Behind the Scenes: Understanding Teacher Perspectives on Technology Integration in a Suburban District Technology Initiative: A Dissertation

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BEHIND THE SCENES: UNDERSTANDING TEACHER
PERSPECTIVES ON TECHNOLOGY INTEGRATION
IN A SUBURBAN DISTRICT TECHNOLOGY INITIATIVE

A DISSERTATION
Submitted by
John Woolard

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Abstract

Efforts to prepare students with skills necessary to compete in a 21st Century global, digital economy require technological literacy, but many teachers are inhibited by antiquated models of education and epistemological beliefs that leave them reluctant to integrate educational technologies in their content instruction (Dunn & Rakes, 2010; Mouza & Wong, 2009). At the most basic level, apart from time constraints influenced by contradictory school improvement plans, elementary school teachers must contend with the barriers known to hinder the integration of information and communication technology (ICT) including: access, familiarity, training and support (Collins & Halverson, 2009, Levin & Wadmany, 2008). This case study consisted of face-to-face interviews with 10 elementary teachers and two elementary administrators who have seemingly overcome these established barriers, are actively using ICT in their personal life, but remain reluctant toward implementation in the classroom. Results from this study show that there was no connection between ICT integration and teachers high levels of ICT use in their personal life or between those who were born prior to or during the digital era. This is significant because it means that teachers’ pedagogical beliefs are influenced more by their own experiences and traditions than by the dominant culture that may influence their personal lives. It was also found that teachers’ epistemological perspectives are significant for shaping their attitudes toward integration as adult learners, and directly influence their perception of teaching and learning and their pedagogical practices. Understanding teachers’ cognition and epistemic beliefs is an important first step for planning professional development opportunities for technology integration and beyond. With many classroom teachers being familiar with ICT use for their personal
lives, training focuses should be less on the how-to and more on the integration of technology and the transformative process of teacher practice.
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Preface

When I applied to the PhD program at Lesley University I knew or thought that I knew what I was interested in studying for my doctoral research. It became apparent rather quickly, however, that there were significant gaps in the field of adult learning theory in regard to teachers’ integration of educational technologies in elementary education and in my own assumptions about adult education. My presuppositions of adult learning and development theory were initially clouded by my own learning experiences with teaching and learning as an elementary school teacher. This resulted in a generalization of the field, an expectation of finding a stagnant history of Adult Learning that resembled the little-changed system of educating children that many others and I know first-hand.

It did not take long for me to see that history did repeat itself, but it was not recursive the way I had anticipated. Instead of a mundane and redundant account of adult education, I discovered some interesting tenets of adult learning theory that transcended varied domains and influences that have shaped the field of adult learning. By examining the historical record of adult education I was able to observe theory develop through the varied milestones that marked changes over the decades. One of the more significant milestones was the Industrial Revolution. The industrial age disrupted previous forms of learning and proved significant because it mirrored today’s digital era and, with it, the idea that education must adapt to the changing needs and expectations of society.

What I ultimately discovered from this journey, comprised of research and reflection, is that education has certainly influenced adult learning, especially as it relates to technology’s role in adult learning programs.
Chapter I: Introduction

Efforts to prepare students with 21st Century technological skills are significant for life in a global, digital economy, but it is also a task that teachers contend is increasingly difficult for them to accomplish as adult learners and practitioners (Dunn & Rakes, 2010; Knowles, Holton, & Swanson, 2005; Kolb, 1983; Mouza & Wong, 2009; Tennant & Pogson, 2002). Research indicates that at the most basic level, apart from time constraints influenced by contradictory school improvement plans, elementary school teachers must first contend with the information and communication technology (ICT) integration barriers of access, familiarity, professional development and support (Chapman, Masters, & Pedulla, 2010; Christensen, Horn, & Johnson, 2008; Collins & Halverson, 2009; Selwyn, Potter & Cranmer, 2010). Hsu (2010), Glazer et al. (2009) and Levin and Wadmany (2008) are but a few who offer insight into the complexities of the technology barriers and factors that influence ICT use in educational settings. These concerns represent numerous challenges and are most often the focus of educators and professional developers when making purchasing decisions, planning workshops and training teachers (Collins & Halverson, 2009; Selwyn et al., 2010).

Though much of the research and attention focuses on the obstacles and limitations that prevent or impede teachers from effectively integrating ICT in their instruction, there has been little or no research that includes the perspectives of teachers who resist technology integration, even when these common barriers are absent.

Background/Context

Twenty-eight years ago David Kolb (1983) could not have anticipated the dramatic global economic change that occurred during the last decade when he said “as
tools of culture change, so too will the course of human development be altered” (p. 134). Today, Kolb’s words resonate with many, as life in 2011 is comprised of a complex, global economy where there is an increasing reliance on digital literacy and communication.

Subsequently, the ubiquity of technology in modern culture is quickly redefining the perception of knowledge and the context of how information and communication are both acquired and transmitted. Inherent in this digital revolution is an associated paradigmatic shift by many in the dominant society that assumes others have adopted this new way of thinking and are therefore digitally literate (Sawchuk, 2003; Selwyn, Goddard and Furlong 2006). By dominant society, I am referring to the pervasive school of thought and ideological underpinnings that often dictate societal norms in western culture. As technology proficiency is the pervasive modus operandi in 2011, without prerequisite technological skills, individuals face myriad obstacles at the most basic levels, including: furthering one’s education, working in entry-level positions, and attempting to stay abreast of news and information now disseminated through various digital platforms (Christensen et al., 2008; Collins & Halverson, 2009).

With such expectations for 21st Century learning have come best-practice educational rhetoric and calls for reform, as evidenced in the Enhancing Education Through Technology Act (EETT) (2002) or in President Obama’s recent Educate to Innovate campaign (2009). Despite these efforts and the influx of information and communication technology (ICT) including hardware, software, and access, including connectivity, change in the United States’ public education system over the past century is negligible, or resistant to modification (Christensen et al., 2008, Collins & Halverson,
2009; Gao, Wong, Choy, & Wu, 2010; Stubblefield & Keane, 1994; Svedberg, 2010). We know from the literature and empirical evidence from the National Council for Educational Statistics (NCES) and the U.S. Department of Education, that while attempting to catch up to the demands of expected technological proficiency for themselves and their students, many teachers find ICT integration difficult and challenging (Chapman et al., 2010; Schibeci et al., 2008). By integration\(^1\) I mean the active pursuit of authentic, student-centered learning experiences that incorporate various educational technologies to increase student engagement and achievement. Teachers may find ICT integration difficult because it requires an entirely new set of classroom instructional practices that are not representative of their experience as learners in teacher preparation programs. It may also be helpful to reference the 2008 International Society for Technology in Education (ISTE) National Education Standards for Teachers (NETS-T) that outline expectations for ICT integration that begins with the statement below and is followed by five core indicators,

Effective teachers model and apply the National Educational Technology Standards for Students (NETS•S) as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community.

While the expectations for digital literacy are not clearly articulated directly in the federal legislation, the 2007 National Education Technology Standards for Students (NETS-S) offers performance directives for teachers that include: “creativity and

\(^1\) There is common understanding in the literature regarding what constitutes an active pursuit of effective ICT integration strategies and these may include: teachers’ facilitation of student-centered learning, authentic real-world scenarios, and integrated curricula (Borthwick & Pierson, 2008; Chen, 2010; Collins & Halverson, 2009; Ottenbriet-Leftwich, Glazewski, Newby, & Ertmer, 2010; Plair, 2008).
innovation, research and information fluency, critical thinking, problem solving, digital citizenship, and technology concepts” (2007). Likewise, the 2009 National Education Technology Standards for Administrators (NETS-A) are performance guidelines school principals can utilize for increasing their own ICT integration and for promoting and supporting teaching and learning through technology among their staff.

The various ISTE NETS standards for students, teachers and administrators are helpful in refocusing educational efforts in a digital society and they are useful for determining how to facilitate this process. These standards have influenced current models of educational technology training that attempt to address relevant concerns that must be ameliorated, yet those who plan such learning experiences often do little to acknowledge how adults learn, the contextual relevance of the training or consider the affective concerns that may serve as tacit barriers to technology integration.

With a bleak economic forecast and strained education budget, large-scale teacher trainings are perceived as pragmatic solutions to many of today’s educational dilemmas. Such approaches are therefore large, one-size-fits-all, Band-Aids intended to address more complex issues. These professional development trainings are traditional objective-focused (how-to) methods of instruction that infrequently alter teacher behavior (Hsu, 2010; Levin & Wadany, 2008; MacDonald, 2008; Mouza & Wong, 2009; Sugar & Wilson, 2005).

Within such traditional theories of learning, where centuries old epistemologies reside, learning outcomes are fixed entities and not to be interpreted or influenced by the learner (Kolb, 1983). In other words, when training models operate with predetermined objectives, the adult learner becomes influenced by the experience, rather than creating
ownership of the experience and transforming it to be meaningful to her or his life (Brookfield, 2005; Cranton, 2006; Merriam, Caffarella, & Baumgartner, 2007; Mezirow, 2000; 2009; Tennant & Pogson, 2002). Regardless of efforts to mandate change or compliance, evidence shows that ensuring teachers’ access to technology, training, and support yields little change in the school culture, teacher behavior, or the education their elementary aged students receive (Borthwick & Pierson, 2008; Judson, 2006; Sugar & Wilson, 2005).

Teachers’ learning encounters represent a portion of the dilemma, but it is often their ontological positions (values about the worth or place of ICT in education), epistemological perspectives (learner-centered beliefs regarding the nature of knowledge and its construction), and axiological stances (beliefs and efficacy) that together are the underlying causes for their resistance to change (Brookfield, 1986, 2005; Illeris, 2009; Kegan & Lahey, 2009). This could be stated simply as, teachers often teach students the way they, themselves, were taught. In regard to professional development for ICT in education, each of these perspectives informs a teacher’s paradigm and may manifest in her or his willingness to adopt constructivist principles or adapt teaching practices to include the authentic integration of ICT (Borthwick & Pierson, 2008; Dunn & Rakes, 2010; Judson, 2006; Mouza & Wong, 2009; Schibeci et al., 2008; Sugar & Wilson, 2005). The constructivist paradigm is frequently associated with a progressive pedagogy and traces its roots the work theorists including Dewy and Piaget (Mertens, 2010; Nager & Shapiro, 2000; Zemelman, Daniels, & Hyde, 1998). From the constructivist perspective, information is not blindly accepted, but restructured and therefore recreated (constructed) in a way that is meaningful to the individual engaged in the learning
experience (Mertens, 2010; Zemelman et al., 1998). Therefore, when constructivist principles are defined in relation to technology in education, such presuppositions include: teachers’ beliefs as to how knowledge is acquired, how and where learning occurs, and a teacher’s limited personal engagement or familiarity with ICT (Borthwick & Pierson, 2008; Dunn & Rakes, 2010; Judson, 2006; Sugar & Wilson, 2005).

Operating through a constructivist lens, a teacher may adopt pedagogical practices that are student-centered, focus on authentic and real-world experiences that allow students to construct knowledge in social settings where the content is contextually relevant. In such environments, teachers, who often consider themselves facilitators and co-learners with students, do not claim to be the sole possessors of knowledge, but value the collective efforts of learners in the class who contribute to the construction of knowledge from their experiences.

Under the current educational system in the United States, teachers have lost a great deal of autonomy in how they guide students through the formative schooling years, yet they are faced with increased accountability measures for student achievement. Additional expectations for classroom teachers include differentiation for students that require special and gifted education, English language learners (ELL) and state and national assessments, primarily for upper elementary students, that must be supported by “research-based” programs and initiatives that target a particular segment of the student population (Chen, 2010; Selwyn et al., 2010).

Some may contend that clocks, textbooks, tests, and research-based methods of instruction are designed to ensure teachers have curricular knowledge, an ability to teach large numbers of students, and rigorous documentation of increased student learning. The
current educational system is struggling to train teachers to effectively integrate ICT in their content instruction with these 19th century teaching models that reinforce outmoded assumptions about learning (Chen, 2010; Christensen et al., 2008; Collins & Halverson, 2009; Plair, 2008; Sugar & Wilson, 2005). As Jones (1982) in Brookfield (1986) contends, leadership approaches like this, which are based on power and authority, do little more than “constrain and control rather than broaden and liberate” (p. 215). The result of following this methodology is that teachers are not prepared to integrate ICT in their instruction (Franklin, 2007; Plair, 2008). In addition, change is difficult when 69% of elementary teachers believe “the use of educational technology is adversely affected by competing priorities in the classroom” (NCES, 2010, p.18). For many teachers these conflicts are made manifest in high-stakes testing and accountability measures that monopolize much of the school year and are arguably enough incentive for resisting integration of ICT (Chen, 2010; Collins & Halverson, 2009; Hsu, 2010).

