacher input does not need to be a vital part of OPD design.	6	7	0	0
OPD training should link to the curriculum and classroom instruction.	0	1	5	7
I would love to participate in additional OPD training.	0	0	6	6
OPD is no more beneficial than traditional professional development (TPD).	2	9	2	0
I have no uncertainties about integrating OPD content knowledge into classroom instruction.	1	5	7	0
School districts should provide year round, mandatory OPD training to its teachers.	0	6	4	3
Additional support should be available to assist teachers in the integration of OPD content	0	0	8	5

knowledge into their instructional practices.

The results of teachers' perceived benefits of participating in OPD are in Table 4.

Table 4

Teachers' Perceived Benefits of Participating in OPD

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is beneficial to my professional growth and success.	0	0	7	6
OPD is more interesting and beneficial than TPD.	0	5	8	0
Communicating with other participants was easier with OPD than with TPD.	0	9	4	0
OPD training provides and enhances skills that I use in my classroom.	0	0	12	1
OPD clarifies and simplifies content material and lessons.	0	2	9	1
The integration of OPD content knowledge has little effect on student interest, comprehension, and performance.	2	9	2	0

	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD integration does not accommodate a variety of learning styles.	1	10	1	0
OPD eliminates the travel required to attend traditional professional development (TPD) trainings.	0	0	4	9
OPD minimizes the amount of money spent on professional development.	0	1	10	1
OPD participation interferes with my classroom time.	4	8	0	1

The next survey section was intended to measure the level teachers integrate technology and transfer the OPD content knowledge into their instructional practices. In the context of this study, technology refers to computers, smart boards, software, apps, and other electronic instruments used in the educational technology setting. The results from the questions on the integration of technology into instructional practices are found in Table 5.

Table 5

Integration of Technology into Instructional Practices

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
I use technology to teach	0	1	10	2

concepts/lessons.

I use technology to reinforce concepts/lessons.	0	0	12	1
I use technology to integrate the content knowledge from OPD training.	0	2	10	1
I use technology to support individualized learning.	0	2	8	3
I use technology to accommodate the teaching and learning of students with exceptionalities.	1	3	6	3
I use technology to prepare concepts/lessons.	0	1	8	3
I use technology to create, draft, and publish classroom activities, homework assignments, group projects, and assessments.	0	1	6	6
I use technology to collect, analyze, and report data.	1	2	7	4
I use technology to enhance classroom lessons.	0	0	10	2
I use technology to increase students' interest, comprehension, and performance.	0	0	11	2
I use technology to display content related web pages, videos, and other interactive materials.	0	0	8	5

	Strongly Disagree	Disagree	Agree	Strongly Agree
I use technology to retrieve and/or upload educational information and material from online repositories.	0	0	9	4
I use technology as an alternative approach to students practicing deficient and prerequisite skills.	0	3	9	1

Results from the transfer of OPD content knowledge into instructional practices are found in Table 6. One respondent only answered the first four questions and left the remaining seven questions blank.

Table 6

Transfer of OPD Content Knowledge into Instructional Practices

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel comfortable transferring the OPD content knowledge into my instructional practices.	0	2	10	1
I successfully transfer at least 75% of the OPD content knowledge of trainings into my instructional practices.	0	7	6	0
I do not receive the support needed to transfer the OPD content knowledge into my instructional practices.	1	8	4	0

I have the computer skills needed to transfer the OPD content knowledge into my instructional practices.	0	4	8	1
I have enough time to transfer the OPD content knowledge into my instructional practices.	0	8	4	0
I need additional training before I am comfortable transferring the OPD content knowledge into my instructional practices.	0	6	6	0
I have the technology equipment needed to transfer the OPD content knowledge into my instructional practices.	1	5	5	1
I use OPD content knowledge in tandem with traditional methods of teaching to ensure student comprehension.	0	2	7	3
I use OPD content knowledge as a vital part of my instructional practices at least 3 days a week.	0	6	6	0
I have evaluated the learning outcomes of the lessons taught using the OPD content knowledge.	0	6	6	0
Student comprehension and performance increased with the integration of the OPD content knowledge.	0	6	4	1

At the end of the survey, teachers had an opportunity to share any additional information or thoughts about OPD. One teacher commented "I am excited to begin this course as I hope it will enhance my ability and confidence using technology in the classroom." Another teacher commented "the challenge is school resources to integrate certain learned technology strategies" while another commented about how technology can be used "directly into the classroom and benefit both the teacher and student."

In summary, overall teachers had mixed responses to statements regarding attitudes toward and beliefs about OPD (Table 3). Teachers agreed with the perceived benefits of participating in OPD (Table 4) and agreed with statements that they integrate technology into instructional practices (Table 5). Teachers had mixed agree and disagree reponses to questions about transferring OPD content knowledge into instructional practices (Table 6).

Post-Survey Results

Nine participants completed the post-survey. Eight responders (88.89%) were female and one responder (11.11%) was male. Eight teachers (88.89%) indicated their ethnicity is White and one teacher (11.11%) identified as Asian. Four teachers (44.44%) identified their age was 46+ years old. Two teachers (22.22%) were between 26-30 years old, one teacher (11.11%) was between 36-40 years old, and two teachers (22.22%) were between 41-45 years old.

Five teachers' (55.56%) highest degree is a Bachelors, three (33.33%) hold a Masters, and one (11.11%) responded "other." Five teachers (55.56%) indicated they had between 7-9 years of teaching experience. One teacher (11.11%) indicated 1-3 years of

teaching experience, one teacher (11.11%) indicated 4-6 years of teaching experience, one teacher (11.11%) indicated 13-15 years of teaching experience, and one teacher (11.11%) indicated 16-19 years of teaching experience.

Seven teachers (77.78%) have a current teaching license and two teachers (22.22%) indicated they are working toward certification. When asked to select all responses that apply, seven teachers (87.50%) have or are working toward certification in elementary grades, four teachers (50.00%) in middle grades, and two teachers (25.00%) in high school. Again when asked to check all responses that apply, five teachers (55.56%) indicated that they teach English, five teachers (55.56%) teach religion, four teachers (44.44%) teach reading, and four teachers (44.44%) teach science. Three teachers (33.33%) teach mathematics, three teachers (33.33%) teach social studies, and two teachers (22.22%) teach world languages. One teacher (11.11%) teaches fine arts, one teacher (11.11%) teaches health and physical education, one teacher (11.11%) teaches pre-school and one teacher (11.11%) teaches library.

Technology and professional development. The technology and professional development section was intended to obtain information about teachers' use of technology and experience with traditional and online professional development. Teachers were instructed that in the context of this study, technology referred to computers, software, and other electronic apps used in the educational technology setting.

When asked how participants would describe their level of proficiency with using the computer, no teacher responded they have expert level of proficiency, six teachers

(75.00%) responded they have a good level, and two teachers (25.00%) responded they have a fair level. No one responded that their level was novice.

Six teachers (66.67%) when asked how many OPD trainings they participated in from 2014-2016 responded they participated in 1-3 OPD trainings. Three teachers (33.33%) responded with 4-6 OPD trainings. No one responded with seven or more OPD trainings. When asked how many traditional (face-to-face) professional development (TPD) the teachers participated in from 2014-2016, four teachers (50.00%) responded they participated in 1-3 TPD trainings, one teacher (12.50%) participated in 4-6 TPD trainings, and one teacher (12.50%) participated in 7-9 TPD trainings. Two teachers (25.00%) responded that they participated in more than 12 TPD trainings from 2014-2016.

When asked to describe personal motivation to participate in additional online professional development trainings, eight teachers (88.89%) described themselves as highly motivated while one teacher (11.11%) described him/herself as somewhat motivated. No one responded with barely motivated or not motivated.

The teachers were asked on a weekly basis how often do they integrate technology into their instructional practices. Four teachers (44.44%) responded that they integrate technology 1-2 days a week and four teachers (44.44%) responded that they integrate technology 3-4 days a week. One teacher (11.11%) responded that they integrate technology five days a week. No one responded that they do not integrate technology on a weekly basis.

Five teachers (55.56%) when asked to describe their level of comfort with technology responded "very comfortable." Four teachers (44.44%) responded that they are "somewhat comfortable." No one responded "not comfortable." When asked about their level of experience with technology, four teachers (44.44%) responded they have "limited experience" while five teachers (55.56%) responded they were "very experienced." No one responded that they have "no experience."

When asked to describe their level of comfort in integrating technology into their instructional practices, six teachers (66.67%) responded "somewhat comfortable" while three teachers (33.33%) responded "very comfortable." No one responded "not comfortable." When asked to describe the amount of experience integrating technology into their instructional practices, seven teachers (77.78%) responded "limited experience" while two teachers (22.22%) responded "very experienced." No one responded "no experience."

Teachers were then asked about transferring OPD content knowledge into instructional practices. When asked to describe the level of comfort in transferring OPD into instructional practices, four teachers (44.44%) responded "somewhat comfortable," five teachers (55.56%) responded "very comfortable" and no one responded "not comfortable." When asked to describe the amount of experience in transferring OPD into instructional practices, five teachers (55.56%) responded "limited experience" while four teachers (44.44%) responded "very experienced" and no one responded "no experience."

Teachers were then asked about evaluating the OPD content knowledge integrated into their instructional practices. When asked to describe the level of comfort

of evaluating OPD content knowledge integrated into their instructional practices, six

teachers (66.67%) responded "somewhat comfortable," three teachers (33.33%)

responded "very comfortable," and no one responded "not comfortable." Then, when

asked to describe the amount of experience of evaluating OPD content knowledge

integrated into their instructional practices, eight teachers (88.89%) responded "limited

experience," one teacher (11.11%) responded "very experienced," and no one responded

"no experience."

Teachers' attitudes toward, beliefs about, and perceived benefits of

participating in OPD. The next sections of the survey were intended to understand

teachers' attitudes toward, beliefs about, and perceived benefits of participating in OPD.

Teachers indicated the extent to which they agreed or disagreed with each statement

regarding each construct. The results of teachers' attitude toward and beliefs about OPD

are in Table 7.

Table 7

Post Teachers' Attitude toward and Belief about OPD

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is of little benefit to me.	7	1	1	0
OPD opportunities should always be available.	0	0	2	7

OPD is not relevant to my success as a teacher.	7	2	0	0
One session of OPD training will not positively impact my instructional practices.	4	5	0	0
I have not had adequate time to properly evaluate the OPD content knowledge integrated into my instructional practices.	2	4	3	0
Teacher input does not need to be a vital part of OPD design.	4	5	0	0
OPD training should link to the curriculum and classroom instruction.	0	0	3	6
I would love to participate in additional OPD training.	0	0	1	8
OPD is no more beneficial than traditional professional development (TPD).	2	6	1	0
I have no uncertainties about integrating OPD content knowledge into classroom instruction.	1	3	5	0
School districts should provide year round, mandatory OPD training to its teachers.	0	3	4	1
Additional support should be available to assist teachers in the integration of OPD content knowledge into their instructional practices.	0	0	3	5

The results of teachers' perceived benefits of participating in OPD are in Table 8.

Table 8

Post Teachers' Perceived Benefits of Participating in OPD

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is beneficial to my professional growth and success.	0	0	0	9
OPD is more interesting and beneficial than TPD.	0	4	4	1
Communicating with other participants was easier with OPD than with TPD.	0	6	3	0
OPD training provides and enhances skills that I use in my classroom.	0	0	3	6
OPD clarifies and simplifies content material and lessons.	0	1	7	1
The integration of OPD content knowledge has little effect on student interest, comprehension, and performance.	4	5	0	0
OPD integration does not accommodate a variety of learning styles.	3	6	0	0

	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD eliminates the travel required to attend traditional professional development (TPD) trainings.	0	0	1	8
OPD minimizes the amount of money spent on professional development.	0	0	4	5
OPD participation interferes with my classroom time.	6	3	0	0

The next survey section was intended to measure the level teachers integrate technology and transfer the OPD content knowledge into their instructional practices. In the context of this study, technology refers to computers, smart boards, software, apps, and other electronic instruments used in the educational technology setting. The results from the questions on the integration of technology into instructional practices are found in Table 9.

Table 9

Post Integration of Technology into Instructional Practices

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
I use technology to teach concepts/lessons.	0	0	6	3
I use technology to reinforce concepts/lessons.	0	0	7	2

I use technology to integrate the content knowledge from OPD training.	0	0	7	2
I use technology to support individualized learning.	1	1	5	2
I use technology to accommodate the teaching and learning of students with exceptionalities.	1	0	6	2
I use technology to prepare concepts/lessons.	0	0	5	4
I use technology to create, draft, and publish classroom activities, homework assignments, group projects, and assessments.	0	1	3	5
I use technology to collect, analyze, and report data.	1	1	3	4
I use technology to enhance classroom lessons.	0	0	4	5
I use technology to increase students' interest, comprehension, and performance.	0	0	3	6
I use technology to display content related web pages, videos, and other interactive materials.	0	1	2	6
I use technology to retrieve and/or upload educational information and material from online repositories.	0	0	5	4
I use technology as an alternative approach to students practicing	1	2	3	3

deficient and prerequisite skills.

Results from the transfer of OPD content knowledge into instructional practices
are found in Table 10.

Table 10

Post Transfer of OPD Content Knowledge into Instructional Practices

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel comfortable transferring the OPD content knowledge into my instructional practices.	0	0	4	5
I successfully transfer at least 75% of the OPD content knowledge of trainings into my instructional practices.	0	2	5	2
I do not receive the support needed to transfer the OPD content knowledge into my instructional practices.	2	6	1	0
I have the computer skills needed to transfer the OPD content knowledge into my instructional practices.	0	0	7	2
I have enough time to transfer the OPD content knowledge into my instructional practices.	0	4	5	0

I need additional training before I am comfortable transferring the OPD content knowledge into my instructional practices.	1	8	0	0
I have the technology equipment needed to transfer the OPD content knowledge into my instructional practices.	0	3	5	1
I use OPD content knowledge in tandem with traditional methods of teaching to ensure student comprehension.	0	0	5	4
I use OPD content knowledge as a vital part of my instructional practices at least 3 days a week.	0	2	7	0
I have evaluated the learning outcomes of the lessons taught using the OPD content knowledge.	0	5	4	0
Student comprehension and performance increased with the integration of the OPD content knowledge.	0	1	8	0

At the end of the survey, teachers had an opportunity to share any additional information or thoughts about OPD. One teacher commented "I learned a lot in this class and will implement the technology referenced in my classes this year. I feel that my students will benefit from my online training. The modules were set-up properly and were a wealth of knowledge." Another teacher commented "I enjoyed this OPD. I

would like to take it again next summer since I am moving grades and subjects this year. It will be a work in progress to see how I will integrate my new technology" while another teacher commented "I enjoyed learning about new technology to use in the classroom and plan to continue learning through OPD opportunities."

In summary, overall teachers had mixed responses to statements regarding attitudes toward and beliefs about OPD (Table 7). Teachers agreed with the perceived benefits of participating in OPD (Table 8) and agreed with statements that they integrate technology into instructional practices (Table 9). Teachers had mixed agree and disagree reponses to questions about transferring OPD content knowledge into instructional practices (Table 10). These findings were very similar to the pre-survey results.

Follow-Up Survey Results

Eleven participants completed the follow-up survey. This survey was administered in early December, four months after the completion of the OPD. Ten responders (90.91%) were female and one responder (11.11%) was male. Nine teachers (81.82%) indicated their ethnicity is White, one teacher (9.09%) identified as Hispanic, and one teacher (9.09%) identified as other. Five teachers (45.45%) identified their age was 46+ years old. Two teachers (18.18%) were between 26-30 years old, one (9.09%) teacher was between 36-40 years old, one (9.09%) teacher was between 31-35 years old and two teachers (18.18%) are between 41-45 years old.

Six teachers' (54.55%) highest degree is a Bachelors and five (45.45%) hold a Masters. Four teachers (36.36%) indicated they had between 7-9 years of teaching experience. One teacher (9.09%) indicated 1-3 years of teaching experience, two

teachers (18.18%) indicated 4-6 years of teaching experience, two teachers (18.18%) indicated 10-12 years of teaching experience, and two teachers (18.18%) indicated 16-19 years of teaching experience.

Eight teachers (72.73%) have a current teaching license and three teachers (27.27%) indicated they are working toward certification. When asked to select all responses that apply, eight teachers (80.00%) have or are working toward certification in elementary grades, four teachers (40.00%) in middle grades, and two teachers (20.00%) in high school. Again when asked to check all responses that apply, four teachers (36.36%) indicated that they teach English, five teachers (45.45%) teach religion, five teachers (45.45%) teach reading, and four teachers (36.36%) teach science. Seven teachers (63.64%) teach mathematics, four teachers (36.36%) teach social studies, and one teacher (9.09%) teaches world languages. One teacher (9.09%) teaches fine arts, one teacher (9.09%) teaches health and physical education, one teacher (9.09%) teaches pre-school and one teacher (9.09%) teaches library.

Technology and professional development. The technology and professional development section was intended to obtain information about teachers' use of technology and experience with traditional and online professional development. Teachers were instructed that in the context of this study, technology referred to computers, software, and other electronic apps used in the educational technology setting.

When asked how participants would describe their level of proficiency with using the computer, two teachers (18.18%) responded they have expert level of proficiency, six

teachers (54.55%) responded they have a good level, and three teachers (27.27%) responded they have a fair level. No one responded that their level was novice.

When asked how many OPD trainings they participated in from 2014-2016 eight teachers (72.73%) responded they participated in 1-3 OPD trainings. One teacher (9.09%) responded with 4-6 OPD trainings. Two teachers (18.18%) responded with 7-9 OPD trainings.   No one responded with more than 12 OPD trainings. When asked how many traditional (face-to-face) professional development (TPD) the teachers participated in from 2014-2016, four teachers (36.36%) responded they participated in 1-3 TPD trainings, three teachers (27.27%) participated in 4-6 TPD trainings, and three teachers (27.27%) participated in 7-9 TPD trainings. One teacher (9.09%) responded with participation in more than 12 TPD trainings from 2014-2016.

When asked to describe personal motivation to participate in additional online professional development trainings, six teachers (54.55%) described themselves as highly motivated and five teachers (45.45%) described themselves as somewhat motivated. No one responded that they were barely motivated or not motivated.

The teachers were asked on a weekly basis how often do they integrate technology into their instructional practices. Three (27.27%) responded that they integrate technology 1-2 days a week and four teachers (36.36%) responded that they integrate technology 3-4 days a week. Three teachers (27.27%) responded that they integrate technology five days a week. One teacher (9.09%) responded that technology was not integrated on a weekly basis.

Five teachers (45.45%) when asked to describe their level of comfort with technology responded "very comfortable." Six teachers (54.55%) responded that they are "somewhat comfortable." No one responded "not comfortable." When asked about their level of experience with technology, seven teachers (63.64%) responded they have "limited experience" while four teachers (36.36%) responded they were "very experienced." No one responded that they have "no experience."

When asked to describe their level of comfort in integrating technology into their instructional practices, six teachers (54.55%) responded "somewhat comfortable" while five teachers (45.45%) responded "very comfortable." No one responded "not comfortable." When asked to describe the amount of experience integrating technology into their instructional practices, eight teachers (72.73%) responded "limited experience" while three teachers (27.27%) responded "very experienced." No one responded "no experience."

Teachers were then asked about transferring OPD content knowledge into instructional practices. When asked to describe the level of comfort in transferring OPD into instructional practices, five teachers (50.00%) responded "somewhat comfortable," four teachers (40.00%) responded "very comfortable" and one (10.00%) responded "not comfortable." One teacher did not respond to this question. When asked to describe the amount of experience in transferring OPD into instructional practices, seven teachers (63.64%) responded "limited experience" while four teachers (36.36%) responded "very experienced" and no one responded "no experience."

Teachers were then asked about evaluating the OPD content knowledge integrated into their instructional practices. When asked to describe the level of comfort of evaluating OPD content knowledge integrated into their instructional practices, seven teachers (63.64%) responded "somewhat comfortable," four teachers (36.36%) responded "very comfortable," and no one responded "not comfortable." Then, when asked to describe the amount of experience of evaluating OPD content knowledge integrated into their instructional practices, all eleven teachers (100.00%) responded "limited experience." No one responded "very experienced" or "no experience."

