EXPLORING PROFESSIONAL DEVELOPMENT NEEDS OF DIGITAL IMMIGRANT AND DIGITAL NATIVE TEACHERS FOR THE SUCCESSFUL INTEGRATION OF TECHNOLOGY IN A JEWISH ELEMENTARY EDUCATION SETTING

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Anna M. Salomon

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Abstract

Today’s teachers are tasked with the integration of technology in their curriculum and their classrooms. In order to do that, teachers require professional development/training and support. Further, schools are encountering a unique landscape of teaching with digital natives becoming teachers alongside digital immigrants. This study aimed to discover whether the professional development needs of digital immigrant and digital native teachers differ in order to successfully integrate technology in a Jewish elementary education setting. Additionally, the research explored what models of professional development those teachers report as most beneficial and/or successful for their abilities to integrate technology in an elementary education setting. This qualitative case study used Activity Theory and Concern Based Adoption Model (CBAM) as the theoretical framework to guide the research. Participants were from two independent schools in the southern United States. Both schools were Jewish elementary schools in similarly sized Jewish communities, with approximately equal resources (both educational and Jewish) with ongoing technology integration initiatives in place. Findings of the research study concluded that both digital immigrant and digital native teachers require professional development that addresses pedagogical change to inform curricular impact. Despite the greater comfort with technology as a whole, digital natives still require training for pedagogical change in order to integrate technology effectively into the curriculum. Models of professional development most favorably reported were those of on-site designated specialists and peer sharing and collaboration. Notable characteristics of successful professional development (as reported by teacher participants) included professional development training and support being held one on one and on an ongoing basis.

Keywords: technology integration, professional development, digital native, digital immigrant, activity theory, CBAM
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Chapter One: Introduction

Topic

Technology integration is a common focus in education today. Teachers are tasked with the job of successfully integrating technology into their classrooms and the curriculum, with the professed goal of creating a strong twenty-first century skill set for students.

In order to successfully integrate technology, teachers must be provided with adequate professional development. With the rise of the technological era, teacher ability gaps have a greater potential to occur and have noticeable impact (when considering technology usage and integration) from a perspective of basic ease of use, familiarity, and comfort with technology. Prensky (2009) identified and labeled two demographic groups for technological immersion.

Digital natives are defined as those born “into” technology; those that are growing up with technology a part of their everyday reality. Digital immigrants are those that are seeing the emergence of new technology and interacting with it later in their lives, having to adjust and adapt to the use and capabilities of that technology (Prensky, 2009). Given the distinct differences in these two groups, it is important to consider their needs individually when assessing needs of teachers. However, there is currently a dearth of research exploring the potentially diverse professional development needs of digital immigrant and digital native teachers. With the current lack of attention paid to the needs of these two distinct groups of teachers, it is possible that the professional development that is provided will not meet that goal.

Further, Jewish educational institutions have unique challenges and opportunities that necessitate additional consideration. According to Woocher, Woocher, and Rubin Ross Jewish education has “much to feel good about” while suffering from “persistent challenges,” particularly the digital divide (2008):
A “digital divide” between generations that slows Jewish education’s adaptation to the new technological era characterized by learning in small chunks, multitasking, distributed learning and new uses of technology like gaming, simulations, and learning objects. (p. 9)

Bloomberg (2007) stated “There is also still much we need to learn about Jewish educators, particularly around issues of demographics, recruitment and retention, as well as how teacher education and professional development impact teaching and learning.”

**Research Problem**

The challenge for our education system is to leverage the learning sciences and modern technology to create engaging, relevant, and personalized learning experiences for all learners that mirror students’ daily lives and the reality of their futures. In contrast to traditional classroom instruction, this requires that we put students at the center and empower them to take control of their own learning by providing flexibility on several dimensions (U.S. Department of Education, 2010, p. x).

With such a call for widespread change embracing technology integration, it is no surprise that an increasingly large amount of money and attention is being allocated to technology in education (Nagel, 2008). T H E (Technological Horizons in Education) published a 2008 news update stating government education technology spending would be over $56 billion by 2012, based on a report from Compass Intelligence, an information technology (IT) marketing and consulting firm. That is a significant increase from the projected 2008 year ends $47.7 billion spending (Nagel, 2008). While the increase in money and attention has helped flood educational institutions with technology, there is not an accompanying increase in
professional development funds and support to allow for the successful integration of the
technology (Fletcher, 2005). Further, professional development currently offered may not allow
for the potentially divergent needs of digital native and digital immigrant teachers in order to
successfully integrate technology in an elementary education setting.

Technology integration in Jewish education settings is accompanied by further
considerations, both positive benefits and distinct challenges. Jewish education settings in
general offer more autonomy in teaching and curriculum (perhaps both a benefit and a
challenge). Funding opportunities (or lack thereof) also create both benefits and challenges.
Seeking private donations and support for technology integration initiatives can be considerably
easier with a parent population that is arguably affluent (and therefore able to afford tuition that
can average $15-20,000 per child per year), while obtaining government grants and large scale
discounts more challenging.

**Justification for the Research Problem**

Teachers must integrate technology in order to motivate students, enhance instructional
practice and productivity, and strengthen twenty-first century learning skills (Cifuentes, Maxwell
& Bulu, 2011). Best practices indicate that it is necessary to not only use the technology within
existing teaching practice frameworks, but to develop new pedagogical methods for technology

Bingimlas (2009) and Hew and Brush (2007) address various barriers to technology
integration, as well as deficiencies and successes in professional development models. Koehler
and Mishra (2005) succinctly explain that “For teachers to become fluent with educational
technology means going beyond mere competence with the latest tools (Zhao, 2003), to
developing an understanding of the complex web of relationships between users, technologies, practices, and tools.” (p. 132) This pedagogical stance is necessary irrespective of the teacher as a digital immigrant or native; it is merely sound teaching strategy.

Concern Based Adoption Model (CBAM; Chong, Brewer, Angel-Jannasch-Pennell & DiGangi, 2010) is frequently employed as a framework in research involving technology integration issues. CBAM identifies and examines the concerns that prevent successful integration of technology, and provides suggestions for overcoming and compensating for these concerns. Barriers include institutional considerations (such as funding, time for integration and professional development) and teacher specific considerations (such as (in)experience with technology and technical abilities) that impact successful integration of technology. CBAM gives suggestions to overcome the barriers in order to aid in more successful integration efforts, including professional development and assistance to overcome teacher resistance and abilities.

**Deficiencies in Evidence**

Current research addresses various barriers to technology integration, as well as deficiencies and successes in professional development models (Bingimlas, 2009; Hew & Brush, 2007). What is not addressed is the potential difference in professional development needs between digital natives and immigrants. In conducting a qualitative research study examining the professional development experiences and needs of teachers from both the ‘digital native’ and ‘digital immigrant’ perspectives, a new level of analysis was introduced and specific professional development models that teachers have experienced will be anecdotally evaluated. Currently, there is a dearth of research regarding the potentially divergent professional development needs of digital immigrant and digital native teachers for the successful integration of technology. This
research will allow for an in-depth consideration of the professional development needs that the
two groups of teachers have and the implications for technology integration initiatives at an
elementary school level, with possible considerations for technology integration initiatives at
higher levels. Content area specific considerations may also emerge throughout the research,
providing additional potentiality to the analysis.

**Relating the Discussion to Audiences**

Administrators at all levels, including superintendents, principals, team leaders, and
funders, including federal, state, and private sources, will benefit from a solid understanding of
the needs of their faculty and staff that reaches beyond the equipment and hardware/software.
The resulting professional development provided for educators will allow for more effective
implementation and integration of technology. Teachers will benefit directly from the
opportunity to explore their practice and acquire the differentiated knowledge that will allow for
their adoption and use of technology in their classrooms successfully. Students will benefit from
this research through the enhanced teaching practices and pedagogical knowledge of their
teachers. Possibilities for new, dynamic models of professional development may also emerge
through the research, creating a more beneficial and engaging experience for teachers, and an
indirect benefit to students, schools, and districts.

Scholarly contributions include generating discussion and contributing data in the under-
researched area of digital immigrant and digital native teachers, as well as furthering discussion
and around barriers to integration, and appropriate professional development.
Significance of Research Problem

As an elementary teacher, I witnessed hundreds of thousands of dollars being spent on technology. Concurrently, I watched professional development budgets shrink and the training for how to use the technology become shorter and shorter, more finite in nature. It was also based specifically on achieving minimal technological proficiency. In one school where I was teaching, we received private grants to bring significant technology into the school. The training/professional development for this technology lasted half a day and consisted of practical technological aspects of use such as how to turn it on, basic functionality, and a few examples of how people might use it. There was absolutely no discussion or training involving pedagogical stance and change, or even advanced use of the technology and how it impacts student learning. Current literature reveals similar deficiencies and issues with a lack of professional development in other schools and education in general (Ertmer, 2001; Hew & Brush, 2007; Lawless & Pellegrino, 2007; Snoeyink & Ertmer, 2001-2002; and Zhao et al., 2002).

With funding continuing to funnel towards technology, it is vital that professional development receive significant consideration. Further, the needs of the teachers as either a digital native or digital immigrant must also be considered. While the digital native teacher might have the technological proficiency to use a given technology, there is no guarantee that is categorically true. Further, there is no guarantee that their pedagogical stance will automatically include skills allowing them to integrate technology successfully. Likewise, it cannot be assumed that a digital immigrant teacher must begin with skills to operate technology. What is important to consider is that teachers as digital natives or immigrants have varying degrees of exposure to and experience with technology.
**Researcher Bias/Perspective**

Briscoe (2005) states that it is important to question “who should represent whom” (p. 37) within research. Ultimately, Briscoe (2005) decides that it is not necessary to be a member of the demographic group you are representing in the research so long as it is an ethical and rationale representation (p. 37). Parsons (2008) states that the positions of the researcher and the researched are relevant and pertinent (p. 1129). I am not part of the demographic group I am proposing to research – teachers that do not receive professional development to integrate and implement technology; I am an administrator responsible for a technology integration initiative and teacher training, though I am not a supervisor of any participants in this research. I do find my position to be ethically sound in conducting this research.

Machi and McEvoy (2009) state that “researchers have opinions about the problems in their field…” (p. 19), and that this bias must not only be controlled; it must be confronted. The purpose of this positionality statement is to explore and define the researcher perspective and bias towards my research.

The private Jewish day school where I was a full-time (general studies) elementary teacher received over $5,000 over a three year period in privately funded technology grants. We purchased Kindles for the library, tablet PCs for the fourth and fifth grade classroom, and SMART Boards for the pre-kindergarten, kindergarten, first, second/third, fourth/fifth grade classrooms and our Judaics classroom. We also used grant funding for a twelve station computer laboratory for both school and senior-adult use. As the grant funding was received, and the technology purchases were made, there was exactly one professional development day.

The professional development day was not actually a full day or even a half day; it was a two hour session that covered the basic use of the Smart Boards. This professional development
session instructed teachers on how to turn on, calibrate, and use both the computer and the touch screen to perform basic functions with their SMART Boards. The specific features shown were the functionality and physical use capabilities. Teachers learned how to start new notebooks, insert pages, cut/paste, and manipulate text, highlight, lock, group, clone, and infinite clone objects. As teachers left, they were excited to see the technology but questioning what to do with it. How was this tool going to actually be used in the classroom? Having used one before, and being technologically savvy and interested, I began using my SMART Board daily. Students learned how to use the board and began practicing math problems on it. Using base ten blocks on the board, students modeled and developed conceptual understandings of their math facts. We explored source integrity as a research skill and learned how to take notes to avoid plagiarism. Map games and geography exercises were especially helpful. We Skyped with grandparents across the country, and even the world, for Read Across America Day. We blogged daily as a student reflection piece. The other teachers used the SMART Board solely as a projector. They would show pictures or documents to the whole class at once. Some teachers would view it as an expensive white board and simply use it for writing. When we sat down to discuss the technology and how it was working, the other teachers said it was fine but they did not really need it. My enthusiasm for the technology was puzzling to the other teachers; they could not figure out what I really needed or wanted it for. Sadly, this is not unique to my experience (Bingimlas, 2009; Hew & Brush, 2007).

As a self-professed technology junkie, I feel passionate about the integration of technology in schools. The reality is that the children today are growing up with technology around them. My oldest son was two years old when he began using a computer. He taught himself to load a CD-ROM, run the program installation (before auto-load!), and read computer
story-books. My youngest son started texting emoticons (smiley faces, etc.) at age two. By three years old, he was calling his grandparents. At age five, he is extremely computer literate and can search YouTube for videos, play children’s games at PBS Kids, Disney, Nick, Jr., and other children’s websites that he independently identifies and pulls up. My middle son (age 9) just conducted an entire research project online as part of a social studies assignment. Technology is part of the daily reality for children today. Without being taught important skills like source integrity/citation verification, appropriate search terms, and even internet safety, students will not be able to function appropriately in a technological society. Teachers cannot teach students how to effectively teach these skills without the appropriate knowledge and training. This is just one example of the difference between skills in operating technology (turn it on, find a website on the internet, locate information on the internet) and how to use technology (the information you found needs to be from a source with academic integrity) with a pedagogical stance towards effective integration.

While my bias is leaning towards the need for ongoing and meaningful professional development, I am also able to foresee circumstances where teacher experience and experimentation might yield equal (or perhaps even superior) results to that of the professional development group.

Another important factor to consider is generational bias. Older or younger generations and their respective abilities to integrate technology successfully are at the very least subconsciously present; throughout the research process it will be important to maintain this open mind and be aware of the possibilities of generational bias.

To avoid and control my bias, I plan to use open-ended questions in a qualitative research approach that will allow for a full narrative outlook at each situation. This will allow me to fully
uncover the positive and negative and even indifferent effects of professional development and technology integration experiences. By using open-ended questions, I will avoid narrowing the possible answers to reveal only that which I want to uncover. Overall, I am open to the exploration of this topic and the results and am eager to see the conclusions.

Finally, it is ethical to disclose that participants in this research are from two different school sites. The first school is one where I was formerly employed, and the participants have the potential to be former colleagues of mine. The new Head of School at this site is also a colleague in the doctoral program.

Research Question
How do the professional development needs of digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting differ?

- What professional development models do Jewish elementary classroom teachers feel best support the successful integration of technology in an elementary education setting?

Theoretical Framework
In order to guide and focus this research, a theoretical framework was adopted. The use of a theoretical framework provides a lens through which to view the literature, data collected, and overall research. While there are multiple lenses through which this research could be viewed, a focus on the activity theory was selected.

Activity theory is a sociocultural theory. The use of a sociocultural theory has multiple advantages, including the ability to represent data from individuals participating in collaborative
learning in their natural setting, as well as the ability to look at teachers from both a (personal) learning and teaching perspective.

The foundation of activity theory is Vygotsky’s (and arguably, Piaget’s) constructivist perspective. Vygotsky (1978) posited that people construct their understanding of their environment and the larger world around them through engaging in goal oriented activities and interacting with their environment. He further maintained that learning was a semiotic process, or mediated action, and that people interact with both artifacts and other people in order to construct meaning and understanding. This triangular model, in which individual, artifacts (tools), and other (social) people are each a corner, formed Vygotsky’s (1978) semiotic process of learning (see figures 1 and 2). This representation of learning makes the learner an active participant, rather than a passive recipient. The distinction between the two is a vital piece of Vygotsky’s puzzle.

Leont’ev (1978) contended that activity and the corresponding conditions, goals, and means construct the middle link between the organism and the environment. Documenting and recording the conditions, goals, and means is extremely difficult, if not virtually impossible, because they are not visible, though the activity itself (on the human level) is (Yamagata-Lynch, 2003). Leont’ev (1978) presented a three-level process to address observation of the human
behaviors of activity-action-operation and the relationship of non-observable human terms of motive-goal-instrumental conditions. The result is the definition of activity as that which emerges through reciprocal processes that transforms the subject-object relationship between themselves and their contexts (Yamagata-Lynch, 2003). In the context of this research, the subject-object relationship is teacher-technology in an elementary classroom context.

In addition to Vygotsky’s triangular model (individual, artifacts, and social others), Engestrom (1987) adds rules, community, and division of labor (see figure 3). These two interlocking triangles visually represent the reciprocal relationships and interactions of each component (Scanlon & Issroff, 2005).

![Figure 3](image)

Community is the social group of which the subject(s) are a part during the observed activity. Rules are both formal and informal regulations or guidance that can limit or liberate the subjects in the activity. Division of labor is how the community shares the tasks. The inclusion of these aspects allows for a greater observation of the interactions and greater depth of research.

**Use of Activity Theory.** Using activity theory as a theoretical framework will provide a basis for understanding interactions. Scanlon and Issroff (2005) state that activity theory is increasingly popular for evaluating and researching human-computer interactions. As my
research involves the professional development needs of teachers for the successful integration of technology in educational settings, this is arguably an evaluation of sorts of human-computer/technology interactions. In many of the empirical articles, the CBAM (Concern Based Adoption Models; Chong et al, 2010) is employed as a framework. In this framework, the concerns that prevent successful integration of technology are identified and examined, and suggestions for overcoming and compensating for these concerns are given. It is my belief that the CBAM is a useful framework, but not sufficient.

Activity theory allowed for an identification of the concerns and obstacles as viewed through the rules/community/division of labor lenses, while also identifying the individual interactions with the tools and environment. This fuller picture provided a foundation for richer narratives. Elementary classroom teachers do not exist in isolation.