Early adopters and proponents of ICT in education, as well as the U.S. Department of Education, have argued that ensuring student-centered integration is often a matter of articulating expectations for teachers’ use of ICT, increasing teacher training through professional development, and providing equal access for high needs schools (Chen, 2010; Christensen et al., 2008; Collins & Halverson, 2009). Policy makers have supported student-centered ICT integration through such means as: The Enhancing Education through Technology Act of 2001, the International Society for Technology in Education (ISTE) National Education Technology Standards for Teachers (NETS-T), and procuring funds through Title I allocations (Chen, 2010; Christensen et al., 2008; Collins & Halverson, 2009; ISTE, 2010; United States General Accounting Office 2002). While
increasing teachers’ access to ICT and articulating expectations for its implementation may be relevant to the desired objectives and involve most stakeholders, I argue that such perspectives are neglectful and illusionary considering the current digital divide (disparities in digital literacy) and gaps in access as well (Chapman et al., 2010; Christensen et al., 2008; Collins & Halverson, 2009). This is a particularly important consideration for many disenfranchised students whose only opportunity to become digitally literate may occur during their time at school. The NCES (2009) reports that when students in more impoverished schools do receive instruction with educational technology, teachers’ technology use and support rank below those with lower concentrations of poverty (p. 3). These statistics become more profound as Mouza and Wong (2009), among others, argue that the most powerful professional learning for teachers’ use of technology, regardless of their teaching assignment, is embedded in classroom practice, yet most professional development models focus on how-to training (Borthwick & Pierson, 2008; Kotyk, 2010; Schibeci et al., 2008). The disconnect between professional development models of best practice versus a one-size-fits-all approach becomes more problematic because such practices are focused on formal leadership and fail to authentically situate the learning in a way that promotes a shared vision within a school (Leonard & Leonard, 2006).

The fact remains for many classroom teachers that “the world we live in today is much different from the world our minds evolved in” (Conan, 2010). As one considers the risk of repeating past failures with current models of teacher training, proponents of ICT integration in elementary education must understand that technology in isolation is insufficient for igniting sustainable change (Glazer et al., 2009; Schibeci et al., 2008;
Sugar & Wilson, 2005). It was perhaps Kegan (in Illeris, 2009) who articulated it best, when he said, it is “not what we know, but our way of knowing” (p. 44) that is most significant. So, in order to reach teachers, trainers must understand how adults learn and how to support these teacher-learners in their development.

**Research Statement and Question**

In an effort to better understand the complexity of teachers’ diverse experiences with the integration of information and communication technology (ICT) in elementary school classrooms, I engaged in research that led to a better understanding of teachers’ perceptions of ICT, its role in instruction, and the teachers’ associated concerns regarding implementation. My research question was,

*Why are teachers reluctant to integrate information and communication technology when the established barriers of access, familiarity, professional development, and support are seemingly absent?*

Additional questions I had for my research were:

1. *In what ways do teachers perceive ICT use in personal life as preparation for curricular integration?*
2. *In what ways do teachers perceive technology-focused professional development as preparation for integration of ICT in instructional content?*
3. *In what ways do teachers perceive accountability and administrative expectations of ICT integration as determining factors for implementation?*
4. *In what ways does teachers’ perception, including attitudes and beliefs, influence their integration of ICT?*
5. *What additional barriers to ICT integration in elementary education do teachers perceive?*

**Purpose**

The purpose of this study is to better understand the perspectives of representative K-5 elementary school teachers whose district appears to have eliminated the common barriers to ICT integration, but where teachers are still reluctant to implement educational technologies in their instructional practice. It is for this reason that I have situated these case studies contextually in an elementary school and an intermediate school in a suburban school district where there would not be overtly apparent barriers toward ICT integration.

Although the literature provides extensive inquiries into the established barriers that inhibit ICT integration, there is a gap in the understanding of teacher perspectives when these known barriers are removed. Therefore, it is imperative that studies, such as this, occur so we can hear first-hand, why teachers seem reluctant to integrate ICT and the obstacles they perceive as most influential for lasting change.

**Theoretical Framework**

This research study finds its genesis in my experiences as an elementary school teacher and my endeavor to align classroom instruction with what is available in the technology-rich, global culture that operates outside the four walls of the classroom. To better serve my students and myself in this manner, I received a graduate degree in technology in education, a program designed for classroom teachers. Both my graduate experience and my role as an educator inform my desire to better understand ways that elementary teachers respond to continued exposure to various forms of technology.
professional development designed to transform their teaching practices.

In a 2009 report by the National Council for Educational Statistics (NCES), 58% of school districts receiving technology professional development indicated teachers’ lack of preparedness to effectively integrate ICT with classroom instruction. Similarly, in a 2010 survey of elementary school teachers’ attitudes, beliefs and integration of ICT, I found that teacher perception, constructivist pedagogy and learner-centered beliefs were not indicative of effective implementation of ICT in elementary education (Woolard, 2010). Though my research did not include observation of teacher practice like that of Sugar and Wilson (2005) or Judson (2006), it did support their findings and evidenced a lack of connection between a teacher’s self-reporting of constructivist pedagogy with effective integration of ICT. Additional evidence by the NCES (2000, 2002, 2005), as reported by Franklin (2007), indicates that only one third of elementary teachers in the U.S. perceived themselves as prepared to integrate ICT (p. 268).

My experiences in elementary education provide me with a unique perspective into many teachers’ classrooms and I find evidence regularly in support of the empirical research that illustrates the minimal integration of ICT that occurs. This qualitative study provides a venue for getting to the core of the individual and collective experiences of elementary teachers who have years of experience with a district-wide technology initiative.

To better understand my position it is helpful to refer to Kolb (1983) who posits that it is the dialectically opposed operations of concrete experiences/abstract conceptualization and reflective observation/active experimentation where learning occurs. The connection to teacher training therefore resides in application of adult
learning principles and begins by situating the individual learner in the context of the experience (Brookfield, 1986, 2005; Cranton, 2006; Knowles et al., 2005; Mezirow, 2000). In these situations, adult learners (teachers) socially construct knowledge by engaging in the experience, discourse, on-going reflection and experimentation of concepts in new and authentic settings (Brookfield, 1986; Cranton, 2006; Kolb, 1983; Mezirow, 2000, 2009). When teachers are empowered with autonomy and free to challenge assumptions and beliefs through an interpretive process, they begin trying on new ideas in order to transform praxis (Brookfield, 1986, 2005; Cranton, 2006; Kolb, 1983; Merriam et al., 2007; Mezirow, 2000, 2009; Tennant & Pogson, 2002).

**Significance of the Study**

If teachers are arguably unprepared or resistant to the integration of ICT in elementary education, then my quest was to understand the underlying reasons for their reluctance through their lived experiences. Whether the gap is real or perceived, there is a digital division that exists between teacher who integrate ICT in their content instruction and those who do not. My research addressed many of the questions regarding what influences a teacher’s integration efforts and what models of professional development or learning environments best support such practices. Consistent with the research on ICT integration that I have articulated previously (Woolard, 2010), there is little associated transference or influence of either technology use in teachers’ personal life or technology professional development to teachers’ integration of ICT in their content instruction. This understanding is significant because of its influence on our understanding of adult learning and the associated research efforts needed for improving methods for preparing teachers for technology integration.
A growing body of research suggests that lasting change is often not realized because, while elementary school teachers are expected to implement ICT in their classroom instruction, the learning they experience themselves in this regard, are not situated contextually (Dunn & Rakes, 2010; Glazer et al., 2009; Judson, 2006; MacDonald, 2008; Mauza & Wong, 2009; Schibeci et al., 2008; Sugar & Wilson, 2005). This research adds to the existing body of knowledge for both adult learning theory and development and is therefore likely to resonate with my colleagues in colleges and universities, with readers of educational journals, educational stakeholders in district and school professional development and in the economic sector that employees students matriculating through formal schooling.

What I do suggest, however, is a need to acknowledge the danger of neglecting the introduction of ICT at the formative, stages, particularly in elementary schools, when young children are impressionable, and where many life-long learning skills are developed (Chen, 2010; Collins & Halverson, 2009). It is important to point out here that never in recorded history was there a time when true equality existed and I do not purport it will come during the digital revolution or with the advancement of future technologies (Stubblefield & Keane, 1994).

The idea behind the study is that learning and experience are interactive and without the ability to build on previous experiences and prior knowledge, the self-empowerment efforts of these individuals remain stagnant (Usher in Illeris, 2009). Robin Usher (Usher in Illeris, 2009) expounds on a similar issue as a matter of personal autonomy and social empowerment, whereby adults choose to work with like-minded peers and offer one another a supportive network. Teachers, therefore, need learning
opportunities and novel experiences where they may relate pedagogy and social practice with experiential learning and postmodern perspectives.

The challenge arises with adult learners in the 21st Century who can learn a new language, calculus, organic chemistry, to play any instrument, manipulate video, sew, build, design, sell, and create new technologies and do it all with the aid of untrained “instructors” when and where they choose. The scaffolding still exists, though informally, as the adult moves in and out of practice at will until he or she has learned the skill or task. It is, however, the social context at work in all situations.

The social context of adult learning and the theories that lead educators of adults are likely to look different in the coming decade. I believe, however, that the new theories of adult learning will remain true to the basic tenets that have characterize adult learners for centuries: adults want to understand why they are learning; they have a desire to learn; experience is significant; adult learning is social and takes place inside and outside formal institutions.
CHAPTER II: REVIEW OF LITERATURE

In a qualitative research study such as this, it is helpful to consider that there are various domains at work in an individual’s life that inform her or his teaching practice and ultimately the degree to which these adults integrate ICT in their instructional content. It was for this reason that I structured the review of the literature to highlight each of the domains that are integral, as educational change factors, to this study. The three primary focal areas are adult learning theories, leadership and the correspondence between the two. By focusing on the separate change factors and then the gestalt of teacher practice that is informed by the correspondence of the two separate domains, there is an opportunity to better understand the situational context of adult learners whose primary role is that of an elementary education classroom teacher.

Despite the increase in socio-cultural awareness and the technological advancements that pervade the 21st century, a mass delivery model for educating youth or adults has changed little since Horace Mann’s mass schooling efforts of the 19th century (Christensen et al., 2008; Collins & Halverson, 2009; Stubblefield & Keane, 1994). Models of professional development experiences in this paradigmatic framework become problematic when used for preparing elementary school teachers to use information and communication technologies (ICT) effectively in their classroom instruction (Mouza & Wong, 2009, Plair, 2008; Schibeci et al., 2008). Though much of the research and attention focuses on the obstacles and limitations that prevent or impede teachers from effectively integrating ICT in their instruction, little is known about the perspectives of teachers reluctant to implement technology when these common barriers are absent.
From this researcher’s perspective, we cannot expect to change teacher behavior until we understand these perspectives and adjust our professional development accordingly.

The idea of Adult Learning has been around for centuries, yet it has garnered little attention in comparison to the education of young children in the history of American schooling. In recent years, however, the recognition of adults as a distinct population of learners has become increasingly more apparent (Borthwick & Pierson, 2008; Brookfield, 2005). The following review of the literature examines elementary teachers as adult learners through the lens of technology integration. This distinct population of learners and practitioners is significant for preparing young children for life in a digital society and represents a gap in the adult education literature.

With the identification of the Adult Learner came the task for theorists to determine how best to meet the specific needs and expectations of the adult population. One of the tenants of adult learning theory is to consider adult learners’ prior knowledge and experience while valuing their contributions to the learning opportunity. Before proceeding, however, I think it is imperative at this point to examine the historical roots of education and its earliest influences so as to better understand where adult education is today considering that the overwhelming majority of educators are female, and the relevance of this to the population of teachers used for this research (Christensen et al., 2008).