Teachers' attitudes toward, beliefs about, and perceived benefits of participating in OPD. The next sections of the survey were intended to understand teachers' attitudes toward, beliefs about, and perceived benefits of participating in OPD. Teachers indicated the extent to which they agreed or disagreed with each statement regarding each construct. The results of teachers' attitude toward and beliefs about OPD are in Table 11.

Table 11

Follow-up Teachers' Attitude toward and Belief about OPD

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is of little benefit to me.	7	2	1	1
OPD opportunities should always be	0	0	3	8

available.

OPD is not relevant to my success as a teacher.	8	3	0	0
One session of OPD training will not positively impact my instructional practices.	6	4	1	0
I have not had adequate time to properly evaluate the OPD content knowledge integrated into my instructional practices.	2	6	3	0
Teacher input does not need to be a vital part of OPD design.	6	5	0	0
OPD training should link to the curriculum and classroom instruction.	0	0	4	7
I would love to participate in additional OPD training.	0	0	5	6
OPD is no more beneficial than traditional professional development (TPD).	5	6	0	0
I have no uncertainties about integrating OPD content knowledge into classroom instruction.	0	4	4	3
School districts should provide year round, mandatory OPD training to its teachers.	1	5	3	2
Additional support should be available to assist teachers in the integration of OPD content knowledge into their instructional	0	1	5	5

practices.

The results of teachers' perceived benefits of participating in OPD are in Table

12.

Table 12

Follow-up Teachers' Perceived Benefits of Participating in OPD

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is beneficial to my professional growth and success.	0	0	2	9
OPD is more interesting and beneficial than TPD.	0	6	3	2
Communicating with other participants was easier with OPD than with TPD.	0	6	3	2
OPD training provides and enhances skills that I use in my classroom.	0	0	5	6
OPD clarifies and simplifies content material and lessons.	0	2	7	2
The integration of OPD content knowledge has little effect on student interest, comprehension, and performance.	6	4	1	0

	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD integration does not accommodate a variety of learning styles.	6	4	1	0
OPD eliminates the travel required to attend traditional professional development (TPD) trainings.	0	0	3	8
OPD minimizes the amount of money spent on professional development.	0	2	6	3
OPD participation interferes with my classroom time.	6	4	1	0

The next survey section was intended to measure the level teachers integrate technology and transfer the OPD content knowledge into their instructional practices. In the context of this study, technology refers to computers, smart boards, software, apps, and other electronic instruments used in the educational technology setting. The results from the questions on the integration of technology into instructional practices are found in Table 13.

Table 13

Follow-up Integration of Technology into Instructional Practices

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
I use technology to teach	0	1	5	5

100

concepts/lessons.

I use technology to reinforce concepts/lessons.	0	1	5	5
I use technology to integrate the content knowledge from OPD training.	0	0	7	2
I use technology to support individualized learning.	1	3	6	2
I use technology to accommodate the teaching and learning of students with exceptionalities.	1	2	7	2
I use technology to prepare concepts/lessons.	0	1	7	3
I use technology to create, draft, and publish classroom activities, homework assignments, group projects, and assessments.	0	3	4	4
I use technology to collect, analyze, and report data.	0	2	6	3
I use technology to enhance classroom lessons.	0	1	4	6
I use technology to increase students' interest, comprehension, and performance.	0	1	6	4
I use technology to display content related web pages, videos, and other interactive materials.	0	1	5	5

	Strongly Disagree	Disagree	Agree	Strongly Agree
I use technology to retrieve and/or upload educational information and material from online repositories.	0	1	5	5
I use technology as an alternative approach to students practicing deficient and prerequisite skills.	0	3	7	1

Results from the transfer of OPD content knowledge into instructional practices are found in Table 14.

Table 14

Follow-up Transfer of OPD Content Knowledge into Instructional Practices

Constructs	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel comfortable transferring the OPD content knowledge into my instructional practices.	0	1	4	5
I successfully transfer at least 75% of the OPD content knowledge of trainings into my instructional practices.	0	5	4	1
I do not receive the support needed to transfer the OPD content knowledge into my instructional practices.	1	6	3	0
I have the computer skills needed to transfer the OPD content knowledge	0	0	6	4

into my instructional practices.

I have enough time to transfer the OPD content knowledge into my instructional practices.	0	8	1	1
I need additional training before I am comfortable transferring the OPD content knowledge into my instructional practices.	1	6	4	0
I have the technology equipment needed to transfer the OPD content knowledge into my instructional practices.	1	3	4	2
I use OPD content knowledge in tandem with traditional methods of teaching to ensure student comprehension.	0	0	7	3
I use OPD content knowledge as a vital part of my instructional practices at least 3 days a week.	0	3	5	2
I have evaluated the learning outcomes of the lessons taught using the OPD content knowledge.	0	4	4	2
Student comprehension and performance increased with the integration of the OPD content knowledge.	0	2	5	3

At the end of the survey, teachers had an opportunity to share any additional information or thoughts about OPD. One teacher commented,

I have had very positive experiences with online professional develop and some

that was so-so. I think I really didn't like the kind that makes you read and then

tests whether you read it's like taking a teacher SOL, I much rather like the ones

that allow you to learn and participate in other forms of utilizing the lessons of the

course.

Another teacher commented,

I learned a lot from the OPD this past summer, although I still rated myself as

somewhat comfortable as I feel there is so much more to learn before I would

consider myself as very comfortable evaluating and integrating all aspects of

technology into the classroom.

Teachers also had an opportunity identify any item on the questionnaire that may have

been unclear or difficult to answer. One teacher commented "for the questions with the

choices of 'Strongly Disagree, Disagree, Agree, Strongly Agree' I would like to see a

category with "neither agree nor disagree" because, honestly, I have not considered a few

of these points at all!" Another teacher commented

Well it is hard to generalize all OPD as one way or another, just because not all

OPD training is as effective, engaging or has the depth of others, so some

questions would be easier if I was answering for just one particular program or

course than collectively.

In summary, overall teachers had mixed responses to statements regarding

attitudes toward and beliefs about OPD (Table 11) and statements about the perceived

benefits of participating in OPD (Table 12). Teachers agreed with statements that they

integrate technology into instructional practices (Table 13). Overall, teachers agreed to

statements about transferring OPD content knowledge into instructional practices (Table

14). These findings were similar to the pre- and post-survey results.

The teachers were asked to indicate how often they used each of the technology

tools identified. Table 15 indicates their responses to this question. The most common

technology being used by these teachers is interactive whiteboards.

Table 15

Follow-up Use of Technology Tools throughout the School Year

Technology	Never	Once a Year	Once a Quarter/ Semester	Once a Month	Weekly
Interactive Whiteboards	2	1	0	0	8
Google Tools	3	1	2	2	3
Blogs	9	1	1	0	0
Wikis	9	2	0	0	0
Podcasts	9	0	2	0	0
Digital Story or Video Creation Tools	4	2	4	0	0
Reading a book	2	0	5	1	2

or story online

Fan Fiction	10	1	0	0	0
Literacy Games	4	0	1	3	3
Infographics	7	1	2	0	1
Web 2.0 Tools	8	0	2	0	1

One respondent omitted the question asking for frequency of digital story or video

creation tools. The same one respondent omitted the question asking about frequency of

reading a book or story online. When asked to list other technologies students use in

their classrooms, two teachers responded with Google Classroom, two teachers

responded with Chromebooks, one teacher responded with Fitbits and pedometers, and

one teacher responded with apps.

Use of Technology Tools

During the Enrollment Survey in June and again during the Follow-Up Survey in

December, the teachers were asked to indicate how often they used each of 11 technology

tools identified. Table 2 indicates their responses to this question during the Enrollment

Survey ($N = 18$). Table 15 indicates their responses during the Follow-Up Survey ($N =$

11). Table 16 indicates responses from both the Enrollment Survey and the Follow-Up

Survey using the categories: never, occasionally, and weekly. The occasionally category

in this table combines the responses for "once a year," "once a quarter/semester," and

"once a month."

Table 16

Use of Technology Tools Contrast of Enrollment Survey and Follow-Up Survey

Technology	Never		Occasionally		Weekly	
	E	F	E	F	E	F
Interactive Whiteboards	2	2	3	1	13	8
Google Tools	12	3	2	5	3	3
Blogs	17	9	1	2	0	0
Wikis	16	9	2	2	0	0
Podcasts	14	9	3	2	0	0
Digital Story or Video Creation Tools	12	4	6	6	0	0
Reading a book or story online	8	2	7	6	3	2
Fan Fiction	18	10	0	1	0	0
Literacy Games	10	4	5	4	3	3
Infographics	17	7	1	3	0	1
Web 2.0 Tools	16	8	2	2	0	1

In reviewing the frequency of use from the enrollment survey to the follow-up survey, many tools increased in classroom frequency use. Based on the 11 tools identified, interactive whiteboards were still the most frequently used technology on a weekly basis. This is consistent on both surveys with 72% reporting weekly use in the enrollment survey and 73% reporting weekly use in the follow-up survey. Google tools use on a weekly basis was 17% in the enrollment survey and increased to 27% in the follow-up survey. Furthermore, 66% reported never using Google tools in the enrollment survey which decreased to only 27% never using Google Tools in the follow-up survey. In the enrollment survey, 44% responded "never" to reading a story online and that decreased to 11% in the follow-up survey. In the enrollment survey, 94% responded "never" to using infographics which decreased to 63% in the follow-up survey.

For digital stories or video creation tools, 66% reported "never" in the enrollment survey while only 36% reported "never" in the follow-up survey. 17% reported using digital stories or video creation tools once a quarter or semester in the enrollment survey which increased to 36% reported once a quarter or semester in the Follow-Up Survey. For literacy games, 56% reported "never" in the enrollment survey while only 36% reported "never" in the follow-up survey. For weekly use of literacy games, 17% reported this in the enrollment survey while 27% reported this in the follow-up survey.

Some of the identified tools are still not frequently used in classrooms according to the surveys. In the enrollment survey, 89% said they never use Web 2.0 tools and that

decreased only to 72% in the follow-up survey. No one identified using them on a weekly basis in the enrollment survey and that increased only slightly to 9% identifying weekly use in the follow-up survey. In the enrollment survey, 100% identified never using fan fiction in the classroom. This decreased only slightly in the follow-up survey with 91% identifying never using fan fiction and 9% identifying using fan fiction only once a year.

Blogs, wikis, and podcasts are also tools with infrequent use. In the enrollment survey, 94% reported they never use blogs, 89% reported they never use wikis, and 78% reported they never use podcasts. In the follow-up survey, 81% identified never using blogs, wikis, or podcasts in the classroom. Thus, most teachers who completed the survey still do not use blogs, wikis, or podcasts in the classroom.

In summary, interactive whiteboards, Google tools, digital stories or video creation tools, reading a story online, infographics, and literacy games all increased in classroom use over time from the enrollment survey to the follow-up survey. The frequency did not increase for the following tools: Web 2.0 tools, fan fiction, blogs, wikis, and podcasts.

Quantitative Results

Dependent sample t-tests were used to analyze survey response data collected from the pre-, post-, and follow-up surveys. To compare participants' responses to each question, dependent t-tests were calculated. The first set of dependent sample t-tests analyzed results from the questions in the pre- and post-surveys ($N = 5$). For the statement in the survey "OPD is beneficial to my professional growth," there was a

significant difference in the scores from the pre-survey ($M = 3.2$, $SD = .447$) to the post-survey ($M = 4.0$, $SD = .000$); $t(4) = 4.000$, $p = .016$. These results suggest participation in OPD did have an effect on participants' beliefs in the benefits of OPD to professional growth. Specifically, the results in Table 8 show that after OPD, all participants strongly agreed with the statement "OPD is beneficial to my professional growth."   For the statement on the survey "I feel comfortable transferring the OPD content knowledge into my instructional practices," there was a significant difference in the scores from the pre-survey ($M = 3.0$, $SD = .000$) to the post-survey ($M = 3.8$, $SD = .447$); $t(4) = 4.000$, $p = .016$. These results suggest participation in OPD did have an effect on participants' comfort in transferring OPD content knowledge to their instructional practices. Specifically, the results suggest that after OPD, most participants strongly agreed with the statement "I feel comfortable transferring the OPD content knowledge into my instructional practices." There was not a significant difference in the scores from the other survey questions.

The second set of dependent sample t-tests analyzed results from the questions in the post- and follow-up surveys ($N = 6$). There was not a significant difference in the scores from any of the survey questions.

The third set of dependent sample t-tests analyzed results from the questions in the pre- and follow-up surveys ($N = 5$). For the statement on the survey "OPD is no more beneficial than TPD," there was a significant difference in the scores from the pre-survey ($M = 2.4$, $SD = .548$) to the follow-up survey ($M = 1.6$, $SD = .548$); $t(4) = 4.000$, $p = .016$. These results suggest participation in OPD did have an effect on participants' beliefs in

the benefits of OPD over TPD. Specifically, the results suggest that after participation in

OPD and time in their classrooms, most participants disagreed or strongly disagreed with

the statement "OPD is no more beneficial than TPD" meaning they believe OPD is more

beneficial than TPD. There was not a significant difference in the scores from any of the

other survey questions.

A one-way ANOVA was conducted to determine if the mean scores from the

survey questions differed by group (pre-survey group, post-survey group, and follow-up

survey group). For the statement on the survey "I have not had adequate time to properly

evaluate the OPD content knowledge integrated into my instructional practices" the mean

scores significantly differed by group, $F(2, 30) = 3.65$, $p = .038$. A post hoc Bonferroni

test determined the significant difference was between the pre-survey group ($N = 13$) and

the follow-up survey group ($N = 11$), with the follow-up group mostly strongly

disagreeing or disagreeing with this statement. For the statement on the survey "OPD is

beneficial to my professional growth and success" the mean scores significantly differed

by group $F(2, 30) = 5.17$, $p = .012$. A post hoc Bonferroni test determined the significant

difference was between the pre-survey group ($N = 13$) and the post-survey group ($N = 9$),

with the post-survey group all strongly agreeing to the statement.   For the statement on

the survey "OPD training provides and enhances skills that I use in my classroom" the

mean scores significantly differed by group $F(2, 30) = 5.92$, $p = .007$. A post hoc

Bonferroni test determined a significant difference between the pre-survey group ($N =$

13) and the post-survey group ($N = 9$) as well as a significant difference between the pre-

survey group ($N = 13$) and the follow-up survey group ($N = 11$). Majority of the

respondents in the pre-survey group agreed with this statement whereas majority in the post-survey and follow-up survey strongly agreed with this statement.

In summary, respondents believed OPD was as beneficial or more beneficial than TPD, recognized the benefits of OPD to their professional growth, and felt comfortable transferring the OPD content knowledge into classroom instructional practices. At the conclusion of OPD and during the December follow-up survey, respondents all strongly believed the OPD training provided and enhanced skills that they used in their classroom. In addition, after completing OPD respondents felt they were able to properly evaluate the OPD content knowledge integrated into classroom instructional practices; respondents were able to make connections between what they learned in OPD and their classroom instructional practices.

OPD Artifacts

The first two OPD modules introduced the concept of technology integration and the remaining six modules introduced a specific technology that could be used to support literacy. During the six modules that introduced technologies to support literacy, OPD participants were introduced to the technology, were provided direction for playing and using the technology (play time), and were provided ideas for successful classroom integration. At the conclusion of the module, participants created and submitted a lesson plan for classroom integration.

Lesson plans were reviewed by the researcher using a rubric (Appendix E), designed by Harris, et al. (2010). This rubric identifies four criteria for analyzing lesson plans: (1) curriculum goals and technologies, (2) instructional strategies and technologies,

(3) technology selections, and (4) fit. The first criterion, curriculum goals and

technologies, reviews curriculum-based technology use in the lesson plan to see how

strongly aligned is the technology with the curriculum goal. The second criterion,

instructional strategies and technologies, reviews how technology is used in the teaching

and learning focusing on how strongly the technology supports the instructional

strategies. The third criterion, technology selection, reviews the compatibility of the

technology with the curriculum goals and instructional strategies seeking exemplary

technology selections. The fourth criterion, fit, reviews how strongly the content,

pedagogy, and technology all fit together. Through analyzing the lesson plans using the

rubric, the researcher identified three possible categories of teachers: (1) teachers who

experienced some challenges with the technology integration module lesson plans, (2)

teachers who were moderately successful with creating the lesson plans, and (3) teachers

who were highly successful at creating technology integration lesson plans. Table 17

provides the number of lesson plans in each category for the technology modules.

Table 17

Lesson Plan Categories

Modules	Some Challenges	Moderately Successful	Highly Successful
Module 3	4	5	4
Module 4	2	6	5

Module 5	1	5	6
Module 6	0	4	8
Module 7	0	2	7
Module 8	0	2	7

Thirteen participants submitted lesson plans for Module 3 and Module 4, twelve participants submitted lesson plans for Module 5 and Module 6, and nine participants submitted lesson plans for Module 7 and Module 8. As seen in Table 17, over time from Module 3 to Module 8 more participants created highly successful lesson plans.

Case Study Results

All OPD participants were invited to participate in the case study. After three distinct communication attempts with all the teachers who participated in the OPD, only two teachers consented to participate in the case study. Each teacher was assigned a psyeudonym.

The classroom observation instrument (Appendix G) developed by Hofer, Grandgenett, Harris, and Swan (2011) was used by the researcher to collect field notes during the classroom observations in light of the TPACK framework. In addition to field notes, a rubric is provided on the classroom observation instrument to evaluate the lesson based on six categories: (1) curriculum goals and technologies, (2) instructional strategies and technologies, (3) technology selection(s), (4) fit, (5) instructional use, and (6) technology logistics. For each category, the researcher used the rubric to assign a score

of 1, 2, 3, or 4 with a score of 1 representing a weak observation with not supporting

allignment, inadequate effectiveness, or ineffective use to a score of 4 representing strong

alignment, maximally effective, or exemplary use.

Allison. Allison is a School Librarian with 15 years of experience all at the same

school. Allison's age is 46+ years old and she shared with the researcher that she

believed it takes a little extra practice, time, and dedication for older teachers to utilize

technology most effectively. Her ethnicity is White. Allison submitted all six lesson

plans. Three lesson plans were moderately successful and three lesson plans were highly

successful. Allison shared with the researcher that she participated in the summer OPD

to learn more ways to integrate technology into her Library classroom. Allison had

limited technology skills but in recent years was learning more ways to utilize technology

in the classroom. She shared that she knew there were ways to utilize technology and

replace many of the projects her students had been doing in a more traditional fashion for

many years. Allison also shared that as a result of OPD, she was willing to try new

technology in the classroom, especially technology that helped students' literacy skills.

Observation 1. This classroom observation took place on October 11, 2016, from

10:15 a.m. to 11:15 a.m. Eight students were enrolled in this eighth grade class. The

classroom was clean, organized, and clutter-free. Students sat at tables and chairs. The

learning objective for this lesson was for students to utilize electronic timelines. Allison

introduced timelines during the week before this observation. Students used a web-based

timeline (timeline.knightlab.com) to chart details in the infamous Lindbergh kidnapping

story. The students had previously read a story about the kidnapping. Every student had

a Chrome Book laptop; each student borrowed a laptop from the cart in the room. From observing the quick and orderly distribution of laptops, it was evident that the students knew the routine for borrowing a laptop. Before students started using the laptops, Allison reminded the students of the need to pay attention to details. Allison had three different students demonstrate the use of the timeline at the front of the class on the interactive whiteboard. During the observation, students interacted with each other and explained the process for using the website to create the timeline as well as answered each other's technology questions.

Using the interactive whiteboard, Allison modeled types of information available on the Federal Bureau of Investigation (FBI) and Public Broadcasting System (PBS) websites and provided specific links to pages on these sites. The lesson was realistic; students used problem based learning to try to solve the kidnapping mystery. When students had questions about technology, Allison was positive and open to questions and discussion. Allison said to one student, "how do you think we might be able to fix this?" In order to add graphics to their timelines, students were encouraged by Allison to search for images online. Using the interactive whiteboard, Allison modeled procedures for searching for images online. The class time was not rushed and students were encouraged to spend time searching for images and creating their timelines. Thus, play time was afforded to the students for their technology use.