The community, both at a school level and on a teacher-group level, is a vital component of the interactions. Identifying how the subjects interact (or do not), as well as the rules for integration, is important. The further examination of teachers according to their digital native or immigrant status is indicated within the community level as well. The community division distinguished between digital natives and immigrants, while the professional development offered will not. These tensions will affect the division of labor and, bringing us back to the CBAM, create or remove obstacles.

Using CBAM allowed for an isolated view of the obstacles and concerns that create barriers for successful integration of technology. Weaving the CBAM into the community and division of labor aspects of the activity theory provided a more elaborate view of the professional development needs of teachers.
The use of activity theory, along with components of CBAM, contributed a solid theoretical framework through which to review literature and conduct research on the professional development needs of teachers for the successful integration of technology in educational settings.
Chapter Two: Literature Review

Introductory Statement

This qualitative case study examined the professional development needs of teachers, both the digital immigrants and the digital natives, in order to effectively integrate technology. Through an interpretivist framework, using interviews, observations, and supporting documentation, the research investigated personal experiences of teachers when tasked with integrating technology, in comparison with current literature on effective professional development in order to develop an understanding of the professional development needs for successfully integrating technology.

An interpretivist framework operates on the underlying premise that there are multiple truths. Crotty (2005) explains that “truth, or meaning, comes into existence in and out of our engagement with the realities in our world. In this understanding of knowledge, it is clear that different people may construct meaning in different ways, even in relation to the same phenomenon.” The idea that understanding is different for each person based on their “truth,” or perspective, will allow for an individualized exploration of the research topic while seeking commonalities that speak to possible forms of address for the issues at hand.

Technology integration is understood, for purposes of this research, as the curricular infusion of technology “as a tool to enhance the learning in a content area of multidisciplinary setting….” (Forum on Education Statistics, 2002). Technology is effectively integrated into the curriculum when students are able to select and use the appropriate technology to “help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally” (NETS-S; ISTE, 2002). It is not just having technology in the classroom, but making technology an integral part of the classroom learning experience. Technology must be
accessible to students, and as accessible as other classroom tools, with the appropriate instruction in use and advantages. It should be seamlessly incorporated into the curriculum and classroom, making it an efficient and effective tool for reaching learning goals (Forum on Education Statistics, 2002).

Given the figures of $56 billion in technology spending (Nagel, 2008) and $25 billion in teacher development spending (Duncan, 2011), professional development spending, then, is approximately half what the technology investment is. Duncan (2011) further states that while this large amount of money is being spent on teacher development, it is also often used to purchase more equipment or to reduce class sizes. That further reduces the actual spending on professional development. When you look at professional development based on best practices designed to enhance teacher efficacy and skills, you see a further reduction in actual monies spent (Duncan, 2011).

Teachers need to look beyond knowing how to use the technological tools. They must instead develop an understanding of the complex relationships between the user, technology, practices, and tools (Koehler & Mishra, 2005) in order to integrate technology successfully. This requires appropriate professional development. Whether that professional development need will differ between digital immigrant and digital native teachers is a primary focus of this research. Digital immigrant teachers have not been ‘growing up’ with and surrounded by technology in an immersive environment such as digital natives have. With this difference comes the possibility for potential divergent professional development needs for technical proficiency as well as the willingness and skills to adopt technology and develop a pedagogical stance to do so.

This literature review will start by addressing common barriers to successful integration of technology. Through an examination of these barriers, the literature review will then identify
the arguments for professional development to address the successful integration of technology. From there, a brief discussion of Jewish educational settings will give voice to the context of this research. The chapter will conclude with an overview of different types of professional development with an eye towards building a foundation for the research study to identify teacher perceptions of the most effective professional development models to address the successful integration of technology.

**Discovery Argument**

Digital natives are defined as those born into technology, those who are growing up with technology a part of their everyday reality. Digital immigrants are those who are seeing the emergence of new technology and interacting with it later in their lives, having to adjust and adapt to the use and capabilities of that technology (Prensky, 2009). According to Prensky (2009) the designation of digital immigrant or digital native is an issue of age. Digital immigrants are those born before 1979 and digital natives born 1980 or later. The argument can be made, however, that access to technology also affects the designation. Technology being abundant and integrated in society does not guarantee personal adoption and exposure. Lack of exposure and/or access to technology can greatly impact a person’s abilities to use technology. For this research, it is further acknowledged that there is a group of people that straddles the fence between the two designations. This group presents a unique dilemma, being born into a time without the prevalent presence of technology, yet with strongly emergent technology becoming main stream in their early childhood years. The level of personal exposure to, interaction with, and adoption of technology for this group also affects their designation. In this
research, teachers will self-identify and provide justification for their designations, whether chosen strictly by age or experience and exposure to technology.

**Reasons for integration.** The basic purpose of pursuing effective integration of technology in education is three-fold. First, technology is a significant part of our world today. In order to become prepared for living and working in a ‘digital world,’ students must learn how to appropriately use and take advantage of the ever-changing technology around us. These twenty-first century literacy skills are essential to their life-long success.

Second, technology is a strong student engagement tool. The K20 Center for Educational and Community Renewal at the University of Oklahoma has developed a research-based framework and systemic reform model to address technology integration. In a study by K20, a teacher reflected that, “At first the new technology is scary, but once you become comfortable, you get excited about a new way of teaching that involves the students more” (Williams, Atkinson, Cate & O’Hair, 2008, p. 299).

In the same study, a high school principal stated, “For some of my at-risk kids, it’s the magic potion that engages them in learning” (p. 299). Not only does this pinpoint student engagement as a key outcome, but hints at technology as a bridge for socio-economic disadvantages. When students lack access to technology in their home and lives outside of school, it becomes even more crucial for schools to provide this essential access and training. The principal further observed increases in attendance and decreases in discipline problems in classrooms in which the teachers were actively integrating technology (Williams, Atkinson, Cate & O’Hair, 2008).

Finally, technology positively impacts student achievement. Lowther, Inan, Strahl and Ross (2008), conducted a study to assess the effectiveness of Tennessee EdTech Launch
(TnETL), the statewide technology program that employs a fleet of technology coaches who train teachers to create lessons using computers to increase learning. When looking at student achievement, students in the program classrooms were measured to be “significantly more engaged in student-centered learning activities such as experiential hands-on learning, independent inquiry/research, and cooperative learning” (Lowther, Inan, Strahl & Ross, 2008, p. 23). Martin et al. (2010) conducted a study evaluating the University of Missouri at Columbia’s program, eMINTS (enhancing Missouri’s Instructional Networked Teaching Strategies). eMints began in 1999 to provide professional development to teachers in the state. Two aspects of the evaluation were of particular relevance to this literature review. First, they looked at the relationship between lesson plan quality after the professional development and student achievement. The findings indicated that there was a correlation between higher quality lesson plans, as impacted by the professional development and technology integration, and student achievement (Martin et al., 2010). Second, they looked at the impact of Professional Development fidelity scores for the teachers and student achievement. Those findings were even stronger, indicating higher student achievement associated with higher PD fidelity scores for teachers (Martin et al., 2010).


To prepare students to learn throughout their lives and in settings far beyond classrooms, we must change what and how we teach to match what people need to know, how they learn, and where and when they learn and change our perception of who needs to learn. We must bring 21st-century technology into learning in meaningful ways to engage, motivate, and inspire learners of all ages to achieve (p. 10).
Factors that influence integration. Many schools have technology, but few are using it in a way that makes a significant impact on student learning (Cifuentes, Maxwell & Bulu, 2011). In the review of research, several recurring barriers to the successful integration of technology in an educational setting were broached. These barriers include confidence, competence, access to resources, institution, assessment, subject culture, and attitudes and beliefs (Bingimlas, 2009; Hew & Brush, 2007). The barriers are obstacles that make it more difficult, or impossible, for the successful integration of technology in an educational setting by a classroom teacher. It is important to briefly define all of the barriers in order to fully understand and develop a sense of the importance and impact of professional development.

Bingimlas (2009) interprets confidence, or more appropriately a lack thereof, as a fear of failure and/or a lack of knowledge and familiarity with technology. Teachers that are not comfortable with, or knowledgeable about, technology hesitate to integrate it meaningfully into the classroom environment. A teacher who does not speak a foreign language would not begin employing that language in his/her classroom without support and training prior to the implementation; technology is indeed a foreign language to some.

For competence, Bingimlas (2009) describes an inability to operate computers and technology for basic functions. It stands to reason that if a teacher cannot use a computer for basic functions, he/she will be unable and/or unwilling to integrate said technology into their teaching practice.

When considering access to resources, Hew and Brush (2007) expand the definition to include the physical resources of technology (computers, interactive whiteboards, etc.), access to the physical technology, time, and technical support. It is not possible for a teacher to integrate
technology he/she do not possess; it is equally problematic to include technology when there is not ready access to it. Time is necessary in order to plan, evaluate, and implement technologically-based or enhanced lessons. Finally, technical support is a vital component whenever technology is used.

Institutional barriers, as defined by Hew and Brush (2007), include leadership, time-table and scheduling, and school planning. If school leadership is not responsive and supportive to technology, teachers face substantial obstacles. School time-tables and scheduling often include firm and exact periods, preventing teachers from scheduling longer lessons or integrating technology due to time required for its effective use. School planning for technology integration provides a strong precedence for success or failure. Schools must have a vision and plan for teachers to be able to see the big picture.

Assessment is restricting technology integration for several reasons. Teachers feel pressured to meet strict testing benchmarks and therefore lack the time to integrate technology. Another implication of assessment is that computers are being used for assessment, rather than instruction and learning (Hew & Brush, 2007).

Hew and Brush (2007) refer to subject culture as the accepted traditional instructional methods and practices in a given course or subject area. Teachers oftentimes find discomfort in diverging from the path forged by traditional instructional methods. Hew and Brush (2007) cite an example of an art teacher not wanting to diverge from painting taking place on a canvas with a paintbrush. The physical act of painting, the tangible process of holding a brush and transferring paint from palette to canvas, is what constitutes painting to that teacher; ‘painting’ without those tools and instead using a computer to paint is highly divergent from the traditional method of instruction for painting.
Finally, attitudes and beliefs are the preconceived notions and feelings about technology integration and instruction that a teacher holds (Hew & Brush, 2007). If a teacher likes technology, he/she is more inclined to adopt it within their instructional repertoire. Conversely, teachers who do not like or are intimidated by technology are understandably more hesitant to adopt it. Teachers also hold preconceived notions about the advisability of using technology in the classroom. It is important to recognize these attitudes and beliefs are part of the landscape of successful technology integration.

One newly identified difficulty or barrier with technology integration is that of digital immigrants (or many veteran teachers) struggling to gain fluency and proficiency with technology (Plair, 2008). Furthermore, there is an unending change and turnover with the advances in technology, creating a need to be constantly acquiring new skills and proficiency.

These barriers present a formidable obstacle to integrating technology in a classroom environment. They are not, however, impossible to overcome. Indeed, many of the core barriers can be addressed through successful professional development. Confidence, competence, access to resources, subject culture, and attitudes and beliefs are all affected through professional development. Perhaps to a different extent, though still relevant and significant, institutional barriers can also be addressed through professional development.

**Context in Jewish Education.** Technology integration is not an issue that is unique to Jewish educational settings by any means. At the same time, however, Jewish educational settings do provide a different contextual setting when considering the issues at hand.

Jewish educational settings are encumbered by many of the same issues as other educational settings are. They are also endowed with benefits. Teachers in Jewish educational settings often have more autonomy and flexibility than their public school counterparts. While
public schools are required to strictly adhere to state standards, testing, and process, Jewish educational settings are not required to do so. That is not to say that Jewish education lacks standards and accountability; rather, there is a greater flexibility. Faith based educational settings have the benefit of bringing religion and cultural practices into the classroom and curriculum. Funding is both more flexible and more challenging. There are potentially increased possibilities of private donors due to their independent school status; however, due to the size of many schools and the limitations of federal funding and grants, Jewish educational settings may or may not be able to easily secure support.

Change in Jewish educational settings is also often considered to lag. Woocher, Woocher, and Rubin Ross (2008) state that “the world has changed, and that Jewish education has not changed fast enough or far enough to keep pace with these changes” (p. 38). Woocher et al are not alone; Amkraut (2011) agrees, saying:

The first decade of the twenty-first century has seen a fair amount of attention given to the dramatic changes in the worlds of communication and information technology, and the Jewish education community of course has taken note of these changes, even if it has assimilated these developments less rapidly than the surrounding environment. (p. 599) For Jewish education, technology integration is not just an issue of twenty-first century skills, but an issue of survival. Back in 2006 Woocher addressed the issue of technology:

…we need to come to grips with the tremendous changes wrought by the technological revolution, which is changing our entire experience of learning and communication. In the age of Google, open source software, MySpace, iPods, and instant messages, we need to recognize that information is plentiful and easy to access (though not so easy to assess); “customers” expect to get just what they want; and learning is a multisensory
experience…If we embrace these new realities, we can have Jewish education that is “always on,” fresh, customized, and flexible, available when, where, and how we want it. (p. 3)

Being slow to embrace change does not keep Jewish educational settings relevant and competitive. “If Jewish education is to thrive, it is clear that it must attract and engage a new and different population of learners” (Woocher, 2011, p. 2). Jewish educational settings need to be competitive and relevant while embracing Jewish values and culture. Doing that requires preparing teachers accordingly.

Advocacy Argument

Support and Argument for Professional Development. Having defined and recognized some of the most common and formidable barriers to successful integration of technology in educational settings, a further review of literature makes a strong argument for the importance of professional development in overcoming the aforementioned barriers.

In a study to examine the conditions that promote effective technology integration, it was found that technological based, content-rich professional development enables more effective integration. It was further found that increasing time available for teachers to interact with technology as a collaborative group also aided in effectiveness of integration (Buckenmeyer, 2010). Teachers do not always have basic, foundational technological skills, and it is important that they develop these skills. Those teachers that do have basic skills may not necessarily know how to integrate technology into the curriculum. This idea is addressed by Ertmer and Ottenbreit-Leftwich (2010) when they state that knowing how to use the physical hardware and
software programs is not what will enable effective integration. Teachers must be able to not only *use* the technology themselves; they must be able to teach students how to do so, find the appropriate software (or hardware) that will enrich the learning in the curricular area being addressed, develop appropriate assessments, and know how to *teach* using the hardware and software (Ertmer & Ottenbreit-Leftwich, 2010). How to teach is more than sharing a technological operation, but a modification or shift in pedagogical stance to create true technological integration.

This is a fundamental misconception that often arises; if a teacher knows how to operate the hardware and/or software, it is assumed that technology integration will therefore be effective. There is, however, a significant difference between personal and professional use of technology.

Another significant point is that equipment must be *used*. “The value of the equipment lies in the ability of the teacher to use it in a way that enhances instruction, and many teachers won’t be able to do this without adequate support” (Overbay, Mollette, & Vasu, 2011, p. 58). It is not the physical task of using the technology that needs to be addressed in professional development, but the task of integrating it successfully into the curriculum in order to positively impact student learning and growth.

Principals want new teachers to know how to use technology to create authentic learning experiences for students (75 percent) and how to leverage technology to differentiate instruction (68 percent) before they apply for a position at their school (Blackboard, 2013, p. 4).

The U.S. Department of Education discussed existing educators, stating
The technology that enables connected teaching is available now, but not all the conditions necessary to leverage it are. Many of our existing educators do not have the same understanding of and ease with using technology that is part of the daily lives of professionals in other sectors…This gap…influences program and curriculum development, funding and purchasing decisions about educational and information technology in schools, and pre-service and in-service professional learning. This gap prevents technology from being used in ways that would improve instructional practices and learning outcomes (2010, p. xii).

Professional development needs to address how technology fits with the rest of the curriculum (Clark, 1999). That principals want new teachers to be able to do this before they are hired, before they are in the classroom, means that teacher training and professional development at all states is vital. Existing educators are not exempt from the call to action. The question then becomes what kind of professional development is needed.

Barnett (2003) argues that professional development needs to fit a teacher’s stage and level of comfort with technology in order to be effective.

Another study raises concerns that it is not only important to conduct professional development, but to have consistent follow-ups because of the rapid changes in technology (Wang, 2008). It is important to have a space and time set aside for teachers to come together as a community, to share their experiences and best practices. The hardware and software used today will be outdated in the near future. Being proficient in instructional strategies involving the technology of today does not guarantee success with integrating newer technology tomorrow.
With the importance of professional development established, it is also significant to consider the type of professional development that is most effective in furthering the successful integration of technology.

**Types of Professional Development.** Hixon and Buckenmeyer (2009) combine two similar developmental theories to create several stages of teacher development along the continuum of technology integration. These stages are: A – resistance to and lack of knowledge of technology; B – interest in technology and personal application/knowledge; C – use of technology as a supplemental instructional method; D – technology is an integral part of the instructional process; E – teachers begin to redefine teaching and learning as technology becomes a vital part of the classroom environment; and F – teachers actively recognize and advocate for the integration of technology as a powerful instructional component (Hixon & Buckenmeyer, 2009).

Professional development is often lacking, or perhaps even worse, ineffective, when dealing with issues arising from technology integration. Technology professional development is not the same as traditional professional development; there are different needs and models required (Schrum, 1999). Bingimlas (2009) states that “providing pedagogical training for teachers, rather than simply training them to use ICT (information and communications technology) tools, is an important issue” (p. 239). This semantic difference is the key to understanding the importance and impact of professional development. Pedagogical training versus training for a specific technological tool is what enables teachers to succeed with technological integration.