According to Walter Ong (in Collins and Halverson, 2009), true “study” of the type that adult learners today have, was not feasible prior to the invention of printed text. Knowledge, after the printing press, however, was no longer saved for the elite few, but diffused to the masses, marking a dramatic shift to a literate society (2009). Despite the
ability of printed text to distribute knowledge to a greater number of adults (learners), the field of access remained small due to the targeted vernacular of the dominant culture driven in large part by the religious sector of that time (Stubblefield & Keane, 1994). In other words, religion restricted access of printed texts. Therefore, as learning became accessible to more adults than it had before, there were other subordinate groups and cultures that were further disenfranchised by these advancements.

Over the course of the next century, as printing enterprises became more efficient and more varied texts were printed and distributed, adults extended their learning practices beyond that of the Bible and into other areas of personal interest and specializations. As the ability to produce information grew, so too did the diffusion of information; reaching more and more people. Not unlike the social networks in today’s modern era, social, cultural and political news became commonplace and soon fostered networks of like-minded individuals who could learn and connect with a broader population beyond their immediate community (Collins, 2009; Stubblefield & Keane, 1994).

While compounding information spilled over into the existing culture and workers found new learning opportunities, adults continued the practice of teaching and learning new trades primarily through an apprenticeship model that entailed being trained by a skilled worker in a particular trade. Quite different from today’s formal schooling efforts, learning additional skills, in the traditional textbook sense, was secondary and dependent on the need of the particular trade being learned. Skills and knowledge that were needed to operate successfully in a particular trade were embedded in the apprenticeship model; not separate and apart. This trend persisted until the mid 1800s and the emergence of the
Industrial Revolution when an influx of immigrants, knowledge, and technological innovations called for a change in the way information was disseminated and skills assimilated (Cvetello in Wilen-Daugenti, 2008; Collins & Halverson, 2009; Sawchuck, 2003; Stubblefield & Keane, 1994). The shifting economy, industry and culture required that the learning paradigm also change. From this point forward it is evident that adult education was shifting toward a situated approach with an objective of preparing people for factory work in an industrial society.

Collins and Halverson (2009) posit that an assimilation of immigrants’ cultural and social identity resulted from Mann’s attempts to streamline education. Adult learning was highly influenced by Mann’s attempt to further universalize student learning, as evidenced in the creation of the first teacher preparatory school in 1839 (Collins & Halverson, 2009; Stubblefield & Keane, 1994). This teacher preparatory school marked a significant change in the educational system and in formal adult education for women. Women would be paid less than men, thus reducing the cost of school expansion, but it would also provide a platform for women to increase their skills, social experiences, and entrepreneurial enterprises (Christensen et al., 2008; Collins & Halverson, 2009; Stubblefield & Keane, 1994).

The changing nature of the United States and teacher preparation also changed the expectations for educating the public with all of the information and skills required for new industries that were arriving with the Industrial Revolution. Textbooks, tests, accountability, and distribution of information were established to insure that teachers, now mostly women, were able to learn the content, teach it to large numbers of students, and ensure that the students were learning the material. Coverage of large bodies of
information became possible as class sizes were increased and the pragmatic one-size fits all mantra was capitalized (Christensen et al., 2008; Collins & Halverson, 2009; Stubblefield & Keane, 1994).

It would not be but a few decades after Mann’s teacher prep school was initiated that other public universities were established to further learning for adults. In 1862 the Morrill Act was passed and the University of Michigan and Wisconsin were established under a land grant to promote the study of agriculture (Collins & Halverson, 2009). It was some 50 years later that the University of Wisconsin president fought for the rebirth of the antiquated lecturing format for the diffusion of knowledge in American institutions. Mann’s aspirations fell short of fruition due to the increased general knowledge of citizens, their social, cultural, and educative expectations and the demands they had for learning in their lives; a period not dissimilar to adults’ accessibility of knowledge in today’s society (Stubblefield & Keane, 1994).

The 20th century saw a significant development of new learning technologies, including: the use of the radio in the 30s and 40s (Cevetello in Wilen-Daugenti, 2008; Stubblefield & Keane, 1994), the television in the 50s and 60s (Cevetello in Wilen-Daugenti, 2008; Stubblefield & Keane, 1994), and in the form of film and learning through video, which became popular in the 1970s (Cevetello in Wilen-Daugenti, 2008). The introduction of film allowed learners and educators opportunities to approach content beyond the confines of text. It was also in this decade that correspondence courses provided opportunities for accessing information while being removed from the physical brick and mortar school (Cevetello in Wilen-Daugenti, 2008). It wasn’t until the 1980s, however, that learning with computers came to fruition (Cevetello in Wilen-Daugenti,
These new technologies had some localized success, but none offered the ready acceptance of the Internet (Sloman, 2002).

Adult education, prior to the industrial era occurred primarily in the context of informal learning situations. Though not always in novel situations, adults engaged in learning experiences that supported the demands and needs specific to the context of their social, economic, and cultural situations. (Cevetello in Wilen-Daugenti, 2008; Christensen et al., 2008; Collins & Halverson, 2009; Sawchuck, 2003; Stubblefield & Keane, 1994).

**Current Adult Education**

The struggle for making changes in education is not, however, a new enterprise and “those not in positions of power, classroom teachers, rarely decide what learning opportunities are offered. Teachers’ roles are historically limited to deciding whether to participate” (Merriam, Caffarella, & Baumgartner, 2007, p. 74). As Brookfield (1986), Merriam, Caffarella, and Baumgartner (2007) assert, the problem is the close adherence to older behaviorist orientations, like those of Thorndike, that influence current adult education programs and which are not adapting to our growing understanding of the adult learner and the attendant newer theories. As Kotyk (2010) and Plair (2008) assert, behaviorist-based teacher training serves as the dominant form of professional development. Further evidence is provided by Mouza & Wong (2009) who reference the National Center for Educational Evaluation and Regional Assistance (NCEE)(2007) report that most technology professional development experiences for teachers were on basic computer operations (p. 176); “how-to” style instruction that neither needs the teachers’ experience nor values their social context. While large-scale teacher trainings
may offer a pragmatic, one-size-fits-all approach, Sugar and Wilson (2005) echo many others, as well as myself, who find that this a traditional method of instruction infrequently alters teacher behavior (Hsu, 2010; Levin & Wadmany, 2008; MacDonald, 2008; Mouza & Wong, 2009).

In addition, for many teachers, high-stakes testing and accountability monopolize much of the school year and are enough incentive for resisting change (Chen, 2010; Collins, 2009; Kegan and Lahey, 2010; Thousand & Villa, 2010). Additional barriers include textbooks, tests, and research-based methods of instruction established to insure that teachers are able to learn the content, teach it to large numbers of students, and ensure that the students are learning the material (Chen, 2010; Christensen et al., 2008; Collins & Halverson 2009; Kotyk; 2010; Plair, 2008; Sugar & Wilson, 2005). As Jones (1982) in Brookfield (1986) contends, such an approach is intended to “constrain and control rather than broaden and liberate (p. 215).

At the most basic level, apart from time constraints influenced by contradictory school improvement plans, elementary school teachers must contend with ICT integration barriers of: infrastructure, access, familiarity, training and support to insure digital literacy for students (Chapman et al., 2010; Christensen et al, 2008; Collins & Halverson, 2009; Selwyn et al., 2010). Hsu (2010), Glazer et al. (2007), Levin and Wadmany (2008) are but a few who offer insight into the complexities of technology barriers and factors that influence ICT use in educational settings. These concerns represent numerous challenges and are most often the focus of educators and professional developers when making purchasing decisions, planning workshops and training teachers (Collins & Halverson, 2009; Selwyn et al., 2010). With current understandings of adult learning
and development, it is apparent that current methods for adult education neglect the individual needs of learners within groups (Brookfield, 1986; 2005; Freire, 1990; Merriam et al., 2007). Lacking culturally responsiveness, as Plair (2008) asserts, makes training illusive for teachers and provides further evidence that traditional “sit and get” models are not viable options for igniting social change (Borthwick & Pierson, 2008; Mouza & Wong, 2009; Sugar & Wilson, 2005).

**New Theories of Adult Learning**

Unabashedly, in the early 20th century Jerome Bruner, John Dewey, Malcolm Knowles, and Eduard Lineman, began to develop adult learning theories that characterized adults as having unique qualities and needs for learning. Some of the initial assumptions included: readiness, motivation, self-direction, and experience (Illeris, 2009; Knowles et al., 2005).

Malcolm Knowles, often hailed as the father of adult education, developed the theory of andragogy, highlighting the conditions that facilitate the success of adult learners. These theories are similar to Piaget’s constructivist pedagogy for young children, but were built on the work of Lindeman (1926) and include:

1. The need to know
2. The learner’s self-concept
3. The role of the learner’s experiences
4. Readiness to learn
5. Orientation to learning
6. Motivation

Eduard Lindeman saw adult education as more situational and not as subject oriented, and, like his predecessor John Dewey (1938), didn’t necessarily distinguish adult learning as different from the education of children, but focused on the process of
learning for adults as centering on the context of one’s life (Knowles et al., 2005). While there is contention regarding Knowles’ theory of andragogy as being incomplete (Sawchuk, 2003), his impact on adult learning theory is widespread in institutions of higher education.

Like Knowles, Jack Mezirow’s Transformative Learning theory acknowledges adults as individuals and assists them in the transformative process of learning (Mezirow, 2000, 2009). Mezirow (2000) helps to translate these ideas into more practical terms by distinguishing the differences between the goal of education and the objective of education. The goal of adult education, according to Mezirow (2000) is to assist adults in becoming more critically reflective as “dialogical thinkers” as they operate within social contexts. The objective, on the other hand, is to help adults accomplish what they’ve set out to do (i.e. meet their needs) (Mezirow, 2000). Therefore, if the purpose is to educate teachers, encourage them to take ownership in their learning, become critically aware of their practice, and continually reflect and reframe their thinking from previously held assumptions; then the focus should be more on the transformation of teachers’ habits of mind and not on “how-to” training for technology (Brookfield, 1986; 2005; Cranton, 2006; Merriam et al., 2007; Mezirow, 2000; 2009; Tennant & Pogson, 2002). Levin and Wadmany (2008) make clear the incompatibility that exists between the actions of education and the educational goals that must be remedied for lasting change to occur (p. 235).

According to Transformative Learning, adults undergo a transformation brought on by a disorienting dilemma. This is perhaps one of the most complex and emotionally charged tents of Transformative Learning requiring adult learners to undergo a shift in
their frame of reference; comprised of habits of mind and points of view (Mezirow, 2000). The paradigmatic shift often manifests itself in what is known as reflective discourse. It requires a great deal of emotional maturity as it occurs within the social context. In reflective discourse, adults articulate, examine, and criticize their underlying assumptions in order to engage with others for continued intellectual and ethical development in their adult years (Belenky, 2000). With western society’s mantra being one of independence and individuality, adult learners are infrequently afforded opportunities to develop or participate in a dialogue where there are no absolutes. Thinking globally has a different connotation as cultural norms, values, and belief, cross over one another at an ever-increasing rate. Kegan’s illustration, “Revised maps become outdated before the ink is dry” (1994), is evidence of the ever-changing world we inhabit and one that requires adult educators to examine their roles in preparing adult learners for participation in reflective discourse.

Paolo Freire, who inspired the work of Jack Mezirow, (Illeris, 2009) is best known for his work with impoverished laborers and illiterate rural groups in Brazil (Horton, 1990). Freire’s Critical Pedagogy theory, conscientization or “pedagogy of the oppressed” posits that learning is enmeshed within social practice (Horton, 1990; Sawchuk, 2003). According to Freire (1990) “…all of the disciplines are not isolated from social life.” (p 108). In this critical pedagogy, adult educators seek to empower marginalized populations of learners to overcome obvious inequalities, a practice often termed emancipatory education (Horton, 1990; Sawchuk, 2003). This theory, unlike many adult-learning theories, acknowledges and emphasizes situational or informal
learning experiences within the everyday lives of individuals (Horton, 1990; Sawchuk, 2003).

Allen Tough, another adult learning theorist, is best known for his “lasting change” extension of Knowles’ theory of andragogy and the self-direction of the individual within the social context of learning (Sawchuk, 2003). Tough, like Freire, asserted that learning in the workplace or everyday life of the individual was significant and produced a “lasting change” (Sawchuk, 2003). The implications for Tough’s research extend beyond the dominant ideology and into the social and cultural milieu where learning is situational and often self-directed (Sawchuk, 2003).