During this classroom observation, the researcher observed that Allison was very patient and willing to answer questions. Allison made a comment, "one thing I wish to figure out is why the timeline is so pale that you can barely see it. I will figure

that out and let everyone know during the next class." Allison asked students open-ended questions to assist with memory recall. As seen from their facial expressions, this was helpful for students as they tried to remember details from the story they read about the kidnapping.

In light of the TPACK framework, from the classroom observation instrument rubric used during this observation, Allison received a score of 4 in four of the six categories: curriculum goals and technologies, technology selection(s), fit, and instructional use. In the two remaining categories, instructional strategies and technologies and technology logistics, Allison received a score of 3. For the instructional strategies and technologies, the technology use supported the instructional strategy but did not optimally support it. Optimal support would have occurred if students had more opportunities to research online. For the technology logistics category, the assigned score of 3 indicated the teacher and students operated the technology well in the observed lesson.

Observation 2. This classroom observation took place on December 8, 2016, from 11:00 a.m. to 11:50 a.m. Twenty-one students were enrolled in this fifth grade class. The learning objective for this lesson was for students to use computers to research their assigned countries for their social studies project. Thus, the librarian and social studies teacher collaborated together for this country project. The focus on this lesson was for students to research how to say "Merry Christmas" in their assigned country and identify some of the country's Christmas traditions.

Allison emphasized that today's class time was for researching and finding data. During the next class, they would format their Google document. A few days later they would create a Christmas ornament as a final project. When class started, all students recited the five classroom rules for technology use. Online safety skills were stressed in these student technology procedures. During this class period, Allison first demonstrated searching for information using a specific website (www.reindeerland.org/Christmas-traditions). Then she demonstrated the use of another website (www.whychristmas.com) for images and symbols. After modeling these sites on the interactive whiteboard, she required the students to use only these two sites for all their research.

The students had five tasks to complete: (1) research how to say "Merry Christmas" in that country's native language, (2) identify the Christmas gift giver (for example, Santa Claus), (3) find an image of the gift giver, (4) find images of symbols, and (5) find Christmas customs. Throughout the classroom time, Allison reminded the students that they must provide sources for all images and information. Students spent the class time on their computers researching for the necessary data. From facial reactions and smiles, it was evident that students were enjoying these tasks.

The researcher observed that Allison was positive and proactive in helping students; she invited students to learn by encouraging them to do their best. The rules were firm and clear, yet this was a loving and very productive environment. Allison answered questions and went from chair to chair as hands were raised. Despite many questions, the classroom was organized and students spent the given time using their computers. Allison provided instructions for the entire class on how to right click using

the Chrome book since the students did not have mice with the laptops and students needed to use two fingers to complete this task. At the end of the period, students put away laptops and checked out books for individual reading.

In light of the TPACK framework, from the classroom observation instrument rubric used during this observation, Allison received a score of 4 in all six categories: curriculum goals and technologies, instructional strategies and technologies, technology selection(s), fit, instructional use, and technology logistics. These highest scores in each category represented that the technology was strongly aligned with the curriculum goal, technology optimally supported instructional strategies, instructional use of technology was maximally effective, and teachers and students operated technology very well during the observation. In addition, a score of 4 for the fit category represented curriculum, instructional strategies, and technology fit together strongly in the lesson.

Observation 3. This classroom observation took place on February 3, 2017, from 10:15 a.m. to 11:15 a.m. Thirteen students were enrolled in this seventh grade class. The learning objective for this class period was for students to present their completed technology projects. The students used Animoto (https://animoto.com/) or PowToon (https://www.powtoon.com/) to create projects and had spent two weeks working on the projects. Allison selected the literacy project and the technology to help students learn visual literacy skills.

At the start of the two-week unit, Allison introduced the Hero's Journey project and the students selected a book for personal reading that contained the story of a hero. The project was designed for students to create an animated video based on the hero in

the book they read and to document the hero's journey. Allison used *The Hero's Journey, A Guide to Literature and Life: A Comprehensive Guide for Teaching the Journey* (Harris & Thompson, 2005) as a curriculum reference for creating the unit. Allison taught and required the students to all use the same steps for every hero's journey. The steps for a hero's journey were (1) the call to adventure, (2) crossing the threshold, (3) mentors and helpers, (4) challenge, (5) abyss, (6) transformation, (7) atonement, and (8) return (Harris & Thompson, 2005). The students used these eight steps to visually show their hero's journey.

The students' videos were organized and structured. The names of each of the eight steps were visible in order throughout the presentations. The students searched for their own pictures on the Internet and were required to cite the URL for each picture. Students selected music from the Animoto or PowToon music library. Every student's video was one to two minutes in length. All students had used Animoto earlier in the year. Allison allowed the students to use PowToon for this project if they wanted but she made it clear that she had never used it and would not be able to assist with technical questions. Four of the thirteen students chose to use PowToon.

During the project, Allison emphasized writing first and required students to create and use a storyboard. Allison required completion of the storyboard before the students were allowed to search for images or music. Allison shared with the researcher that she was very happy with the quality of the projects and that she felt Animoto was a great tool because it was relatively easy for students to use and navigate through the steps. The researcher saw eight student videos during the classroom observation.

In light of the TPACK framework, from the classroom observation instrument rubric used during this observation, Allison received a score of 4 in all six categories: curriculum goals and technologies, instructional strategies and technologies, technology selection(s), fit, instructional use, and technology logistics. These highest scores in each category represented that the technology was strongly aligned with the curriculum goal, technology optimally supported instructional strategies, instructional use of technology was maximally effective, and teachers and students operated technology very well during the observation. In addition, a score of 4 for the fit category represented curriculum, instructional strategies, and technology fit together strongly in the lesson.

Interviews. Interviews with Allison after each classroom observation provided time for the researcher to listen to Allison and her ideas about her OPD experience and how she designed classroom technology integration lessons based on what she learned in the summer OPD. Regarding her OPD experience, Allison shared that she enjoyed the play-time since it provided time to use the technology and think of ways to integrate it into her classroom lessons; "the creation of the projects and lesson plans were helpful and provided hands-on time to explore and play." Allison shared with the researcher that because of the OPD, she was integrating more technology; "I am using technology more in my classroom this year. The OPD helped me experience and understand the ways to use technology in the classroom." In the interviews, Allison shared that she was trying different instructional strategies in her classroom because of the OPD experience. "This OPD experience has positively impacted my classroom instructional strategies. It is getting me to try new and different things using technology in the classroom. I am trying

things I have not tried before." Specifically, Allison used online timelines for literacy integration. In previous school years, Allison did a timeline project on paper, but this year she modified the project to integrate online timelines into the instruction. The researcher observed students working on the online timelines during the first classroom observation.

The researcher asked Allison why she asked a student the question "how can we fix this?" Allison shared that she enjoys input from the students because it helps the students build critical thinking skills. Allison believed that asking students to state in words the process for modifying a procedure using technology is part of project-based learning and necessary for student technology growth and development of thinking skills. In reference to the Christmas project during the second classroom observation, the researcher asked Allison why she only wanted students to get data and not do any formatting. Allison explained that she had been focusing on data collection strategies with the students in addition to Internet research skills. Allison believed that it was important in the learning process to give students plenty of time to research and find the necessary information. She shared that students love to format text by changing fonts, sizes, colors, and styles. Allison shared that the next class period would be dedicated to formatting, but she was trying to teach the students the necessary steps of proper data collection and organization of data before working on formatting the text.

After the third classroom observation, the researcher asked Allison how she created the hero's journey technology project. Allison shared that another teacher shared the hero's journey curriculum book with her and she enjoyed the curriculum resources

provided in the book. When asked why she allowed students to use PowToon even though she had only previously taught the students to use Animoto, Allison shared that she believed some students were ready and interested in using a web-based program they had not yet experienced. Allison shared that she knew some students would be more comfortable with Animoto and other students would want to take time to play with and explore PowToon. Allison shared that she enjoyed play time during the summer OPD and wanted to provide play time for her students, especially those who were interested in trying to use PowToon for the first time. When asked what was the most time consuming task while she was planning this technology integration unit, Allison shared that she had to spend time creating alias accounts for the students to use PowToon and Animoto. Allison shared that she believed it was necessary to create the accounts ahead of time to prepare for the students and to allow them to maximize their time. Allison shared that she selected Animoto and PowToon because both were very user-friendly and easy for students to learn and utilize for this project. When asked if she would change anything to this project the next school year, Allison responded that she would like to see more students try PowToon on their own and she would like to provide even more play time for the students to use the software, create their movies, and consider utilizing some advanced features and animations.

Betty. This fifth grade teacher had eight years of experience with the past six years at the current school. Betty's age is between 26-30 years old and her ethnicity is White. Betty submitted all six lesson plans. One lesson plan was moderately successful and five lesson plans were highly successful. Betty was very comfortable using

technology and teaching with technology. She designed classroom peer coaching time to allow for students to help each other with technology challenges in the classroom. Betty enrolled in the summer OPD specifically to learn more technology and literacy tools and how to effectively integrate them in the classroom. Prior to OPD, only minimal technology was used in her classroom; she used Google Classroom and some websites. Betty shared that as a result of the OPD, she was willing to design and implement technology integrated lessons. She shared that she was hoping to utilize Google Classroom more during the school year on a daily and weekly basis for teaching and learning, not just for posting information.

Observation 1. This classroom observation took place on October 12, 2016, from 10:30 a.m. to 11:20 a.m. Thirty students were enrolled in this fifth grade class. This was a very organized and clean classroom. Three posters were on the side board containing the daily schedule, the objectives for each class throughout the day, and the homework assignments. The learning objective for this class period was for students to work on their saint projects by creating five of ten slides using information they researched during the previous class. Every student had a Chrome Book. The instructional strategies and learning activities focused on learning Google Slides to create a presentation. Betty selected this technology since students would be giving a presentation on their saint to the class. The students had no prior experience using Google Slides, although a few students had experience with Power Point, a similar program.

This classroom routine was extremely organized. The distribution of 30 laptops was done in an efficient way by calling tables of students up to the front of the room one

table at a time. All students had individual logins and passwords for the laptops. Betty used a variety of classroom management techniques to check for student progress with certain tasks. For example, at one point Betty said, "raise your right hand when you find this screen." Through this technique she was then quickly able to get to the desks of the four remaining students and help them with individual issues. She also used this technique "clap twice if you have the white Google screen." This was another excellent classroom management technique to help make sure students were paying attention to her instructions. At one point, Betty said "hands off the laptop and look at the teacher" in order to have all students' attention.

During the observation, students created five slides with no sound or pictures. The directions were to create slides and add text content. Betty reminded the students that they needed a title slide to start the presentation. The students were quiet while they were working. Many hands were raised throughout the time asking Betty individual questions. Many students were smiling as they were working. Betty used a clock for the last 12 minutes of the class to help students stay organized. The students had the freedom to format the slides any way they wanted. Betty stated she was going to try something new; she gave the students two minutes and instructed them to turn to a student next to them and coach them through any issue the student was having. Some students asked their peers formatting questions while other students asked how to do certain tasks on the slide presentation. Betty reminded students that they needed to think about when they are older and at a job they will need to create a nice, readable presentation for their boss.

At the end of the class period, Betty had students turn to a peer and discuss what they liked and what they did not like. One student commented that "it was hard to enlarge the page" and another student said it was difficult without having a mouse. One student shared that she liked having ownership and the ability to pick what she wanted to include on the slides and another student liked that they were able to type their slides instead of using handwriting skills. Betty shared with the researcher that she wanted to integrate technology into her classroom and was willing to try new things in the classroom. Betty was extremely organized and positive. She was energetic and treated all students in a respectful manner.

In light of the TPACK framework, from the classroom observation instrument rubric used during this observation, Betty received a score of 4 in four categories: curriculum goals and technologies, fit, instructional use, and technology logistics. In the two remaining categories, instructional strategies and technologies and technology selection(s), Betty received a score of 3. For the instructional strategies and technologies, the technology use supported the instructional strategy but did not optimally support it. For the technology selection(s) category, the assigned score of 3 indicated the selection of Google slides was appropriate but not exemplary given the curriculum goals and instructional strategies.

Observation 2. This classroom observation took place on December 15, 2016, from 12:30 p.m. to 1:20 p.m. Thirty students were enrolled in this fifth grade class. The learning objective for this class period was to provide computer practice for students to use Chrome Books without mice in preparation for the upcoming standardized testing.

These students had never before taken a standardized test on the computer. Since the school did not have mice for these laptops, Betty planned a lesson to help students use the laptops without mice and get comfortable with the no mice situation. Betty selected this lesson for December so the students could practice before Christmas break, prior to their standardized testing in mid-January 2017. Usually Betty does not do any extra preparation with the students for standardized testing. This technology lesson was not focused on any content learning but instead focused on time for students to learn how to use technology. The learning activities included multiple opportunities for students to practice drag and drop computer skills without a mouse.

In a very organized manner, students were called to the front of the room by table groups to pick up a laptop from the cart. There was excellent classroom control; all students were respectful and quiet while instructions were presented by Betty. Betty gave the students a short assignment to discuss a topic with a student next to them while all laptops were distributed. A clapping routine, "clap once if you can hear me; clap twice and let's be quiet" was used once laptop distribution was complete. Using the interactive whiteboard, Betty displayed a webpage and introduced the activities by modeling an example of the activity. Betty shared the website URL (http://minimouse.us/) through the use of a Google document. Students opened the Google document and utilized right clicking on the URL to open the website.

In order to maximize classroom control, Betty used a strategy by stating "open your screen to 45 degrees." All students knew what to do. By having the screens at 45 degrees, the laptops were not closed causing the computers to lock and, at the same time,

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the students could not see what was on the screen. Betty utilized this practice to have the students' attention instead of allowing their attention to be on the computers. This practice was utilized three times during the classroom observation, each time Betty made announcements, gave suggestions, or reminded students of the task.

Students spent the allotted class time playing the game on the website. This was an online game designed to help students practice the drag and drop computer skills. It was a creative and interactive game. Students had to do tasks to move the main character, Bongo. Instructions provided included "lift Bongo above the seesaw and then drop him to make Beenie dive into the water." Through their smiles and positive comments, it was evident that students were happy and enjoyed using the computers to play the interactive games.

In light of the TPACK framework, from the classroom observation instrument rubric used during this observation, Betty received a score of 4 in all six categories: curriculum goals and technologies, instructional strategies and technologies, technology selection(s), fit, instructional use, and technology logistics. These highest scores in each category represented that the technology was strongly aligned with the curriculum goal, technology optimally supported instructional strategies, instructional use of technology was maximally effective, and teachers and students operated technology very well during the observation. Optimal support was observed with students actively using the computers for a variety of activities to learn based on student selection. The curriculum goal was to utilize computer skills without mice and these activities fit the need for

learning without mice. In addition, a score of 4 for the fit category represented curriculum, instructional strategies, and technology fit together strongly in the lesson.

Observation 3. This classroom observation took place on February 1, 2017, from 10:30 a.m. to 11:30 a.m. Thirty students were enrolled in this fifth grade class. Betty stated that the learning objective for this math class period was to learn to work with variables while balancing equations. Students used Chrome Books and utilized Google Classroom. The students had previous experience using Google Classroom and usually used it once a week. On the previous day, the students used math manipulatives to balance equations.

The class started with a very organized distribution of laptops. Students were called in groups by their assigned number. Betty called group 1-5 followed by 6-10 and continued in groups of five. Students were given clear directions to log onto the computer and then sign onto Google Classroom. The students had their passwords in their assignment books for reference when needed. Betty was very patient and organized. As students were getting laptops Betty said, "I will tap you when I see you are logged in. At that time, plug in your earphones, put them on, and watch the video in Google Classroom." The plan for the class was organized and clearly communicated with the students.

The students watched a Math Antics video titled "Variables in Equations." They accessed the video by clicking on the link in Google Classroom. After giving time for students to watch the video individually, Betty stated "when you are done watching the video, please raise your right hand." This was a good classroom control technique to

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keep students on task and to check for completion. Then, Betty gave "turn and talk time" which allowed students an opportunity to turn to a student next to them and share what they learned in the video. The researcher heard students use words such as variable, operations, division, and equations. While students watched the video, Betty shared with the researcher that she wanted a classroom set of earphones so that all students have earphones and not earbuds. She explained that earbuds cause a lot of extra noise that is heard in the classroom since they are small ear pieces while earphones do not cause any extra classroom noise or distractions.

Next Betty led a discussion by asking students to recall facts from the day before. She asked "what manipulatives did you use yesterday to balance equations?" Multiple students answered her questions and she modeled the activity from the day before on the interactive whiteboard. Then, Betty instructed students to take out their math journals and open to a clear page. Betty displayed four practice math problems on the interactive whiteboard and asked students to use their pencils, copy the problems in their journals, and solve the equations. One equation on the board was "$a + 15 = 35$." Betty turned on the timer and gave students six minutes to complete two tasks. The first task was to solve the four problems. The second task was to get back onto Google Classroom and complete the second assignment. While giving instructions, Betty complemented the students by stating "I love that you are all looking and listening." The second task was a mathematics free-write, a literacy technique that required students to write about a topic using their own words and thoughts. The instructions for this free-write were for students to choose a math term they used this year and then define the term

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in their own words and give an example. The students were to write two to three sentences.

Betty walked around the classroom and checked students' journals to see how each student answered the four questions. Betty placed a circle or a triangle sticker on the students' journal page based on the work shown and answers calculated. After all students completed the activity, Betty told those students with triangles to go to table four and all others to find an open seat at another table. Then two worksheets were distributed; one to table four while all other students in the class received a different worksheet. Table four had six students, all who had some difficulty solving the four equations given. Betty gave instructions to table four to do the first two problems as a group while all other students were told to complete the left column of the worksheet. Betty was patient and talked through the first problem with the students at table four. These students needed extra help in understanding how to solve basic mathematical one-variable equations. Through the use of different shapes to identify different student needs, Betty differentiated mathematics instruction based on the needs of the students.

Betty differentiated in her classroom without the students even knowing it. She differentiated in a professional way by using stickers in geometric shapes that provided extra support to struggling math students based on their work on the previous tasks. Betty asked open-ended questions to table four including "what are you all doing? Are you having any trouble that I may help you with?" When the students finished the worksheet problems, Betty called on individual students to answer the worksheet questions. Betty reminded the students "when you answer the question, say the variable,

such as say 'n equals 8' when stating your answer." It is evident that Betty created a positive learning environment that encouraged students to ask questions and seek help as needed.

In light of the TPACK framework, from the classroom observation instrument rubric used during this observation, Betty received a score of 4 in all six categories: curriculum goals and technologies, instructional strategies and technologies, technology selection(s), fit, instructional use, and technology logistics. These highest scores in each category represented that the technology was strongly aligned with the curriculum goal, technology optimally supported instructional strategies, instructional use of technology was maximally effective, and teachers and students operated technology very well during the observation. In addition, a score of 4 for the fit category represented curriculum, instructional strategies, and technology fit together strongly in the lesson. This lesson received a score of 4 in all categories since how to use Google Classroom was clearly explained, students were provided play time to use the technology and explore Google Classroom, and students completed activities provided by the teacher that were posted in Google Classroom.

Interviews. Interviews with Betty after each classroom observation provided time for the researcher to listen to Betty and her ideas about her OPD experience and how she designed classroom technology integration lessons based on what she learned in the summer OPD. Betty shared that her OPD experience was positive in helping her own ongoing professional growth; "the experience was detailed and I have been using this OPD as a stepping stone to learn more ways to use technology in the classroom." Betty

shared that in previous school years, prior to the summer OPD, she only utilized a small amount of technology, mostly Google Classroom to post information and limited website use. Specifically, Betty shared

As a result of this OPD, I am using Google Classroom much more this school year than in past years. I have learned to use it in different ways beyond just posting information; I use Google Classroom to support my instruction.