This distinction is supported by the finding that professional development must address what Hixon and Buckenmeyer (2009) referred to as second-order barriers. Second-order barriers
are those that are in the control of the teacher and most strongly effect the integration of technology, namely perception and personal belief (Hixon & Buckenmeyer, 2009). When teachers begin to see the pedagogical impact and importance of technology, they will be able to move beyond current perceptions and be open to changes. Professional development needs to devote a small amount of time to the technological teaching of a specific tool and instead focus on the pedagogical importance and instructional strategies.

A further examination of the literature yielded a surprisingly cohesive group of professional development strategies that have been determined to be successful in aiding in effective technology integration.

One of the most recurring models involves a collaborative group. A collaborative group model of professional development involves the formation of a professional learning community (PLC) or community of practice (CoP) and subsequent instruction, exploration, and implementation of technological integration in the curriculum. PLCs and CoPs are able to address second-order barriers and provide support and trouble shooting in an authentic environment that allows for comfort and confidence in exploration and growth. One discussion laid out further possibilities that a CoP could be a powerful tool for research into integration and its efficacy, as well as a model for supportive professional development (MacDonald, 2008). The power of a collaborative group was well documented throughout multiple studies and reviews, with the findings consistently pointing to a high rate of success and recommendations for collaborative groups (Foulger, Williams, & Wetzel, 2008; Glazer, Hannafin, Polly, & Rich, 2009; Klieger, Ben-Hur, & Bar-Yossef, 2010; Reel, 2009).

Similar models included a mentoring approach (Kopcha, 2010) and peer coaching – as examined through the Microsoft Peer Coaching program (Barron, Dawson, & Yendol-Hoppey,
These models involve either individuals or groups being led by peers or mentors in their efforts in enact integration.

One such model is discussed by Denton, Davis, Strader, Clark & Jolly (2003) wherein what is termed digital native (for their paper they used the term ‘net generation’) pre-service teachers are paired with digital immigrant teachers for a peer support group. Their study found that faculty was willing to be coached and supported by a younger digital native provided that their experienced interactions were relevant to the needs of the digital immigrant teacher (Denton, Davis, Strader, Clark, & Jolly, 2003).

Another effective model is tech immersion. This involves students and teachers being immersed in the simultaneous instruction and use of technology, usually laptops (Shapley, Sheehan, Maloney, & Caranikas-Walker, 2010). The success of the immersion model can largely be attributed to the ‘real-time’ use and ability to see the effects on instruction and learning, perception is changed through the actual implementation and use of the technology. Similar to immersion is the longer-term immersion seminar. One study focused on the effects of a twenty day seminar on the integration of technology in mathematics instruction and found it to be highly successful (Hartsell, Herron, Fang, & Rathod, 2009).

More important, however, than the actual model of the professional development is the type of professional development. The most effective professional development models cited above all have important commonalities: they involve a hands-on, needs-based approach that allows for teachers to change pedagogical thinking and approach through exposure to and use of technology. Further evidence supports an ideal condition for the professional development to be conducted using the actual technology that will be used in the classroom, preferably in the classroom or at the educational facility (Reel, 2009).
**Summation**

This research study aims to explore the diverse professional development needs of digital natives and digital immigrant teachers for the effective integration of technology.

The impact and importance of professional development on the effective integration of technology in the classroom has been well documented through the literature reviewed. The implication of the review is that it is a necessity to focus not only on the physical technology but pedagogical change in professional development efforts, whatever the model may be. The collaborative model is purported to be a highly successful effort, immersion and longer term instructional seminars were other noted effective models.
Chapter Three: Research Design

Methodology

The purpose of this research study was to explore the different professional development needs of digital immigrant and digital native teachers for the successful integration of technology in an (elementary) educational setting. Through a qualitative exploratory case study approach, the research used interviews and teacher-provided documentation to create a narrative exploration of the issue of concern. The unit of analysis was the two groups of teacher participants, digital immigrant and digital natives. The main question looks to both groups of teachers in an examination of their needs, with the sub question aiming to identify specific models of professional development that teachers have experienced favorably.

- How do the professional development needs of digital immigrant and digital native teachers for the successful integration of technology in an elementary education setting differ?
  - What professional development models do teachers feel best support the successful integration of technology in an elementary education setting?

Research Design

This research was conducted using qualitative research design. Qualitative research provides the best avenue to explore the professional development needs of the two distinct participant groupings (digital immigrant and digital native Jewish elementary school teachers). By using qualitative research, the participants were able to engage in a narrative discussion of their experiences and needs. This narrative discussion was an integral part of the research, allowing for a more rounded and open-ended exploration of the research questions. Furthermore, case studies allowed for the placement of context in the data set. Context is an important element
for research, particularly when considering implications and recommendations, as well as further research possibilities. In addition to the narrative data, case study design brings opportunity for multiple data types to be incorporated, including observations and artifacts such as lesson plans and student work.

**Research Tradition**

The approach to this research was an exploratory descriptive case study. Creswell (2007) describes a case study as the exploration of a given issue through research of a single case or multiple cases in a specific setting or a context (bounded system). A case study allows for, and is an appropriate methodology for, research seeking a more in-depth look at and understanding of the issue of concern (Creswell, 2007). Descriptive case studies allow for exploration of an issue as it currently stands, analyzing the data to speak to possible recommendations and implications. Using an exploratory case format takes the issue of concern and uses the case(s) to illustrate the issue (Creswell, 2012).

Case studies emerged through anthropological and sociological origins (Hamel, Dufour, & Fortin, 1993). The use of case studies as a methodology is well justified, though there are divergent opinions in that regard. Stake (2006), for example, views case studies as a choice of what to research rather than a methodology, while Yin (2003), among others (Denzin & Lincoln, 2005, Merriam, 1998) do in fact look at case studies as a methodology. The researcher sides with Yin (2003) and others in the use of case study as a methodology.

While reflecting minor differences in the approach to case study as a methodological design for research, Merriam (1998), Stake (2006), and Yin (2003) generally agree on the approach to analyzing data. Stake (2006) details the process of using a single instrumental case
study to illuminate a particular issue or concern that has been selected, while Yin (2003) uses multiple case studies to illuminate differing perspectives on the issue selected. Merriam (1998) uses a general approach to case study research, while Yin (2003) and Stake (2005) have structured approaches to case study research.

This research used an approach similar to Stake (2006), using cases to illuminate the issue of concern, rather than following Yin (2003) and using multiple cases to find emergent themes. The participant pool of digital immigrant and digital native teachers was one level of analysis, while the second level was the context of Jewish (elementary) day schools. Using an exploratory case study format, the research looked at the issue of concern through multiple cases (Creswell, 2007). The issue of concern, professional development needs of digital immigrant and digital native teachers for the successful integration of technology in an elementary educational setting, was best explored through the case study format and its depth. Case studies allow for multiple data source collection, including interviews, observations, and artifact/documents. Using multiple data sources created a rich narrative picture of the teachers’ professional development needs and experiences with respect to their given technology initiatives. By using an exploratory case study format, the researcher had the ability to look at the issue of concern through both groups of participants, digital natives and digital immigrant teachers, while specifically looking at the interplay of the context – private Jewish (elementary) day schools.

**Participants and Sampling Strategy**

Participants were chosen through a combination of typical and criterion sampling strategies. Criterion sampling is a strategy used in which all cases chosen meet a given criterion (Creswell, 2007). For this research, that criterion was participation in a technology integration
initiative in a Jewish elementary education classroom setting and participation in at least one professional development session or long(er)-term experience within the past three years. Participants disclosed their age and self-identified as digital natives or digital immigrants.

Typical sampling is a strategy wherein the cases chosen are typical of the given population, showcasing the average case or experience (Creswell, 2007). Because the research did not aim to highlight extreme cases, these sampling strategies were adequate to ensure an authentic participant pool. Overall goals for participation were eight teacher participants, composed of both digital immigrants and digital natives from each of the two case study sites. The division of participants into groupings of digital immigrants and digital natives represents a level of analysis for the case study. Actual participation was composed of a total of six participants. At one site, the goal of two digital immigrants and two digital natives was achieved, while the second site produced two digital immigrant participants and zero digital native participants. This sample size, though not at the ideal goals for participation, allowed for an adequate look at an array of experiences and potential identification of preferred models of professional development. It also allowed for an in-depth look at both levels of analysis, the digital immigrants and digital natives, with the relatively intimate participant pool.

Recruitment and Access

Two specific schools were identified to use as cases. Both schools were independent Jewish day schools, one was located in the southwest United States and the other one located in the southeast United States. Each school was an elementary school with classrooms from pre-kindergarten/kindergarten through fifth grade. Both principals/heads of school gave written approval for teachers to be asked to voluntarily participate once Institutional Review Board
(IRB) approval was obtained ensuring the safety and well-being of all participants. All educators meeting the criterion were given an invitation to participate in the research study, with the understanding that the first eight that fit the criteria would be chosen if potential participants exceeded the targeted participant pool size. In order to assess and evaluate whether potential participants fit the profile, the applicants were asked to fill out the demographic profile (Appendix C), giving essential information and background about the potential participant.

A total of four participants were obtained from the first site; two digital immigrant teachers and two digital native teachers. From the second site, however, only two participants were obtained. Both were digital immigrant teachers. Participants were given a $15 Amazon gift-card at the conclusion of the study. This was a small compensation for their time and participation in the interviews and sharing of lesson plans and other documentation. Data collection lasted approximately five months after IRB approval.

**Protection of Human Subjects**

IRB approval was applied for and obtained before any participants were approached. No participants were considered protected at-risk groups (children, institutionalized persons, cognitively impaired, pregnant women/fetuses, etc.), and there was no physical risk to the participants. There was no potential harm to the participants. In order to eliminate risk, in all documentation (including interview transcripts) teachers were given pseudonyms, as were their corresponding schools. Only the researcher has access to a password protected list of participant data with the assigned aliases. No data collected had student information or work in it, and all confidential data (names of teachers, school, websites, etc.) and identifying information were removed. All participants were given an unsigned informed consent document to read and
discuss until they were comfortable before data collection began (Appendix B). Interviews were conducted via Skype in the home office of the researcher, guaranteeing privacy and confidentiality. Audio of the interviews was recorded using the software program easyVOIP.

Data Collection

This research sought to collect data specifically about the professional development needs for successful integration of technology from the perspective of both digital immigrants and natives. Specifically, the research aimed to know how teachers have integrated technology and whether they feel prepared/aided and successful to integrate technology based on the professional development they have (or have not) received. Any information or documentation available for the technology integration initiative or particular lesson plans that demonstrates an integrative aspect was collected if permitted by the interviewees. Documentation and information includes information given by the school regarding the technology integration initiative, professional development artifacts, and teacher notes. This data collection was appropriate to case study methodology, as “extensive forms” including interviews are collected as part of case studies (Creswell, 2007, p. 121).

Data was collected via questionnaire, open-ended interview conducted either in person or via Skype/Google Hangout due to the geographic location of the proposed sites and the researcher, and by participant submission. With remote interviewing, there were both advantages and disadvantages for the research study. Major advantages include a much wider geographic reach, potential for greater comfort with participants due to a sense of anonymity when sharing information that potentially leaves them feeling vulnerable (such as views on technology integration, their interests and proficiency, and observations), and the ability to collect data at
multiple sites and with multiple participants in a day or shorter period of time. Significant disadvantages include potentially greater difficulty building rapport with participants, lack of casual in person observations (all observations would have to either be taped or performed via Skype with the participants’ knowledge), difficulties with technology, and greater discomfort for those participants not familiar with or proficient in the use of technology. Despite the disadvantages, the advantages of the possibility of remote interviewing and data collection benefited the study as the participants were able and willing to participate from a wider geographic region. All participants indicated an overall comfort and familiarity with the use of Skype to conduct the interviews. Had a participant expressed concern or was not familiar with the use of Skype, the interviews would have been conducted in an alternate format, including with audio only or via other video conferencing technology. When there were complications or difficulties with Skype interviews, the interviews began on Skype and were continued via telephone and recorded using Audacity.

The questionnaire was a demographic profile of the participants. The data collected included information on their age, their self-identification as either a digital immigrant or as a digital native, number of years of experience teaching, their personal exposure to technology, a short discussion of recent (within the past three years) professional development experiences, and an overview of their schools’ technology integration initiatives. Interviews were recorded, with notes taken in shorthand as needed and appropriate. Transcription was done by Rev, an independent data transcription service, with a signed non-disclosure agreement in order to maintain confidentiality.
Data Storage

The recordings are being securely kept in a password protected file, labeled using only aliases and the date obtained. Transcripts have been (and will be) kept confidential at all times. Transcription was completed solely by the researcher and by Rev.com (an independent professional transcription service with a signed non-disclosure agreement). All documentation collected was accepted via e-mail and kept confidential using assigned aliases, or was sent via e-mail with a link included to a given website. No tracking information (e-mail addresses, IP addresses, etc.) was revealed in the documentation collection or analyzing processes. All documents are kept in a password protected file on the researchers personal computer, which is also password protected. Any physically collected data is being kept in a locked file cabinet in the researcher’s personal home office. Notes and any documents that are not needed will be shredded within three months to maintain confidentiality. All documents and data will be destroyed seven years after final dissertation approval.

Data Analysis Process Overview

This social science based methodology provides for single and multiple case studies; this research uses a single case with two units of analysis, digital immigrants and digital natives. According to Creswell (2007), case study data analysis and representation flows through a process as follows:

creating and organizing data files, initial reading, margin notes and coding, description of the case and the context, categorical aggregation establishing themes and/or patterns, direct interpretation, naturalistic generalizations, and the in-depth presentation of the case through a combination of narratives, tables, and/or figures (p. 156-157).
Using embedded analysis, the researcher looked for “specific aspect(s) of the case”(s) that emerge, as guided by Yin (2003). Following Yin’s (2003) strategy of identifying issues in and common themes and differences that cross participant groups, the researcher will be able to establish themes and patterns that have emerged. As guided by Creswell (2007)’s data analysis process, the researcher will finish with an in-depth presentation of the case(s).

Software utilized for this process was limited to Microsoft Word and Excel. Recordings, as referenced above, were captured using easyVOIP, and Audacity, and transcribed into a Microsoft Word document. Once transcribed and member checked, transcripts were transferred into individual Microsoft Excel documents for coding.

Beginning after initial transcription, the data analysis process looked at the words of the participants in their interviews. Codes were assigned according to Saldaña’s (2009) style called “lumper coding” (p. 19). Lumper coding is a process wherein chunks of data are coded together using, as opposed to a smaller data set being coded together (Saldaña, 2009). Looking at the larger chunks of data, the initial coding will be completed using descriptive coding (Saldaña, 2009). Descriptive coding is a summary of the passage being coded (Saldaña, 2009, p. 70). Once initial coding of all transcripts is completed, the transcripts will be coded together using pattern coding for the second round. Pattern coding is the process of evaluating data and looking for inferential themes and emergent patterns (Miles & Huberman, 1994). The codes from individual transcripts were then brought together, grouped and re-coded by themes and patterns to validate the information across transcripts. The themes and patterns were then evaluated and discussed in-depth.

Documentation provided by the participants was discussed with the participant, evaluated for information regarding what the integrated aspects aim to be and what they are enacted as, as
well as what support and professional development is provided for the success of the initiative or lesson. This was then compared to the narrative information provided by the participant in their interviews and demographic profiles, and discussed within the case analysis both individually and in cross-case comparisons.

**Trustworthiness**

Validity is an important and ethical concern when conducting research. Ensuring credibility, or that research findings are consistent with the perception and the data collected in the context of the research, is of extreme importance and consideration in this research. Because research data can be interpreted multiple ways, depending on perspective, it is important to note the steps taken to ensure integrity. The researcher used several methods of to maintain validity and credibility.

Triangulation is “a validity procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study” (Creswell & Miller, 2000, p. 126). The researcher used triangulation to ensure internal validity with the interview data, demographic profiles, and documentation collected from the participants including lesson plans, and notes. The second method used to maintain internal validity is the disclosure and discussion below of researcher bias and steps taken to minimize that bias.

To ensure external validity, transferability of findings is important. According to Creswell, thick description is an integral part of this. Thick description is

…statements that produce for the readers the feeling that they have experienced or could experience, the events being described in a study. Thus credibility is established through
the lens of readers who read a narrative account and are transported into a setting or situation. (Creswell, 2000, p. 129)

By using thick description to weave a rich narrative illustrating the experiences of the participants, giving detailed accounts of the data and the school setting for each teacher and technology integration initiative, readers will be able to compare their experience and setting to the research participants in order to consider the transferability of findings to their unique situations. Member checking was also utilized to give research participants the opportunity to review their transcripts. This helped ensure integrity of the data collected and confirm the validity.

**Positionality Statement**

At the start of the school year, a teacher is given a compilation of important classroom teaching materials to unpack and put to use: textbooks, a copy of the curriculum, and computers, among other tools. Unfortunately, what is oftentimes absent from that compilation of important tools is training/professional development for their effective implementation and use in the classroom. Teachers muddle their way through the use of textbooks and the curriculum, often seeking assistance from other teachers in the same school or even within the same district. The quality and advisability of such a situation is questionable. Computers are just another example of this issue. Technology integration requires a more diverse skill-set than traditional curricular materials, however. Beyond the necessary technological skills necessary to physically operate the technology, a pedagogical understanding is critical (Ertmer, 1999; Ertmer & Ottenbreit-Leftwich, 2010; Koehler & Mishra, 2005; Overbay, Mollette, & Vasu, 2011).