Brookfield (2005), Cranton (2006), and Mezirow (2000; 2009) describe the process of change teachers experience as they move through stages of learning and development as Transformative Learning theory. Cranton (2006) posits this theory includes the need of the learner to: experience a disorienting dilemma, undergo self-examination, explore new options, plan for action, and try out new roles (p. 20). As progressive models of professional development make noticeable efforts to include these newer adult learning and development theories in their practice, it may be argued that lasting change in teacher practice is often not realized because more is being asked of elementary school teachers than to simply implement ICT in their classroom or have their own learning situated contextually (Dunn & Rakes, 2010; Glazer et al., 2009; Judson, 2006; MacDonald, 2008; Mauza & Wong, 2008; Schibeci et al., 2008; Sugar & Wilson, 2005).

Though Selwyn, Goddard and Furlong (2006) suggests there is nothing new in adult learning in the information revolution, theorists from a variety of fields including
anthropology, education, psychology, and sociology are trying to better understand what
adult learning is and how it should be adapted to meet the changing needs of adults and
the fluctuating expectations of society. According to Borthwick and Pierson (2008), staff
developers and curriculum coordinators are beginning to acknowledge a need to focus on
the adult learner, while others are turning to Tennant’s and Pogson’s (2002) contention
that teachers’ varied assumptions and inherent expectations for learning influence their
perception of the overall purpose and goal of education. As a result, there is increased
attention in the literature for incorporating these more recent adult learning theory and
development concepts in ICT integration professional development in elementary
education (Borthwick & Pierson, 2008; Dunn, 2010; Kotyk, 2010; Levin & Wadmany,
2008; MacDonald, 2008; Merriam et al., 2007; Mouza & Wong, 2009; Onchwari,
Lawson-Body, & Keengwe, 2008; Plair, 2008; Schibeci et al., 2008; Snyder & Dillow,
2009; Stevenson, 2004). Changing adult learning programs and the long-held associated
theories, however, is a highly sensitive and contentious enterprise, particularly as the
acquisition of knowledge for adults becomes a commodification of sorts in postmodern
society and the equality gaps widen among previously marginalized groups (Brookfield,
2005; Sawchuk, 2003; Selwyn et al., 2006).

It was Kegan (in Illeris, 2009) who helped capture this salient issue when he says
it is “not what we know, but our way of knowing” (p. 44) that is most significant for
learning in adulthood. For Jarvis (2009), Kolb’s Experiential Learning model is but one
of the many psychological models of learning that are flawed because of the failure to
include the influence of learning within one’s social milieu (p. 22) (Illeris, 2009). Elkjaer
(2009) agrees with Jarvis (2009) arguing that Kolb’s focus is on the individual learner
and her or his perspective (p. 286). Elkjaer’s (2009) disagreement is toward the learning cycle stages in Kolb’s model, he claims are disconnected, specifically in regard to the learner’s action and cognition. By having a focus merely on epistemological perspectives, Elkjaer (2009) also contends that teachers of adult learner have difficulty using this model to capture the learner’s subjective experience (p. 75). Any adult learning theory, however, be it Knowles (2005), Kolb (1983) or from Mezirow’s (2000) Transformative Learning theory, is not immune to criticism. Hart (1990) in Sawchuk (2003), for example, suggests Mezirow’s ideals are lofty abstractions that lead to serious difficulties; while Sawchuk (2003) himself write of Mezirow’s application of Habermas’ influence as “selective and incomplete (p. 33). While none of these models of adult learning and development have yet reached full potential, it becomes clear that the adult learning theorists are more concerned about the learning than the training itself.

Contemporary theories of adult learning are challenging previously held assumptions about how adults learn, the environments in which they learn, and how one defines learning in adulthood. Now, nearly a century after adult education emerged on the mainstream consciousness, adult learning studies are gaining popularity and intense scrutiny. The field of Adult Learning has changed over the many decades since Knowles theory of andragogy was first introduced, but his contributions are no less significant. What has changed dramatically is the society, a digital era that Collins and Halverson (2009) term as the Information Revolution and Solman (2002) calls e-Learning Revolution, within which adult learners find themselves immersed in a global network infused with learning opportunities.
According to Clark (1993), effective research for implementing new instructional technologies begins with a question or problem to be studied. He believes that researchers often favor particular adult learning theories and manipulate their research to fit into that ideology. Like Clark, Peter Sawchuk (2003) is one academic who sees the implications of information revolution and challenges the acceptance and applicability of long-held adult learning theories. Some of the theorists with whom Sawchuk offers his contentions include: Freire, Knowles, Mezirow, and Tough.

Sawchuk’s (2003) argument around Knowles’ theory of andragogy is that it was acceptable in its time and place, but in today’s global society, it falls short of addressing the differences between the social positions of the teacher and student or extending learning beyond the confines of institutional or formalized learning. Despite Knowles, shortcomings, according to Sawchuk (2003), technology-laden adult learning programs provide the platform for today’s adult learners and match closely with his theory of andragogy (Knowles et al., 2005). In a similar manner, Sawchuk (2003) acknowledges the efforts of Paolo Freire’s Critical Pedagogy, whose roots are in social practice, but criticizes its failure to confront issues of the oppressed beyond the confines of educational endeavors. The same conclusion cannot be drawn, however, for formal adult learning programs for educators in the form of technology professional development.

As technology changes the face of American culture, it has arguably altered how adults learn, as well as their learning needs and expectations for learning. For a large portion of the population that has access to high-speed Internet connectivity, much of the learning that occurs takes place in social networks and would, therefore, be described by many as informal. It is a “just-in-time” or “just enough” expectation that adults have
grown accustomed to with the widespread access to information that is “just a click away” (Christensen et al., 2008; Collins & Halverson, 2009; Knowles et al., 2005; Moe & Cubb, 2009; Sawchuk, 2003; Selwyn et al., 2006).

At the time of Wilen-Daugenti’s (2008) publication, she reports that young adults are the ones who are determining the speed at which the technology grows and changes. Some of the figures she shares include: 83% of all U.S. households have Internet access, 270 million worldwide, MySpace, a social networking site, adds over 200,000 new accounts daily, YouTube has more than 6 million videos and is growing substantially every month, (2009). Collins and Halverson (2009) further suggest that computers are now as commonplace in American homes as microwaves. These statistics have increased significantly in the past several years, and now MySpace has all but been replaced by Facebook and Twitter, two prominent social networking sites for open and instant communication that are not restrained by geographic boundaries. According to Facebook’s (2011) Social Media Statistics, Twitter added 100 million users in the last year and continues this trend with an addition 15 million users added each month. These numbers may be staggering, but they are easily overshadowed by the 800 million Facebook users who have replaced the world’s largest search engine, Google, as the most visited Internet site (2012).

In the United States the popular term for this advancement of technology is IT or information technology. In Europe, however, the term information and communication technology (ICT) denotes the importance of the social context in which users participate. The difference may appear only semantic, but it offers significant insight into the social nature that the digital revolution has offered those who teach in today’s digital society.
Adults, being the primary users of the technology, rely more on technology for basic tasks and social networks of people to engage in inquiry, learning, and practice than they do on formal learning scenarios (2006).

Sawchuk (2003) posits that learning for the working class individual, which would include educators, looks remarkably different than the stereotypical adult learner described in a number of adult learning theories. It is his contention that learning in adulthood is primarily situational and centered around a particular epistemic milieu, which is commonly seen in grade level arrangements in elementary schools. Lave and Wegner (2009) took this idea further with a social theory, coining the term Community of Practice (COP), to denote how groups of individuals who share common interests and studies converge in the practice of facilitating learning as a social network. These networks of people mirror the daily interactions of family, lifestyle, culture, and workplaces where adults interact. Under social theory, learning in the workplace, is not unlike the communities of learning that existed prior to the Industrial Revolution in the apprenticeship model where knowledge could be socially constructed among peers (Selwyn et al., 2006; Wegner in Illeris 2009).

Wegner’s work in social theory is applicable and highly relevant in modern adult education. His assumptions about learning, like Freire’s and Engeström’s, regard the social context of learning and community as imperative components for adults to find meaning (Wegner in Illeris 2009). Learning, according to Wegner (2009), isn’t separated from the everyday experiences of adults, but rather embedded in the individual and community (Wegner in Illeris, 2009).
Activity theory and expansive learning is the work of Yrjö Engeström (2009), who suggests that learning occurs within a defined epistemic milieu that directs the learner through the process of learning from being a novice to becoming an expert. Like the apprenticeship model, Engeström focuses his theory on the social context of nonformal or informal learning situations that exist primarily in the workplace. Utilizing the social milieu within the context of learning, multiple voices are heard and experiences shared, which are inclusive of the individual’s culture and the larger society (Illeris, 2009; Sawchuck, 2002).

Brookfield’s (1986) contention is that the problem may find resolution in upholding the idea that “education must be distinguished from training” (p. 17). Titmus (1981) in Brookfield (1986) agrees and suggests that interdisciplinary approaches to learning should be the focus of adult education (p. 176).

According to Vavasseur (2008), one cause for this phenomenon is the majority of teachers’ professional development experiences are relegated to operational functions of ICT. Though Brookfield (1986) concludes that pre-determined professional development sessions are a major flaw in education, Webb and Cox (2004) in Schibeci et al. (2008) argue that focusing on adult learners’ values and beliefs are difficult and therefore seldom acknowledged. In search of a remedy, Matzen and Edmunds (2007) argue in favor of adopting a constructivist methodology for training, while Mouza and Wong (2009) believe it is the contextualized and situational learning orientation that ignite change and increase teacher efficacy (p. 177). In other words, if evoking change in teachers’ practice is the objective, then learning should be relevant and embedded contextually in classroom practice (Glazer, et al., 2009; Plair, 2008; Sugar & Wilson, 2005).
Juxtaposed to Kolb’s influence on ICT professional development, one framework responding to concerns over teachers’ effective implementation of ICT in elementary education development is the work of Mishra & Koehler (2006) known as technological, pedagogical and content technology (TPACK) (Hsu, 2010). Borthwick & Pierson, (2008), Hsu (2010), Kotyk (2010) are but a few ICT advocates speaking to the advantages of TPACK and calling for adult learning theory to inform effective learning experiences for teachers.

In the ideal TPACK framework for professional development, teacher training combines technological knowledge, pedagogical knowledge, and content knowledge through on-going, embedded professional development experiences with peers (Borthwick & Pierson, 2008; Mishra & Koehler, 2006; Levin & Wadmany, 2008; Mouza & Wong, 2009). TPACK, a situated, context-specific learning model, mirrors tenets of Kolb’s (1983) Experiential Learning Theory of Development suggesting that adults create knowledge through engagement with concrete experiences, reflective observation, abstract conceptualization, and active experimentation (p. 40). Kotyk (2010) concludes in her dissertation that these areas are what comprise successful models of professional development (p.21). Similarly, McKenzi (2002) in Schibeci et al. (2008) posits that training in the TPACK framework is intended to increase confidence and competence by focusing learning experiences on the individual and not on the technology training itself.

According to Angeli & Valandides (2009), the ideal TPACK framework for professional growth is teacher-centered, embedded and on going. McKenzi (2002) in Schibeci et al. (2008) says that TPACK is intended to increase confidence and competence by focusing learning experiences on the individual and not on the technology
training itself. A case development study by Mouza and Wong (2009) who used personal narratives of teachers participating in a graduate course, in the TPACK framework, documents such a transformation process.

**Current Problem**

Building community among teachers is important, yet many professional development models revert to an objective focus with numerous assumptions for one-size fits all mantra (Brookfield, 2005; Mezirow, 2000; 2009). Efforts then to ameliorate these experiences are further complicated when, out of convenience, program developers group learners by grade level, discipline, or area of specialization instead of taking time to consider individual learners and how knowledge is socially constructed (Brookfield, 1986; 2005; Dunn & Rakes, 2010; Mouza & Wong, 2009; Schibeci et al., 2008).