Google Classroom is a technology Betty used to support instructional strategies in her classroom, more than just as an electronic bulletin board for posting announcements. "My students are being exposed to technology in a variety of different ways which are different from before. It is great preparation for middle school and beyond." Thus, Betty believed integrating technology in her classroom was helping to prepare her fifth grade students for middle school.

After the first classroom observation, the researcher asked Betty about the coaching time provided when she had students coach each other for approximately two minutes. Betty shared that she thought about this strategy earlier in the school year but had never utilized it in the classroom until this class period. Betty enjoyed providing time for students to collaborate and help one another as peers while focusing on the class topic. Betty shared that she believed students were good at many technology uses since they had grown up with technology; she believed that students often need a little help and utilizing their peers for assistance was a great way to provide help and support for each other. Betty shared that her distribution of laptops by student number helped to have an efficient distribution and held students accountable for listening and following directions.

When asked to share information about the lesson and selection of this interactive game used in the second observation, Betty shared that she found the game online when she was searching for ways to teach drag and drop skills without a mouse. Betty commented that she liked this game because it was interactive and caught the students' attention. She had hoped the game would keep the students occupied and help them learn at the same time. After this observation, she shared that she believed the game was a successful use of time since she heard student reactions and saw their focus on the computers while playing the game.

After the third classroom observation, the researcher asked Betty to explain her "turn and talk time" strategy. Betty shared that she used this strategy to provide time for students to talk to each other in groups of two and share what they learned. Betty shared that she listened to the conversations to make sure students were not off topic, but instead that the students were actually discussing the math video. Betty shared that she used math journals because she believes literacy is an important part of every subject. She wanted students to put in writing what they learned in the math lesson because she felt that writing about the process of balancing equations was an important aspect of the lesson. Betty shared that she used the mathematics "free-write" time to help foster literacy skills in math by providing time for the students to write a definition in their own words.

Codes and themes. Classroom observations were conducted by the researcher to determine how the teachers integrated technology in the classroom and how the OPD impacted how they taught with technology. These observations were designed to observe

the effects on how teachers integrated technology throughout the school year from their summer OPD experiences. Field notes from the observations along with the codes are included in Appendix N.

Interviews were conducted to collect data on teacher perspectives of the reasons for participating in OPD and the reasons for teaching with technology. Interviews were conducted after each classroom observation. The formal interviews took place after the December classroom observation. The transcriptions of the interviews along with the codes are included in Appendix O.

The data was labeled with codes, overlap was reduced, and the codes were collapsed into five themes. A critical friend coded the data independent of the researcher. The researcher code-checked the codes of the critical friend and compared it to his own codes. The codes and the themes are identified in Table 18.

Table 18

Codes and Themes from Interviews and Observations

Themes	Codes
OPD provides hands-on opportunities	Openness
	Willing to learn
	Interactivity
	More technology use
OPD is practical for classroom	Need to use what was learned in OPD; put

implementation	in practice
	Practical
	Realistic
	Needs training; important for technology use
	Takeaways to implement right away
	Limited technology use prior to OPD
	Information sharing
Technology supports instruction	Demo at front of class
	Coach
	Ownership
	Practice
	Excellent strategy
	Practical
	Specific technology
	Prompts teacher exploration
	Student background knowledge
	Student benefits
	Technology is a focus
	Prepare
	Supports higher order thinking
Classrooms are flexible and focus on	Interact

student engagement	Open to student input
	Play time
	Search
	Create
	Research
	Patient
	Energetic
	Productive
	Encouraging
	Question
	Enjoy
	Student engagement
	Flexibility
Strong classroom management and organization	Asks open ended questions
	Organized
	Positive classroom
	Class control
	Optimistic, gentle, loving
	Positive teacher response

Five themes emerged from the qualitative data collected through the classroom observations and the interviews. Two themes focus on OPD and three themes focus on

classrooms. The five themes are: (1) OPD provides hands-on opportunities, (2) OPD is practical for classroom implementation, (3) technology supports instruction, (4) classrooms are flexible and focus on student engagement, and (5) strong classroom management and organization.

OPD provides hands-on opportunities. Teachers wanted hands-on opportunities to work with technology during OPD. Allison commented

> Every time I am introduced to new technology I am willing to try it but if there are activities to do with it, then I learn it. If I am just given a list of tools, it remains a list and is not very helpful. The creation of the projects and lesson plans were helpful and provided hands-on time to explore and play.

When asked about OPD play-time that was provided and the requirement to create lesson plans, Allison stated "do not change the play time. It's hands-on and practical for my classroom!" When discussing flexibility, Allison commented "I like the freedom to choose different modules" and "I like the flexibility of learning on my own time." Betty commented "information sharing was key to this experience between the teacher/student and student/student." A benefit to OPD was that hands-on opportunities provided time for Betty to collaborate with other participants.

OPD is practical for classroom implementation. When asked about impact on classroom instruction, Allison commented

> This OPD has absolutely had a positive effect on my teaching! This OPD experience has positively impacted my classroom instructional strategies. It is

getting me to try new and different things using technology in the classroom. I

am trying things I have not tried before.

Technology tools learned in OPD were practical for classroom teaching practices.

Because she learned about online timelines in the OPD, Allison integrated online

timelines in her classroom. Betty shared that she was using Google Classroom more this

year due to learning more about it in the summer OPD. Betty commented "the OPD

experience was detailed and I have been using this OPD as a stepping stone to learn more

ways to use technology in the classroom." When asked about helpful hints for teacher

OPD, Betty stated

Teachers should ensure they are clear about the commitment and expectations for

learning in OPD classes and be ready to use this knowledge. If they do not, they

will forget which would then be wasted time. Who needs that? Not me.

Classroom implementation of technologies learned during OPD provide practical

opportunities for teachers.

Technology supports instruction. When asked how OPD impacted her classroom

teaching, Betty commented that OPD "made me more aware of ways for students to use

technology and apply learning. Technology helps to meet the needs of all learners."

Allison integrated online timelines as a tool to support her instructional strategies. "In

the past I have done timelines on paper and they were a mess, so I did love the online

timelines" stated Allison. Betty stated

As a result of this OPD, I am using Google Classroom much more this school year than in past years. I have learned to use it in different ways beyond just posting information; I use Google Classroom to support my instruction.

During the first observation of Allison's classroom, the researcher observed technology supporting the instruction on the details of the Lindberg kidnapping news event. The website searches helped students actively use technology to attempt to solve the mystery. Then, students used this knowledge and images to create their online timelines. During the second observation of Allison's classroom, the researcher observed technology supporting the instruction of Christmas customs around the world. The two websites students were allowed to use provided all the necessary data for students to research. Google docs provided technology for students to keep a log of their data and sources. During observation three of Allison's classroom, the researcher observed technology supporting the instruction of a hero's journey. Students utilized video technology to create an animated story about their hero and the hero's journey.

During the first observation of Betty's classroom, the researcher observed technology supporting the instruction of creating a presentation on the saint selected by the students. The technology utilized was Google Slides. Students used Google Slides for the first time and focused on creating slides containing information about their saint without any colors or images. During the second observation of Betty's classroom, the researcher observed technology skills instruction for standardized test preparation. Students utilized online website tools to help them learn how to drag and drop on the laptop without a mouse. The second classroom observation of Betty focused on

technology skills by teaching the students how to use the keypad instead of a mouse. Although useful for their upcoming standardized test, this was a technology skill lesson and not technology supporting instruction. During the third observation of Betty's classroom, the researcher observed technology supporting math instruction as students worked with variables to balance equations. The technology used included Google Classroom for individual students to watch a movie and then students utilized Google Classroom assignment feature to complete a mathematics free-write using literacy skills. Technology supporting instruction was observed in five of the six classroom observations.

Classrooms are flexible and focus on student engagement. When asked about her students' reactions to increased technology use in the classroom, Allison commented

Oh, the students love it. They grew up with technology. Some of it I love just because it helps address messy handwriting by looking better. For them, they do not see it as work. For some reason, when they have a Chrome Book, they see it as play.

Betty commented

My students enjoy technology in the classroom and have welcomed this way. However, they surprise me sometimes because they do not want to stretch and challenge themselves all the time. As teachers we think they know so much more than us regarding technology however they don't and sometimes it is surprising to me as they are not risk takers. I have to push them.

During the first observation of Allison's classroom, the researcher observed her flexibility in allowing the students class time to search for images and not rushing the students in the tasks. In response to student technology questions, Allison was positive and answered questions often asking students to think about the best solution or what steps to try next to address the question. The researcher observed the students engaged in hands-on time searching for images, researching information, creating timelines, and interacting with one another to provide support. During the second observation of Allison's classroom, the researcher observed the teacher's flexibility in her positive spirit, proactive approach to student learning, and encouragement of students. The researcher observed the students engaged in their utilization of individual computers to find the information and images. During the third observation of Allison's classroom, the researcher observed the teacher's flexibility in allowing the students opportunities to make choices in the design and layout of all animated story scenes. Students had the flexibility to select images, music, fonts, scene flow, and many other details when they created their videos.

During the first observation of Betty's classroom, the researcher observed flexibility in allowing students to create the five slides any way they wanted including selecting the slides' details, fonts, and colors. At one point during the observation, Betty stopped everyone and gave all students two minutes to pause and coach someone near them. Students were engaged in this process by helping their peers with any technical issues they were having or questions they had during the slide creation process. During the second observation of Betty's classroom, the researcher observed flexibility in

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allowing students to choose how to navigate and play the game in order to learn drag and drop skills. Student engagement was observed by watching students smile and focus on the Bongo games on the computer. During the third observation of Betty's classroom, the researcher observed flexibility in allowing the students to rewind the video if they needed clarification or wanted to hear it again. The mathematics free-write also provided flexibility in allowing students to select any math term from the year and write about it. Student engagement was observed in this classroom by watching students focus on the computer, complete the tasks assigned, and work with other students on the worksheets. Flexible classrooms with a focus on student engagement were observed in all six classroom observations.

   Strong classroom management and organization. During the first observation of Allison's classroom, the researcher observed organization by watching the students enter the classroom, pick up their laptop, check out a book, and take a seat. Students raised hands when they had questions. During the second observation of Allison's classroom, the researcher observed that classroom rules were firm and clear and at the same time the classroom was very organized and productive. Many students raised their hands and asked questions. Allison was constantly moving around the room answering questions. During the third observation of Allison's classroom, the researcher observed organization through the laptops setup around the room and videos on the monitors ready to play.

   During all three observations of Betty's classroom, the researcher observed an extremely efficient distribution of laptops. The laptop cart was located in the front of the room and Betty called small groups of five to the front by number to pick up a laptop. It

was observed that students knew exactly what to do and how to pick up and return laptops. Betty had excellent classroom management in this classroom of thirty students which was observed through an organized classroom routine and Betty stated the objectives and the procedures at the start of the period. Classroom management was efficient and the teacher used phrases such as "clap two times if you hear me" and "clap three times if you are listening" to make sure students were paying attention when it was time to change tasks or stop and listen to her instructions. Strong classroom management and organization were observed in all six classroom observations.

Summary

This chapter discussed the results of data collected from surveys, observations, and interviews. Survey data came from four surveys: enrollment survey, pre-survey, post-survey, and follow-up survey. Survey data was analyzed quantitatively through dependent sample t-tests and a one-way ANOVA test. The case study provided interview data as well as three classroom observations of each of the two teachers. Observation and interview data was analyzed qualitatively and five themes emerged from the data.

Chapter Five

This study was designed to investigate online professional development (OPD) and classroom impacts guided by the following research questions:

(1) Why do teachers participate in OPD?

(2) How does OPD focusing on technology integration impact classroom teaching practices over six months?

This chapter summarizes the research study and states the conclusions drawn from the research. A discussion of the major results is included along with limitations of this research. Recommendations for practice as well as for future research studies are also included.

Research Study Summary

The purpose of this study was to explore the reasons teachers participated in OPD and to understand the impacts of OPD on teachers' technology integration practices in the classroom. This research investigated what teachers learned during a summer OPD, what impacts OPD had on classroom teaching practices, and how teachers implemented strategies in their classroom based on what they learned in OPD. By observing classroom teaching practices throughout the academic year, over a six month period, the researcher studied how OPD sustained and encouraged teaching practices throughout the six months.

The research participants were Catholic school, K-12 teachers who participated in a summer OPD workshop. This mixed methods case study collected both qualitative and quantitative data. Data came from surveys, lesson plans designed by teachers during the OPD, interviews, and classroom observations throughout the six months after OPD.

In spring 2016, Catholic school teachers were invited to participate in a summer 2016 OPD workshop. Those who decided to participate were asked to complete an Enrollment Survey (Appendix C) in June 2016. The goal of this enrollment survey was to collect data on the reasons teachers enrolled in OPD, what technology tools teachers used in their classrooms, and how frequently the teachers were using the technology tools. The OPD took place from June through August 2016. Participants completed eight modules designed to introduce technology and literacy integration standards as well as a variety of technology tools including digital stories, Google tools, fan fiction, Web 2.0 tools, blogs, wikis, podcasts, infographics, and online timelines. Those participants who gave consent were asked to complete a pre-survey (Appendix D) in June at the start of the OPD, a post-survey (Appendix D) in August at the conclusion of the OPD, and a follow-up survey (Appendix D) in December. The same survey was used each of these three times.

A case study was conducted after the conclusion of the OPD. Participants in the case study agreed to have their classroom observed by the researcher three times during the school year (October, December, and February) and agreed to participate in face-to-face interviews with the researcher. During observations, the researcher used a classroom observation instrument (Appendix G) to collect data. The formal interview questions

(Appendix H) were used after the December observation. Two teachers volunteered to participate in the case study.

Quantitative data from the pre-, post-, and follow-up surveys were analyzed using descriptive statistics. In addition, a set of dependent sample t-tests was used to compare survey response data collected from the pre- and post-surveys. Another set of dependent sample t-tests was used to compare survey response data collected from the post- and follow-up surveys. A third set of dependent sample t-tests was used to compare survey response data collected from the pre- and follow-up surveys. A set of ANOVA tests was used to compare survey response data between the three groups of responses on the pre-survey, the post-survey, and the follow-up survey. Data from the enrollment survey and the follow-up survey on the use of technology tools were analyzed with frequency distributions.

Quantitative data analysis using dependent sample t-tests found three statements statistically significant after participation in OPD. As a result of participation in OPD, all participants strongly agreed with the statement "OPD is beneficial to my professional growth." Most participants strongly agreed with the statement "I feel comfortable transferring the OPD content knowledge into my instructional practices." The third statistically significant statement was "OPD is no more beneficial than TPD" (traditional professional development). Most participants disagreed or strongly disagreed with this statement meaning they believed OPD was as beneficial as or more beneficial than TPD.

Quantitative data analysis using a one-way ANOVA found significant differences in the mean scores from survey questions between groups (pre-survey group, post-survey

group, and follow-up survey group). For the statement "I have not had adequate time to properly evaluate the OPD content knowledge integrated into my instructional practices," there was a significant difference between the pre-survey group and the follow-up survey group with the follow-up survey group mostly disagreeing or strongly disagreeing with the statement. For the statement on the survey "OPD is beneficial to my professional growth and success" the change from the pre-survey to the post-survey with the post-survey responses all strongly agreeing with the statement. For the statement "OPD training provides and enhances skills that I use in my classroom," the difference between the pre-survey group and the post-survey group and the difference between the pre-survey group and the follow-up survey group both indicate changes to most participants strongly agreeing with the statement.

Qualitative data from the teacher interviews and classroom observations was coded for content analysis following the process of an initial read through, labeling data with codes, reducing overlap, and collapsing codes into themes (Creswell, 2008). A critical friend assisted with code-checking the observation and interview data. Case study participants completed a member check process to review data collected during observations and interviews. Critical friend code checking and member checks helped to establish validity of qualitative findings.

Qualitative data analysis coded the teacher interview data and classroom observation data. As a result, five themes emerged: (1) OPD provides hands-on opportunities, (2) OPD is practical for classroom implementation, (3) technology

supports instruction, (4) classrooms are flexible and focus on student engagement, and (5) strong classroom management and organization.

In the enrollment survey in June before OPD and again in the follow-up survey in December four months after OPD, teachers were asked how often they used each of 11 technology tools identified. The frequency of use slightly increased for some tools including interactive whiteboards, Google tools, reading a story online, infographics, digital stories or video creation tools, and literacy games. The following tools were still not used frequently in the classrooms: Web 2.0 tools, fan fiction, blogs, wikis, and podcasts.

Research question 1. Why do teachers participate in OPD? The quantitative data from the surveys answered this question with three statistically significant statements. First, teachers believed OPD was beneficial to professional growth. Second, teachers believed they were comfortable transferring the OPD content knowledge into their instructional practices. Third, teachers believed OPD was either as beneficial as or more beneficial than TPD. Qualitative data from classroom observations and teacher interviews answered this first research question with two themes that emerged from the data. First, OPD provided hands-on opportunities for the teachers to experience technology and play with the technology. Second, OPD was practical and provided ideas for classroom implementation.

The enrollment survey also asked participants why they enrolled in the OPD. The two themes from this data were similar to the two themes from the survey data, technology integration and teaching practices. One participant commented "I am

constantly looking for ways to improve and enhance teaching, and technology is a great tool for this goal." Participants responded that they wanted to learn how to integrate technology in the classroom and how to improve the quality of teaching.

Teachers participated in OPD because they valued OPD and recognized the benefits to their professional growth and learning. Additionally, teachers believed OPD was relevant to their teaching since OPD provided practical opportunities for learning instructional practices. Teachers participated in OPD because they were interested in the topic of technology integration and enjoyed hands-on time to learn technology tools and ways to integrate the technology tools into their literacy instruction.

Research question 2. How does OPD focusing on technology integration impact classroom teaching practices over six months? This research question was answered during the case study through qualitative data collected from classroom observations and teacher interviews as well as data from the follow-up survey that took place four months after the OPD. Three themes emerged from the data. First, technology supported classroom instruction and teaching practices. Second, classroom teaching practices occurred in flexible classrooms that have a focus on student engagement with technology. Third, classroom teaching practices with technology occurred in organized classrooms with strong classroom management. Through the technology tool frequency data from the enrollment and follow-up surveys, the data showed that OPD focusing on technology integration only slightly impacted classroom teaching practices by minimally increasing the use of a few technology integration tools. Those tools were interactive whiteboards,

Google tools, reading a story online, infographics, digital stories or video creation tools, and literacy games.

The first theme, technology that supports classroom instruction and teaching practices, means technology tools are used in the classroom with a focus on student learning. Classroom instruction with technology means that teachers use technology in the teaching and learning process; students engage with technology and use technology to learn. Classroom instruction has technology integrated into the instructional practices designed with the primary focus of helping students learn.

The second theme, classroom teaching practices occurred in flexible classrooms that have a focus on student engagement with technology, focuses on classroom design. Flexible classrooms are classrooms that allow for student questions, opportunities for exploration, and a focus on learning that leads to student growth. When students engage with technology, they participate in "play-time" that allows students to experience hands-on time using technology that supports their learning.

The third theme, classroom teaching practices with technology occurred in organized classrooms with strong classroom management, focuses on the teachers' design and management of the classroom. The teachers had set routines that allowed for student growth while at the same time teachers had rules and procedures designed to assist in effective classroom teaching. These classrooms were organized with clear student expectations, classroom displays that correlated to curriculum and procedures, and efficient routines understood by students. Overall, these three themes focused on effective classrooms that successfully provided technology integration teaching practices.

Conclusions

Analysis of the data supported the following conclusions:

- Teachers believed OPD was beneficial to their professional growth.

- Teachers want OPD to be practical with classroom integration ideas so they can transfer the knowledge from OPD into instructional practices.

- OPD must provide hands-on opportunities and time for teachers to experience technology.

- After OPD, teachers integrated technology throughout the school year in organized, flexible, and student-centered classrooms that had strong classroom management and focused on opportunities for student learning and student engagement with technology.

- Classroom technology integration supported instruction and teaching practices.

- Based on 11 identified technology tools, interactive whiteboards remained the most frequent technology used in classrooms.