Technology and 21st century education are the new ‘buzzwords’ in education. It seems that in every school’s marketing materials there is information about the technology they have or
the 21st century educational skills and/or curriculum they teach. The reality is that we are surrounded by technology today and students are growing up in a digital world. It makes sense that technology is seeping into our classrooms and schools.

Teachers themselves need the skills and proficiency inherent in a 21st century education. Technology is being put in the classrooms and schools – we are receiving funding to purchase it, but without the training and support, will teachers be able to ‘muddle through’ and truly integrate technology?

This research studied the potentially divergent professional development needs of digital immigrant and digital native teachers in order to successfully integrate technology in a Jewish elementary education setting. This was accomplished through the collection of data from teachers (both digital immigrants and natives) regarding their professional development needs and experiences. It is important to note that my own professional development training has been greatly supplemented with personal experience with technology that has aided my previous classroom experiences. While I am by age just barely defined as a digital native, I do self-identify as such given my exposure to and experience with technology throughout my entire life.

Data Collection and Results

Participant Recruitment and Interview Protocol. Participants were obtained from two independent schools in the southern United States. Both schools are elementary grade level schools in similarly sized Jewish communities, with approximately equal resources both educational and Jewish. Both sites have ongoing technology integration initiatives in place. The researcher approached the Head of School at both sites and obtained written permission before beginning participant recruitment. The first step was to send a recruitment e-mail (Appendix A) with the demographic profile questionnaire (Appendix B) attached to each site for the Heads of
School to forward on to their teaching staff. Once the e-mail was sent, any potential participants that were interested filled in the demographic profile questionnaire and returned it to the researcher. Eligible participants were contacted to schedule interviews. There were no ineligible participants that expressed interested.

At site one, Jewish Day School of the South (JDSS), there were a total of four participants recruited. Two were digital natives and two were digital immigrants, meeting targeted participant recruitment goals.

At site two, Jewish Day School of the Southeast (JDS-SE), only two participants were successfully recruited. Both participants were digital immigrants. The Head of School sent the recruitment e-mail a total of four different times, with personal notes requesting attention to the study. Despite the request only two participants emerged. The total participant pool was comprised of four digital immigrants and two digital natives, all females. No males expressed interest in participating; it is worth noting that at JDSS there are no male teachers on staff. Individual interviews were scheduled to be conducted on Skype at mutually agreed upon times and any questions or concerns from the participants were addressed.

**Digital Immigrant and Digital Native Designations.** Participants were asked to self-define as either digital immigrants or digital natives on the demographic profile questionnaire. In order to determine their status as a digital immigrant or digital native, potential participants were given the following definition and collaborative understanding of the terms on the demographic profile questionnaire.

**Digital natives** are defined as those born “into” technology; those that are growing up with technology a part of their everyday reality. **Digital immigrants** are those that are seeing the emergence of new technology and interacting with it later in their lives, having
to adjust and adapt to the use and capabilities of that technology (Prensky, 2009).

*According to Prensky (2009) the designation of digital immigrant or digital native is an issue of age. Digital immigrants are those born before 1979 and digital natives born 1980 or later. For this research you can identify yourself as either according to age or to your experience and exposure to technology.*

No participants expressed any concern or difficulty over self-selecting their status as a digital native or digital immigrant. During the interviews, all were quite clear and definitive as to their decision to self-select as either a digital immigrant or digital native. No participant self-selected a designation outside of the one indicated by their age either.

**Lesson Plans.** Each participant was then asked to submit at least one written lesson plan that demonstrated how they have integrated technology in the curriculum. Only one participant (Rachael, a digital immigrant) sent a lesson plan in written form via e-mail. Three participants sent links to their school blogs, portfolios, or an online video of a lesson via e-mail (containing hyperlinks). The remaining two participants provided verbal information on their lessons during the interview process, stating that they did not have a formal lesson plan written up and did not submit anything further on their lessons. All lessons (for all participants) were discussed in detail during the interview process. Participants were offered the opportunity to submit lessons and information via electronic means or through postal mail. No participants chose to submit via any means other than electronic submissions.

**Study Context.** The context of the study must be addressed in order to fully consider the data (collected and) analyzed. JDSS is an independent Jewish day school located in the southern United States. The school is a community day school, meaning there is no adherence to one
particular observance of Judaism. The school is funded through tuition and grants; technology is funded strictly through grants. Professional development is funded at a rate of $200 per teacher, per year, according to the employee handbook. The funds are granted based on availability for outside professional development. At the beginning of a school year there is a staff week that constitutes the majority, if not the sum total, of professional development for teachers for the duration of the school year. Monthly staff meetings bring the staff together, but the participants report that there is little to no sharing of practice, but rather a review of upcoming events and information teachers need regarding special events and schedule modifications.

The general studies teachers are responsible for all core subject content, while there are Judaic teachers that are responsible for Jewish and Hebrew content. General studies teachers are welcome, but not required, to integrate Judaic content into their classes as applicable through year cycle (holidays and observances), life cycle (births, b’nei mitzah, weddings, funerals,) and curricular content (Torah portions, themes, and ethics). Every classroom (including Judaics and music) is equipped with a SMARTboard and at least two computers. There are iPads and laptops for every student in the school, as well as document cameras. During data collection a new Head of School began employment, and the new Head of School was informed of the research. JDSS did not, at time of data collection, have any technology standards that were formally adopted.

JDS-SE is an independent Jewish day school in the southeast. It is part of the Conservative Jewish day school network, meaning it adheres to Conservative Jewish values, observance, and teaching. Funding is through tuition, grants, and community support from the Jewish Federation.

They have both general studies and Judaic teachers as well, though Hebrew is taught in an immersion model. Each classroom has abundant technology as well, with SMARTboards,
document cameras, and iPads. There is a single classroom per grade. Professional development is provided in-house on an individualized basis by the twenty-first century specialist. Staff week at the beginning of the school year provides opportunities for large group professional development. At regular staff meetings there is also an opportunity to share with colleagues, providing a quick preview that interested parties can then follow up on and connect with the teacher(s) that shared. In addition, JDS-SE has hosted a conference on technology integration in education on their campus.

JDS-SE has formally adopted technology standards and benchmarks as part of their curriculum. JDS-SE states that they meet or exceed the standards set forth by ISTE (International Society for Technology in Education; formerly known as NETS, the National Educational Technology Standards).

The ISTE standards “set a standard of excellence and best practices in learning, teaching and leading with technology in education” (ISTE, 2013). There are sets of standards for students (learning), teachers (teaching), and administrators (leading), as well as coaches (leading) and computer science educators (teaching). Each set of standards contains benchmarks to evaluate specific skills and knowledge sets identified as necessary for learning, teaching, and leading in the twenty-first century digital age.

Both school sites have community based contextual factors that have the potential to impact the data, whether directly recognized or not. The community factors include information detailed above in developing a profile of each site, as well as those things that were not discussed. Other factors may include the staff interpersonal relationships both inside and outside of the respective school sites, barriers or obstacles in the specific school sites due to lack of
training, administrative support, or overall support given, resources and support in place, and
teacher perception and attitude of the school sites themselves.

**Technology in the Study**

The researcher acknowledges and recognizes that a significant amount of technology was
used in the course of the research study. At the time that the researcher obtained permission from
the research sites, the process for securing participants was discussed. Both school sites require
their teachers to use e-mail for communication, assuring that the method for reaching out to
potential participants via e-mail was not problematic. Potential participants had the option of
returning the Demographic Profile Questionnaire via e-mail or postal mail, depending on their
comfort and preference. All profiles were returned via e-mail. When notifying potential
participants of the receipt of their information and acceptance into the research study, e-mail was
utilized. Again, all participants have a basic comfort and familiarity with e-mail, allowing for
meaningful communications through that method. When arranging for interviews, participants
were given options to use Skype or Google Hangout, with telephone conferencing as an
acceptable substitute if the participants were more comfortable thusly. All participants expressed
a familiarity with Skype. When interview transcripts were sent to participants for member-
checking, e-mail was sent with a Word document attached. Participants had the opportunity to
review transcripts and either electronically modify, send e-mail notes, or schedule a phone call to
discuss any concerns, comments, or follow up information. Overall, all participants had a strong
familiarity and a minimum of “basic” ability with all technology utilized in the study, ensuring
that their participation was meaningful and substantial, without technological barriers affecting
the data collection and the integrity of the research.
Interview Process

After establishing a time to Skype for the interview, each participant was e-mailed the unsigned informed consent form to review. At the start of each Skype call, the interviewer thanked each participant and began establishing rapport. After an overview of the research and a brief agenda for the interview, questions and concerns were addressed. Participants were reminded that their participation was entirely voluntary and could cease at any time (including during the interview process itself). Once consent to record was obtained, the interview formally began.

Only one interview was fully conducted via Skype. Every interview was intended to be conducted via Skype once confirmation was received that participants were experienced and/or comfortable with using the platform for the interviews. Each interview began on Skype as intended. One interview was completed on Skype, leaving five interviews that were not. Of the remaining five, three participants experienced technical difficulties. Two were constantly losing signals and getting disconnected, one maintained a connection but it was freezing and the participant was unable to establish a good connection. The remaining two asked if they could switch to phone calls as it was more convenient. In each instance, the researcher had obtained phone numbers in case of difficulties (and given a number to participants to call as well). After the introduction on Skype, which enabled stronger rapport and comfort, the remaining five interviews switched to phone conversations that were recorded with the participants’ permission. The two participants that requested phone interviews were the digital natives. The digital immigrants were all open to full Skype interviews, though were comfortable switching to phone once the initial introductions were performed.
During the course of the interview the researcher asked open-ended and guiding questions as needed (see Appendix D). Most participants maintained a steady conversational pace and gave detailed answers. In a few instances the participants asked for clarification of questions or needed further prompting to give more thorough answers. Interviews averaged 40 minutes, though the shortest interview was completed in 20 minutes, with further time for follow up. That interview obtained strong data, but the participant was very succinct in her answers. The longest interview was an hour and a half.

After the interviews, the recordings were transcribed into a Word document. Aliases were utilized even in the transcription phase to ensure confidentiality and anonymity of participants. Each participant was sent an e-mail attachment with their individual interview transcript for member checking. They were given the opportunity to review their transcripts, ensuring that the transcripts portray their thoughts and information accurately. Participants were also issued an invitation to elaborate on any information either in e-mail, in writing, or via telephone. No participants offered any corrections, two participants called (without advance notification) to share some additional information that the transcripts prompted.

**Coding**

**Coding Process.** After the interviews were completed the audio files were sent to Rev Transcription (rev.com) to be transcribed. A signed non-disclosure agreement was obtained from Rev. After transcription the Microsoft Word documents were sent to the participants for review. None of the participants requested any changes to their interview transcripts.

The first round of coding was completed using lumper coding (Saldaña, 2009). Lumper coding takes larger chunks of data and assigns a descriptive code to the passage being analyzed.
The researcher began by doing a thorough reading of one transcript at a time. During this thorough reading, the researcher carefully looked for errors and began coding.

The second round of coding used pattern coding, taking the data and looking for emergent patterns and inferential themes (Miles & Huberman, 1994). Codes assigned in the second round labeled the data according to those larger themes. When completing second round coding, the researcher read each transcript again and began developing more comprehensive codes that fit the data’s emergent themes. A code book was created, keeping track of the codes used and adding (or combining) codes as needed, as well as descriptives regarding the use of the code in the data.

Once the second round of coding was completed, all transcripts were coded together, reducing the overall number of codes to nine larger categories according to this cross-analysis. The code book was updated to reflect the new codes and their correlation to the first two rounds of coding.

The coding was completed on printed transcripts in corresponding colors. The first round of coding was completed in red, second round in purple. Final coding was completed in purple with numbers corresponding to the themes detailed in the code book. Once coding was completed in writing, the final codes were transferred into the computer. Each transcript was moved into an Excel document, with the chunks of data coded together composing a single cell entry. The columns to the right contain the codes used for each cycle of coding. The table (3.1) below shows the template used in the Excel document for coding.

**Table 3.1 Coding Template**

<table>
<thead>
<tr>
<th>Transcript Data</th>
<th>Lumper Code</th>
<th>Pattern Code (Theme)</th>
<th>Final Code (Category)</th>
</tr>
</thead>
</table>

Summary

This chapter summarized the overall research study design and data collection process. Details for the beginning analysis and coding of the data were also discussed. The researcher designed this study in order to examine the professional development needs of both digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting, with the secondary goal to determine what (if any) models of professional development teachers identified as particularly beneficial (or not) for the successful integration of technology.

The data collection process consisted primarily of participant interviews, with supporting data consisting of lesson plans submitted by participants demonstrating a time they feel they integrated technology into their classrooms/curriculum. Coding was completed using lumper coding, pattern coding (resulting in the creation of themes), and final coding creating categories from the data.
Chapter Four: Research Findings

Introduction

Technology integration is not consistently and effectively achieved in education (Cifuentes, Maxwell & Bulu, 2011; Harris, Mishra and Koehler, 2009). This lack of success can begin to be partially addressed with appropriate professional development.

Harris, Mishra and Koehler (2009) state that:

…typical approaches to technology-related professional development are based upon assumptions that it may be enough to just expose teachers to particular educational technologies and possible curriculum-based uses of those tools and resources.

While it is, indeed, important to be able to physically operate the technology employed, it is necessary to go further and address pedagogical change (Ertmer and Ottenbreit-Leftwich, 2010).

The purpose of this study was to investigate the professional development needs of digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting. By differentiating teachers into two groups, those of digital natives and digital immigrants, the research specifically aimed to identify whether there are divergent professional development needs based on the distinct differences in their basic technological exposure and experience.

Participants for the research were selected through a combination of criterion and typical sampling. The criterion was current participation (defined as involvement during the 2012-2013 or 2013-2014 academic school year) in a technology integration initiative in a Jewish elementary education classroom setting and participation in at least one professional development session or long(er)-term experience within the past three years. Participants disclosed their age and self-identified as digital natives or digital immigrants. Typical sampling is a strategy wherein the
cases chosen are typical of the given population, showcasing the average case or experience (Creswell, 2007). By using criterion sampling to ensure participants had a minimal baseline of experience with the research area, and typical sampling to identify average cases/experiences (as opposed to extreme cases/experiences), this ensured an authentic participant pool relevant to the research. This chapter summarizes the findings that emerged from the data collection and analysis process.

**Research Questions**

How do the professional development needs of digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting differ?

a. What professional development models do Jewish elementary classroom teachers feel best support the successful integration of technology in an elementary education setting?

**Data Analysis**

As noted above, the first research question aims to identify the professional development needs of digital immigrant and digital native teachers to effectively integrate technology in a Jewish elementary education setting. The sub-question aims to identify any professional development models that teachers identify as particularly effective.

There were several codes used to identify and isolate specific background information, including teacher background and credentials, curriculum, technology, and scale of adoption ratings. These codes all contain important data that is necessary to understand the rest of the data
obtained from the participants, but does not necessarily speak specifically to the direct
information sought in answer to the research questions.

Background & General Information Codes

**Background and credentials (Participant profiles).** Through the demographic profile
questionnaire that participants completed in order to qualify for the research study and
preliminary interview questions, demographic data on each participant was collected. The digital
immigrant teachers have an average of nineteen years teaching experience.

Abby is not a certified teacher but has a college degree and teaches Judaic studies at JDS-
SE. She has been teaching for fifteen years. Her personal exposure to technology evolved from
typing on a typewriter in high school, moving on to PC’s at home and work, then a laptop and an
iPad. She self-identifies as a digital immigrant.

Jackie has a Masters in Library Science and has been teaching for twenty-three years. She
currently has a varied teaching schedule including library, reading, and technology at JDSS. She
has always had an affinity for technology, adopting it early as it became available. She began in
the mid-eighties with a home PC (personal computer, also commonly referred to as a “windows”
machine) and AOL (America Online) dial-up. Jackie self identifies as a digital immigrant due to
her age and exposure to technology as an adult.

Rachael has a BA in Education and is a certified early grades teacher. She has been
teaching for twenty-two years and is currently a kindergarten general studies teacher at JDSS.
She has had ‘basic’ exposure to technology personally with computers and cell phones. Rachael
identifies herself as uncomfortable with technology. She self-identifies as a digital immigrant.

Lina has a Masters in Counseling and has been teaching sixteen years. She is a
kindergarten teacher as well, teaching at JDS-SE. Her personal exposure to technology includes
personal computers and cell phones and now an iPad. She has taken computer/software courses for personal and professional benefit. Lina self-identifies as a digital immigrant.

The digital native teachers have been teaching an average of only three and a half years. Ilene has been teaching four years and has a Masters in Elementary Education. She is now a kindergarten general studies teacher; she was previously a first grade teacher at JDSS. She reports that she has grown up surrounded by technology, self-identifying as a digital native.

Wendy has a Masters in Composition and Rhetoric and has been teaching three years. She is an assistant teacher in reading, writing, and Hebrew at JDSS. She is also a Marketing Associate for her school. She has been online since “late adolescence” and has been an early adopter of technology, substantiating her self-identification as a digital native.

Table 4.1 (below) presents a visual summary of participant background and credentials, as well as years of teaching experience, (self-selection of) digital native or digital immigrant designation, and their school location and teaching assignments.