In regard to teachers’ lived experiences, it is important then to consider how one constructs knowledge and if the use of ICT were included in their schema development (mental patterns). If teachers’ previous learning experiences did not include interactions with ICT, then it is plausible that the ICT training relegated to “technology how-to” is misaligned individuals’ epistemological perspectives (Dunn & Rakes, 2010; Mouza & Wong). Tennant & Pogson (2002) may offer support for this presupposition, as they remind us that reframing one’s perspectives (habits of mind) is one of the more difficult tenets adult learners face. With this in mind, it would be worth investigating how ICT training fosters such a transformative process (Brookfield, 2005; Cranton, 2006; Glazer et al., 2009; Mezirow, 2000).
Influence of Leadership on Technology Integration

In the discussion of teachers’ reluctance toward ICT integration in elementary education, it is helpful consider the relationship between technology and leadership. This is perhaps most significant because we operate in a complex, global economy where an increasing reliance on digital literacy and communication has blurred geographic boundaries and fostered the growth of collaborative and context-specific networks of people (Ayman & Korabik, 2010; Kegan & Lahey, 2009; Selwyn et al., 2010; Zemblas & Iasonos, 2010). Ushered in with this e-Revolution are myriad opportunities for individuals to encounter others who possess diverse leadership styles and perspectives (Wilen-Daugenti, 2008; Jones & Rudd, 2008; Svedberg, 2010). It is in these experiences where individuals’ social milieu, culture, gender, ideology, and previous encounters with leadership, are said to influence their perception of the situation and subsequent response in the leadership experience (Ayman & Korabik, 2010; Gordon & Patterson, 2006; Kegan & Lahey, 2010).

Though there is clear evidence of a paradigmatic shift of leadership and focus on collaboration in the workplace, change in the United States’ public education system over the past century is negligible and some suggest even resistant to modification (Christensen et al., 2008, Collins & Halverson, 2009; Gao et al., 2010; Stubblefield & Keane, 1994; Svedberg, 2010). Many agree with Bass (1985) in Nguni, Sleegers, and Denessen (2006) who says that education’s “mainstreaming” of culture and gender issues are collective attempts of the dominant culture to maintain the status quo, a practice also known as transactional leadership, which I will discuss in more detail later (Christensen et al., 2008; Minnich, 2005; Moe & Chubb, 2009; Svedberg, 2010).
While Wen and Huang (2008) remind us that leadership is subjective, few would argue with Stone and Patterson (2005) who posit that many educational leaders operationalize schools in ways that mirror bureaucratic forms of industry that are no longer relevant in today’s society (p. 10). For others, including Heifetz (1994) and Sawchuk (2003), leadership that focuses on control and not adaptation (change with an educative focus), may further marginalize populations and/or manifest itself as a digital divide (a gap in basic technology skills) among adults (Selwyn et al., 2006, p. 20).

When today’s leaders are responsible for navigating their way through new leadership structures and styles that are at once unfamiliar, inclusive of diverse perspectives and dialogically opposed, the task becomes problematic when leaders think they can do it alone (Ayman & Korabik, 2010; Jones & Rudd, 2008). One of the major barriers to lasting educational change is the perception by many who perceive the sole responsibility for igniting change, ICT integration or increasing teacher commitment and job satisfaction resides with a school’s principal (Crippen, 2005; Gao et al., 2010; Stone & Patterson, 2005). Heck and Hallinger (1999) in Gordon & Patterson (2006) attribute this perspective of leadership as one of the four blind spots that impedes consensus in educational decision-making and in school reform efforts (p. 206).

While management style leadership perspectives were arguably effective at preparing people for factory work in the 1900’s, according to many, this assimilative model is not a viable option in today’s society for various reasons (Ayman & Korabik, 2010; Kegan & Lahey, 2009; Sawchuk, 2003; Selwyn et al., 2006; 2010, Zemblas & Iasonos, 2010). One reason this model is not appropriate as Svedberg (2010) asserts, is that by having a single expert or leader (principal) who makes all decisions (top-down),
the communicated message to others is that they have less authority and legitimacy in the decision making process (p. 424). While this is in stark contrast to the social inclusion leadership ideals espoused by Crippen (2005), Zemblas and Iasonos (2010), assimilative models of leadership represent a historically exclusive practice that has marginalized women and minorities (Ayman & Korabik, 2010, Brookfield, 2005, Heifetz, 1994; hooks, 1994; Minnich, 2005). The problem as Heifetz (1994) says is that “…we are not used to distinguishing between leadership and authority….“ (p. 184) and when that occurs, those in positions of power seek technical solutions to solve adaptive problems (Kegan & Lahey, 2009).

If a lack of socio-cultural awareness and ethnocentric perspective were not reason enough to dismiss traditional educational leadership practices, research in the field clearly shows that many educational leaders (principals) do not have the necessary digital literacy or the appropriate leadership perspectives to tackle the technological and social challenges enmeshed with empowering teachers to prepare their students for life in a digital society (Gao et al., 2010; Leonard & Leonard, 2006; Plair, 2008; Svedberg, 2010; Tondeur, Coopert, & Newhousetet, 2010).

While Mouza & Wong (2009) argue that the most powerful professional learning for teachers’ use of technology is embedded in classroom practice, most professional development models focus on how-to training (Borthwick & Pierson, 2008; Kotyk, 2010; Schibeci et al., 2008). According to Leonard & Leonard (2006) such practices are focused on formal leadership and fail to authentically situate the learning in a way that promotes a shared vision within a school.
If teachers are the greatest factor of influence on students’ development, as Gao et al. (2010) asserts, then understanding teachers’ perspectives regarding their beliefs about knowledge construction and how it relates to ICT integration is important. This is most significant because of the influence epistemological perspectives have teachers’ own pedagogical practices, including the degree to which ICT integration occurs (Franklin, 2007; NCES, 2009; Nguni, et al., 2008; Plair, 2008; Svedberg, 2010). In the pages to follow I continue this discussion on educational leadership that includes: three leadership models (transactional, democratic, and transformational) that influence teacher practice, the theoretical underpinnings of each and how they are applicable to adult learners and educational leaders who are endowed with the responsibility of educating young children.

**Transactional**

Tenets of democratic leadership, such as the participatory actions in decision-making, are in stark contrast to a transactional leadership style (Pashiardis, 2009; Wen & Hwang, 2008). The roots of transactional leadership are steeped in authoritarian principles where power is wielded to garner compliance and therefore asks a lot in return (Heifetz, 1994; Pashiardis, 2009; Stone & Patterson, 2005). Many business models and behaviorist education principles of the 1970s rely on the contractual agreements between the leader and the follower (subordinate) (2005). With a focus on control, or what I like to think of as a customary transaction, leadership accounts only for the objective and omits the situated context or impact on building capacity (Heifetz, 1994; Kegan & Lahey, 2009).

If teachers are missing critical components necessary for igniting change, including a shared vision, they may be reluctant to invest in school improvement or assist
in their efforts to overcome barriers (Kegan & Lahey, 2009; Leonard & Leonard, 2006; Thousand & Villa, 2010). Plair (2008) suggests learning becomes illusive for teachers and increases their vulnerability because transactional leadership, as seen in many ICT teacher-training efforts that are narrowly focused on immediate *how-to* technology tasks. The significance for this study then is in the correlation in ICT professional development scenarios where research shows, teachers often leave such experiences feeling either unprepared or unwilling to effectively implement ICT in their instructional content (Knight, 2007; Leonard & Leonard, 2006; Stone & Patterson, 2005; Svedberg, 2010; Tondeur et al., 2010).

**Democratic Leadership**

According to Pashiardis (2009) though the digital age is rife with change, this period is marked by a gap between theory and practice. Educational leaders may espouse many democratic principles, but their rhetoric has fallen short of including a common vision among stakeholders (Gordan & Patterson, 2006; Jones & Rudd, 2008; Stone & Patterson, 2005; Thousand & Villa, 2008; Tondeur et al., 2010). This shared vision is important to understand in this study because the prevalence of ICT is a fixed feature in modern society and, as Leonard & Leonard (2006) assert, it enables schools to access the full potential for learning (p. 222). The implication for leadership then is that learning to lead is a social enterprise (Brookfield, 2005; Gao et al., 2010). As adults enter the leadership learning experiences with others, there is often an implicit expectation that leadership will be distributed (Kegan & Lahey, 2009). From this democratic school leadership perspective, where harmony is encouraged, power and authority does not
descend from the top-down, as seen in transactional leadership, but rather it is focused on the participants’ discourse (Svedberg, 2010, p. 428).

Svedberg (2010) says that democracy should therefore be combined with learning and communicative leadership (DLC) in order to facilitate autonomy and encourage teachers to work collaboratively to make decisions. An important qualification of these collaborative environments, then, is the commitment of the principal to develop the individual and collective purpose by continually challenging teachers’ perspectives in order to change the school culture (2010). Because truth can be confounded by one’s virtues and willingness to accept that truth, leaders are often in a predicament in regard to placing ethics over politics and public perception (Pashiardis, 2009; Plato, 1998).

In regard to educational leadership, Fullan (2001) in Tondeur et al. (2010) argues the supportive environment is important for school improvement. Others, however, suggest challenging perspectives (including cultural and gender awareness) is equated with maximizing leadership potential and the collective endeavor (Ayman & Korabik, 2010; Fullan, 2003; Zemblas & Iasonos, 2010). According to Plato (1998) the focus of such an endeavor is to achieve the good of the organization and offer mutual respect for the individuals involved (Pashiardis, 2009). In other words, teachers who are respected as professionals and provided autonomy are more inclined to work toward the collective good of their school’s vision.

**Transformational**

While Stone and Patterson (2005) posit transactional leaders focus their efforts on maintaining the status quo, on the opposite end of the leadership spectrum is transformational leadership, that Burns (1978) in Nguni et al. (2006) says is where
leaders endeavor to assist others’ moral development and organizational commitment by investing in the followers’ affective domain (p. 148). The affective dimensions are important considerations as they often represent the hidden competing commitments that leaders must acknowledge and address before assisting others in overcoming their resistance to change (Kegan & Lahey, 2009, p. 36). Hater and Bass (1988) link three dimensions to achieving transformation leadership: a charismatic leader (the inspirational model), intellectual stimulation (shared understanding of the problem and vision for action), and individualized consideration (scaffolding/coaching) (Nguni et al., 2006, p. 148).

In a study by Gordon & Patterson (2006), the authors found leadership distributed throughout the school and that was not limited to their classroom practice (p. 218). They called this transformational leadership model Network Leadership that, according to Tondeur et al. (2010), is expressed in school improvement. Harmony is achieved among teachers because the emphasis is on edifying others, collaboration, and then a sustainable integration of ICT (p. 297). Similar results were found by Bycio, Hackett, and Allen (1995) and Porter, Steers, Mowday, and Boulian (1974) who discovered a correlation between transformational leadership practices and individuals’ organizational value and commitment which is particularly important when a school system is focused on teachers’ technology integration (Nguni et al., 2006).

**Correspondence of Leadership and Adult Learning**

It is important then to recognize the efforts of staff developers and curriculum coordinators who are beginning to acknowledge the importance of valuing the individual adult learner’s needs in technology professional development (Borthwick & Pierson,
For Glazer et al. (2009), the attention to adult learners’ needs arrived with cooperative groups through the formation of learning apprenticeships for teachers. Similar evidence is found in the case development the work of Mouza and Wong (2009), where teachers confront their beliefs and assumption in combined learning experiences in: content, pedagogy and technology.

While each of these ideas are important, it is Cranton’s (2006) discussion of Mezirow’s Transformative Learning theory that highlights this combined process that includes the need of the learner to: experience a disorienting dilemma, undergo self-examination, explore new options, plan for action, and try out new roles (p. 20). In Mouza’s and Wong’s (2009) study they highlight this transformative process by evidencing personal narratives of teachers participating in a graduate course structured on the TPACK framework. This theory acknowledges adults as individuals and assists them in the transformative process of learning as seen in the TPACK and adaptive framework models (Mezirow, 2000; 2009).