Discussion

When participants completed the technology use questions in the enrollment survey (Appendix C), the results showed very little technology use in the classroom. These participants chose to enroll in the OPD; no one was required to enroll and participate. In addition, from the enrollment survey all 18 participants responded and shared their desire to learn how to use technology more effectively in the classroom, but the current use of technology in the classroom was infrequent. Fifteen of the 18

respondents indicated that laptops were available for classroom use. Thus, most have access to laptops for their classrooms.

The data from the surveys was self-reported by the participants. In the pre-survey data (Table 5), 12 of 13 participants agreed or strongly agreed with the statement "I use technology to teach concepts/lessons." In the post-survey data (Table 9), all nine participants agreed or strongly agreed with the statement "I use technology to teach concepts/lessons." In the follow-up survey data (Table 13), 10 of 11 participants agreed or strongly agreed with the statement "I use technology to teach concepts/lessons."

Three distinct communication attempts were made with all the teachers who participated in OPD inviting them to participate in the case study. After these attempts, only two teachers consented to participate in the case study. If the teachers were using technology like they reported in the surveys, why were they so reluctant to participate in the case study and allow the researcher to observe? The survey data might not be as accurate as possible since the participants may have responded the way they thought the researcher wanted them to respond or the way they thought they should respond after participation in OPD focusing on technology integration.

Are the participants responding the way they respond because they are participating in a study? This is the Hawthorne effect, an educational research concept named "to account for unexpected outcomes which are believed to depend on the fact that the subjects in a study have been aware that they are part of an experiment and are receiving extra attention as a result" (Merrett, 2006, p. 143). Teachers often believe observations are only designed for evaluation and do not provide focused feedback that is

constructive and useful for implementing changes in the classroom (Ferlazzo, 2013).

Many times teachers want feedback and look to teacher-driven observations that

empower teachers to seek ways to improve instruction and student achievement with

input from fellow teachers and mentors (Grimm, Kaufman, & Doty, 2014). Voluntary

teacher observations often seek to use fellow teachers as peer observers and are usually

focused with teachers having a specific essential question they wish to have identified in

their classroom by observing teaching practices with goal of hearing feedback and

reflection for improvement (Bramschreiber, 2012). Perhaps teachers were reluctant to

participate in the case study because they did not feel these observations would provide

useful feedback for their own teaching.

Through the technology tool frequency data collected in the enrollment survey

and again in the follow-up survey, a few tools slightly increased in frequency in the

classroom but many tools from the summer OPD did not increase in classroom

frequency. According to the survey responses, the interactive whiteboard remained the

most frequent tool for classroom use. During classroom observations, the researcher

observed both teachers using the interactive whiteboards but only observed the students

using the interactive whiteboards during one observation (Observation 1 of Teacher A).

In their study to explore teachers' beliefs and technology use related to teaching literacy,

Sprague, Groundwater, and Opfer (2016) also found that interactive whiteboards were the

most frequent classroom technology used on a weekly basis. In addition, this study also

found teachers were not using the other tools frequently. Thus, this research study's

results are consistent with other study results in terms of technology tool use.

There was a small shift in use of some of the technology tools after OPD but the teachers were not using many of the technology tools that were introduced during OPD. These technology tools that were introduced during OPD and have infrequent use after OPD are Web 2.0 tools, fan fiction, blogs, wikis, and podcasts. Thus, as a result of OPD, there was not a large shift in technology use in the classroom. As identified in the case study interviews, teachers desired to use technology and had positive attitudes for technology integration, but there was not a significant overall change in the use of technology tools. Thus, this OPD did not make a big difference in classroom teaching practices. Although a little shift was evident, it was small. OPD did make a difference for the two case study participants. The researcher was able to observe technology use in their classrooms and these teachers tried to implement what they learned in OPD.

Why did OPD not make a difference overall? Perhaps the OPD was not long enough; it was eight weeks in the summer. Future OPD may consider expansion into the school year. The OPD was not a course and no grade was assigned or credit earned. Some participants started the OPD but did not finish. Perhaps they did not take it seriously? In order to encourage teachers to complete OPD, research has found that teachers participating in OPD need administrator support and understanding why they want to participate as well as a school culture that supports ongoing OPD and teacher engagement (Ketelhut, McCloskey, Dede, Breit & Whitehouse, 2006). Massive open online courses (MOOCs) also often have a high percentage of participants who do not complete the courses because some participants just want to explore course content and do not need a grade or course completion credit; often times MOOC participants find that

too many people, often hundreds of participants, are enrolled and participants do not receive quality, individual feedback (Ho et al., 2014; Khalil & Ebner, 2013). Although the summer OPD had a small number of participants and participants received individual feedback on lesson plans, the participants of the summer OPD were not earning a grade or credit. Perhaps some participants just wanted to explore ways to integrate technology and were not interested in creating lesson plans. Reasons for non-completion are also valid questions for future studies.

The tools not used (Web 2.0 tools, fan fiction, blogs, wikis, and podcasts) are tools that allow students to create and to write; these tools are not passive tools for the classroom. When using these tools in the classroom, these tools provide opportunities for active and engaged learning. Although podcast use can be passive when students only listen to them, creating podcasts allows students to be active participants in the creation of a product. Why were some technology tools selected over others? Teachers want a variety of technology tools to select from for classroom technology integration based on the needs of the students in their classrooms and what tools will best support student learning (Alexander & Alexander, 2011; Rawat, 2008). For example, some teachers often use Web 2.0 tools for literacy instruction of struggling readers since Web 2.0 tools are student-centered and provide opportunities to help students learn by creating, writing, and editing (Hu, Oslick, & Feng, 2014). Teachers need professional development that provides opportunities to learn about technology tools and how to use them; more teacher education programs in recent years now provide courses that teach teachers about technology integration standards and technology tools for classroom use that focus on

facilitating student-centered learning (Kim, Rich, & Hannafin, 2004; Li, Lemieux, Vandermeiden, & Nathoo, 2013; Wall, 2013). Some technology tools are selected by teachers over other tools because teachers feel most comfortable using the selected tools and also do not fully understand how powerful other tools are for student learning (Fransson & Holmberg, 2012; Wachira & Keengwe, 2011). Teachers continue to need ongoing professional development and confidence in technology integration in order to consider using other technology tools in the classroom (Chapman, Masters, & Pedulla, 2010; Pierce & Ball, 2009).

Allison. This teacher was the first volunteer to participate in the case study. As a School Librarian with 15 years of experience all at the same school, it was evident that her passion for quality literacy education was a top priority for the education of all her students. Her Library classroom was clean, organized, and clutter-free. Students entered the classroom and always knew the routine, listened to directions, and respectfully participated in class. Through the interviews, the researcher quickly learned that Allison was always open to trying technology or new teaching strategies, anything that she thought would help a student love to read and learn. With a focus on literacy, it was evident that trying new technologies from the OPD were examples of technology supporting classroom instruction and teaching practices. The whiteboard was always used during the researcher's classroom observations. Allison's classroom was flexible and productive; this was observed through her patient style and willingness to answer questions and sometimes say "I will have to check into this and get back to you." It was

evident that Allison was willing to try new technology in the classroom and she was flexible with technology glitches.

Betty. This fifth grade teacher had eight years of experience with the past six years at the current school. Immediately from the first classroom observation, the researcher recognized Betty's efficient distribution of laptops by calling students up to the front of the room in small groups by numbers. Most importantly, the researcher observed students complete tasks using technology, participate in classroom discussions, and collaborate with each other during peer help sessions that focused on technology assistance. Betty was comfortable with her students' technology experience and designed peer coaching time to allow for students to help each other. At the conclusion of the third observation, the researcher complimented Betty on her strong, positive, and effective classroom management skills and said "you should be mentoring and teaching new teachers on the values of strong classroom management and practical tips for success." It was evident to the researcher through the observations and interviews that Betty had a passion for quality education. Betty held a high standard for her students and was an experienced teacher who was able to differentiate in the classroom, provide support for struggling students, and model technology use for all the students. After the third classroom observation, Betty shared with the researcher that she would be interested in OPD again this summer to learn more technology and also learn other teaching strategies she can use with the technologies she learned last summer. Specifically, Betty was hoping to utilize Google Classroom more during the remainder of the school year.

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Course self-critique. Six modules were designed to introduce teachers to specific technology tools, yet according to the results of the follow-up survey, some of these tools (Web 2.0 tools, fan fiction, blogs, wikis, and podcasts) were not utilized in the classrooms. It was hoped that teachers would utilize all the tools from OPD in their classrooms. Why did the teachers not adopt these tools? The modules provided information on the tools, play-time, and suggestions for classroom implementation. If the OPD were to be used again, it may be necessary to modify the modules containing these technologies. One change might be to include better examples of classroom use including testimonials or lesson plans from other teachers who use the tools and stronger arguments for how these tools helps students actively learn and engage. Another modification might be to provide more structured play time for these modules with more detail-oriented directions for the play time. Another modification might be to provide additional modules based on teacher input from the pre-survey and enrollment survey.

Eight weeks in the summer during July and August is a short period of time for OPD. Although this OPD was accessible from any computer with Internet connection, the OPD did take place during teachers' summer vacations. In addition, this OPD ended the week before school started. In late August, perhaps teachers wanted one final vacation break before starting a new school year. Perhaps this is why some teachers did not finish the OPD by submitting lesson plans and participating in discussion boards on the final modules.

Addressing threats to validity. The first validity threat concerning proper collection and interpretation of data was addressed through multiple strategies. Member

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checks were utilized to verify accuracy of classroom observation and teacher interview data. Audio recordings were used for interviews and recordings were played again after transcription to verify accuracy. Data was triangulated through the collection of data from observations, interviews, and surveys.

The second validity threat concerning researcher bias was addressed through member checks. Both teachers in the case study participated in member checks by verifying the accuracy of the data in the classroom observations and the interview transcriptions by reviewing the written field notes. Checking for divergence from initial expectations by reviewing all field notes, memos, and journals also addressed this validity threat. This was an important threat since the researcher earned a degree in instructional technology and believed in a positive approach to assist teachers in maximizing effective instructional technology integration practices; the researcher wanted to see technology integration work in every classroom.

The third validity threat concerned the presence of the researcher in the classroom during observations. It was important to understand what was happening in the classrooms between visits. The researcher addressed this through specific interview questions. It was important to question what was really happening between visits to verify that technology integration was a part of regular classroom practices between observation visits.

Significance. When classroom changes do occur after traditional, one-shot professional development they are often implemented immediately and observed in classroom teaching practices (Duran, Brunvand, Ellsworth, & Sendag, 2012; Holland,

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2001; Kazemi & Hubbard, 2008; Niess, 2005; Rentie, 2008). Unlike traditional, face-to-face professional development, OPD should provide for teachers to implement classroom instructional practices long-term, throughout the academic year because OPD's online format allows for repeated opportunities to observe content, video examples, discussion boards, and other provided online resources. Research (described in Chapter 2) has not addressed the issue of long term impacts of OPD on classroom teaching practices. This research study investigated changes over a six month period after participation in OPD to see what was happening in classrooms and to observe how OPD sustained and encouraged teaching practices throughout the six months. This research study found that changes were occurring in the two classrooms six months later because of OPD. Through the classroom observations, the researcher observed the use of electronic timeslines and Google Classroom. Allison used electronic timelines because she learned about them in the OPD. Betty shared that she was utilizing technology as a result of OPD; "as a result of this OPD, I am using Google Classroom much more this school year than in past years." According to self-reported data in the interviews, these two teachers shared that increased instructional strategies that integrated technology were used in the classrooms between visits. These technology integration strategies focused on tools that were presented to teachers during the summer OPD workshop. In addition to the classroom observations, interviews confirmed that the two teachers were still integrating tools six months later and throughout the school year as a result of OPD.

Limitations

The small sample size is a limitation to this research study. Eighteen participants completed the enrollment survey in June but only fourteen participated in the OPD. Thus, four teachers who completed the enrollment survey did not continue and participate in the summer OPD. Thirteen teachers completed the pre-survey. One teacher chose not to give consent and not complete the pre-survey. After two email reminders and the information in the final module, only nine participants completed the post-survey in late August. However, in December, eleven participants gave consent and completed the follow-up survey. Overall, this is a small sample size.

In order to analyze survey data using dependent sample t-tests, participants' responses to each survey question were compared. The first set of dependent sample t-tests analyzed results from the questions in the pre- and post-surveys, but only five participants completed both surveys. The second set of dependent sample t-tests analyzed results from the questions in the post- and follow-up surveys, but only six participants completed both surveys. The third set of dependent sample t-tests analyzed results from the questions in the pre- and follow-up surveys, but only five participants completed both surveys. Thus, there was a lack of participation which resulted in a very small sample size for these dependent sample t-tests but it is not unprecedented to have small sample sizes and still obtain valid results from t-tests (de Winter, 2013).

The case study was originally designed to include three teachers. The researcher hoped to identify three teachers: (1) a teacher who experienced some challenges with the technology integration module lesson plans, (2) a teacher who was moderately successful

with creating the lesson plans, and (3) a teacher who was highly successful at creating technology integration lesson plans. After three distinct communication attempts with all the teachers who participated in the OPD, only two teachers consented to participate in the case study. Although most participants said they were using technology, only two volunteered to take part in the case study. In early October, one teacher who participated in the summer OPD and did not participate in the case study approached the researcher when she saw the researcher at a school music concert. She thanked the researcher for the summer OPD and said she was using some of the module information this year in her classroom. She told the researcher she did not respond to the request for participation in the case study because that year her classroom had a brand new SMART Board and she was having technical difficulties with the SMART Board at the start of the school year when the case study request was made.

Another limitation to this research study is that this study haslimited generalizability . The study researched a small sample of Catholic school teachers' participation in OPD and observed only two Catholic school teachers' technology integration practices in the classroom on three occasions. The qualitative data tells the story of all the teachers who participated in the OPD and the case study, but this data has limited generalizability to the larger population of teachers.

Recommendations

There are many ways to share the results of this research study to positively influence practices in schools. Since many schools wish to provide quality OPD for teachers, results of this research study are helpful to school administrators influencing the

design of future OPD for teachers. Teachers enjoy options and are interested in learning about technology that they can use in their classroom. During the classroom observations, the researcher observed lesson plans being used that were designed during OPD. Designing lesson plans as part of the professional development experience helped teachers take what they learned and apply it to designing a realistic classroom lesson they can utilize in the classroom. Thus, OPD was practical and provided helpful tools for classroom implementation.

Looking at the results of research question one which answers why teachers participated in OPD, those who design OPD should use these results and take them into account when designing and encouraging OPD. The results of this study indicated that teachers participated in OPD and appreciated professional growth opportunities that provided hands-on opportunities to experience technology. Current school leaders should design and encourage OPD participation that provides play-time so that teachers have hands-on opportunities to experience a variety of technology tools and requires the creation of practical lesson plans teachers can use in their own classrooms. Even though some tools were introduced in OPD and not used in the classrooms, these tools are important for literacy and technology classroom integration. OPD should continue to provide teachers with information on how to use these tools, how to integrate them into classroom teaching practices, and explain why these tools are important for student literacy growth and learning. These tools support and enhance student literacy education and teachers need to continue to learn how to use technology to integrate literacy instruction with technology (Larson, 2010; Stover & Yearta, 2015; Zeig, 2015). In

addition, school leaders should share the reasons why teachers have participated in OPD so that ongoing OPD can meet the needs of teachers and be designed reflecting those needs.

Future Studies

As a result of this research, new questions arise that could guide future similar investigations. Why were so few OPD participants willing to join in the case study and allow the researcher to observe their classrooms? Only two teachers volunteered to participate. Why only two? The requirements were minimal; the teacher only had to allow the researcher to observe three times and the teacher had to participate in an interview after each observation. Were teachers not really integrating technology? Did teachers have previous negative observations that were too critical of their teaching strategies? This should be a future study especially since teachers self-reported that they were using technology tools in the classroom, but only two agreed to participate in the case study.

Another future study should focus on why teachers are and are not using certain tools. This should be an ethnographic study of teachers that seeks to discover specific reasons why certain popular technology tools are not being used in the classroom. This study should include a long term case study to understand the affordances of technology in the classroom. We know teachers use certain technology tools they are comfortable with using, but future studies should seek to better understand if technology is transforming the teaching. A long term study will help to learn about teachers' day-to-day applications of technology tools with which they become familiar in OPD.

Summary

This chapter summarized this mixed methods research study with an overview of the OPD and case study in addition to discussing the quantitative and qualitative data collection and data analysis. The conclusions drawn from the analysis of the data were presented. A discussion section included identifying questions from the data, introducing the two teachers who participated in the case study, addressing threats to validity, and recognizing the significance of the study. Limitations of the study were presented followed by recommendations and considerations for future studies. This study investigated OPD and classroom impacts guided by these two research questions:

(1) Why do teachers participate in OPD?

(2) How does OPD focusing on technology integration impact classroom teaching practices over six months?

Appendix A

GEORGE MASON UNIVERSITY | Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-5445; Fax: 703-993-9590

DATE:	May 16, 2016
TO:	Debra Sprague
FROM:	George Mason University IRB
Project Title:	[899907-1] Teacher Participation in Online Professional Development: Exploring Academic Year Classroom Impacts
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	May 16, 2016
REVIEW CATEGORY:	Exemption categories 1, 2

Thank you for your submission of New Project materials for this project. The Office of Research Integrity & Assurance (ORIA) has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please note that any revision to previously approved materials must be submitted to the ORIA prior to initiation. Please use the appropriate revision forms for this procedure.

If you have any questions, please contact Bess Dieffenbach at 703-993-5593 or edieffen@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

Appendix B

Online Module Overview

The initial plan for the module topics include: (1) technology and literacy integration basics, (2) TPACK and ISTE standards, (3) digital stories and online storybooks, (4) Google tools, (5) fan fiction and literacy with technology, (6) Web 2.0 tools, (7) blogs, wikis, podcasts, and collaborative tools, and (8) infographics and online timelines.

1. Technology and literacy integration basics
   - Why integrate technology?
   - What are the benefits for students?
   - What are the barriers to technology integration?
   - Literacy and Technology
   - How to find additional resources and support
2. TPACK and ISTE Standards
   - What is the TPACK framework?
   - Investigating your technology, pedagogy, and content knowledge
   - What is ISTE?
   - ISTE Standards for Students
   - ISTE Standards for Teachers
   - How to integrate ISTE standards into classroom teaching
3. Digital stories
   - What are digital stories?
   - Why do students enjoy digital stories?
   - How can digital stories influence student literacy skill development?
   - How to create digital stories
4. Google tools
   - Google for Educators
   - Tools to help student literacy
   - How to use Google tools in the classroom
   - Integration of tools
5. Fan fiction
   - What is fan fiction?

- Encouraging students to read and write
6. Web 2.0 tools
    - Web 2.0 tools for educators
    - Web 2.0 tools for students
    - How to use and integrate tools in the classroom
7. Blogs, wikis, podcasts, and collaborative tools
    - Introducing the purpose of the tools
    - Integration in learning and sharing knowledge
    - Reading and writing skills development through these tools
8. Infographics and online timelines
    - Defining infographics and timelines
    - Creating and using these tools
    - Literacy skills integration in these tools

Digital Stories Module Details
- Read the Ohler article on Digital Storytelling.
- In order to introduce Digital Storytelling, watch this background video:
    o What is Digital Storytelling?
      https://www.youtube.com/watch?v=dKZiXR5qUlQ
- There is a tutorial to help you create your photo story:
    o https://www.youtube.com/watch?v=06MFnTRqcKM
    o If you need additional help, go to the Resources link and scroll down to Photo Story.
- Review the assignment for details about creating your Digital Story and start working on your Digital Story. Use Photo Story to create your digital story.
- On the discussion board:
    o Discuss your work while creating your Digital Story.
    o What was easy? What was difficult?
    o What do you anticipate your students' reactions will be to this tool?
- Write a lesson plan for integrating a digital story project in your classroom.

Appendix C

Enrollment Survey

Thank you for your interest in the online professional development workshop this summer. In order to better prepare for this online workshop, please answer the following questions.

What do you hope to learn from this workshop?