**Table 4.1 Participant Demographics**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Credentials</th>
<th>Years Teaching</th>
<th>Digital Designation</th>
<th>School &amp; Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rachael</td>
<td>BA Education</td>
<td>22</td>
<td>Digital Immigrant</td>
<td>JDSS Kindergarten</td>
</tr>
<tr>
<td>Abby</td>
<td>BA not certified teacher</td>
<td>15</td>
<td>Digital Immigrant</td>
<td>JDS-SE Judaics</td>
</tr>
<tr>
<td>Ilene</td>
<td>MAT Elementary Education</td>
<td>4</td>
<td>Digital Native</td>
<td>JDSS Kindergarten</td>
</tr>
<tr>
<td>Lina</td>
<td>MA Counseling</td>
<td>16</td>
<td>Digital Immigrant</td>
<td>JDS-SE Kindergarten</td>
</tr>
</tbody>
</table>
With a combined eighty-three years of teaching experience collectively the participant pool has a diverse background that lends an overall strength to the integrity of the data collected during the course of this research study.

**Students.** Every participant referenced student learning, achievement, or motivation as reasons to support integration. There was no question in any interview that the participants felt that students completely benefited from technology integration. As Ilene noted, “…the kids really, really enjoy it…It’s just another way for them to explore education.”

**Curriculum.** Data coded under curriculum included information relating to integrating technology into the curriculum, effects of technology on curriculum, and ways technology is used as an instructional method. All participants discussed their lesson (plans) that integrate technology during the interview process. Data relating to the participants’ specific lessons is also coded under curriculum.

Ilene, Rachael, and Wendy all shared lessons for their classrooms that are done on the SMART Board. Ilene has her students “sign in” by using the interactive white board to move their names from one side marked “At Home” to “At School” as a method for taking attendance and developing name recognition. Rachael does Calendar Math lessons on the SMART Board, where students manipulate coins, days, and other mathematical data to complete problems. Wendy has students complete a “Daily Edit” activity on the SMART Board. Students physically edit passages on the interactive white board while the class watches and is able to participate both at their desks and observe. All three teachers felt that their lessons were “better” because of
the use of technology, but none felt that their lessons were only accessible via technology and had in fact taught them without technology previously. These lessons are all indicative of technology being used as a supplementary instructional method.

Jackie shared information on a reading lesson. Students in a reading group all read a book on a Kindle together. When students encounter a new word or a word they are struggling to pronounce, they use the dictionary feature to explore the word. Students also learn how to take notes and highlight text on the Kindle. This lesson more seamlessly and authentically integrates technology, teaching students how to access technology to support their learning.

Lina’s students all have digital portfolios. At the end of a unit, project, or specific time frame, students choose samples of their work (or Lina identifies exemplars) and discuss it on video. These video reflections are compiled and travel with them throughout their time at the school, being added to every year. This self-reflection is an important skill for students.

Abby’s lesson was on Hebrew vocabulary. Students had their pictures taken digitally in the cafeteria while eating. They then recorded themselves speaking the Hebrew words for what they had eaten, learned different tenses for eating, and shared this with other classes and schools. This lesson took advantage of the benefits of technology for student engagement and project completion. It also taught students important skills necessary for success in today’s world.

Agreeing with Harris, Koehler and Mishra (2009) and Ertmer and Ottenbreit-Leftwich (2010), Lina shared,

The hardest part really I think is coming up (with) ways to do it that will not…like I don’t want to come up with something, oh, it’s a paper and pencil activity, it happens on the iPad. That’s not transformative. That is no better than using paper/pencil. It’s thinking of ways to use technology to actually transform the learning…
She returned to the idea later by stating that the physical use of technology is not the hardest part, it’s the transformative learning ideas.

**Scale of Technology Integration Adoption**

**Stages.** During the interviews, each participant was asked to place themselves on a scale of technology integration adoption. The scale, created by Hixon and Buckenmeyer (2009), is a continuum of technology integration with the following stages:

- A – resistance to and lack of knowledge of technology
- B – interest in technology and *personal* application/knowledge
- C – use of technology as a supplemental instructional method
- D – technology is an integral part of the instructional process
- E – teachers begin to redefine teaching and learning as technology becomes a vital part of the classroom environment
- F – teachers actively recognize and advocate for the integration of technology as a powerful instructional component (Hixon & Buckenmeyer, 2009, p. 138).

Rachael placed herself at stage B, despite her multiple examples of using technology as a supplemental instructional method in her classroom. She explained that she is interested in technology a little and uses it because she knows she is expected to, though no clear goals for the technology integration initiative were articulated to her. Ilene placed herself at stage C, stating that she uses technology as a supplemental instructional method. She is comfortable with her own personal technology, but not necessarily entirely comfortable with classroom technology integration.
Wendy placed herself at stage D. She likes to use technology and believes it should be used in the classroom. At the same time she also feels it is important to be unplugged and that technology shouldn’t be used as a crutch.

Abby had difficulty placing herself on the scale, choosing both stage C and stage F. Her initial thought was stage C, because she feels her technology use is clearly supplemental. However, she felt she was also at stage F because she is “definitely advocating using technology and striving towards that.” She continued with “in Jewish settings I guess we’re not there yet.” Lina placed herself in-between stages D and E, stating that she does think technology is integral to her classroom and teaching.

The scale question was not posed to Jackie during her interview as the conversation did not lend itself to that specific question. Throughout her interview, however, Jackie articulated a clear argument for technology integration and her use of technology in each area of her work.

Table 4.2 (below) represents the adoption scale rating chosen by each participant and their (self-selected) designation as a digital native or digital immigrant. One digital native participant (Ilene) placed herself lower than some of the digital immigrant participants, while the other digital native participant (Wendy) placed herself at the highest rating, shared in part with a digital immigrant participant (Abby).
Table 4.2 Participant Adoption Scale Rating and Self-Selection as Digital Native or Digital Immigrant

<table>
<thead>
<tr>
<th>Participant</th>
<th>Adoption Scale Rating</th>
<th>Digital Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rachael</td>
<td>B</td>
<td>Digital Immigrant</td>
</tr>
<tr>
<td>Abby</td>
<td>C and F</td>
<td>Digital Immigrant</td>
</tr>
<tr>
<td>Ilene</td>
<td>C</td>
<td>Digital Native</td>
</tr>
<tr>
<td>Lina</td>
<td>D and E</td>
<td>Digital Immigrant</td>
</tr>
<tr>
<td>Wendy</td>
<td>D</td>
<td>Digital Native</td>
</tr>
</tbody>
</table>

Primary Codes and Data

The codes discussed below refer to the data that directly relates to the participant answers given in response to the interview questions aimed at understanding the primary research question and the sub-research question, as opposed to general background information to develop a fuller and richer picture of the participants. Table 4.3 illustrates the themes (pattern codes) that correlate to the final codes (categories) discussed below.

Table 4.3 Themes and Categories

<table>
<thead>
<tr>
<th>Pattern Coding (Theme)</th>
<th>Final Coding (Category)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background/Credentials</td>
<td>Background/Credentials</td>
</tr>
<tr>
<td>Equipment</td>
<td>Technology</td>
</tr>
<tr>
<td>Software/Apps</td>
<td>Technology</td>
</tr>
<tr>
<td>Social Media</td>
<td>Technology</td>
</tr>
<tr>
<td>Curriculum</td>
<td>Curriculum</td>
</tr>
<tr>
<td>Peer Sharing</td>
<td>Support</td>
</tr>
<tr>
<td>Specialist</td>
<td>Support</td>
</tr>
<tr>
<td>Group/Agency/Cohort</td>
<td>Support</td>
</tr>
<tr>
<td>General Professional Development</td>
<td>Support</td>
</tr>
<tr>
<td>Technical Training</td>
<td>Support</td>
</tr>
<tr>
<td>Software Training</td>
<td>Support</td>
</tr>
<tr>
<td>Administration/Leadership</td>
<td>Support</td>
</tr>
<tr>
<td>Teacher Autonomy</td>
<td>Factors</td>
</tr>
<tr>
<td>Teacher Comfort/Attitude/Perception/Confidence</td>
<td>Factors</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Previous Exposure/Experience</td>
<td>Factors</td>
</tr>
<tr>
<td>Technical Abilities</td>
<td>Factors</td>
</tr>
<tr>
<td>Curricular Interplay</td>
<td>Factors</td>
</tr>
<tr>
<td>Class Management</td>
<td>Factors</td>
</tr>
<tr>
<td>Technological Change/Advancement</td>
<td>Factors</td>
</tr>
<tr>
<td>Professional Development/Lack of PD</td>
<td>Factors</td>
</tr>
<tr>
<td>Student Engagement/Interest</td>
<td>Students</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Students</td>
</tr>
<tr>
<td>Student Perception</td>
<td>Students</td>
</tr>
<tr>
<td>Safety</td>
<td>Technology Considerations</td>
</tr>
<tr>
<td>Responsibility/Respect</td>
<td>Technology Considerations</td>
</tr>
<tr>
<td>Policy</td>
<td>Technology Considerations</td>
</tr>
<tr>
<td>Parental Support/Involvement</td>
<td>Technology Considerations</td>
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<tr>
<td>Technological Malfunctions</td>
<td>Technology Considerations</td>
</tr>
<tr>
<td>Equipment Care</td>
<td>Technology Considerations</td>
</tr>
<tr>
<td>Access</td>
<td>Technology Considerations</td>
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<tr>
<td>Funding</td>
<td>Technology Considerations</td>
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<tr>
<td>Webinars</td>
<td>PD Models</td>
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<tr>
<td>Online Workshops</td>
<td>PD Models</td>
</tr>
<tr>
<td>Collaboration/Observations</td>
<td>PD Models</td>
</tr>
<tr>
<td>1:1</td>
<td>PD Models</td>
</tr>
<tr>
<td>Single Session (in-person) Workshops</td>
<td>PD Models</td>
</tr>
<tr>
<td>Interactive with technology</td>
<td>PD Models</td>
</tr>
<tr>
<td>Ongoing Series</td>
<td>PD Models</td>
</tr>
<tr>
<td>PD Effectiveness</td>
<td>PD Effectiveness</td>
</tr>
<tr>
<td>Technology Scale Placement</td>
<td>Scale</td>
</tr>
</tbody>
</table>

**Technology.** Data coded under technology included three pattern codes, equipment, software/apps, and social media. *Equipment* was used to label any data discussing specific hardware and equipment technology. Equipment included SMART Boards, document readers, Kindles, iPads, laptops, tablets, cell phones, iMacs, and desktops. *Software/apps* was data including any mention of a specific software program or package or an specific app. *Social media* referred to any mention of social media including Facebook, Twitter, Instagram, and LinkedIn.
At JDSS, Jackie spoke to the excess of technology present. Due to the constant evolution of technology, and available funding for purchases, JDSS has an interesting problem. Beginning with the purchase of fifteen Dell desktop computers to stock a computer lab, JDSS started the push for technology integration. After purchasing SMART Boards for every classroom, a set of Kindles for the library and for reading group use, the school then purchased fifteen touch screen laptops for their oldest students. Realizing that “mobile is the way of the future,” the school broke down their computer lab and moved the computers into classrooms. At the same time, they purchased iPads for students and document cameras for two classrooms. With enrollment as it stands currently, the school has an excess of functional technology.

At JDS-SE, there are SMART Boards in classrooms, a mobile cart of iPads, as well as iMacs and document cameras. There, the technology integration initiative is a significant focus of the school, and therefore a big focus in the teaching.

Software and apps were mentioned throughout each discussion, particularly when discussing the lesson plans. Teacher participants shared specific software and apps utilized during their specific lessons and part of the overall curriculum and/or daily life of the classroom. Both digital immigrant and digital native teachers mentioned the same software and apps, with no noticeable difference in their utilization by digital immigrant and digital native designations.

**Technology Considerations.** Another emergent theme was technological considerations. The technology considerations addressed in participant interviews included safety, responsibility/respect, policies, parental support/involvement, technological malfunctions, equipment care, access, and funding.

*Safety* refers to concerns for student safety when using the internet. While Wendy’s students have iPads and laptop computers with internet access, they all have safety filters in
place. She does have concerns that students might (accidentally or deliberately) find their way through the safety filters and encounter inappropriate material. There is also the need to instruct students in internet safety overall, including not sharing personal information, secure passwords, and interactions with other people when online.

*Responsibility/respect* overlaps with safety concerns but specifically addresses the need for discussions and prevention of cyber bullying, responsible posting, and pictures. Wendy’s students are older, and she instructs them on internet etiquette, a unique aspect of twenty-first century life. She states that “unfortunately, cyber bullying is becoming alarmingly prevalent,” and it is part of her responsibility to help students understand what constitutes bullying online and what to do as both the aggressor and the victim.

*Policies* refers to school technology policies, including equipment, internet, and social media for students and teachers alike. Wendy discussed how her school developed a social media policy to address the proper usage and structure for school students and employees.

*Parental Support/Involvement* was a significant issue with Jackie. She referred to parental support/involvement as an important facet of technology integration. She shared that often parents are “dragged along for the ride,” not really knowing what is going on or why “their second grader has an e-mail address.” JDSS is developing a parent technology group, aimed at sharing the integration initiative and what it means for their students.

*Equipment care* was another consideration of several participants. The need to properly care for and prepare equipment impacts technology integration. Teachers and students must know how to care for the equipment in order to properly maintain it. Wendy discussed a need to instruct students on equipment care in order to maintain proper working condition of the equipment. With the finite ability to provide technology for the students, the school needs to
ensure that the equipment is in good repair. That requires additional student preparation by the teachers.

*Technological malfunctions* were also mentioned by multiple participants. Ilene discussed frustration with having technology all ready to go for a lesson and having something go wrong, delaying the lesson and possibly leading to a total change or “scrapping” of the lesson. She stated that one of the most common refrains when dealing with technology is “well, that’s technology for you!” Other technological malfunctions might include the internet being down, a software package corrupting, a hard drive crash, equipment physically breaking, iPads being dropped and malfunctioning, and overall breakdowns that prevent the use of the technology.

*Access* to technology was another significant concern. JDS-SE has a 1:1 iPad integration model for certain grades, with parents responsible for purchasing the iPads. This is in place of purchasing textbooks as they previously did, so over a three year period it is roughly equivalent in expense. There is not, to Lina’s knowledge, any provision for families that cannot afford this expense. Given that the school is an independent school it is a fairly reasonable assumption that if parents can afford tuition, the expense of an iPad is manageable. It is not, however, an absolute given. There are also larger issues of access. Previously, teachers had scheduled computer lab times at JDSS and JDS-SE. If they needed access to computers at other times, it was required to be scheduled and planned in advance. Both schools are mobile with their technology now. JDS-SE still has a few classes utilizing the same mobile technology, however, meaning that there is some amount of planning in advance that is required. Teachers must also have access to the technology outside of school for their planning. Abby explains “You still spend a lot of time on your own independently sort of playing around with things and exploring.”
Funding is one of the most significant technology considerations participants discussed. Jackie shared that the (now dissembled) computer lab desktops have been placed into classrooms, fully functional and in great condition. The issue, however, is that they are on Windows XP, which is no longer going to be supported by Microsoft as of April 2014. It will require a fairly substantial financial investment to upgrade those fifteen desktops to Windows 8. She continues “the changes that happen out there in the industry go a little too fast for our budget.”

Factors That Influence Integration

Throughout the interview data, a clear pattern emerged wherein several areas were identified by participants as influencing their integration, either positively or negatively. These factors included teacher autonomy, teacher comfort/attitude/perception/confidence, a teacher’s previous experience, teacher’s technical ability, curricular interplay, classroom management, technological change/advancement, and professional development (or a lack thereof).

Teacher autonomy was discussed by three different participants, each saying that teachers integrated to varying degrees due to a lack of strict requirements or direction. This closely ties into the data related to teacher attitude/comfort/perception/confidence. Every participant shared that for both themselves and their colleagues’ attitude/comfort/perception and overall confidence impacted technology integration. One teacher spoke about an assistant that does not support technology integration and is not willing to learn how to use technology (in or out of the classroom), creating difficulty for her ability to integrate. Rachael shared, “I wanted to do as little as possible because I was not very comfortable with it. I had never done it before…I was very reluctant to do more than the minimum that I could get by with to say I was trying…” While Abby said, “A lot of teachers were not comfortable with this (technology) and like I said,
they didn’t do it.” According to Jackie, “It depended on the teacher. Some of the teachers were ready for it. Some are still not ready for it, but I think overall, pretty much open. Some have taken a little bit longer to integrate, fully integrate the possibilities of the technology in their classrooms, and some of them have gone beyond what I ever even thought that they would want to do or be able to do.” Ilene thought “it was interesting and I was intimidated because again I felt like there was so much more to it and I wasn’t using it to its full potential.”

Teacher technical ability and comfort/attitude/perceptions were also discussed. Abby brought up the fact that student abilities relating to technology have the potential (and likelihood) to eclipse the abilities of a teacher, and that can affect integration as well. “You have to have that attitude that it’s okay if your student is going to correct you and your students are always wanting to do it and willing to help which is great. On the other hand, you’re still a teacher and you still know the curriculum part more than they do. You have to kind of know how to balance that. Let them help you with the tool fluency I guess but you still be the boss I guess.” The idea of teachers not being the expert and letting students guide such a significant portion of a lesson/the overall curriculum can definitely be challenging.

For previous experience and technical abilities, the participants all felt that it influenced their ability to integrate. While she felt a little more prepared to think about integration due to her personal experience with technology, Abby continued, “It was really tough especially for people who…we have some teachers who don’t, didn’t even know how to use e-mail.” Ilene feels extremely comfortable with personal technology but finds some classroom technology frustrating, stating, “I wish that this is something that I was able to use as well as I use the other devices.”
Curricular Interplay. Similar to the discussion in curriculum, data from this subsection refers to participant comments relating to how technology integration fits into the curriculum. Several participants referenced a need to focus on authentic integration, meaningfully integrating technology into the curriculum.