These professional development models are accomplishing their objective, which is aligned with helping adults accomplish what they have set out to do (i.e. meet their needs) (Mezirow, 2000). As I have highlighted, adult learners face myriad barriers when attempting to effectively integrate ICT in elementary education including: access, familiarity, training, and support (Ertmer & Ottenbriet-Leffwich, 2010; Hsu, 2010; Levin & Wadmany, 2008; Schibeci et al., 2008). While these obstacles can impede change, there may be additional, tacit, barriers enmeshed within teachers’ consciousness that they continually confront (Brookfield, 2005; Merriam et al, 2007; Minnich, 2005; Mezirow, 2000; 2009; Tenant & Pogson, 2002).
If the digital era is to bring changes to elementary education that includes effective ICT integration and implementation, there is a need to understand the perspectives of elementary teachers who are reluctant to integrate ICT in their instructional content. It will be through hearing these lived experiences of teachers that will give insight into this phenomenon that I believe may be linked to teachers’ epistemological and ontological perspectives (Levin & Wadmany, 2008; Onchwari, et al., 2008, Snyder & Dillow, 2009).
CHAPTER III: METHODS

The context of this dissertation research is situated within the framework of doctoral study at Lesley University in Cambridge, Massachusetts. The pragmatic decision I made, as a researcher, was to collect qualitative data with open-ended questions, by engaging in one-on-one interviews with current classroom teachers and practicing administrators. This inquiry allowed me to examine elementary teachers’ attitudes and beliefs about content-based information and communication technology (ICT) integration, their perception of the barriers that contribute to their reluctance toward ICT integration, as well as, teacher’s epistemological perspectives. Since the teachers were all from one school district, the interviews provided collective insight into the specific school and phenomenon (Creswell, 2007, Patton, 2002).

Methodology

A qualitative research approach was applied to this research study in an effort to better understand the lived, and often unrecognized, experiences and emotions of teachers in regard to the ICT integration in two suburban elementary schools in central Alabama (Patton, 2002). According to Creswell (2008), this bounded system or case study research methodology, is situated contextually in order to understand the “central phenomenon” occurring without making the study evaluative or attempting to generalize the findings (p. 214). Because all insight gained was relevant to the particular schools’ culture of learning and ICT integration efforts, face-to-face interviews with a purposefully selected heterogeneous sampling of participants increased the reliability of this study (Creswell, 2007; 2008; Merriam, 2009). Guba and Lincoln (2005), as cited in Mertens (2010), assert a need for qualitative methods when the researcher has a need to
understand the underlying context within the research study (p. 226). Patton (2002) offers further support for qualitative data because it gives a story to the program.

From my perspective, the approach of considering the whole as made up by the sum of separate parts, is akin to the intricate nature of reflection and action that Freire (1970) says cannot be separated, because if one is removed the other suffers (p. 87). Because a classroom observation was not conducted, nor was it appropriate for this study, the reported ICT integration of these teachers was not evaluated on being student-centered or teacher-directed. This resulted in situating my primary focus on the research participant and the individual experiences they offer. Juxtaposed with these efforts was an adherence to strong ethical standards of beneficence, respect, and justice as found in the Bellmont Report: (Denzin & Lincoln, 2008; Israel & Hay, 2006; Mertens, 2010). My familiarity with this school district was balanced by imparting ethical relativism, that Israel and Hay (2006) contends occurs when the researcher maintains an adherence to ethical principles relative to an individual’s culture (p. 20).

Selection Criteria

A thorough understanding of the literature related to the known barriers believed to impede technology integration in formal education settings is critical to this research and represents the first step toward constructing a significant study. The second, and equally important, step involved selecting an appropriate site for conducting research on teachers’ reluctance to integrate technology into their teaching when the known barriers to such adoption are seemingly absent.

With an understanding of the barriers known in the literature to impede ICT implementation, I chose two Alabama schools, Tinley Park Elementary School and
Rooney Intermediate School, in a particular school district that in 2008 implemented a full-scale technology initiative to ensure that the common barriers of access, professional development, and support would not prevent or impede a teacher’s integration of ICT for student learning. Furthermore, this purposefully selected site has garnered local, state and national attention\(^2\) for its commitment to offering access to technology, extensive opportunities for technology professional development, and on-going instructional support. Both the initiative and the system’s accolades were significant factors for this research study site selection, adding to the supposition that no overly apparent reasons for teachers’ reluctance to ICT integration existed.

The sites represented in this case study include the largest of ten elementary schools and a newly formed intermediate school in a suburban school system that is home to around 13,000 students and more than 300 teachers. The elementary school opened its doors to the community in 2001 to several hundred economically and socio-culturally diverse students. In 2010 the school’s population was raised to nearly 1,000 students that represented five different ethnicities, races and 15 different primary languages. Due to the academic and athletic reputation of the school system and overwhelming growth of the student population over the last decade, the district initiated its first intermediate school at the beginning of the 2011 school year. This new school houses the sixth grade students from the middle school and the fifth grade students from three area elementary\(^3\) schools. Teachers in this school consist primarily of the sixth grade teachers from the middle

\(^2\) National recognition or awards include: Dell Corporation, USDA, the U.S. Department of Education’s Presidential Scholars Program, Alabama State Department of Education, National Board for Professional Teaching Standards, and MTV.

\(^3\) The elementary school used in this study is one of the three elementary schools that relocated its fifth grade to the intermediate school.
school and a team of fifth grade teachers who were assembled from four of the district’s elementary schools.

Participants in this case study were classroom teachers in Kindergarten through Fifth Grade, where each respective teacher was responsible for teaching all of the content or a majority of the core curricular areas to her or his students. Participants from the intermediate school were purposefully selected based on their experience in the district prior to moving into their new position in the fall of 2011. Two of the three participants from the intermediate school were previously housed at the same elementary school chosen for this case study research.

A qualitative interview was carefully constructed in advance of this case study through a pilot study research study comprised of teachers within the same pool of prospective participants. The pilot study was specifically targeted toward the population of teachers who match the participant exclusion and inclusion criteria relevant to my guiding research question.

These criteria included the following qualifications: current K-5 regular education classroom teacher, consistent, daily access to technology resources, participated in a minimum of two technology focused professional development sessions in the past two school years, had access to an instructional technology coach, used technology in personal or professional life, and considered the integration of technology (students’ active use of technology) to be difficult and challenging.

Sample

To best represent the population of perspective participants, 10 female teachers, were identified as perspective participants to represent the criteria mentioned above. One
school administrator from each of the selected case study sites also participated in this research study. As outlined in Table 1, this group of teachers represents four grade-level spans: kindergarten (the first year of formal schooling), second grade (a mid-elementary grade), fourth grade (the last year for students in this elementary school) and fifth grade, respectively, (the first year of intermediate schooling). The majority of the research participants purposefully selected for this case study are upper elementary grade teachers. This focus was because some argue that the emphasis placed on formal education for primary aged students may be disrupted by technology during those formative years. These emphases may include a focus on letter and number recognition, reading, writing and social development. While including the lived experiences of all elementary teachers is integral to understanding teachers’ reluctance to integrate technology in their teaching, this study is most concerned with examining teacher perspectives when the known barriers to integration are removed.

The participants in this study were between 28-55 years old and had teaching experience that ranged from six to 29 years. The demographic information of these research participants represents the site’s general demographics and is consistent with statistical data of elementary school teachers throughout the United States (NCES, 2010, p. 21). These participants were drawn from the pool of prospective participants that included 55 women and one male; 51 are Caucasian and four are African-American.
Solicitation of the prospective research participants occurred in-person at her or his respective school. Email correspondence served in some cases to determine the participants’ favored time and location for scheduling the interview. Participants received an overview of the research study and an informed consent document, providing them with additional information relevant to the research study.

Ten teachers and two administrators agreed to participate in the study and subsequent meeting dates, times, and locations were mutually agreed upon. All of the interviews were conducted face-to-face with nine of the twelve interviews being held at the participant’s school and three at a neutral, off-site, location. The interviews lasted for about an hour with a few extending beyond or falling just short of an hour. With an understanding that I would follow up with them or conduct a member check of the data, Participants were not compensated monetarily, however, they were provided with a lunch one day at her or his school as a gesture of gratitude for their participation.
Perspective and Bias

I approached this case study research through a pragmatic lens that I acknowledge as being influenced by a constructivist epistemological framework. As a former classroom teacher who has experience integrating ICT in elementary education and instructing teachers in the knowledge and skills necessary for implementation, I recognize that my bias towards effective use exists. I am confident, however, that by selecting this case study approach, and also bracketing my own perspectives and bias, I was situated to hearing the voices and experiences of the teacher participants. Ways that I bracketed my perspectives included written and oral communication with peers and faculty regarding presuppositions that I held regarding the barriers that inhibit ICT integration. According to Creswell (2007) and Mertens (2010), acknowledging the influence that my paradigm serves in my research, how it was and is shaped, and how it differs from other paradigms, are important as I identify myself as an ethical researcher.

Having already paid mention to the genesis of my research question, I acknowledge the underlying assumptions inherent in my research and further acknowledge that my background is destined to influence my research methodology. Acknowledging that I identify with the social constructivist paradigm provides me with an opportunity to examine how others view technology-in-education programs and how their experiences as adult learners and their epistemological perspectives inform their views on technology integration.

Despite my best intentions for using interviews for collecting qualitative data, I acknowledge that participant responses are as legitimate as the honesty of the participant at the time of the interview and influenced by the quality of the questions I designed. It
was in this regard that I piloted this research study by following the advice of Merriam (2009) who suggests that the most successful interviews are held when the researcher knows the context well, asks quality questions and listens for thoughtful responses.

Assumptions and Limitations

A qualitative methodology, such as this case is best suited to understanding the lived experiences of a particular group of teachers and/or particular programs. While this method is favorable, it has the potential to neglect diversity among participants and learning experiences, primarily because it was not replicated in a different region of the country (Creswell, 2009; Mertens, 2010). I made a concerted effort to purposefully select participants who were dissimilar in age, level of education, years of experience and ethnicity to minimize the limitations of this study.

As a white, male researcher with an ICT in education background, there are a number of assumptions and generalizations I could have made about why teachers are reluctant toward integration in this research, in constructing the research questions and in my data analysis. Though my experiences have shaped my paradigm, I followed the advice of Patton (2002) and Creswell (2009) to utilize epoche as a first-step in confronting my own bias and epistemological framework throughout the investigative process (Salkind, 2008). This process was initiated when I articulated my reflections and assumptions prior to beginning the research with university faculty and colleagues. Bracketing my assumptions was not relegated to these early efforts and soon became an iterative process that I committed myself to. The primary way I accomplished this was through the notes feature of my iPhone 4. This electronic journal was with me at all times and proved to be an effective and pragmatic way for me to record my thoughts,
observations and assumptions pertaining to the study (Appendix 1). Another way I endeavored to bracket my assumptions or influence was to communicate with my research participants that I wanted to be cautious as to how I asked questions and follow-up questions so that I would not lead them toward a particular response.

Ethical issues inherent in studies such as this may include disparities that exist among race, gender, culture, and class. To maintain responsible research integrity, I remained in contact with colleagues throughout the semester and had doctoral faculty and the Institutional Review Board (IRB) available to address culturally sensitivity issues were they to arise. Before and during this case study I continually confronted my own bias and assumptions about teaching and learning with technology for adults in elementary education.
CHAPTER IV: DATA ANALYSIS

The purpose of the research was to investigate the research question: Why are teachers reluctant to integrate information and communication technology when the established barriers of access, familiarity, professional development, and support are seemingly absent?

Though much of the research and attention focuses on the obstacles and limitations that prevent or impede teachers from effectively integrating ICT in their instruction (Borthwick & Pierson, 2008; Judson, 2006; Sugar & Wilson, 2005), there has been little or no research that includes the perspectives of teachers who resist technology integration, even when the common barriers are removed. Therefore, the guiding question, mentioned above, provided the overarching inquiry to this study, and five additional questions, below, aided in framing the contextual relevance of the investigation:

1. In what ways do teachers perceive ICT use in personal life as preparation for curricular integration?

2. In what ways do teachers perceive technology-focused professional development as preparation for integration of ICT in instructional content?

3. In what ways do teachers perceive accountability and administrative expectations of ICT integration as determining factors for implementation?

4. In what ways does teachers’ perception, including attitudes and beliefs, influence their integration of ICT?

5. What additional barriers to ICT integration in elementary education do teachers perceive?
To best answer these questions and, thereby understand the perspectives of K-5 elementary school teachers, this case study was situated contextually in one elementary school and in one intermediate school, where an existing technology initiative was established within the district. Following more than a year of technology pilot programs, this suburban school district fully released its technology initiative in 2008. The district’s efforts to encourage teaching for the 21st Century included providing teachers with consistent and reliable access to educational technology, technology professional development, and support in the form of technology coaches and IT professionals. In addition to the teachers’ knowledge and effective use of ICT being the focus at the local level, these efforts are further supported by the state board of education with its technology-focused objectives in the state course of study, and the federal government, who through the No Child Left Behind Act of 2001 (2002), which seeks to ensure that all students are digitally literate by the time they complete the 8th Grade.