Why have you enrolled in this online workshop?

What classroom technologies have you heard about that you are interested in learning more about?

How often do you have your students use the following technologies? Please indicate
1 = *never,* 2 = *once a year*, 3 = *once a quarter/semester*, 4 = *once a month*, 5 = *weekly*.

	1	**2**	**3**	**4**	**5**
Interactive Whiteboards such as Smartboard or Promethean					
Google Tools					
Blogs					
Wikis					
Podcasts					
Digital Story or Video Creation tools					
Reading a book or story online					
Fan Fiction					
Literacy Games					
Infographics					
Web 2.0 Tools					

Please list other technologies that your students use in your classroom.

Appendix D

Pre-, Post-, and Follow-Up Survey

Demographic Information

What is your gender?

       Female
       Male

What is your ethnicity?

       African American
       Asian
       Hispanic
       Native American
       White
       Other

Which range best describes your age?

       21 – 25 years old
       26 – 30 years old
       31 – 35 years old
       36 – 40 years old
       41 – 45 years old
       46+ years old

What is the highest academic degree you have earned?

       Bachelor
       Master
       Master + 30
       Doctorate
       No degree
       Other

How many years have you been a teacher?

    1-3 years
    4-6 years
    7-9 years
    10-12 years
    13-15 years
    16-19 years
    20 -23 years
    24-26 years
    27 + years

Please indicate whether you are a certified teacher

    Yes
    No
    Working toward certification

Please indicate your level of certification

    Elementary
    Middle
    High School
    Post-Secondary

What subject do you teach? Check all that apply.

    Reading
    English
    Social Studies
    Mathematics
    Science
    Fine Arts
    World Language
    Heath and Physical Education
    Other (please specify):

Technology and Professional Development

This section is intended to obtain information about your use of technology and experience with traditional and online professional development. In the context of this study, technology refers to computers, software, and other electronic apps used in the

educational technology setting. Please provide the following information by choosing the appropriate response.

How would you describe your level of proficiency with using the computer?

Expert
Good
Fair
Novice

How many online professional development (OPD) trainings have you participated in from 2014-2016?

1-3
4-6
7-9
10-12
More than 12

How many traditional (face-to-face) professional development (TPD) have you participated in from 2014-2016?

1-3
4-6
7-9
10-12
More than 12

How would you describe your personal motivation to participate in additional online professional development trainings?

Highly motivated
Somewhat motivated
Barely motivated
Not motivated

On a weekly basis, how often do you integrate technology into your instructional practices?

0 days
1-2 days
3-4 days
5 days

How would you describe your level of comfort with technology?

      Very comfortable
      Somewhat comfortable
      Not comfortable

How would you describe your level of experience with technology?

      Very experienced
      Limited experience
      No experience

How would you describe your level of comfort in integrating technology into your instructional practices?

      Very comfortable
      Somewhat comfortable
      Not comfortable

How would you describe the amount of experience you have integrating technology into your instructional practices?

      Very experienced
      Limited experience
      No experience

How would you describe your level of comfort in transferring online professional development (OPD) content knowledge into your instructional practices?

      Very comfortable
      Somewhat comfortable
      Not comfortable

How would you describe the amount of experience you have with transferring online professional development (OPD) content knowledge into instructional practices?

      Very experienced
      Limited experience
      No experience

How would you describe your level of comfort in evaluating the online professional development (OPD) content knowledge integrated into your instructional practices?

      Very comfortable

Somewhat comfortable
Not comfortable

How would you describe the amount of experience you have with evaluating the online professional development (OPD) content knowledge integrated into instructional practices?

Very experienced
Limited experience
No experience

This section is intended to understand your attitude toward, beliefs about, and your perceived benefits in participating in online professional development (OPD). Please indicate the extent to which you agree or disagree with each statement regarding each construct. You should have one response for each statement.

Teachers' Attitude toward and Belief about online professional development (OPD)

	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is of little benefit to me.				
OPD opportunities should always be available.				
OPD is not relevant to my success as a teacher.				
One session of OPD training will not positively impact my instructional practices.				
I have not had adequate time to properly evaluate the OPD content knowledge integrated into my instructional practices.				
Teacher input does not need to be a vital part of OPD design.				
OPD training should link to the curriculum and classroom instruction.				
I would love to participate in additional OPD training.				
OPD is no more beneficial than traditional professional development (TPD).				
I have no uncertainties about integrating OPD content knowledge into classroom instruction.				

School districts should provide year round, mandatory OPD training to its teachers.				
Additional support should be available to assist teachers in the integration of OPD content knowledge into their instructional practices.				

Teachers' Perceived Benefits of Participating in online professional development (OPD)

	Strongly Disagree	Disagree	Agree	Strongly Agree
OPD is beneficial to my professional growth and success.				
OPD is more interesting and beneficial than TPD.				
Communicating with other participants was easier with OPD than with TPD.				
OPD training provides and enhances skills that I use in my classroom.				
OPD clarifies and simplifies content material and lessons.				
The integration of OPD content knowledge has little effect on student interest, comprehension, and performance.				
OPD integration does not accommodate a variety of learning styles.				
OPD eliminates the travel required to attend traditional professional development (TPD) trainings.				
OPD minimizes the amount of money spent on professional development.				
OPD participation interferes with my classroom time.				

This section is intended to measure the level at which you integrate technology and transfer the OPD content knowledge into your instructional practices. In the context of this study, technology refers to computers, smart boards, software, apps, and other electronic instruments used in the educational technology setting. Please indicate the extent to which you agree or disagree with each statement regarding each construct. You should have one response for each statement.

The Integration of Technology into Instructional Practices

	Strongly Disagree	Disagree	Agree	Strongly Agree
I use technology to teach concepts/lessons.				
I use technology to reinforce concepts/lessons.				
I use technology to integrate the content knowledge from OPD training.				
I use technology to support individualized learning.				
I use technology to accommodate the teaching and learning of students with exceptionalities.				
I use technology to prepare concepts/lessons.				
I use technology to create, draft, and publish classroom activities, homework assignments, group projects, and assessments.				
I use technology to collect, analyze, and report data.				
I use technology to enhance classroom lessons.				
I use technology to increase students' interest, comprehension, and performance.				
I use technology to display content related web pages, videos, and other interactive materials.				
I use technology to retrieve and/or upload educational information and material from online repositories.				
I use technology as an alternative approach to students practicing deficient and prerequisite skills.				

The Transfer of OPD Content Knowledge into Instructional Practices

	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel comfortable transferring the OPD content knowledge into my instructional practices.				

I successfully transfer at least 75% of the OPD content knowledge of trainings into my instructional practices.				
I do not receive the support needed to transfer the OPD content knowledge into my instructional practices.				
I have the computer skills needed to transfer the OPD content knowledge into my instructional practices.				
I have enough time to transfer the OPD content knowledge into my instructional practices.				
I need additional training before I am comfortable transferring the OPD content knowledge into my instructional practices.				
I have the technology equipment needed to transfer the OPD content knowledge into my instructional practices.				
I use OPD content knowledge in tandem with traditional methods of teaching to ensure student comprehension.				
I use OPD content knowledge as a vital part of my instructional practices at least 3 days a week.				
I have evaluated the learning outcomes of the lessons taught using the OPD content knowledge.				
Student comprehension and performance increased with the integration of the OPD content knowledge.				

This section is intended to allow you an opportunity to share any additional information or thoughts about OPD or express any concerns about any item you thought was unclear or difficult to answer.

Please use this area to share any additional information and thoughts you may have pertinent to online professional development. Please type in "none" if you do not have any additional information or thoughts to share.

Please use this area to identify any item on the questionnaire that may have been unclear to you or difficult to answer. Please indicate the number of the question or page number

that the question was on for any question that was unclear or difficult to answer. Please write "none" if there were not any.

You have reached the end of the survey! Thank you so much for your assistance. It is the researcher's desire that this study will reveal data that will benefit you, your students, your district, and the education community at large.
Thank you!

Appendix E

Lesson Plan Rubric

Criteria	4	3	2	1
Curriculum Goals & Technologies (Curriculum-based technology use)	Technologies selected for use in the instructional plan are <u>strongly aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>partially aligned</u> with one or more curriculum goals.	Technologies selected for use in the instructional plan are <u>not aligned</u> with any curriculum goals.
Instructional Strategies & Technologies (Using technology in teaching/learning)	Technology use <u>optimally supports</u> instructional strategies.	Technology use <u>supports</u> instructional strategies.	Technology use <u>minimally supports</u> instructional strategies.	Technology use <u>does not support</u> instructional strategies.
Technology Selection(s) (Compatibility with curriculum goals & instructional strategies)	Technology selection(s) are <u>exemplary</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>appropriate, but not exemplary</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>marginally appropriate</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>inappropriate</u>, given curriculum goal(s) and instructional strategies.
"Fit" (Content, pedagogy and technology together)	Content, instructional strategies and technology <u>fit together strongly</u> within the instructional plan.	Content, instructional strategies and technology <u>fit together</u> within the instructional plan.	Content, instructional strategies and technology <u>fit together somewhat</u> within the instructional plan.	Content, instructional strategies and technology <u>do not fit together</u> within the instructional plan.

Appendix F

Pre-Observation Questionnaire

I look forward to visiting your classroom on _____ (day) at ___ (time).

What is the learning objective for this lesson?

What instructional strategies and learning activities have you planned for this lesson?

What technology will be used?

Why did you select this technology?

What experience do the students already have, if any, using this technology?

How is this class different from what usually happens?

What else would you like to share?

Appendix G

Technology Integration Observation Instrument

Observer Name:
Teacher Name:
Date of Observation:
Grade:
Subject:
Primary Learning Goals:

Directions:
We have tried to key the components of this instrument to different aspects of teachers'
knowledge for technology integration. Please note, however, that the instrument is not
designed to assess this knowledge directly. It is designed to focus upon the use of
technology integration knowledge in observable teaching. Please record the key
curriculum topics addressed, instructional strategies/learning activities observed, and
digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)

What, if anything, do you know about influences upon what you have observed in this
lesson? Examples might include students' learning needs, preferences, and challenges;
access to technologies; cultural, language and/or socioeconomic factors.

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are <u>strongly aligned</u> with one or more curriculum goals.	Technologies used in the lesson are <u>aligned</u> with one or more curriculum goals.	Technologies used in the lesson are <u>partially aligned</u> with one or more curriculum goals.	Technologies used in the lesson are <u>not aligned</u> with one or more curriculum goals.
Instructional Strategies & Technologies (Matching technology to instructional strategies)	Technology use <u>optimally supports</u> instructional strategies.	Technology use <u>supports</u> instructional strategies.	Technology use <u>minimally supports</u> instructional strategies.	Technology use <u>does not support</u> instructional strategies.
Technology Selection(s) (Matching technology to both curriculum and instructional strategies)	Technology selection(s) are <u>exemplary</u>, given curriculum goal(s) and instructional strategies	Technology selection(s) are <u>appropriate, but not exemplary</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>marginally appropriate</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>inappropriate</u>, given curriculum goal(s) and instructional strategies.
"Fit" (Considering curriculum, pedagogy and technology all together)	Curriculum, instructional strategies and technology <u>fit together strongly</u> within the lesson.	Curriculum, instructional strategies and technology <u>fit together</u> within the lesson.	Curriculum, instructional strategies and technology <u>fit together somewhat</u> within the lesson.	Curriculum, instructional strategies and technology <u>do not fit</u> together within the lesson.
Instructional Use (Using technologies effectively for instruction)	Instructional use of technologies is <u>maximally effective</u> in the observed lesson.	Instructional use of technologies is <u>effective</u> in the observed lesson.	Instructional use of technologies is <u>minimally effective</u> in the observed lesson.	Instructional use of technologies is <u>ineffective</u> in the observed lesson.
Technology Logistics	Teachers and/or students operate	Teachers and/or students operate	Teachers and/or students operate	Teachers and/or students operate

(Operating technologies effectively)	technologies <u>very well</u> in the observed lesson.	technologies <u>well</u> in the observed lesson.	technologies <u>adequately</u> in the observed lesson.	technologies <u>inadequately</u> in the observed lesson.

Comments:

Appendix H

Formal Interview Questions

Please tell me a little more about yourself and your teaching career.

Please tell me how you used technology in your classroom before the online professional development?

How do you integrate literacy and technology into your classroom?

Describe your online professional development experience in this recent opportunity this summer. How are you applying what you learned?

What do you believe were the benefits to the online professional development?

Would you recommend online professional development to your colleagues? Why or why not?

What were the challenges and difficulties, if any, in the online experience?

Is there a program or technology you are now using or using more as a result of your online professional development?

Has the online professional development impacted your classroom teaching? If yes, how? If no, why do you believe it has not?

Describe how your online professional development experience is impacting your students.

How are you integrating technology learned during the online professional development?
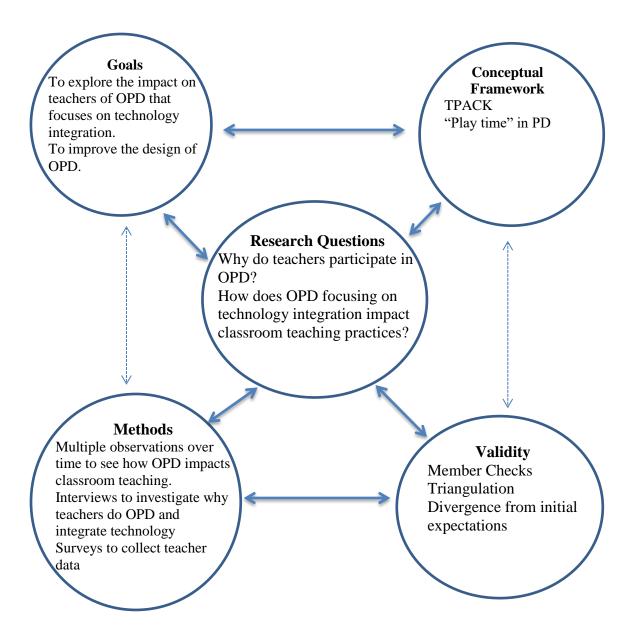
What are your students' reactions to technology integration?

Have you seen the students grow? How?

Regarding today's classroom observation, how was this class different from what usually happens? What happens in the classroom with technology between my visits and how frequent does it happen?

This has been great, thank you, is there anything else you would like to share with me about these topics of professional development or anything else we did not cover that you think are helpful tools for teachers and their professional development?

Appendix I

Goals
To explore the impact on teachers of OPD that focuses on technology integration.
To improve the design of OPD.

Conceptual Framework
TPACK
"Play time" in PD

Research Questions
Why do teachers participate in OPD?
How does OPD focusing on technology integration impact classroom teaching practices?

Methods
Multiple observations over time to see how OPD impacts classroom teaching.
Interviews to investigate why teachers do OPD and integrate technology
Surveys to collect teacher data

Validity
Member Checks
Triangulation
Divergence from initial expectations

Appendix J

Recruitment script at beginning of online modules

Thank you for participating in this online professional development workshop. Before we begin the first module, we are sharing with you that this online workshop is part of a research project. This research is being conducted to study online professional development focusing on technology integration.

If you agree to participate in the research, you will be asked to complete a survey three times: (1) at the start of the online professional development workshop (today), (2) at the conclusion of the online professional development workshop (in late August), and (3) in mid-December as a follow up to the online professional development workshop. Each time the survey should take no more than 20 minutes.

You are not required to participate in the survey. If you choose not to, then you are still welcome to participate in the online professional development workshop.

Clicking NEXT will bring the user to the CONSENT form for the survey.

Appendix K

Teacher Participation in Online Professional Development:
Exploring Academic Year Classroom Impacts

INFORMED CONSENT FORM

RESEARCH PROCEDURES
This research is being conducted to study online professional development focusing on technology integration. If you agree to participate, you will be asked to complete a survey three times: (1) at the start of the online professional development workshop, (2) at the conclusion of the online professional development workshop, and (3) in mid-December as a follow up to the online professional development workshop. Each time the survey should take no more than 20 minutes.

RISKS
There are no foreseeable risks for participating in this research.

BENEFITS
There are no benefits to you as a participant other than to further research in online teacher professional development.

CONFIDENTIALITY
The data in this study will be confidential and only the researchers will have access to this data. You will be asked to provide the last four digits of your social security number. You are never asked for your name or other identifiable information. We ask for the last four digital of your social security number so that we can compare your survey responses over these next few months.

The results of this study will be used for the purposes of scholarly research. Summaries of the findings may be shared with educators and may also be presented at professional conferences or submitted to academic journals.

PARTICIPATION
Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party.

If you decide not to participate in the surveys, you are still welcome to participate in the online professional development workshop.

CONTACT
This research is being conducted by Dr. Debra Sprague and Mr. Tom Opfer at George Mason University. Dr. Sprague may be reached at 703-993-2069 and Mr. Opfer may be reached at 703-

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Appendix L

Recruitment email for case study

Thank you for participating in the online professional development workshop. I hope this workshop provided you with ideas for technology integration in your classroom.

I would like to invite you to participate in a case study. This case study is looking at how teachers are using the knowledge learned in the summer online professional development workshop and applying it to their teaching in the classroom.

What would be asked of you?

You and I would arrange a date for me to come observe your classroom for 60 minutes in October, December, and February. Together we would select a date that works for both of us. After the observation, you are asked to participate in an interview.

You are not required to participate in the case study. If you are interested, please respond to this email and let me know. If you do not respond, then I will assume you are not interested.

Thank you again for your participating in the online professional development workshop.

Appendix M

Teacher Participation in Online Professional Development:
Exploring Academic Year Classroom Impacts

INFORMED CONSENT FORM

RESEARCH PROCEDURES
This research is being conducted to study the classroom impacts after participation in online professional development. If you agree to participate, you will be asked to allow the researchers to observe your classroom three times (in October, December, and February) and participate in an interview after each observation. Each classroom observation will be approximately 60 minutes long. The interviews in October and February will be approximately 20 minutes long and the interview in February will be approximately 40 minutes long.

RISKS
There are no foreseeable risks for participating in this research.

BENEFITS
There are no benefits to you as a participant other than to further research in online teacher professional development.

CONFIDENTIALITY
The data in this study will be confidential and only the researchers will have access to this data. A pseudonym will be assigned and used with collecting all data from the observations and interviews. Interviews will be audio recorded to check for accuracy. Upon completion of transcribing the data, the audio recordings will be destroyed. The results of this study will be used for the purposes of scholarly research. Summaries of the findings may be shared with educators and may also be presented at professional conferences or submitted to academic journals.

PARTICIPATION
Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party.
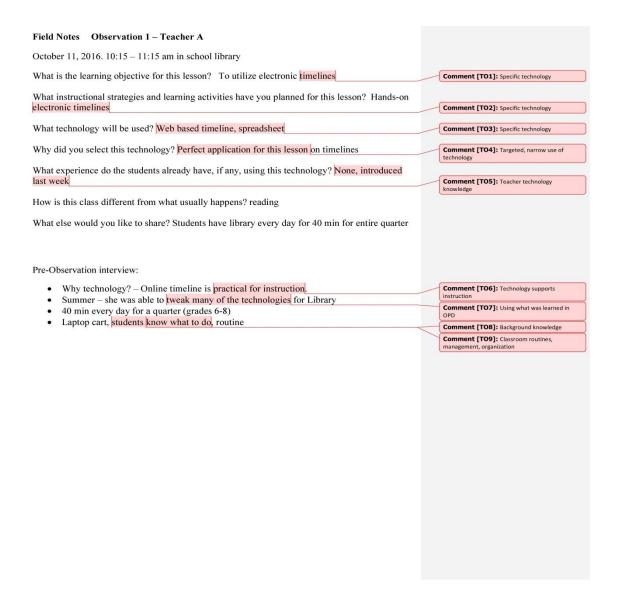
CONTACT
This research is being conducted by Dr. Debra Sprague and Mr. Tom Opfer at George Mason University. Dr. Sprague may be reached at 703-993-2069 and Mr. Opfer may be reached at 703-352-0925 for questions or to report a research-related problem. You may contact the George Mason University Office of Research Integrity & Assurance at 703-993-4121 if you have questions or comments regarding your rights as a participant in the research.