“I’m thinking of ways to use the technology to actually transform the learning…” (Lina)

“I’m becoming more comfortable with it (technology) and thinking about how I can use it in more areas of the curriculum.” (Ilene)

One important piece of data emerged from the interview with Abby, wherein she shared a realization that integration is not about “teaching technology” in addition to the rest of the already packed curriculum:

I think the shift was when the teachers finally, when we realized that we don’t have to teach more or different than what we already have. We just have to take what we are teaching and teach it a different way, and utilize these tools that our kids are now…it’s part of who they are.

Classroom management was also an integral part of the discussion. Rachael discussed how she is integrating iPads into her kindergarten classroom, but is finding it challenging to manage the class. Students enjoy the iPads but require more attention from her (or her assistant teacher) to be successful in working on them, whereas there are other independent activities she could have them work on that require less teacher assistance. In Wendy’s interview she discussed the challenges of technology and classroom management in her third and fourth grade classes. She finds that keeping students on task with the technology can be trickier. Students have instantaneous access to millions of webpages, videos, images, and people with an internet
enabled device. While you circulate and work among the class, there is a certain amount of trust placed in the students and their adherence to the task at hand.

Rapid changes and advancements in technology also lend challenges to classroom integration, according to several participants. Jackie shared that the overabundance of technology at JDSS is proof positive of the incredible changes. Within a five year period, classroom technology shifted from a lab centered environment to mobile and touch interactive set ups. Lina shared that “there’s always something new coming out, so I always have to keep learning” and “every year the end point moves somewhere else. You can never quite get there.”

Training, Professional Development, and Support

Training and professional development was another ongoing part of each interview. Participants explain, “I was open to it but again, I felt like again, you’re not training me and you’re not giving me the tools in the beginning. I felt like we weren’t given the tools. Even now the way it’s happening is like you have to explore it on your own and your own time…” (Abby). Lina, about being told to blog, said “You have to teach me how to use it…well, panic, you know.” Ilene said “there was not a lot of training for the different technology we had.” Rachael feels that an overall lack of professional development is hindering her abilities to integrate as well.

Support for integration. Another significant factor that participants felt impacted their ability (and willingness) to integrate was support. This was such a prominent theme that the researcher separated it from the coding for factors and created a separate code for this data. Subcategories under this code include peer sharing, specialist, group/agency cohort, general professional development, technical training, software training, and administration/leadership.
Peer sharing. In every single interview participants discussed peer sharing as a vital support, and oftentimes their only support. Abby said “One teacher said, okay you want us to integrate technology but we don’t really have a lot of time, and we never see each other, so how can…”

While Ilene shared that she was “able to sit down with my colleagues and sort of figure out the best ways…” and “one colleague in particular would definitely sit down and go over things with me and some ideas that we could use.” Rachael relied on her assistant teacher to help her and share her knowledge, as well as trying to informally talk with other colleagues about their integration. Jackie relies on colleagues in other schools for best practices, equipment and software/app recommendations, and resources. Abby shared how her school builds in time for peer sharing. During monthly staff meetings teachers rotate sharing a short PowerPoint with the staff. Using twenty slides and just five minutes, “you share with the staff something you’re passionate about or something you want to teach them.” The purpose is to give everyone a “quick taste” that they can then follow up on later if they are interested.

Specialist. The biggest support discussed was an in-house specialist. At JDS-SE they have been fortunate to have employed a twenty-first century technology specialist for the past several years. Each teacher has one on one meetings with the specialist to discuss technology integration into their specific curriculum. Lina shared that “a mentoring relationship is key.” With the specialist she brainstormed things to do. The specialist made her feel comfortable. “…I’ve been taught to think that way (about technology) and to look for ways to do it and implement and to expand the learning in that way…”

At JDSS, they have a technology specialist that works with teachers more informally. She identifies resources and passes them on, as well as helping teachers individually as requested.
She provides technical instruction and troubleshooting. Technology is only a portion of her responsibilities, however.

Abby feels that working with a specialist is ideal. She shared that “having a 21st century specialist at our school has definitely been the best…Again it’s in to work but that then becomes again on your own.” The specialist scaffolds the technology for the teachers, enabling them to move forward on their own.

*Other supports.* Wendy was part of an outside group/agency cohort when designing a social media policy for the school, and uses that cohort for ongoing support. General professional development was prominent in discussions. Rachael noted “I felt like I learned [how to use the technology], but then when I went back into the classroom it was, like, hard to put into action, and hard to remember all of the things we did in one lesson…to last the whole year.” Ilene shared that she had “very basic training just sort of figuring out how to get on it…it wasn’t very thorough and we didn’t come back to revisit the topics.” Training through technical training and software training was also mentioned, with Lina sharing she had previously taken software courses periodically, and Ilene sharing that she had received training in how to operate specific equipment in her school. Ilene elaborated with the statement that the technical training pertained to the physical operation and minor software training specific to the SMART Board.

Overall support by the administration/leadership of the school was mentioned as well. Wendy felt like she needs “support from my principal, and whoever is going to be reviewing my curriculum.” She continued to explain that as with any decision relating to curriculum, there needs to be oversight and support from administration.
Professional Development Models

Throughout the interviews, participants identified several models and characteristics of professional development that they felt were beneficial and supportive. There were also characteristics identified as unsupportive and not desirable. The models identified included webinars, online workshops, mentoring, collaboration/observation, and in person workshops/seminars. Characteristics articulated included one on one, single session, interactive, and series/ongoing.

Jackie detailed previous professional development experiences that she found beneficial to be webinars, online workshops, and collaboration/observations. She shared a positive experience visiting another school to learn how they were using their SMART Boards. She likes the flexibility webinars and online workshops provide, and finds learning from her colleagues most beneficial.

Wendy has taken online workshops for software applications and found them to be successful for her. Otherwise, she tends to seek support from her colleagues.

For Lina, the one on one mentoring and collaboration is key. She shares that if she “didn’t have any mentoring relationships and didn’t have a special team to help be our best, I probably never would have developed or I would have developed at a much slower rate as a teacher that uses technology…”

Large workshops and seminars are not beneficial to Rachael. About a recent experience she says, “I don’t think I learned one thing that I took home with me because it was large groups and it was at the point where everybody, I guess, was more advanced than I was, so I didn’t know what they were talking about, what they were doing.” When discussing an observation experience she shares “I felt like it was great while I was there, and it was interesting. I felt like I
learned, but then when I went back to the classroom it was, like, hard to put into action…” When asked to describe what she feels *would* be beneficial she struggled to articulate a model that fit her needs, eventually ending with, “Maybe it needs to be short or overall one thing at a time until you use it, because you learn all these things and then you go away for months and you have…don’t…if it’s not in practice then it’s not remembered.” She further explained that she learns by doing and best in a small, one on one setting. In a group setting she gets intimidated “because I always feel like others are doing it much faster than I am or then you get stuck on one little thing and then you get lost and you’re not really listening to what they’re saying…” She concluded she would in fact be most comfortable one on one.

As a visual learner, Ilene articulated a need to “see a specific lesson so that I can see how it’s properly used and be able to think about “well how could I use this in my classroom, and what areas could I be using this in?” I think that’s what I would really, would really need, is that one on one.”

Abby also felt that one on one mentoring was best for her, allowing her the ability to find the right fit for her classroom and teaching.

No one articulated a specific desire for a series of workshops, but there were overall comments directed at a need for ongoing support over the course of the year. This was also reflected in the consistent identification of one on one support and mentoring as most beneficial models for professional development. The repeated references to peer sharing, and a need for time to do that sharing, also lends itself to the formation of PLC’s (professional learning community) for professional development.
A note about context. In the design of this research study, particular attention was paid to the contextual setting of Jewish day school education, due to some of the unique aspects the context contributes to the overall understanding of the issue of concern. During data collection, no participants mentioned this particular context as being relevant to their experience beyond the technological resources provided in their schools. Even then, those mentions were not attributed to be significant, but rather passive statements that participants made to share what was available.

This is interesting for several reasons. First, both research sites have a small faculty, particularly when compared to public schools or other independent schools. Each school has single classrooms per grade, with a single teacher for the secular/general studies and either shared Judaic studies and Hebrew teachers, or one teacher for each grade responsible for those subjects. With a small faculty, the working relationships are generally closer, making for peer to peer collaboration and support to occur more naturally, even without specific time and space dedicated for such. Obtaining help more specifically geared towards individual teacher needs and experiences is also potentially more viable, as more people are familiar with the needs of the teacher and even the students in particular.

Second, when considering integration in Judaic and Hebrew curriculum, the participants reported a lack of overall available resources for those subject areas. Participants reported that the main resources available were largely limited to assessments and tests. Anything they wanted to do to more fully integrate technology beyond the areas of assessments and tests meant that resources were self-created or required significant research and time to identify. This adds an additional barrier to integration that no participants specifically referenced when discussing their school’s integration initiative. The challenge was mentioned by both participants when sharing
lesson plan content and information. The lack of context in the data is both interesting and significant. For participants to be unaware of their context is significant and also places, though perhaps unconsciously, the context in the research.

**Overview of Findings**

As a result of this study, the researcher uncovered several important findings.

1. Both digital immigrant and digital native teachers require professional development that addresses pedagogical change to inform curricular impact.
   a. Despite the greater comfort with technology as a whole, digital natives still require training for pedagogical change in order to integrate effectively.

2. Professional development needs of digital immigrant and digital native teachers do not significantly differ.
   a. Where the professional development needs do diverge is in the necessity of greater technical training to operate various technologies for the digital immigrants.
   b. Digital native teachers did not necessarily place themselves higher on the scale of adoption than the digital immigrant teachers.

3. The most significant barriers to integration were confidence/attitude and pedagogical knowledge.
   a. Barriers to integration that were reported are consistent with those found in the literature.

4. Mentoring and peer sharing were the most commonly reported successful models of support and professional development.
a. The most important characteristic reported was that professional development and support be 1:1.

Chapter Summary

This chapter detailed the data collection and analysis process for this qualitative case study research. During the coding and analysis, themes emerged that informed the research questions, and with the use of activity theory, illuminated several key findings. These findings included the determination that professional development needs of digital immigrant and digital native teachers do not significantly differ and both require pedagogical training for the successful integration of technology. Where the professional development needs of the two demographic groups diverge is in the necessity of technical training in order to operate the technology and equipment.

Preferred models of professional development were also identified through the data analysis and included the support of an in-house/on-site specialist and peer sharing and collaboration.
Chapter Five: Discussion of Findings and Implication for Practice

Introduction

As technology integration initiatives in education continue, the importance of professional development cannot be overstated. According to the Massachusetts Department of Elementary and Secondary Education (2011b), only a startling 15.2% of teachers are categorized as “proficient” in technology, and 11.1% of teachers are recognized as “advanced.” That leaves 73.7% of teachers labeled below proficiency.

This research aimed to uncover the professional development needs that digital immigrant and digital native teachers have in order to successfully integrate technology in an elementary education setting.

Research Questions

1. How do the professional development needs of digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting differ?

   a. What professional development models do Jewish elementary classroom teachers feel best support the successful integration of technology in an elementary - education setting?

Overview of Research Findings

This qualitative case study was conducted in order to understand the professional development needs of digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting. Through interviews with six participants,
four digital immigrant and two digital natives, from two Jewish elementary school settings, the researcher was able to gain insight into their needs, as well as the professional development models the teacher participants identified as most beneficial and supportive in their endeavor to integrate technology. The research revealed several key findings. These findings are summarized below, with a more detailed and thorough discussion of each finding to follow.

1. Both digital immigrant and digital native teachers require professional development that addresses pedagogical change to inform curricular impact.
   a. Despite the greater comfort with technology as a whole, digital natives still require training for pedagogical change in order to integrate effectively.

2. Professional development needs of digital immigrant and digital native teachers do not significantly differ.
   a. Where the professional development needs do potentially diverge is in the necessity of greater technical training to operate various technologies for the digital immigrants.
   b. Digital native teachers did not necessarily place themselves higher on the scale of adoption than the digital immigrant teachers.

3. The most significant barriers to integration were confidence/attitude and pedagogical knowledge.
   a. Barriers to integration that were reported are consistent with those found in the literature.

4. Mentoring and peer sharing were the most commonly reported successful models of support and professional development.
a. The most important characteristic reported was that professional development and support be 1:1.

Discussion of Findings & Connection to Theoretical Framework

The theoretical framework chosen for this research is activity theory as informed by Vygotsky, Leont’ev, and Engestrom. Vygotsky (1978) maintained that learning was a semiotic process, or mediated action, and that people interact with both artifacts and other people in order to construct meaning and understanding. Leont’ev (1978) added that the corresponding conditions, goals, and means construct a crucial middle link between the organism and the environment. The resulting definition of activity is that which emerges through reciprocal processes that transform the subject-object relationship between themselves and their contexts (Yamagata-Lynch, 2003). In the context of this research, the subject-object relationship is teacher-technology in a Jewish elementary classroom context. Engestrom (1987) added rules, community, and division of labor to the framework. The community, both at a school level and on a teacher-group level, is a vital component of the teacher interactions. Identifying how the subjects interact (or do not), as well as the rules for integration, is important. Adding in CBAM allows for obstacles to integration to be addressed.

The use of activity theory helped guide the formation of the research interview protocol. By using the foundation of activity theory to inform the design, interview questions were chosen that address each aspect of the theory. The resulting questions and use of activity theory grounded the research and data analysis and lent validity to the findings.
Findings

Both digital immigrant and digital native teachers require professional development that addresses pedagogical change to inform curricular impact. During data analysis, a clear pattern emerged when discussing professional development needs. While all teachers indicated a desire to integrate technology into their curriculum and classrooms as a whole, with only Rachael saying she was willing but not overly enthusiastic about the endeavor, the need for guidance in how to integrate was clear. Jackie shared that it is helpful and important to know “what the best practice is…” in integration, to be able to model her own integration accordingly. Rachael feels she is still “lacking in the knowledge and the know-how,” while Abby relied on her school technology specialist to help brainstorm and identify appropriate technology integration opportunities. Wendy also looks for assistance in integration, using the following example “I really want to integrate an iPad into the classroom, but I’m not quite sure how…”

A need for pedagogical change is well substantiated throughout the literature. Buckenmeyer (2010) found that technological based, content-rich professional development enables more effective integration. Ertmer and Ottenbreit-Leftwich (2010) state that teachers must be able to not only use the technology themselves; they must be able to teach students how to do so, find the appropriate software (or hardware) that will enrich the learning in the curricular area being addressed, develop appropriate assessments, and know how to teach using the hardware and software (Ertmer & Ottenbreit-Leftwich, 2010). Strudler (2010) and Cuthell (2006) concurred, stating that technology must be used as a pedagogical tool. This is a basic idea and understanding of what the pedagogical shift/change for technology integration entails.
Pedagogy (ped· a· go· gy [ped-uh-goh-jee, -goj-ee]) is defined by Dictionary.com (2013) as 1. the function or work of a teacher; teaching and 2. The art or science of teaching; education; instructional methods. When considering the idea of pedagogical shift/change, the shift/change requires teachers to be able to teach students using the technology, teaching students how to learn with the technology, and using it purposefully and with intention is critical. How teachers do that requires their work as a teacher and their instructional methods to shift/change to allow for technology to be integrated appropriately. This idea is widely embraced in the literature, particularly with TPACK.

The foundation of TPACK (Koehler & Mishra, 2005) is that there are three primary forms of knowledge, content (CK), pedagogy (PK), and technology (TK). The intersections between these three forms of knowledge create four additional knowledge bases, Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK). The final intersection, of all three circles is Technological Pedagogical Content Knowledge (TPACK). (See Table 5.1)

“Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts.” (Koehler & Mishra, 2005)
Table 5.1 TPACK (Koehler & Mishra, 2005; tpack.org)

This visual representation of TPACK illustrates the core knowledge areas and the intersections creating additional knowledge bases. The anecdotal data from the participant interviews is consistent with the literature and previous research on technology integration. Teachers must have appropriate professional development in each of the core knowledge areas, as well as the additional knowledge bases, in order to successfully integrate technology in curriculum and education.

Despite the greater comfort with technology as a whole, digital natives still require training for pedagogical change in order to integrate effectively. The need for pedagogical training was not limited to the digital immigrant participants. The digital native participants also sought greater assistance in technology integration in the curriculum. While the digital native participants expressed a security in utilizing technology, particularly for their personal use, they sought help with bringing it into their curriculum.
Strudler (2010) and Cuthell (2006) both posit that technology must be used as a pedagogical tool for successful technology integration. Digital natives may be more comfortable with technology, accepting it as a given part of their lives and more naturally relying on it. While capable of adopting the technology personally, that adoption does not automatically transfer into the ability to teach with integrated technology. Pedagogical change and teaching is different than personal adoption or willingness to use technology (Ertmer & Ottenbreit-Leftwich, 2010).

Professional development needs of digital immigrant and digital native teachers do not significantly differ. The data indicated a lack of divergence in the professional development needs of digital immigrant and digital native teachers. Both groups of participants clearly had the same basic needs – to be able to physically operate the equipment/hardware and the software/apps being used, and to understand how to integrate technology into the curriculum. There was no indication that the digital native teachers were better able to make the pedagogical shift to integrate technology into the curriculum, moving beyond using technology as a supplemental instructional method. Indeed, the digital native teachers expressed the same desire to be supported in achieving integration as the digital immigrant teachers did.