Collection

For these case studies I chose to follow Creswell’s (2007) advice and construct questions to focus on a population that was not too diverse in order to understand participants’ experiences in regard to teaching and learning with technology. The reasoning behind this was that I wanted the fewest number of extraneous variables that might confound the study and lead me in multiple directions, without a clear sense of the teachers’ experiences with ICT who had seemingly overcome existing integration barriers. The questions were central to the following areas: (a) technology use (personal/professional), (b) attitudes and beliefs, including efficacy and consequence concerns, (c) technology integration, (d) perceptions of technology, (e) adult learning
(formal/informal), (f) perceived implementation barriers for technology, (g) instructional practices/beliefs, (h) support, and (i) culture (expectations). These categories are consistent with my pilot research on teaching and learning with educational technology and are consistent with the NCES (2010) questionnaire to study teachers’ technology use (Woolard, 2010).

**Analysis**

This research and the associated interviews were efforts to understand the teachers’ perspectives and ensure that I captured enough of their experiences to conceptualize the answer to my research questions in order to better understand the phenomena. This qualitative data analysis, a process of finding core ideas and identifying associated themes, is based on the work of qualitative researchers including: Creswell (2007, 2008, 2009), Hill et al. (2005), Merriam (2009) and Patton (2002).

To understand the collective experience of this select group of teachers, or phenomenon as a whole, I used a multi-faceted process that included aspects of both a holistic perspective and an inductive analysis approach (Patton, 2002). Patton (2002) reminds us that the goal of inductive analysis is “to discover important patterns, themes, and interrelationships” (p. 41) while he says that a holistic perspective is to see the study as a “complex system of interdependencies…not reduced to few variable or cause-effect relationships” (p. 59). This approach was an asset to maintaining a holistic perspective throughout the course of inductive analysis and the culminating creative synthesis.

The three overarching patterns that emerged from this study were,

- General agreement that technology is important for student learning
• Participants espoused their commitment to using best-practice pedagogy for increasing student learning
• Participants were expected to be involved in ongoing professional development and exhibit professional growth in their teaching practice

There were also eight themes that emerged from this case study research.

1. A heavy reliance on informal learning that manifested in one-on-one, pairs, or small group technology support from individuals close to the participant
2. Limited connection between participants’ epistemological perspectives and formal training/professional development experiences
3. Limited structured professional opportunities for reflection on how to transfer ICT training to integration
4. Influence of existing school culture
5. A dichotomy between the participants’ self-reported high levels of personal ICT use (reliance) and their low levels of ICT curricular integration
6. Participants’ common attitudes and beliefs on factors inhibiting their ICT integration (pedagogy, learner-centered beliefs, efficacy and consequence concerns)
7. Competing priorities (time)
8. The occurrence of a digital divide

Overarching Patterns

As I listened to participants tell their life stories it was apparent that they mutually agreed on the importance of technology for student learning. As evidenced below, participants reported their beliefs that technology was integral for students’ future
success, particularly because of the digital society they will join when they complete the formative years of schooling. This first overarching pattern provides insight into teachers’ attitudes and beliefs and demonstrates how their paradigm includes the use of ICT. It is also interesting to note how these participants connected this perspective to their own experiences in the digital society and to the lives of those, with whom they are familiar, who rely on technological literacy for their working life.

Technology is huge. There are so many things you can do, so much stuff out there. It’s preparing the kids for their future. And that’s what’s going to be expected of them (Darcie, Fourth Grade teacher).

I think it plays an important role in second grade. It can be a very effective learning resource, whether it is for intervention, reading, spelling, math. There’s something out there for any subject for the kids, which is great (Wanda, Second Grade teacher).

Because this world’s getting more and more centered around technology. These kids are going to have all kinds of projects on it. They already have cell phones so through technology, they’re going to be completing a lot of assignments. When they get into the workforce, they’re going to be doing work with technology. Like me now, they’re going to have their bank account online. There are just all kinds of endless things that they’re going to need it for (Kate, Fifth Grade teacher).

You know, first of all, the tools we’re using today are not going to be the tools that are available when the students get out of school. But just, this age, they’re so inquisitive. We’ve got to teach that desire to get in there and try something new, or that desire to get in there and use tools that access information. And so I think that’s got to be just kind of part of everyday life. And it is, for them. I mean they’re not afraid of anything. So I think too many times we get in their way (Tom, Rooney Intermediate Principal).

Consistent with the perspectives highlighted above that focus on authentic and real-world learning, the teachers in this study contend they were committed to using best-practice pedagogy for increasing student learning. This second overarching pattern is significant in its connection to the belief that constructivist principles are well-aligned
with ICT integration and is highlighted in existing literature as a contributing factor for fostering teachers’ technology integration (Borthwick & Pierson, 2008; Dunn & Rakes, 2010; Judson, 2006; Mouza & Wong, 2009; Schibeci et al., 2008; Sugar & Wilson, 2005). Examples of participants’ perspectives on the importance of effective instructional strategies in order to meet the needs of student learners are evidenced below.

To be effective in your instruction, you have to do a lot of differentiation because all kids are not at the same point. So you would have to have something for those kids who already maybe know whatever you’re teaching, to take them to a higher level. Also, for those kids who are behind, to try to bring them up to, at least, where you are. You have to find something at all different ranges. So to be effective, you have to reach all the kids (Darcie, Fourth Grade teacher).

Instruction is effective when there are two important things, one, the kids can do the thing you are trying to get them to be able to do. And two, I think their attitude about it matters. If they can do it but they absolutely hate it and they would never choose to do it independently, then it wasn’t effective even if they know how to do it (Elana, Second Grade teacher).

Effective instruction is instruction that meets the needs of a variety of learners. It recognizes the differences in kids as far as tactile learning and auditory learning; it recognizes the differences in kids as far as social and economic issues. Effective instruction is much more than just curriculum, it’s recognizing with the differences in learners (Kristy, Fifth Grade teacher).

Because the participants shared similar pedagogical philosophies and talked openly about their involvement with professional development, it was apparent that the administration at the district and local levels expected them to exhibit professionalism and growth in their teaching practice, particularly in regard to ICT integration.

I still think we need to assure people are using it but it’s almost like the whole thing with engagement of students, I think people are starting to see the light and seeing how it can be used effectively to increase instruction. I think demonstrating the excitement of new technologies in the classroom and highlighting that, hopefully we’ll pull people in. But I don’t want it to be my idea. I want it to be their idea and that’s the one reason I tend not to have expectations for them to go further than what’s logical. But if the technology’s sitting there and it’s something that’s going to improve instruction, you know, I’m going to mention it (Justin, Tinley Park Principal).
Our principal’s main goal, since school has started, is professional development that he will have in place for the second semester. He wants it to be something from us, which I’ve kind of said all along that everybody has a lot to offer, and it will really need to make it relevant to our professional development goal (Taylor, Fourth Grade teacher).

Well, of course there’s a high expectation to have your faculty completely onboard, they pour so much money into it of course they expect you to be completely onboard with utilizing it in every aspect of your daily instruction as much as possible. And of course the amount of professional development they provide for that. And, it’s not like they check up on you and make sure you’re doing all those things, but it’s certainly put out there (Ann, Kindergarten teacher).

While there was general consensus among the participants’ in regard to the importance of technology, best-practice pedagogy and the emphasis on professional growth, that represent the overarching patterns, it was the participants’ personal stories that gave insight into the emerging themes. These eight areas are central to this study and provide evidence of contributing factors for teachers’ reluctance toward ICT integration in elementary education.

**Quantitative Significance**

In support of this qualitative study, it is helpful before moving forward to begin with a brief focus on the quantitative significance of the participant responses to provide an overall picture of the case. The rationale for this decision is to impart a conceptual understanding of the perceived phenomena, which is an understanding of teachers’ reluctance toward ICT integration in elementary education. A chart, highlighting these quantitative results, is shown below in table 2 and followed by insight into the data analysis of these statistics.
In What Ways Teachers Integrate Technology

With each teacher having available technologies in her classroom ⁴ to integrate into the curriculum on a daily basis, the degree and breadth of integration was widespread. All participants reported using an ICT at some point in their instruction, but only two of 10 teachers (20%) espoused using it at some level on a regular basis because of its relevance to their instruction. Because a classroom observation was not conducted, nor was it appropriate for this study, the reported ICT integration by these two teachers was not evaluated on being student-centered or teacher-directed. It is evident, however, that with the majority of the classroom teachers describing the use of websites for viewing activities and computers for typing stories, that integration overall was, as teachers reported, minimal.

All participants (100%) reported the use of multiple ICT resources in their personal lives for a variety of uses that include: entertainment, social networking, education, and personal and family business matters. The type and amount of ICT used in the participants’ personal lives was similar in some regards, but varied in other areas. Nine of the 12 participants involved in this study (75%), reported having an iPhone or other similar smart phone. Regardless of the device, all participants (100%) used their phones to communicate primarily through text messaging. Those who owned smart phones and iPads, also used their devices in many ways including: conducting email

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⁴ Educational technologies available in the teachers’ rooms at all times include a minimum of: complete wireless access, 2 tablet (laptop) computers, 3 desktop computers, digital camera, digital video camera, 2 iPods, projector, LightSmith, DVD/TV (elementary), SoundField System (intermediate/some elementary). Other accessible technologies include: iPads, class sets iPodTouch, class sets digital cameras, Flip video recorders, mobile lab, stationary computer lab, Mac computer(s), and Audio/Visual broadcast technologies.
correspondence, managing calendars, surfing the Internet, networking with others through listserves and Facebook, and staying abreast of current news and weather. The three teachers who did not own a smart phone or an iPad, and most who had these devices, used their personal computers to conduct most of the same uses mentioned above. Every one of the participants in this case study also utilized the Internet as a source for conducting some financial transaction, be it shopping, banking and/or planning vacations.

On a personal technology proficiency matrix from novice to expert, as indicated in Table 2, the participants arranged themselves as follows: 2 participants (12.5%) novice, 5 participants (42%) average, 3 participants (25%) average to advanced, and 2 participants (12.5%) categorized themselves as advanced.
Table 2: Participant Perspectives

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<th>Participant</th>
<th>Grade level or position</th>
<th>ICT proficiency</th>
<th>Preferred informal learning</th>
<th>Small Group or 1:1 ideal</th>
<th>PD session groups are too large</th>
<th>Constructivist Pedagogy</th>
<th>ICT integration part of planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann</td>
<td>K</td>
<td>Novice</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Claire</td>
<td>K</td>
<td>Average</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Elana</td>
<td>2</td>
<td>Average</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
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<tr>
<td>Wanda</td>
<td>2</td>
<td>Average</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Darcie</td>
<td>4</td>
<td>Average</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Grayson</td>
<td>4</td>
<td>Advanced</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Taylor</td>
<td>4</td>
<td>Novice</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Shauna</td>
<td>5</td>
<td>Average - Advance</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Kate</td>
<td>5</td>
<td>Average - Advance</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Kristy</td>
<td>5</td>
<td>Average - Advance</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Justin</td>
<td>Admin</td>
<td>Average</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Tom</td>
<td>Admin</td>
<td>Advanced</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
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</tbody>
</table>

It is important to note that participants ranked themselves in regard to technology proficiency based on their perception of their peers as evidenced by the comments of Kate, a Fifth Grade teacher at Rooney Intermediate and her principal, Tom; followed by two of the teachers from Tinley Park Elementary, Darcie who teaches Fourth Grade and Second Grade teacher, Claire.

I’m kind of in the middle, I guess. I mean, I’d have to say that I’m pretty good with technology, but then on some occasions, I’m not very good at it.

I’m closer to the novice than the expert, I guess - just because I compare myself with the people in this district, who are so good. I guess if I were to sit in a meeting across the state, I might be in the middle somewhere (Darcie, Fourth Grade teacher).

I’m the middle. I’m definitely not basic. But I’m not advanced either. There are things I don’t know. There are some teachers that are much, much older and have
taught much, much longer, you know they’re not doing as much as I am, but you
know, these young people now can do so much. So I guess I’m average (Clair,
Second Grade teacher).