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Appendix N

Field Notes   Observation 1 – Teacher A

October 11, 2016. 10:15 – 11:15 am in school library

What is the learning objective for this lesson?   To utilize electronic timelines

What instructional strategies and learning activities have you planned for this lesson? Hands-on electronic timelines

What technology will be used? Web based timeline, spreadsheet

Why did you select this technology? Perfect application for this lesson on timelines

What experience do the students already have, if any, using this technology? None, introduced last week

How is this class different from what usually happens? reading

What else would you like to share? Students have library every day for 40 min for entire quarter

Pre-Observation interview:

- Why technology? – Online timeline is practical for instruction.
- Summer – she was able to tweak many of the technologies for Library
- 40 min every day for a quarter (grades 6-8)
- Laptop cart, students know what to do, routine

Comment [TO1]: Specific technology

Comment [TO2]: Specific technology

Comment [TO3]: Specific technology

Comment [TO4]: Targeted, narrow use of technology

Comment [TO5]: Teacher technology knowledge

Comment [TO6]: Technology supports instruction

Comment [TO7]: Using what was learned in OPD

Comment [TO8]: Background knowledge

Comment [TO9]: Classroom routines, management, organization

Directions:
We have tried to key the components of this instrument to different aspects of teachers' knowledge for technology integration. Please note, however, that the instrument is not designed to assess this knowledge directly. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)
Literacy	Story timelines	Electronic timelines	Story – historical non-fiction Lindberg kidnapping timelines

Comment [TO10]: Specific technology

Comment [TO11]: Specific technology

What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students' learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

Field notes:

- 8 students, 7th grade
- They use Google Classroom
- Online timelines, started with review
- Details matter
- Students interact and explain to each other
- Realistic: solve a mystery
- Teacher is optimistic, gentle, loving, positive classroom, answers questions
- Each student has an ACER laptop
- FBI, PBS websites
- Library -> Literacy
- Each has a laptop, each read a book,
- Each student has good digital skills – students demo at front for whole class; other students commented

Comment [TO12]: Background knowledge

Comment [TO13]: collaboration

Comment [TO14]: classroom management

Comment [TO15]: teacher quality

Comment [TO16]: access to technology

Comment [TO17]: specific technology

Comment [TO18]: access to technology

Comment [TO19]: strong background knowledge

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are strongly aligned with one or more curriculum goals. Timelines in literacy – specific books	Technologies used in the lesson are aligned with one or more curriculum goals.	Technologies used in the lesson are partially aligned with one or more curriculum goals.	Technologies used in the lesson are not aligned with one or more curriculum goals.
Instructional Strategies & Technologies (Matching technology to instructional strategies)	Technology use optimally supports instructional strategies.	Technology use supports instructional strategies. They talk about paper versus electronic timelines	Technology use minimally supports instructional strategies.	Technology use does not support instructional strategies.
Technology Selection(s) (Matching technology to both curriculum and instructional strategies)	Technology selection(s) are exemplary, given curriculum goal(s) and instructional strategies perfect	Technology selection(s) are appropriate, but not exemplary, given curriculum goal(s) and instructional strategies.	Technology selection(s) are marginally appropriate, given curriculum goal(s) and instructional strategies.	Technology selection(s) are inappropriate, given curriculum goal(s) and instructional strategies.
"Fit" (Considering curriculum, pedagogy and technology all together)	Curriculum, instructional strategies and technology fit together strongly within the lesson. yes	Curriculum, instructional strategies and technology fit together within the lesson.	Curriculum, instructional strategies and technology fit together somewhat within the lesson.	Curriculum, instructional strategies and technology do not fit together within the lesson.
Instructional Use	Instructional use of technologies is maximally	Instructional use of technologies is effective in	Instructional use of technologies is minimally	Instructional use of technologies is ineffective in

Comment [TO20]: specific technology

Comment [TO21]: technology supports goals

Comment [TO22]: technology supports goals

Comment [TO23]: technology supports instruction

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(Using technologies effectively for instruction)	effective in the observed lesson. Instruction provided "play time" for students	the observed lesson.	effective in the observed lesson.	the observed lesson.
Technology Logistics (Operating technologies effectively)	Teachers and/or students operate technologies very well in the observed lesson.	Teachers and/or students operate technologies well in the observed lesson. Evident planning. Teacher is prepared.	Teachers and/or students operate technologies adequately in the observed lesson.	Teachers and/or students operate technologies inadequately in the observed lesson.

Field Notes/Comments:

- Teacher is open to student input. This is important because technology does not always work. How can we fix? Try something else.
- I love that students **search** for images online.
- Time in class is not rushed. Excited because it allows for play time.
- She asks questions "one thing I want to figure out is why is the timeline so pale; so you can barely see it"
- Timeline.knightlab.com
- Teacher asks open ended questions to help students recall information from the story (when students are trying to recall information form the story for their timelines). Memory recall
- She is patient. Time is planned and used for trouble shooting.
- I love her wall. Guide for MLA documentation – properly citing a book
- Workspace: beautiful library! Organized, clean, clutter-free workspace: tables and chairs, reading circle, shelves appropriate height

Field Notes   Observation 1 – Teacher B

October 12, 2016. 10:30-11:20 am in Grade 5 classroom.

What is the learning objective for this lesson? Saint project. Each student will create 5 of 10 slides in class to include information they found through research in a prior class.

What instructional strategies and learning activities have you planned for this lesson?
Learn Google sides

What technology will be used?
Cromebooks

Why did you select this technology?
Perfect for Saint presentations

> **Comment [TO33]:** application to curriculum

What experience do the students already have, if any, using this technology?
None for Google slides, some experience with Power Point

> **Comment [TO34]:** specific technology; some background knowledge

How is this class different from what usually happens?
Teacher brought in the Cromebook cart. Cart goes to 4th grade today after this class finishes for the day. Tomorrow, they will edit slides.

What else would you like to share?

This is her 6th year at this school.

Directions:
We have tried to key the components of this instrument to different aspects of teachers' knowledge for technology integration. Please note, however, that the instrument is not designed to assess this knowledge directly. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)
Saint Project	Take key information they researched	Cromebooks – each student has one Google slides	Worksheet with rubric Clear instructions

Comment [TO35]: specific technology

What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students' learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

Field notes/Comments:

- Evident she wants to integrate technology and is willing to try new things
- Each student has a laptop from the cart and they are excited
- All have individual student logins
- This classroom is clean. Organized, and clutter-free.
- Expectations, rules, procedures are clear and organized. Teacher is positive.
- "raise your right hand when you find this"
- "clap twice if you have the white Google screen"
- Teacher is energetic, structured, organized

Comment [TO36]: teacher quality

Comment [TO37]: access to technology

Comment [TO38]: student engagement

Comment [TO39]: school supports technology

Comment [TO40]: teacher qualities; classroom management

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are strongly aligned with one or more curriculum goals.	Technologies used in the lesson are aligned with one or more curriculum goals. <mark>evident</mark>	Technologies used in the lesson are partially aligned with one or more curriculum goals.	Technologies used in the lesson are not aligned with one or more curriculum goals.
Instructional Strategies & Technologies (Matching technology to instructional strategies)	Technology use optimally supports instructional strategies.	Technology use supports instructional strategies. <mark>evident</mark>	Technology use minimally supports instructional strategies.	Technology use does not support instructional strategies.
Technology Selection(s) (Matching technology to both curriculum and instructional strategies)	Technology selection(s) are exemplary, given curriculum goal(s) and instructional strategies	Technology selection(s) are appropriate, but not exemplary, given curriculum goal(s) and instructional strategies. <mark>evident</mark>	Technology selection(s) are marginally appropriate, given curriculum goal(s) and instructional strategies.	Technology selection(s) are inappropriate, given curriculum goal(s) and instructional strategies.
"Fit" (Considering curriculum, pedagogy and technology all together)	Curriculum, instructional strategies and technology fit together strongly within the lesson.	Curriculum, instructional strategies and technology fit together within the lesson. <mark>evident</mark>	Curriculum, instructional strategies and technology fit together somewhat within the lesson.	Curriculum, instructional strategies and technology do not fit together within the lesson.
Instructional Use (Using technologies effectively for	Instructional use of technologies is maximally effective in the observed lesson.	Instructional use of technologies is effective in the observed lesson. <mark>evident</mark>	Instructional use of technologies is minimally effective in the observed lesson.	Instructional use of technologies is ineffective in the observed lesson.

Comment [TO41]: technology supports instruction

Comment [TO42]: technology supports instruction

instruction)				
Technology Logistics (Operating technologies effectively)	Teachers and/or students operate technologies <u>very well</u> in the observed lesson.	Teachers and/or students operate technologies <u>well</u> in the observed lesson. evident	Teachers and/or students operate technologies <u>adequately</u> in the observed lesson.	Teachers and/or students operate technologies <u>inadequately</u> in the observed lesson.

Comments:

- Great lesson! They are learning Slides for the first time so it is new technology for the students. They have to be reminded they need a title slide –instructions on how to do a presentation
- Create 5 slides today with no sound and no pictures
- Think about later… we will add sound later
- She walks them through instructions… slide 1 = name of saint …   **Comment [TO43]:** teacher technology knowledge
- Students already talked in class about a menu: appetizers, salad, meal, etc.; she encourages them now to think about their own presentation.   **Comment [TO44]:** background knowledge
- Classroom is organized everything is in its place
- Posters are positive. Not "I can't" but "I can grow"
- She reminds them today's task is only 5 slides.
- Quiet classroom. Lots of hands up asking individual questions. This makes sense since it is new technology. Students are excited. They are having fun with technology. How do I know? Smiles!   **Comment [TO45]:** student engagement   **Comment [TO46]:** student engagement
- She used a time clock for the last 12 minutes to help keep students organized and aware of time left in the period.   **Comment [TO47]:** organization   **Comment [TO48]:** classroom management
- She gives them freedom to format the slides anyway they want. Can change font; she prefers black because light colors are hard to read.   **Comment [TO49]:** flexibility   **Comment [TO50]:** technology knowledge
- She tried something new… for 2 min, turn to student to left and right to "coach" each other. Ask questions about formatting, how to do certain things regarding slide presentation. Wow! What a great teaching strategy, coaching each other!   **Comment [TO51]:** adaptive teaching. Comfort with technology.   **Comment [TO52]:** collaboration
- Presentation is readable and makes an impression!
- She said… we need to think about if you are older and at a job you need a good presentation for your boss.
- Explains what they need to do: "hands off computer and look at teacher" great teaching strategy   **Comment [TO53]:** classroom management
- Class routine is organized – collection of chrome books is done efficiently   **Comment [TO54]:** classroom management
- Last minute: turn to your table: talk/discuss what you lied and didn't like   **Comment [TO55]:** classroom management; organization
- Feedback from students: **Comment [TO56]:** collaboration
  - Didn't like:
    - Hard once you enlarge the page   **Comment [TO57]:** student barrier
    - No mouse   **Comment [TO58]:** student barrier
  - Did like:

- Ownership – was able to pick things
- Typing ourselves instead of handwriting

Field Notes   Observation 2 – Teacher A

December 8, 2016. 11:00 – 11:50 am in school Library.

What is the learning objective for this lesson?   To utilize computers and technology to correspond country study in social studies

What instructional strategies and learning activities have you planned for this lesson? Google Classroom

What technology will be used? Chrome Books, websites

Why did you select this technology? To help the students with their country research

What experience do the students already have, if any, using this technology? 5 times in class with "regular" classroom teacher

How is this class different from what usually happens? Library reading

What else would you like to share? She sees this class once every 4 days/week

Pre-Observation interview:

- Why tech – timeline practical
- Summer – she was able to tweak many of the technologies for Library
- 40 min every day for a quarter (grades 6-8)
- Laptop cart, students know what to do

Directions:
We have tried to key the components of this instrument to different aspects of teachers' knowledge for technology integration. Please note, however, that the instrument is not designed to assess this knowledge directly. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)
Research country data	Internet research, how to say Merry Christmas	Chrome books, Google docs, internet	encyclopedia

What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students' learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

Field notes:

- Today's focus = get info/data, next week they will adjust formatting
- Teacher is positive, proactive and invites students to learn by encouraging them!
- 21 students
- 5 rules (student technology procedures) for class at the start of the period and read aloud by all
- Christmas Project: Country name, how to say Merry Christmas – use reindeerland.org/Christmas-traditions
- Students use a Google Doc to record data
- Final project = create a Christmas ornament!

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are strongly aligned with one or more curriculum goals. 5th grade countries project	Technologies used in the lesson are aligned with one or more curriculum goals.	Technologies used in the lesson are partially aligned with one or more curriculum goals.	Technologies used in the lesson are not aligned with one or more curriculum goals.
Instructional Strategies & Technologies (Matching technology to instructional strategies)	Technology use optimally supports instructional strategies. Instead of print sources, they used electronic	Technology use supports instructional strategies.	Technology use minimally supports instructional strategies.	Technology use does not support instructional strategies.
Technology Selection(s) (Matching	Technology selection(s) are exemplary, given curriculum	Technology selection(s) are appropriate, but not exemplary,	Technology selection(s) are marginally appropriate,	Technology selection(s) are inappropriate, given curriculum

technology to both curriculum and instructional strategies)	goal(s) and instructional strategies yes	given curriculum goal(s) and instructional strategies.	given curriculum goal(s) and instructional strategies.	goal(s) and instructional strategies.
"Fit" (Considering curriculum, pedagogy and technology all together)	Curriculum, instructional strategies and technology fit together strongly within the lesson. Image search; data search	Curriculum, instructional strategies and technology fit together within the lesson.	Curriculum, instructional strategies and technology fit together somewhat within the lesson.	Curriculum, instructional strategies and technology do not fit together within the lesson.
Instructional Use (Using technologies effectively for instruction)	Instructional use of technologies is maximally effective in the observed lesson. Instruction provided "play time" for students	Instructional use of technologies is effective in the observed lesson.	Instructional use of technologies is minimally effective in the observed lesson.	Instructional use of technologies is ineffective in the observed lesson.
Technology Logistics (Operating technologies effectively)	Teachers and/or students operate technologies very well in the observed lesson. Students asked questions and seemed inquisitive.	Teachers and/or students operate technologies well in the observed lesson.	Teachers and/or students operate technologies adequately in the observed lesson.	Teachers and/or students operate technologies inadequately in the observed lesson.

Comment [TO75]: instruction

Comment [TO76]: student engagement

Comment [TO77]: positive

Comments:

- 5 tasks:
    - 1 how to say Merry Christmas in that country's native language.
    - 2 identify Christmas gift giver (i.e. Santa Claus)
    - 3 find image of #2
    - 4 symbols from whychristmas.com
    - 5 customs from whychristmas.com

Comment [TO78]: specific website/technology

- Students check out books for personal reading
- Teacher stresses that students must provide sources
- Many student questions, but the room is organized. They raise their hands
- She gave instructions for how to right click on Chromebook – use 2 fingers
- This is a creative lesson. Students are held accountable rules are firm yet she is loving
- Cross-curricular: Project for classroom teacher, working with Librarian. Excellent planning!

Comment [TO79]: organization

Comment [TO80]: classroom management

Comment [TO81]: classroom management

Comment [TO82]: time needed

Field Notes   Observation 2 – Teacher B

December 15, 2016. 12:30-1:20 pm. Grade 5 classroom.

What is the learning objective for this lesson? Practice using chrome books without mice in preparation for standardized testing   — Comment [TO83]: specific objective

What instructional strategies and learning activities have you planned for this lesson? Hands-on time using Chrome Books

What technology will be used? Chrome Books, websites   — Comment [TO84]: specific technology

Why did you select this technology? To prepare for use of Chrome Books in January with Scantron standardized testing   — Comment [TO85]: specific

What experience do the students already have, if any, using this technology? Only a little without a mouse   — Comment [TO86]: hardware
                  — Comment [TO87]: little background knowledge

How is this class different from what usually happens? Reading and language arts instruction

What else would you like to share? nothing

Directions:
We have tried to key the components of this instrument to different aspects of teachers' knowledge for technology integration. Please note, however, that the instrument is not designed to assess this knowledge directly. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)
Technology use and learning	Drag and drop computer use skills without a mouse	Cromebooks – each student has one	Assignment books (to remember each students' password)

Comment [TO89]: specific
Comment [TO88]: hardware

What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students' learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

Field notes:

- This is practice for Scantron standardized testing in mid-January. Students will not have a mouse, so this lesson is designed to help them use Chromebooks without mice.
- This is the first year the students will be using computers for Scantron testing. In September, they went to the computer lab and used computers with mice.

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are strongly aligned with one or more curriculum goals. **Preparation for Scantron testing**	Technologies used in the lesson are aligned with one or more curriculum goals.	Technologies used in the lesson are partially aligned with one or more curriculum goals.	Technologies used in the lesson are not aligned with one or more curriculum goals.
Instructional Strategies & Technologies (Matching technology to instructional strategies)	Technology use optimally supports instructional strategies. yes	Technology use supports instructional strategies.	Technology use minimally supports instructional strategies.	Technology use does not support instructional strategies.
Technology Selection(s) (Matching technology to both curriculum and instructional strategies)	Technology selection(s) are exemplary, given curriculum goal(s) and instructional strategies Creative, inviting	Technology selection(s) are appropriate, but not exemplary, given curriculum goal(s) and instructional strategies.	Technology selection(s) are marginally appropriate, given curriculum goal(s) and instructional strategies.	Technology selection(s) are inappropriate, given curriculum goal(s) and instructional strategies.
"Fit" (Considering	Curriculum, instructional strategies and	Curriculum, instructional strategies and	Curriculum, instructional strategies and	Curriculum, instructional strategies and

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curriculum, pedagogy and technology all together)	technology <u>fit together strongly</u> within the lesson.	technology <u>fit together</u> within the lesson.	technology <u>fit together somewhat</u> within the lesson.	technology <u>do not fit</u> together within the lesson.
	evident			
Instructional Use (Using technologies effectively for instruction)	Instructional use of technologies is <u>maximally effective</u> in the observed lesson. evident	Instructional use of technologies is <u>effective</u> in the observed lesson.	Instructional use of technologies is <u>minimally effective</u> in the observed lesson.	Instructional use of technologies is <u>ineffective</u> in the observed lesson.
Technology Logistics (Operating technologies effectively)	Teachers and/or students operate technologies <u>very well</u> in the observed lesson. evident	Teachers and/or students operate technologies <u>well</u> in the observed lesson.	Teachers and/or students operate technologies <u>adequately</u> in the observed lesson.	Teachers and/or students operate technologies <u>inadequately</u> in the observed lesson.

Comment [TO92]: technology supports instruction

Comment [TO93]: technology supports instruction

Comment [TO94]: positive

Comments:

- 5th grade class, 30 students
- Chromebooks issued in a very organized manner. Every student knows his/her assigned number. They come up in organized fashion to pick up the computer.
- There is excellent class control. Gave them an assignment to talk with neighbor. When done, there was a clapping routine.
- 2 websites
- "open your screen to 45 degrees" is an excellent strategy so that their attention is on the teacher.
- "as soon as you are logged in, I want to hear an audible tone"
- Students access Google shared drive and download a file the teacher already created and shared with all students.
- Web link in doc to mvcsd.us for practice with computers
- This was touch pad practice in preparation for Scantron testing
- There was an online game to practice drag and drop. This is creative! Very interactive
- Main character was named "Bongo" "lift him above the seesaw. Drop him to make Beenie dive into the water" more games at minimouse.us
- Students are happy and it is evident they are enjoying the activity. Evident my laughter and comments

Comment [TO95]: organization

Comment [TO96]: classroom management

Comment [TO97]: classroom management

Comment [TO98]: collaboration

Comment [TO99]: cross-curricular connection

Comment [TO100]: classroom management

Comment [TO101]: time needed for teacher prep

Comment [TO102]: specific objective

Comment [TO103]: student engagement

Comment [TO104]: student engagement

Comment [TO105]: specific technology

Comment [TO106]: student engagement

Field Notes   Observation 3 – Teacher A

February 3, 2017. 10:15 – 11:15 am in school library.