Where the professional development needs do potentially diverge is in the necessity of greater technical training to operate various technologies for the digital immigrants. The only real divergence in professional development needs is for digital immigrants, needing increased technical training for the physical operation of technology. One digital native teacher (Ilene) alluded to increased comfort exploring technology, saying, “I am comfortable with electronics in general.” While Rachael reported she was “always self-conscious because I felt like everybody was doing it faster than I was and everybody knew more, everybody had, kind of, computers, more…laptops, everything at home, and were more comfortable.” There is not
sufficient evidence to declare that digital immigrant teachers collectively need significantly more professional development in the technical aspects of technology integration. The data for this research does support that inference; however, it is not a valid assumption for all digital immigrants.

With the reality that not all teachers are guaranteed to have equal access to technology, even digital native teachers will have varying capabilities with technology. Further, even with total access to the most up to date and cutting edge technology there is no assurance that a digital native teacher will automatically be capable of using that technology to its fullest potential or even properly utilize the technology. Digital immigrants have the potential for greater discrepancy in abilities due to the necessity of adopting technology that is entirely new to them; however, these discrepancies are not allocated solely to digital immigrants.

**Digital native teachers did not necessarily place themselves higher on the scale of adoption than the digital immigrant teachers.** As a whole the digital immigrant and digital native teachers were within comparable ranges. Illustrated in table 5.2 (below), the lowest rating was Rachael, a digital immigrant, at stage B. The highest ratings were Wendy, a digital native, at stage D and Lina, a digital immigrant, placing herself somewhere between stages D and E. Ilene, the other digital native, placed herself at stage C, with Abby (another digital immigrant) placing herself at both stages C and F. While the digital natives did place themselves higher than the lowest rated digital immigrant, they did not significantly rate themselves higher than all digital immigrants. This dispels the stereotypical assumption that digital natives, growing up surrounded with technology and using it ‘naturally’, are automatically more adept at technology integration, or at the very least more comfortable with it.
It is also interesting to consider the placements chosen by the participants versus what their discussions and lesson plans indicate. The researcher would place each participant a minimum of one level higher on the scale of adoption based on their shared information. While participants shared varying levels of comfort and preference for technology, all participants indicated that they see a need, advantages, and importance of technology integration. All are actively seeking ways to integrate (more) authentically and purposefully. Even Rachael, the participant ranking herself lowest on the scale and maintaining the most perceived barriers to integration, has voiced a desire to integrate more and seek more purpose with how she integrates in the classroom and curriculum for her students. Stage B, as she self-selected, is an interest in technology and personal application. At the very least, according to her interview and lesson plans, she is at stage C – use of technology as a supplemental instructional method.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Adoption Scale Rating</th>
<th>Digital Native or Digital Immigrant</th>
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</thead>
<tbody>
<tr>
<td>Rachael</td>
<td>B</td>
<td>Digital Immigrant</td>
</tr>
<tr>
<td>Abby</td>
<td>C and F</td>
<td>Digital Immigrant</td>
</tr>
<tr>
<td>Ilene</td>
<td>C</td>
<td>Digital Native</td>
</tr>
<tr>
<td>Lina</td>
<td>D and E</td>
<td>Digital Immigrant</td>
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<tr>
<td>Wendy</td>
<td>D</td>
<td>Digital Native</td>
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The most significant barriers to integration were confidence/attitude and pedagogical knowledge. Participant data coded under factors included both positive and negative factors that participants relayed as affecting their technology integration. These factors included teacher autonomy, teacher comfort/attitude/perception/confidence, previous exposure/experience with
technology, technical abilities, curricular interplay, class management, technological change/advancement, and professional development (or lack thereof).

As the participants were able to self-select their adoption scale ratings, it is interesting to note that the higher the ratings, the lower their perceived (and discussed) barriers to integration were. Rachael voiced the most barriers and rated herself the lowest, while Wendy and Lina voiced fewer barriers and concerns with integration. The levels of personal self-knowledge and confidence certainly contributed to the ratings chosen by the participants.

The most prevalent barrier to integration was teacher comfort/attitude/perception/confidence, for both digital immigrant and digital native participants. Table 5.3 (below) details the number of mentions for each barrier, broken down by digital native participants and digital immigrant participants.

**Table 5.3**

*Numerical Representation of Barriers Mentioned by Digital Native & Digital Immigrant Participants*

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Mentions by Digital Native Participants</th>
<th>Mentions by Digital Immigrant Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Autonomy</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Teacher Comfort/Attitude/Perception/Confidence</td>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>Previous Exposure/Experience</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Technical Abilities</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Curricular Interplay</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Class Management</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Technological Change/Advancement</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Professional Development/Lack of PD</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

For digital native participants, there were fewer mentions overall for barriers. With a total of sixteen mentions of barriers, that is an average of eight mentions per digital native participant. Digital immigrant participants had a total of seventy-four mentions of barriers, averaging eighteen and a half mentions per digital immigrant participant. The digital native participants
were overall represented to be less resistant to integration, reporting fewer instances of barriers. With a combined seven years of teaching experience, less than half the experience of the digital immigrant teacher with the fewest years teaching experience, it is not surprising that the digital native teachers are less opposed to change and are more flexible. Further considering that the issue at hand is technology integration and both digital native teachers share that they enjoy technology overall, it makes sense that there be fewer instances of barriers reported. In both cases, the most prevalent barrier was the category encompassing teacher confidence, attitude, perception, and comfort.

Participants reported that their comfort and confidence with technology played a significant part in their ability to integrate. When they felt uncomfortable with the technology, they had difficulty understanding how to use the technology itself and/or how to integrate it into the curriculum. Several participants also noted that other teachers in their schools that had a negative attitude about technology were unable to integrate, either completely or to the full potential. The significance of this barrier is understandable. For teachers to be able to integrate successfully, they must be open to learning and experiencing change. They must be able to make a pedagogical shift. With the rapid changes in technology, it is even more important that teachers be open to ongoing learning and exposure to new technology.

**Barriers to integration that were reported are consistent with those found in the literature.** Bingimlas (2009) and Hew and Brush (2007) identified barriers to technology integration including confidence, competence, access to resources, institution, assessment, subject culture, and attitudes and beliefs. Using the definitions by Bingimlas (2009), confidence, or more appropriately a lack thereof, is a fear of failure and/or a lack of knowledge and familiarity with technology. Attitudes and perceptions (as well as comfort, as used by the
research participants) are the preconceived notions and feelings about technology integration and instruction that a teacher holds (Hew & Brush, 2007). Teachers that like technology are more likely to integrate it in their teaching. There were no barriers identified in the research that were not addressed in literature.

Second order barriers, such as those defined by Bingimlas (2009) and Hew and Brush (2007) as community/institutional barriers, were present in the research as well.

Community played an integral part of the success in integration as reported by the teacher participants. When teachers felt more fully supported by their peers, specialists, and administration, they ranked themselves higher on the scale of adoption (see table 5.4 below). Lina, for example, placed herself between D and E, and reported that she feels very supported and able to integrate. The rules of integration affected how teachers integrated (or did not), as evidenced by comments like Wendy’s: “it’s never a policy that we have to. A lot of teachers decide that they would rather not integrate as much technology as other teachers who might feel more comfortable. There’s no written policy that says how much technology we should use…”

<table>
<thead>
<tr>
<th>Participant</th>
<th>Adoption Scale Rating</th>
<th>Feelings of Support for Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rachael</td>
<td>B</td>
<td>Not supported</td>
</tr>
<tr>
<td>Abby</td>
<td>C and F</td>
<td>Specialist, individual support, and colleagues</td>
</tr>
<tr>
<td>Ilene</td>
<td>C</td>
<td>Casually supported by colleagues</td>
</tr>
<tr>
<td>Lina</td>
<td>D and E</td>
<td>Specialist, individual support, and colleagues</td>
</tr>
<tr>
<td>Wendy</td>
<td>D</td>
<td>Expert and individual support</td>
</tr>
</tbody>
</table>

The differences for participants between the two research sites gave heed to the importance of community. At JDSS, where participants reported an overall lack of time for
collaboration and support, and one in particular expressed a frustration with the lack of administrative support and direction for integration. Participants from JDS-SE felt that the integration initiative was embedded in the overall administrative running of the school and therefore supported most positively and thoroughly.

**Mentoring and peer sharing were the most commonly reported successful models of support and professional development.** Throughout the interviews, participants were asked to share previous professional development experiences (positive and negative), as well as those models that they found to be most beneficial for technology integration. Models identified included webinars, online workshops, mentoring, collaboration/observation, and in person workshops/seminars. An overwhelming majority of responses centered around two specific models of support and professional development, mentoring and peer sharing.

Participants with a technology expert/specialist as a mentor were extremely satisfied, motivated, and reported overall strong feelings of support. They felt there was no replacement for that relationship and that it was the single best model of professional development available. Every single participant also related the importance of peer sharing. While mostly conducted informally, sharing with and learning from peers provided each participant with ideas, motivation, and general support. Significant time for this was desired by the participants, with several wanting to ‘formalize’ the process. No participants specifically mentioned the ideas of PLCs, yet their descriptions and experiences match the concept.

One of the most recurring models of professional development discussed in the literature is that of a collaborative group, what the participants informally sought out and term peer sharing. PLCs are able to address barriers to integration and provide support and trouble shooting in an authentic environment, allowing for comfort and confidence in exploration and growth for
The interactions between teachers, technology, and other teachers/specialists proved to be among the strongest supports for integration identified in this research. With the participants at JDS-SE strongly advocating for the support of a twenty-first century learning specialist, they shared the strength of the support received helped them overcome their discomfort with operating the technology as well managing how it could be integrated into the classroom. By obtaining support within their classrooms and with the technology they were tasked with integrating, they felt most comfortable and like it was most manageable. They received support that met them where they were at, with skills and comfort, giving them guidance applicable to their individual situations.

Conversely, participants at JDSS shared concerns that the little professional development they had attended off-site led to good ideas but nothing easily transferrable into their own practice in their classrooms and curriculum. Rachael in particular shared concerns that professional development experiences she has had left her still unsure about how to integrate technology into her classroom and curriculum. She felt that she really needed individual coaching to be able to really understand what to do.

**The most important characteristic reported was that professional development and support be 1:1 and ongoing.** Characteristics (positive) of professional development articulated during participant interviews included one on one, single session, interactive, and series/ongoing. Participants identified one on one support and professional development as the most important characteristic for their success. The flexibility and relevancy provided by a one on one approach
provides for practitioners to maximize the benefit of the support received. Literature supports this idea.

CBAM identifies barriers to technology integration, labeled as stages of concern for teachers. Table 5.5 illustrates the stages of concern.

**Table 5.5 Stages of Concern (CBAM)**

<table>
<thead>
<tr>
<th>Stage of Concern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Awareness</td>
<td>Little awareness of a particular innovation.</td>
</tr>
<tr>
<td>1 Informational</td>
<td>Vague or general awareness of an innovation. May begin looking for some information about the innovation to gain additional knowledge.</td>
</tr>
<tr>
<td>2 Personal</td>
<td>Concerns are centered around the personal costs of innovation implementation.</td>
</tr>
<tr>
<td>3 Management</td>
<td>Concerns focus on the logistical challenges of implementing an innovation into their daily job.</td>
</tr>
<tr>
<td>4 Consequence</td>
<td>Concerns are centered primarily on the impact the innovation will have on their students.</td>
</tr>
<tr>
<td>5 Collaboration</td>
<td>Concerns emerge about how teachers compare to peers and how they can collaborate and work with colleagues on an innovation.</td>
</tr>
<tr>
<td>6 Refocusing</td>
<td>Concerns are about how to better implement an innovation.</td>
</tr>
</tbody>
</table>

Adapted from Chong et al, 2010.

The stages of concern are the basis of CBAM. Through properly identifying where teachers are at in the stages of concern will allow for those concerns to be addressed and overcome in order to enable successful integration of technology. During interviews, the researcher asked teachers to self-select a stage on a scale of adoption (Hixon & Buckenmeyer, 2009). The scale placement gave valuable insight into where each participant feels they are at, in order to begin addressing their individual concerns.

It is important to address their individual concerns, as Hope (1997) states “the intensity of
teachers’ concerns about an innovation and the degree to which those concerns can be resolved have bearing on successful innovation implementation” (p. 150). Barnett (2003) states that professional development needs to fit a teacher’s stage and level of comfort with technology in order to be effective. Working one on one ensures that the teacher’s needs are being met as there is an opportunity for clear and consistent communication. Reel (2009) suggests that an ideal condition is for professional development to be conducted using the actual technology that will be used in the classroom, preferably in the actual classroom of the teacher or in the school setting itself. Teachers require long-term professional development to gain a “depth and breadth” of what they need to know and be able to do for successful technology integration (Bybee & Loucks-Horsley, 2000).

While the participants shared that some of the training and support they had received was inadequate due to the lack of follow up, no one specifically articulated the word ‘ongoing’ as an important characteristic. Despite the lack of articulation, the foundation of mentoring and peer sharing both, are an ongoing relationship facilitated to support teachers. If the mentoring and peer support were one time exchanges, the benefits would be considerably less.

**Context and findings.** The context of the study, with research being conducted in two independent Jewish elementary school settings, lends special consideration to the findings. It is important to recall the unique benefits and challenges of the context.

With fewer constraints compared to public school settings, Jewish educational settings have an ostensibly smoother path to integrating technology, as far as policy and procedures for a new initiative. Funding can also be potentially more manageable and either less of a challenge or more difficult, depending on the source.
Woocher, Woocher, and Rubin Ross (2008) and Amkraut (2011) agree that Jewish education has not been quick enough to accept and adopt the changes (and opportunities) that technology brings today. Woocher (2006) states that “If we embrace these new realities, we can have Jewish education that is ‘always on,’ fresh, customized, and flexible, available when, where, and how we want it.” For Jewish education to remain relevant and vital, it will be important to be successful integrating technology. While public schools should integrate technology in order to prepare students for the reality of our twenty-first century world, Jewish education must adopt it for those reasons and in order to survive. The necessity of remaining relevant is critical for schools that are chosen, there is arguably more at stake.

With the smaller faculties in these two research sites in particular, the teachers have the opportunity to develop closer relationships with each other when compared to teachers in a larger school setting with multiple teachers per grade. These relationships potentially impact the comfort and ability of the teachers to develop peer support relationships. Both school sites had participants reporting an overall sense of community and relative closeness with the larger faculty at their respective sites. The ability to both seek out and achieve, successfully, one to one and group peer support is quite potentially assisted and met with greater success due to the comfort and ease the faculty have with each other. This may be harder to achieve and/or less true for larger faculties and school settings wherein the staff do not have the same kind of relationships. With the dominance of peer support/sharing and collaboration, and one on one support by a specialist as the prevailing models of professional development cited by participants, the context lends itself to developing these relationships and models and is significant to note.
Despite the lack of teacher participants placing the context in their conversations, the context was notably present even in its absence. The narrative of each participant is rooted in their school setting context, both consciously and unconsciously. Whether they are aware of it or not, this context influences their experiences with technology integration continuously, from the very basic level of simply providing a given set of circumstances and setting for their experiences, to more complex relationship and community based circumstances.

Implications and Recommendations for Practice

The findings of this research study create distinct implications and recommendations for practice in order to successfully integrate technology in an elementary education setting.

**Design of the technology integration initiative.** When a technology integration initiative is being planned, it is crucial to consider professional development and support for teachers as an integral part of the process. Beyond securing funding and identifying the appropriate technology, administration/leadership needs to ensure that teachers have the necessary training and support for success. Support for teachers should begin before the technology is brought into the classrooms. Confronting teachers with such a large task with limited time before students arrive is understandably likely to encounter resistance. Giving teachers adequate time to be supported in the initiative and plan appropriately will allow for a greater chance of success. Even more, bringing teachers into the planning of the initiative and giving them responsibility in the process is ideal. Teachers are the ones with the ultimate “front line” duty of integrating technology; it makes sense to involve them in all aspects of the initiative, and plan for their ongoing support. Attention to the full picture is essential, and teachers are part of that picture.
**Content of professional development.** Just as planning for the inclusion of teacher preparation and support is important, content of professional development is key. The literature is clear that the content of professional development for technology integration must include significantly more than how to physically operate technology; it must address the pedagogical change and impact of integration. (Bingimlas (2009); Buckenmeyer (2010); Clark (1999); Ertmer & Ottenbreit-Leftwich (2010); Hixon & Buckenmeyer (2009); Koehler & Mishra (2005); and Overbay, Mollette, & Vasu (2011))

Concurrent with the findings in this research study, both digital immigrant and digital native teachers need professional development addressing pedagogical change. Despite a greater fluency with technology, digital native teachers still require training in how to teach with technology. Being able to use the technology for yourself is different than being able to teach others with technology, and more importantly, it is different than being able to teach others *how* to use that technology appropriately. Professional development must address that issue for both digital immigrant and digital native teachers.

**Models of professional development.** This research and the literature have discussed what professional development must be. Now the discussion turns to how professional development is effectively delivered. Content must be relevant to the teachers, fitting their experience and stage of adoption (Barnett, 2003). This advocates for the individualization of professional development. Achieving this individualization is easier said than done. There are models, however, that support and enable this individualization within reasonable measures. These are also the models that the study participants identified as most advantageous; mentoring and peer sharing.
Furnishing teachers with a mentor (with appropriate qualifications and abilities related to successful technology integration in an elementary education setting) creates an individualized, relevant professional development and support experience. By engaging in a one on one mentoring relationship, teachers are afforded the ability to receive instruction, guidance, and support for integration that is relevant to their specific needs and current abilities. The mentor would ideally be retained as the technology expert/specialist for the school. Having a single designated person, or department, that has the sole responsibility of heading the technology integration initiative and teacher support would indeed be extremely valuable. In the absence of that ability, whether due to funding, qualified candidates, or other obstacles, appointing a mentor with adequate time to support the teacher(s) in question is a manageable compromise.