What is the learning objective for this lesson?   To present student technology projects

What instructional strategies and learning activities have you planned for this lesson?
Demonstrations, sharing, presentations

What technology will be used? Animoto (https://animoto.com/) or PowToon
(https://www.powtoon.com/)

> Comment [TO107]: specific technology
> Comment [TO108]: specific technology

Why did you select this technology? To help the students with visual literacy skills

> Comment [TO109]: instruction skills

What experience do the students already have, if any, using this technology? Working with the technology for almost two weeks

> Comment [TO110]: background knowledge

How is this class different from what usually happens? For the past two weeks they have been actively working on the projects.

> Comment [TO111]: background knowledge

What else would you like to share? Teacher is excited to share the final projects.

> Comment [TO112]: teacher quality

Pre-Observation interview:

- Today is Grandparents Day at the school. None are here in this classroom, but that is why there are so many additional people in the building.
- 13 students in this Grade 7 class.

Directions:
We have tried to key the components of this instrument to different aspects of teachers' knowledge for technology integration. Please note, however, that the instrument is not designed to assess this knowledge directly. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)
A hero's journey	Document the journey of a hero using technology to create a presentation/video	Internet, websites, Animoto, PowToon	Library books

> Comment [TO113]: curriculum; instruction
> Comment [TO114]: specific technology

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What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students' learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

Field notes:

- When the unit started, the teacher introduced the Hero's Journey project
- Students selected a book for personal reading that contained the story of a hero
- project = an animated video based on the hero in the book and to document the hero's journey.
- teacher used *The Hero's Journey, A Guide to Literature and Life: A Comprehensive Guide for Teaching the Journey* (Harris & Thompson, 2005) as a curriculum reference for creating the unit.
- teacher taught and required the students to all use the same steps for every hero's journey.
  - (1) the call to adventure,
  - (2) crossing the threshold,
  - (3) mentors and helpers,
  - (4) challenge,
  - (5) abyss,
  - (6) transformation,
  - (7) atonement, and
  - (8) return
- student videos are organized and structured
- names of each of the eight steps are visible
- students searched for pictures on the Internet and teacher reminded them to cite the URL
- music selected from Animoto or PowToon music library
- video length = 1 to 2 minutes
- All students had used Animoto earlier in the year. Students may use PowToon for this project if they wanted, but the teacher made it clear that she had never used it and would not be able to assist with technical questions.
- Four students chose to use PowToon.
- teacher emphasized write first, then use a storyboard
- completion of the storyboard required before the students could search for images or music
- Teacher said she was very happy with the quality of the projects and felt Animoto was a great tool because it was relatively easy for students to use and navigate.
- I saw eight student videos during the classroom observation.

Comment [TO115]: student literacy

Comment [TO116]: specific technology

Comment [TO117]: teacher background knowledge

Comment [TO118]: organization

Comment [TO119]: student creation

Comment [TO120]: organization

Comment [TO121]: specific technology

Comment [TO122]: specific technology

Comment [TO123]: previous knowledge

Comment [TO124]: teacher background knowledge

Comment [TO125]: specific technology

Comment [TO126]: instructional strategy

Comment [TO127]: student engagement

Comment [TO128]: student work

Comment [TO129]: student engagement

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are <u>strongly aligned</u> with one or more curriculum goals. 5th grade hero's journey project	Technologies used in the lesson are <u>aligned</u> with one or more curriculum goals.	Technologies used in the lesson are <u>partially aligned</u> with one or more curriculum goals.	Technologies used in the lesson are <u>not aligned</u> with one or more curriculum goals.
Instructional Strategies & Technologies (Matching technology to instructional strategies)	Technology use <u>optimally supports</u> instructional strategies. Digital video creation using Animoto or PowToons	Technology use <u>supports</u> instructional strategies.	Technology use <u>minimally supports</u> instructional strategies.	Technology use <u>does not support</u> instructional strategies.
Technology Selection(s) (Matching technology to both curriculum and instructional strategies)	Technology selection(s) are <u>exemplary</u>, given curriculum goal(s) and instructional strategies yes	Technology selection(s) are <u>appropriate, but not exemplary</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>marginally appropriate</u>, given curriculum goal(s) and instructional strategies.	Technology selection(s) are <u>inappropriate</u>, given curriculum goal(s) and instructional strategies.
"Fit" (Considering curriculum, pedagogy and technology all together)	Curriculum, instructional strategies and technology <u>fit together strongly</u> within the lesson. Storyboard to plan; Image search; music search	Curriculum, instructional strategies and technology <u>fit together</u> within the lesson.	Curriculum, instructional strategies and technology <u>fit together somewhat</u> within the lesson.	Curriculum, instructional strategies and technology <u>do not fit</u> together within the lesson.

Comment [TO130]: student engagement

Comment [TO131]: technology supports instruction

Comment [TO132]: technology supports instruction

Instructional Use (Using technologies effectively for instruction)	Instructional use of technologies is <u>maximally effective</u> in the observed lesson. Instruction provided "play time" for students	Instructional use of technologies is <u>effective</u> in the observed lesson.	Instructional use of technologies is <u>minimally effective</u> in the observed lesson.	Instructional use of technologies is <u>ineffective</u> in the observed lesson.
Technology Logistics (Operating technologies effectively)	Teachers and/or students operate technologies <u>very well</u> in the observed lesson. Some students taught themselves PowToon. All created great videos.	Teachers and/or students operate technologies <u>well</u> in the observed lesson.	Teachers and/or students operate technologies <u>adequately</u> in the observed lesson.	Teachers and/or students operate technologies <u>inadequately</u> in the observed lesson.

Comment [TO133]: technology supports instruction

Comments:

- One PowToon was on Hunger Games!
- Great curriculum: yourheroicjourney.com
- Videos all labeled with step # and step title
- The Jack Black video started with great quality pictures
- It is evident that the teacher is happy for me to see these.
- Teacher shared Animoto is very user friendly.

Comment [TO134]: specific technology

Comment [TO135]: organization

Comment [TO136]: teacher quality

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Field Notes   Observation 3 – Teacher B

February 1, 2017. 10:30 - 11:30 a.m. Grade 5 classroom.

What is the learning objective for this lesson?   To balance equations; to learn to work with variables

What instructional strategies and learning activities have you planned for this lesson? Students will watch a video, use Google Classroom to complete an activity, and complete a worksheet.

What technology will be used? Chrome Books, Google Classroom

Why did you select this technology? I have a great video to introduce the topic of variables.

What experience do the students already have, if any, using this technology? Students have used Chrome Books and Google Classroom regularly throughout the school year.

How is this class different from what usually happens? Yesterday, the students used manipulatives. They do not usually watch a math video like they will today.

What else would you like to share? Thank you for observing today.

Pre-Observation interview:

- Students will use math journals.
- 30 students in this Grade 5 class.

Directions:
We have tried to key the components of this instrument to different aspects of teachers' knowledge for technology integration. Please note, however, that the instrument is not designed to assess this knowledge directly. It is designed to focus upon the use of technology integration knowledge in observable teaching. Please record the key curriculum topics addressed, instructional strategies/learning activities observed, and digital and non-digital technologies used by the teacher and/or students in the lesson.

Curriculum Topic	Instructional Strategies and Learning Activities	Digital Technologies (indicate use by students or teacher)	Non-Digital Technologies (indicate use by students or teacher)
Variables and balancing equations	Learn to balance equations by watching a video, writing in math journals, completing an activity and a practice worksheet.	Google Classroom; free write; video	Paper/pencil to do 4 math problems; math journals; paper worksheet

What, if anything, do you know about influences upon what you have observed in this lesson? Examples might include students' learning needs, preferences, and challenges; access to technologies; cultural, language and/or socioeconomic factors.

Field notes:

- very organized and clean classroom

  Comment [TO143]: classroom management
- 3 posters on the side board containing the daily schedule, the objectives for each class throughout the day, and the homework assignments
- class started with a very organized distribution of laptops. Students called in groups by their assigned number. group 1-5 then 6-10 and so forth

  Comment [TO144]: classroom management
- Students were given clear directions to log on; then sign onto Google Classroom

  Comment [TO145]: classroom management
- students have their passwords in their assignment books for reference
- teacher is very patient and organized

  Comment [TO146]: teacher quality
- during laptop distribution teacher said, "I will tap you when I see you are logged in. At that time, plug in your earphones, put them on, and watch the video in Google Classroom."

  Comment [TO147]: specific technology
- plan is organized and clearly communicated with students
- teacher has excellent classroom management:

  Comment [TO148]: classroom management
  - "clap two times if you hear me"
  - "clap three times if you are listening."
- Math Antics video titled "Variables in Equations" - access video in Google Classroom

  Comment [TO149]: specific technology
- "when you are done watching the video, please raise your right hand."
- "turn and talk time"
  - students turn to another student next to them and share what they learned in the video

    Comment [TO150]: collaboration; student engagement
  - students use words: variable, operations, division, and equations
- While students watched the video, the teacher shared with the researcher that she wanted a classroom set of earphones so that all students have earphones and not earbuds. She explained that earbuds cause a lot of extra noise that is heard in the classroom since they are small ear pieces while earphones do not cause any extra classroom noise or distractions.
- Teacher led a discussion, asked students to recall facts from the day before
- "what manipulatives did you use yesterday to balance equations?" Multiple students answered
- modeled the activity from the day before on the interactive white board.

  Comment [TO151]: background knowledge
- math journals, open to a clear page, four practice problems on the interactive white board, students use their pencils, copy the problems in their journals, and solve the equations
- $a+15=35$
- teacher turned on the timer and gave students six minutes to complete two tasks
  - task 1: solve the four problems
  - task 2: Google Classroom and complete the second assignment

    Comment [TO152]: specific technology
- teacher complemented students "I love that you are all looking and listening"

  Comment [TO153]: teacher quality
- second task = mathematics free-write. This is a literacy technique that required students to write about a topic using their own words and thoughts. The instructions for this free-write were for students to choose a math term they used this year and then define the term in their own words and give an example. The students were to write two to three sentences.

  Comment [TO154]: technology supports instruction

- teacher walked around the classroom and checked students' journals to see how each student answered the four questions
- teacher placed a circle or a triangle sticker on the students' journal page based on the work shown and answers calculated
- movement: students with triangles to go to table four and all others to find an open seat at another table
- two worksheets were distributed: one to table four, other to everyone else
- Table four had six students, all who had some difficulty solving the four equations given. The teacher gave instructions to table four to do the first two problems as a group while all other students were told to complete the left column of the worksheet. The teacher was patient and talked through the first problem with the students at table four. These students needed extra help in understanding how to solve basic mathematical one-variable equations.
- teacher used different shapes to identify different student needs, the teacher differentiated mathematics instruction based on the needs of the students. This teacher differentiated in her classroom without the students even knowing it.
- She differentiated in a professional way by using stickers in geometric shapes that provided extra support to struggling math students based on their work on the previous tasks.
- teacher asked open-ended questions to table four including
  - what are you all doing?
  - Are you having any trouble that I may help you with?
- When the students finished the worksheet, the teacher called on individual students to answer worksheet questions
- teacher reminded the students "when you answer the question, say the variable, such as say 'n equals 8' when stating your answer."
- teacher created a positive learning environment that encouraged students to ask questions and seek help

Directions: Referring to the notes you made on the previous page, including your responses to the question about influences, please complete the following rubric, considering the lesson as a whole.

	4	3	2	1
Curriculum Goals & Technologies (Matching technology to curriculum)	Technologies used in the lesson are strongly aligned with one or more curriculum goals.	Technologies used in the lesson are aligned with one or more curriculum goals. yes	Technologies used in the lesson are partially aligned with one or more curriculum goals.	Technologies used in the lesson are not aligned with one or more curriculum goals.
Instructional Strategies & Technologies (Matching	Technology use optimally supports instructional strategies.	Technology use supports instructional strategies.	Technology use minimally supports instructional strategies.	Technology use does not support instructional strategies.

technology to instructional strategies)		Students watched a video and wrote in a math journal		
Technology Selection(s) (Matching technology to both curriculum and instructional strategies)	Technology selection(s) are exemplary, given curriculum goal(s) and instructional strategies	Technology selection(s) are appropriate, but not exemplary, given curriculum goal(s) and instructional strategies. yes	Technology selection(s) are marginally appropriate, given curriculum goal(s) and instructional strategies.	Technology selection(s) are inappropriate, given curriculum goal(s) and instructional strategies.
"Fit" (Considering curriculum, pedagogy and technology all together)	Curriculum, instructional strategies and technology fit together strongly within the lesson.	Curriculum, instructional strategies and technology fit together within the lesson. yes	Curriculum, instructional strategies and technology fit together somewhat within the lesson.	Curriculum, instructional strategies and technology do not fit together within the lesson.
Instructional Use (Using technologies effectively for instruction)	Instructional use of technologies is maximally effective in the observed lesson.	Instructional use of technologies is effective in the observed lesson. Instruction provided time to watch a video, write in a journal	Instructional use of technologies is minimally effective in the observed lesson.	Instructional use of technologies is ineffective in the observed lesson.
Technology Logistics (Operating technologies effectively)	Teachers and/or students operate technologies very well in the observed lesson. Strong classroom management; students know what to do; get to task and complete assignments.	Teachers and/or students operate technologies well in the observed lesson.	Teachers and/or students operate technologies adequately in the observed lesson.	Teachers and/or students operate technologies inadequately in the observed lesson.

Comment [TO163]: technology supports instruction

Comment [TO164]: technology supports instruction

Comment [TO165]: organization; classroom management

Comments:

- One PowToon was on Hunger Games!
- Great curriculum: yourheroicjourney.com
- Videos all labeled with step # and step title
- The Jack Black video started with great quality pictures
- It is evident that the teacher is happy for me to see these.
- Teacher shared Animoto is very user friendly.

Comment [TO166]: specific technology

Comment [TO167]: specific technology

Comment [TO168]: teacher quality

Appendix O

Transcription of Teacher A Interview on December 8, 2016

How many years have you been at your current school?

15

Were you a school librarian before working here?

I was not a school librarian before. I used to work for the federal government as a librarian.

Oh wow; so library science has been a part of your life for a while?

Yes, I was trained as a school librarian but the year I was ready to work there was only one opening in all of northern Virginia and they were looking for a lady who was retiring and they wanted a duplicate of her and there were 20 of us applying.

In regards to online professional development that you participated in this summer, do you feel that you are doing more technology use now or did that just help you open your eyes to different uses of technology?

I am using technology more in my classroom this year. The OPD helped me experience and understand the ways to use technology in the classroom.

How did it help you in your teaching this year?

Every time I am introduced to new technology I am willing to try it but if there are activities to do with it, then I learn it. If I am just given a list of tools, it remains a list and is not very helpful. The creation of the projects and lesson plans were helpful and provided hands-on time to explore and play.

Comment [TO1]: Openness; willing to learn

Comment [TO2]: Needs training, PD

So if the OPD was re-designed this summer, you would not change that aspect of play time and lesson plan creation?

Correct, do not change the play time. It's hands-on and practical for my classroom! Some of the things I could not use, I do not remember exactly why, but if we had more options to choose from that would be great. I like the freedom to choose different modules.

Comment [TO3]: Takeaways that teachers can implement in classrooms.

Comment [TO4]: interactivity

Comment [TO5]: flexibility

What do you think were some of the benefits of doing OPD this summer instead of face-to-face?

I like the flexibility of learning on my own time.

Comment [TO6]: flexibility

Would you recommend OPD to your colleagues?

Yes.

Except for some modules not appropriate for the library, did you have any challenges or difficulties overall with the online experience?

Hum.. no. no. The only challenges were to try to get into a website that might have made you pay.

Was there any technology you learned this summer in OPD that you use more of now because of the OPD?

I have to go back and look at the list, because I cannot remember. The online timeline was great. In the past I have done timelines on paper and they were a mess, so I did love the online timelines.

Do you feel that now that the online timeline project is over in your classroom, was it beneficial?

Yes, I do feel it was. I didn't ask the students, but I liked it!

Because you have used some of the technologies, is it appropriate to say that the OPD has positively impacted your instruction?

Absolutely! This OPD has absolutely had a positive effect on my teaching! This OPD experience has positively impacted my classroom instructional strategies. It is getting me to try new and different things using technology in the classroom. I am trying things I have not tried before.

What are your students' reactions to using new things in the classroom?

Oh, the students love it. They grew up with technology. Some of it I love just because it helps address messy handwriting by looking better. For them, they do not see it as work. For some reason, when they have a Chrome Book, they see it as play.

That is very interesting. How was today with this class different from what usually happens?

It was exactly the same. Chatty and hands up at the same time!

When this project is done, what will you do next after Christmas?

They will be working on Europe for a while. Usually we study Asia too. I coordinate with the geography teacher.

Does that differ by grade level?

Yes, the fifth grade teacher loves the collaboration. Other teaches I try to help but it is not always successful, but I try to collaborate.

Thank you so much for taking the time to speak with me and share your insights as well as let me observe today.

Transcription of Teacher B Interview on December 15, 2016

Please tell me a little more about yourself and your teaching career.

I was a career switcher and have been teaching for 8 years now. I have worked at XXX first and now I have been at XXXX for the last six years.

Please tell me how you used technology in your classroom before the online professional development?

I have used Google Classroom. I have also given students website practice.

How do you integrate literacy and technology into your classroom?

At this point, my main focus is on math and technology.

Describe your online professional development experience in this recent opportunity this summer. How are you applying what you learned?

The experience was detailed and I have been using this OPD as a stepping stone to learn more ways to use technology in the classroom.

What do you believe were the benefits to the online professional development?

Information sharing was key to this experience between the teacher/student and student/student.

Would you recommend online professional development to your colleagues? Why or why not?

Yes, but they need to be ready for the work to fit in their schedule.

What were the challenges and difficulties, if any, in the online experience?

None, it is my favorite way to learn.

Is there a program or technology you are now using or using more as a result of your online professional development?

As a result of this OPD, I am using Google Classroom much more this school year than in past years. I have learned to use it in different ways beyond just posting information; I use Google Classroom to support my instruction.

Has the online professional development impacted your classroom teaching? If yes, how? If no, why do you believe it has not?

Yes, it made me more aware of ways for students to use technology and apply learning. Technology helps to meet the needs of all learners.

Describe how your online professional development experience is impacting your students.

My students are being exposed to technology in different ways then before and it is preparing them for middle school and beyond.

How are you integrating technology learned during the online professional development?

Yes, again my students are being exposed to technology in a variety of different ways which are different from before. It is great preparation for middle school and beyond.

What are your students' reactions to technology integration?

My students enjoy technology in the classroom and have welcomed this way. However, they surprise me sometimes because they do not want to stretch and challenged themselves all the time. As teachers we think they know so much more than us regarding technology however they don't and sometimes it is surprising to me as they are not risk takers. I have to push them.

Have you seen the students grow? How?

Yes, even though they are unsure of the next step they are starting to take risks.

Regarding today's classroom observation, how was this class different from what usually happens? What happens in the classroom with technology between my visits and how frequent does it happen?

The students were practicing drag and click in preparation for the Chromebook usage during SCANTRON. This is different than normal as most times the students are working on a website or Google classroom.

Is there anything else you would like to share with me about these topics of professional development or anything else we did not cover that you think are helpful tools for teachers and their professional development?

I just want to share that teachers should ensure they are clear about the commitment and expectations for learning in OPD classes and be ready to use this knowledge. If they do not, they will forget which would then be wasted time. Who needs that? Not me.

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Biography

Thomas Opfer graduated from Paul VI Catholic High School, Fairfax, Virginia, in 1996. He earned his Bachelor of Science degree in Computer Science with a minor in Mathematics from James Madison University in 2000. In 2004, he earned his Master of Education degree in Curriculum and Instruction with a focus on Instructional Technology from George Mason University. In 2006, he earned his Master of Education degree in Education Administration and Supervision from Marymount University. He has been employed at Paul VI Catholic High School since 2002 and has taught mathematics and computer courses in addition to Public Speaking classes. He has served as a teacher, department chairperson, Dean of Academics, Vice Principal, and Principal.