Peer sharing is another successful model of teacher support. As teachers begin integrating technology, peer sharing is an indispensable method to benefit from the collective experience and wisdom of others. Teachers informally create opportunities in their own schools, with their colleagues, and in other venues. Talking to someone who has similar goals and discussing their experiences, methods, and abilities allows a teacher to consider how that may be applicable to their situation. Discussing fears, concerns, burdens, and overall feelings with a peer provides teachers the chance to have an honest and safe conversation without the intimidation of confiding in a supervisor or other administrator.

While teachers do informally seek their own opportunities to share, the research clearly indicates that this peer sharing is valuable. Creating formal times for this peer sharing would enrich the development of teachers’ experiences and positively enhance their integration efforts. Setting aside specific time and space for peer sharing is highly recommended. This allows for genuine professional development that is relevant and beneficial to teachers, with or without the
guidance of a designated expert. The ideal composition of a peer sharing group, which is truly in essence a PLC or CoP, is a small group of four to six teachers involved in compatible integration initiatives, with a balance of more and less skilled practitioners. By creating a balance of skill and ability levels, both groups of teachers have the capability to achieve professional growth. If all practitioners are at similar levels, the support is still valuable in part but lacks the motivation and knowledge of increased learning. If a single member of the group is more highly skilled, then they are placing themselves without support and are solely acting as a guide and expert.

Observation was also mentioned by several teachers as it allowed them to watch technology integration in action. Structuring opportunities for teachers to go observe other practitioners will provide another strong level of support.

Through a combination of professional development approaches, teachers can be provided strong training and support and achieve greater success with technology integration initiatives. While these models are recommended based on the research data and supported in the literature, it is important to remember that the professional development must fit the teacher.

Teacher pre-service training. Current pre-service teacher preparation programs should evaluate their curriculum to ensure that technology integration from a pedagogical standpoint is included. If this pedagogical issue can be addressed during pre-service, it will lessen the barriers to successful technology integration once a teacher begins service.

Personal implications for practice. Implications for practice highly applicable for the researcher were also identified. Given the researcher’s role in directing a Jewish education program (for lifelong learning), there are several implications that are directly applicable. First and foremost, when considering the technology integration initiative that the researcher will be designing and guiding, the involvement of the teachers will be paramount. With teachers that are
less than half-time, the researcher was previously considering their involvement at a later stage. As a direct result of this research, however, their involvement will begin immediately with the preliminary conversations and planning. Further, the importance of designing ongoing professional development has been made clear through this research. The researcher will be building in time for both individual/small group meetings with teachers to discuss their practical integration issues, as well as providing time for peer to peer support. Finally, the researcher will be assessing and discussing the teacher’s barriers to integration and addressing them both in the design and implementation of the technology integration initiative.

**Recommendations for Future Research**

There are several possibilities for future research that could build upon the findings of this current research study.

1. Because this study involved an intimate participant pool, future studies could expand with an increased participant pool. With an increased participant pool a future study could produce more generalizable findings.

2. This study involved two independent Jewish elementary schools. Future studies could use a larger number of sites, including other independent schools and/or public schools. The expansion of sites would allow for exploration of the impact of institutional level barriers and their effect on professional development needs of teachers, as well as potential effect on models of professional development teachers report as beneficial.

3. Future studies could follow teachers’ integration as they experience ongoing professional development and support. Investigating how ongoing professional development directly impacts technology integration would allow for formation of stronger professional development experiences.
4. The impact of professional development on student achievement and engagement could be a future study. There is ample literature substantiating the link between technology and student achievement; exploring whether meaningful professional development for teachers directly impacts student achievement and engagement could provide meaningful insight.

5. Teachers do not exist in isolation. This study only involved teacher participants. Future studies could involve the administrative/leadership perspective and their experiences with professional development. The correlation between the administration’s professional development experiences and those that they offer/arrange for their staff would be interesting to explore.

6. Further research and study into the efficacy of professional development could include a follow-up with long established PLCs, evaluation of the integration of newer technology by teachers that have effectively integrated older technology and a study on the integration of technology by new in-service teachers after a strong pedagogical focus on technology integration in pre-service training.

**Areas of Study Vulnerability and Limitations**

Every effort was taken to maintain the integrity of the research study. Areas of vulnerability and limitations of this study include:

1. This study involved an intimate participant pool. The goal was to have two digital natives and two digital immigrants from each study site, for a total of eight participants. In actuality, only six participants were involved.

2. Of the six participants, two were digital natives. While this does give valid and important data, it does not give equal representation of digital natives.
3. Because of the intimate participant pool and context of independent Jewish elementary schools, the generalizability of the findings may be limited. Teacher professional development needs for technology integration has the potential to be similar in other contexts and for other ages, but this study does not contain a broad enough participant pool to substantiate that fully.

4. Transferability may be limited due to the saturation of technology available in the two research sites. The researcher recognizes that not all schools have equal access to an overabundance of technology and acknowledges this may impact transferability.

5. The researcher put significant effort into maintaining confidentiality during research and reporting. Due to the relatively small size of the Jewish educational community, it is possible that the sites and/or the teachers would be identifiable with effort.

6. One final area of vulnerability is researcher bias. The researcher identified and recognized areas of potential bias in the positionality statement and worked to avoid bias during data analysis and reporting. The researcher chose this topic due to personal interest and experience, specifically with the goal of identifying useful information. Using a peer reviewer to substantiate the findings helped avoid the researcher’s personal bias from affecting the research.

**Conclusion**

Technology in education is met with increased funding and attention, creating a need for teachers to integrate technology into their curriculum and teaching. In order to do that, teachers require professional development training and support.
This research study aimed to examine the potentially divergent professional development needs of digital immigrant and digital native teachers for the successful integration of technology in a Jewish elementary education setting. Differentiating teachers using two categories, digital immigrants and digital natives, allowed the researcher to meaningfully explore any divergence in their professional development needs.

A secondary goal was to identify professional development models/supports that teachers labeled as most beneficial and successful. By generating recommendations based on actual teacher input, stronger consideration might be given to those models as a starting point in order to best support teachers when planning technology integration initiatives.

Using a qualitative case study approach, the researcher explored teachers’ experience with their Jewish elementary education setting’s technology integration initiatives, previous and current professional development, and their feelings regarding their overall preparation and readiness for successful technology integration.

Digital native teachers were not found to have significantly different professional development needs than their digital immigrant counterparts. While there was some minor divergence in their needs when it came to technical abilities to physically operate and use the technology, the significant finding was that both teacher participant groups needed similar professional development regarding the pedagogical implications of integrating technology successfully.

The professional development models that the teacher participants identified as most beneficialuccessful were mentoring and peer sharing. The most significant characteristics identified were that the professional development/support be delivered in a one to one format and that it be ongoing. Both the digital native and the digital immigrant teacher participants identified
these professional development/support models and characteristics as most beneficial and successful for them.

The research study findings were consistent with the current literature on the subjects involved. Overall, the researcher was able to identify several recommendations for future study as well as implications for practice.
References


Appendix A

Recruitment E-mail to Potential Participants

Recruitment e-mail sent to possible teacher participants, contents below:

Dear Teachers,

My name is Anna Salomon and I am a doctoral student at Northeastern University. As part of my degree requirements, I am conducting research for my thesis entitled *Exploring Professional Development Needs of Digital Immigrant and Digital Native Teachers for the Successful Integration of Technology in a Jewish Elementary Education Setting*.

You have been identified as a potential participant in a research study. The purpose of this research study is to examine the different needs that digital immigrant and digital native teachers have in order to successfully integrate technology in a Jewish elementary school setting. The study will also look at particular models of professional development you have experienced and found to be most beneficial.

Your participation is entirely voluntary.

If you decide to take part in this study, you will be asked to complete one short demographic questionnaire (attached), participate in one telephone/Skype/Google Hangout interview (lasting approximately one and a half hours), and share any relevant documents or individual lesson plans pertaining to your technology integration initiatives and professional development you have received or participated in. All information will be kept strictly confidential and you will
not be identified in the study. You will receive a $15 Amazon gift card at the conclusion of the study provided you have completed all parts of the study.

All participants must disclose their age and other demographic information for background purposes, self-identify as a digital immigrant or digital native teacher, and either be currently employed or have been employed in the past year in an elementary education setting with the obligation to integrate technology into your classroom curriculum. Additionally, you must have participated in some form of professional development in the past three years.

If you would like to participate or learn more about the research study, please continue to the survey to see if you are a qualified participant. If you have any questions, please contact Anna Salomon (salomon.a@husky.neu.edu or 504-202-7981).
Appendix B

Informed Consent

Unsigned Informed Consent Document

Northeastern University

Anna Salomon, Student Investigator: Kelly Conn, Principal Investigator

Exploring Professional Development Needs of Digital Immigrant and Digital Native Teachers for the Successful Integration of Technology in a Jewish Elementary Education Setting

Informed Consent to Participate in a Research Study

You are invited to take part in a research study. This form will tell you about the study, but the researcher will explain it to you first. You may ask this person any questions that you have. When you are ready to make a decision, you may tell the researcher if you want to participate or not. You do not have to participate if you do not want to. If you decide to participate, the researcher will ask you to verbally consent.

Why am I being asked to take part in this research study?

You are being asked to participate because you are an elementary educator taking part in a technology integration initiative in your school. Participants self-identify as either digital immigrants or digital natives for the purposes of this study.

Why is this research study being done?

The purpose of this research is to examine the different needs that digital immigrant and digital native teachers have in order to successfully integrate technology in an elementary school
setting. The study will also look at particular models of professional development you have experienced and found to be most beneficial.

**What will I be asked to do?**

If you decide to take part in this study, you will be asked to participate in one interview and share documents or lesson plans pertaining to your technology integration initiatives and professional development you have received or participated in. You will also be given the opportunity to review your interview transcript for accuracy.

**Where will this take place and how much of my time will it take?**

One interview will be conducted via recorded phone conversation, Skype, or Google Hangout. The interview will last about one to one and a half hours each. The sharing of documents or lesson plans pertaining to your technology integration initiatives and professional development you have received or participated in will be done via e-mail or mail. Any cost for copies or mailing documents is not reimbursed by the researcher. All documents must have student and institutional identifiers removed. It is possible that there may be follow up questions once the interview and document collection is over. The follow up will be scheduled at your convenience and kept to a shorter time frame.

**Will there be any risk or discomfort to me?**

There is extremely minimal risk in participating in this research study. Because you will be sharing information that is private, confidentiality will be maintained through the use of pseudonyms and the removal of identifying information in your documents. There is an
extremely minimal (and unlikely) risk that in some way you or your school site will be identified and that research data could be viewed as negative. This research will not use names or identifying information, and does not aim to share profiles of schools and/or teachers in a way that will reflect negatively on practices.

Will I benefit by being in this research?

There is no direct benefit to you for taking part in the study. However, the information learned from this study may help school leaders and teachers advocate for appropriate professional development experiences appropriate to the needs of digital immigrant and digital native teachers.

Who will see the information about me?

Your part in this study will be confidential. Only the researcher on this study will see the information about you. No reports or publications will use information that can identify you in any way. In all documentation (including interview transcripts) you will be given an alias, as will your school. Recording of Skype or Google Hangout sessions will be accomplished using the software add-on called easyVoipRecorder. This software allows for audio to be recorded and captured as an MP3 for later transcription by a professional transcription service (Rev) with a signed non-disclosure agreement. Recordings will be kept in a password-protected file, labeled using only aliases and the date obtained. Transcripts will be kept confidential at all times. Any documentation collected will be accepted via mail or e-mail and kept confidential using assigned aliases. No tracking information (e-mail addresses, IP addresses, etc.) will be revealed in the documentation collection or analyzing processes. All documents will be kept in a password-
protected file on the researchers personal computer, which is also password protected. Any physically collected data will be kept in a locked file cabinet in the researcher’s personal home office. Notes and any documents that are not needed will be shredded to maintain confidentiality. All documents and data will be destroyed within seven years after final dissertation approval. Once data analysis is completed, a peer reviewer will be provided access to the data transcripts and subsequent coding and analysis. The peer reviewer will not share or disclose the information, and they will not have access to your identity – only your alias.

In rare instances, authorized people may request to see research information about you and other people in this study. This is done only to be sure that the research is done properly. We would only permit people who are authorized by organizations such as the Northeastern University Institutional Review Board to see this information.

**What will happen if I suffer any harm from this research?**

No special arrangements will be made for compensation or for payment for treatment solely because of participation in this research.

**Can I stop my participation in this study?**

Your participation in this research is completely voluntary. You do not have to participate if you do not want to. Even if you begin the study, you may quit at any time. If you do not participate or if you decide to quit, you will not suffer any negative consequences.

**Who can I contact if I have questions or problems?**

The researcher, Anna Salomon, E-mail: salomon.a@husky.neu.edu or Phone: 504-202-7981.
Who can I contact about my rights as a participant?

Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University, Boston, MA 02115. Tel: 617.373.4588, Email: irb@neu.edu. You may call anonymously if you wish.

Will I be paid for my participation?

You will be given a $15 gift certificate to Amazon at the conclusion of this study, provided you completed the questionnaire and interview, and submitted appropriate documentation.

Will it cost me anything to participate?

There is no outright cost. Incidental costs may include copies, mailing, and internet and/or data charges. These costs are not reimbursed as part of the research study.

Is there anything else I need to know?

Additionally, you must have participated in some form of professional development in the past three years. I am a previous employee and a current doctoral colleague of the Head of School of one of the sites in the study; I have had professional interactions with the Head of School at the other site.

Do you consent to begin the interview?
Appendix C

Demographic Profile Questionnaire

This information will be obtained via in person visit, e-mail or postal mail, for all applicants to the research study.

What is your age?

How long you have been teaching?

Do you identify yourself as a digital immigrant or digital native*? Why?

What kind of personal exposure to technology have you had?

Professionally?

Tell me about your professional development experiences you’ve had in the past three years (positive, negative, why – what models, etc.)

Is there anything else you think would be helpful background information for me to know?

Thank you so much for this information.

If you are selected, the next step is the interview. That will be an in-depth look at the technology integration initiative in your school and your experience with it. It will last between 1-1.5 hours.

The document submission is relatively simple. I’d like copies of any documents/information you have regarding your schools’ technology integration initiative – what to do, when, meetings, etc.

The other thing(s) I’d like to see is a lesson plan or group of lesson plans you’ve used to integrate technology in your own classroom. You can submit the documents by e-mail or by mail – or a combination of the two. At the end of the process you will have the opportunity to review your transcripts for accuracy.
* Digital natives are defined as those born “into” technology; those that are growing up with technology a part of their everyday reality. Digital immigrants are those that are seeing the emergence of new technology and interacting with it later in their lives, having to adjust and adapt to the use and capabilities of that technology (Prensky, 2001, 2009). According to Prensky (2009) the designation of digital immigrant or digital native is an issue of age. Digital immigrants are those born before 1979 and digital natives born 1980 or later. For this research you can identify yourself as either according to age or to your experience and exposure to technology.
Appendix D

Interview Protocol

This information will be gathered via recorded Skype or Google Hangout interview. These questions are simply a guide and the interview will follow the participant’s flow. The goal is to obtain all of this information throughout the course of the discussion.

Thank you for agreeing to participate in this study. You have already signed the informed consent form. Do you have any questions? Do I have your permission to record this interview?

The recording has begun. For this interview, we will talk specifically about your schools’ technology integration initiative and your experience with it. The interview will take between 1 and 1.5 hours. Do you have any questions before we begin?

Great. Tell me a bit about yourself and your teaching experience.

Let’s start with the basics. Tell me about your schools’ technology integration initiative. (when it started, why, funding, what directions and goals there are, etc.)

When did you get involved (planning, when it started, certain amount of time into it, etc.)?

What is your role in this initiative?

What were your initial perceptions? Were your perceptions influenced by your colleagues?

Have your perceptions changed since the initiative began?

Thinking about the stages of adoption, where would you place yourself? These stages are: A – resistance to and lack of knowledge of technology; B – interest in technology and personal application/knowledge; C – use of technology as a supplemental instructional method; D – technology is an integral part of the instructional process; E – teachers begin to redefine teaching and learning as technology becomes a vital part of the classroom environment; and F – teachers
actively recognize and advocate for the integration of technology as a powerful instructional component (Hixon & Buckenmeyer, 2009).

What training have you had for this integration*? Support?
Do you feel equipped to integrate? Why or why not?
What has been most difficult? Easiest? Frustrating?
Do you integrate in your classroom? Share example (might have documents already, if so, now is a good time to discuss them or to request specific documents)
Has your previous experience (or lack thereof) with technology influenced your integration?
What support/training did/do you need to integrate? Ongoing/one-time/models
Is there anything else you think would be helpful information for me to know?
Thank you so much for this information. I’m going to stop the recording now and we will go over the logistics of the rest of your participation. RECORDING ENDS.
Documents, if not collected already, are discussed. Request for any follow up interviews as needed. $15 Amazon card sent via e-mail once documents are received and discussed.

*Integration, for purposes of this study, is defined as the curricular “infusion of technology as a tool to enhance the learning in a content area of multidisciplinary setting…. (Forum on Education Statistics, 2002)