While Table 2 shows there was not consensus among the participants in regard to
their perceived level of technology proficiency, in all cases the participants (12 of 12)
described their preferred method of learning to use ICT and incorporate it in their lives, to
be conducted informally in small groups or one-to-one (1), as evidenced in the following
participant comments.

Having someone sit down with me and showing me and practicing together. I’m
a visual learner. You have to show me how to do something; you can’t give me a
handout and tell me what to do (Wanda, Second Grade teacher).

Oh, my neighbor, he’s brilliant, he’ll come over and help us with stuff (Claire,
Kindergarten teacher).

There’s a lot of people in there, and I do kind of feel like I ask the person next to
me more than the teacher or whoever’s doing it because they’re being pulled in all
different directions. So a small group for anything is better (Shauna, Fifth Grade
teacher).

Other significant findings in these case studies include: every participant (100%),
regarding time as being the most influential and determining factor that impedes ICT
integration (7). This statistic is particularly significant because these participants not
only perceived time as adding to their reluctance, but they also believed the integration of
technology was encouraged by the schools’ administration, but not a requirement for
their teaching practice.

Well, I haven’t really heard anything about it, so I guess not many high
expectations (Shauana, Fifth Grade teacher).

I think if you’re using technology, that’s great. But there’s no pressure to use it
(Darcie, Fourth Grade teacher).

Well I think he would be disappointed in and my technology cart was covered up
out in a corner. But I mean, I would be disappointed in that too. I think if our
school spent the money that we should at least be using some of it (Claire, Kindergarten teacher).

I don’t think he cares…if I’m using it great, and if I’m not, the kids still know what they’re supposed to know at the end of the year. It doesn’t matter to him (Elana, Second Grade teacher).

When asked about their perception of district-led technology professional development, as highlighted in Table 2, the majority of participants (92%) expressed dissatisfaction in the quantity of teachers receiving the professional development in relation to the one or two presenters leading the learning experience. In other words, the ratio of learners to instructors exceeded what the participants perceived was best for meeting their needs as individuals when the presentation styles was conducted via whole group instruction (6).

The (technology) professional development is like 45 to 1 teacher ratio. So it was real easy to get lost and just get frustrated (Ann, Kindergarten Grade teacher).

I would say no more than 25 or 30 people in a room…I think the smaller the better or I get a benefit out of it because sometimes I tend to zone out or be, “Oh, let me just check my email while I’m listening to this” (Kate, Fifth Grade teacher).

We could say offer more professional development and all this. But to me, when you put a teacher in a room with 30 people, that’s not professional development (Wanda, Second teacher).

This is significant because of the epistemological perspectives and associated pedagogical concerns these teachers have for their students and themselves. These same participants offered ideas for ameliorating technology professional development sessions, as evidenced below by Fourth Grade teachers, Grayson and Darcie, and Fifth Grade teacher, Kristy, who suggest that they be conducted in smaller, more context-specific groups.
I think the thing that would be most helpful is to send out a survey. I think that’s helpful in knowing your beginner, middle and advanced audience; you need to know who your audience is going to be. And then, at that point, I find out what the needs are; making sure that you have the right things there for them and not just talking to them and giving them handouts. It would have to be after school, after school or maybe like on a professional development day when we don’t have kids (Grayson).

Some professional who actually could guide us, but at the same time, give us some autonomy as far as what we would like to do. It doesn’t need to be a lot a people who don’t know, but at least somebody who knows what they’re doing, and then I can add to it. Some resources of what other schools are doing someone who’s doing it right, who has been successful in integrating it in their school district. Then going over to visit other schools to see what they’re doing (Darcie).

I think that ten to one would be idea, or even less. If you get a smaller group, people are going to be more comfortable and willing to speak out. There are people there that are on different levels, and sometimes they do things different. People want to speak out, but if I say something and there’s people of higher levels I might feel stupid if they are thinking “I’ve been doing that since 1999” (Kristy).

It is clear from Table 2 and the examples above, that had there been a sole reliance on inductive analysis, without incorporating tenets of the holistic perspective, I, the researcher, might overlook the contributing external context, in this case professional development, that Patton (2002) says is integral to understanding the gestalt of teachers’ experiences and paradigm (p. 59). As a result, there was a heavy reliance on practicing reflexivity (self-questioning) to check my interpretation of the data and the perspective by which it was applied (Patton, 2002, p. 65). Reviewing the transcribed interviews and associated field notes helped me to gain a sense of the data and to develop tentative codes relevant to my guiding research question (Creswell, 2007). The initial codes evidenced in Table 3 represent both my use of a prior (pre-existing) codes and codes that emerged from the analysis of participant interviews. These codes and associated code segments,
quotes pulled directly from the participant interviews, are integral to understanding the lived experiences of these individuals as they relate to the specific areas of influence.

Though I connected myself in a professional manner with the participants’ plight and felt empathy toward them, I fought to maintain empathetic neutrality by being cognizant of the way I responded to participants and how I worded or framed questions. According to Patton (2002), this process allows for an affective connection to participants, but one that is not judgmental (p. 53). Interviews with two upper elementary educators Darcie, a fourth grade teacher, and Kristy, a fifth grade teacher, are used as evidence of researcher bracketing where I strove to maintain validity and integrity. As indicated in the comment below, I explained to both participants the steps I was taking to ensure each teacher that I wanted their honest and candid perspective and was not looking for any particular or presumptive response.

“And so I obviously have opinions about it. But if I go in and just try to say this is what I think, that doesn’t have much validity to it. So instead, I’m looking at what teachers actually believe are the other things that come into play.”

“I have to be careful when I ask questions that I’m not leading towards something, so I have to stop sometimes and think, so it’s just my own way of keeping myself honest.”

During the iterative process of bracketing my perspective, reviewing transcripts, and revising codes, I was following the advice of Crabtree and Miller (1992), as referenced in Creswell (2007), who suggest a priori codes may limit one’s inclusion of participants’ perspectives. This culminated with the first coding scheme and is organized by the codes I used to describe the patterns that emerged from my analysis. Participant quotes, or code segments, taken directly from the research participant interviews, describe the code category. Several of the codes in Table 2 are multi-faceted and were
significant enough to separate in order to distinguish the existing dichotomies among participant perspectives. Table 3 is formatted with two columns; the first column, on the left, contains code abbreviations and parenthetical numbers to highlight the emergent theme from the data analysis. The second column, on the right, are the expanded code names that correspond to the abbreviations in column one (e.g. AB in column one is expanded as Attitudes & Beliefs in column two). Column two also houses supporting participant examples that illuminate the lived experiences inherent in this case study research and insight into how the participant responses correspond with the existing code.

**CODING SCHEME 1**

<table>
<thead>
<tr>
<th>AB</th>
<th><strong>Attitudes &amp; Beliefs (including efficacy &amp; consequence concerns):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(6)</td>
<td>My experience has been if you can get them there in one area, whether it’s reading, or math or science -the rest of it will come (Elana, 2nd Grade Teacher).</td>
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<tr>
<td></td>
<td>The parents want to see something on paper. They want to have something in their hand – the old-fashioned way that they did it (Darcie, 4th Grade Teacher).</td>
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<td></td>
<td>I just feel like in a way technology needs to be something that they embrace to further their goals. So, they’re all going at their own pace but, I think we’ve got a pretty technology literate group here now, much more than they used to be (Justin, Principal).</td>
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<td></td>
<td>And even though you’re probably thinking right now, well, then why aren’t you on that computer playing with it? Well, because I don’t know what to do with it (Ann, Kindergarten Teacher).</td>
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<td></td>
<td>I would love for them to give us opportunities to go visit a classroom that does it. I need to see it. I need to see how they do it and how the kids respond to it. I need to see the kids do it (Shauna, 5th Grade Teacher).</td>
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</table>

<table>
<thead>
<tr>
<th>AB</th>
<th><strong>Attitudes &amp; Beliefs (ICT perceptions):</strong></th>
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<tbody>
<tr>
<td></td>
<td>My five year old can find an app on my iPhone. Last night she went to my phone and tried to find an app of a website -she can’t even read. So I told my husband that there’s an example of how important technology is today, because she could do that (Kristy, 5th Grade Teacher).</td>
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<td></td>
<td>Because we don’t know that much, we don’t know how to integrate it as much. And it’s not a standard. It’s not something that we have to teach, and it’s not easy to integrate on a daily basis, or even a weekly basis (Shauna, 5th Grade Teacher).</td>
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<td></td>
<td>Right now is an exciting time, and people are finding out all the time -things in technology to improve instruction. So it’s really kind of a good time to have that mentality (Justin, Principal).</td>
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<tr>
<td></td>
<td>We don’t even know how to make (puzzles with their spelling words), but</td>
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</table>
they can. These kids are a lot more advanced (Darcie, 4th Grade Teacher).

I think it enhances all of those (content) areas. I don’t think it’s required at this age. I don’t think it’ll create a digital divide if you didn’t do technology until a little bit later, but having said that, I think that for some kids especially it’s a great motivator (Elana, 2nd Grade Teacher).

<table>
<thead>
<tr>
<th>EP</th>
<th><strong>Epistemology/Pedagogy (including learner centered beliefs):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>To be effective in your instruction, you have to do a lot of differentiation because all kids are not at the same point (Darcie, 4th Grade Teacher).</td>
</tr>
<tr>
<td></td>
<td>Well, in the years that have passed, I have come to think of myself more as a facilitator, maybe than a teacher or instructor (Taylor, 4th Grade Teacher).</td>
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<tr>
<td></td>
<td>Effective instruction is using any and every resource you can to get to a child to help them be successful and reach a point of success to prepare them for the next level (Ann, Kindergarten Teacher).</td>
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<td></td>
<td>Effective instruction is engaging of the students. I think it has to have some degree of, of general inquiry, that the kids have some ownership in it (Tom, Principal).</td>
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<td></td>
<td>I want it to be their idea and that’s the one reason I tend not to have expectations for them to go further than what’s logical. But if the technology’s sitting there and it’s something that’s going to improve instruction, you know, I’m going to mention it (Justin, Principal).</td>
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<tr>
<td></td>
<td>So there’s an attitude component and I think this is kind of overlooked these days. You have to want to be a learner at the end of the instruction (Elana, 2nd Grade Teacher).</td>
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<table>
<thead>
<tr>
<th>TU</th>
<th><strong>Technology Use (personal):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>We have iPhones, which all of my mail from school comes through; computer at home; keep the kids entertained with a movie on the iPad. So it’s everything; I have a Twitter, Facebook (Darcie, 4th Grade Teacher).</td>
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<td></td>
<td>(I use) basically any innovation out there; Transcribe documents for a friend that is at a publishing house; I’ve discovered Groupon in the last couple of a months and I’ve probably spent $300.00 on it already; guitar tutorials on YouTube have been really helpful to teach beginner guitar (Justin, Principal).</td>
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<td></td>
<td>When I get home I will check my email and then on my Blackberry I have my school email, (Facebook) that’s the third thing that you have to get on and check; I have an online bank account; I text (Taylor, 4th Grade Teacher).</td>
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<td></td>
<td>I have an iPhone, I use that a lot. That’s where I check my email, which is very convenient. I just love all the apps on there; If I get lost, it’s my GPS. I mean it’s everything to me. So I don’t know what I would do without it; I also have an iPad (Grayson, 4th Grade Teacher).</td>
</tr>
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<td></td>
<td>Games, Facebook and that was mostly you know, for the pictures from family and friends; Of course email, let’s see I have some list serves -some that are professional and a couple that aren’t, they’re just for fun. You know, that hungrygirl.com, so I get recipes. I do all of my pictures that I’ve taken of the girls, all that stuff’s online. I have some software that allows me to touch it up a little bit (Elana, 2nd Grade Teacher).</td>
</tr>
</tbody>
</table>
I keep up with a lot of my family members, is through Facebook, through email, text messaging. I use my iPhone, I live by it. My calendar. If I lost that I’d be in big trouble. Just keeping track of daily stuff that’s going on between knowing where my kids are each day and things like that. The internet, quick research. There’s so many things that I have access to that I didn’t have access to before, just trying to think back 10 years ago, what my life was like (Tom, Principal).

**Technology Use (professional):**

For instance, in the morning when I come in Pandora – light, classical music; I posted homework on the (Wiki) and communicated with parents as opposed to doing paper; We go in computer lab. They can turn the computer on. They can type a document (Darcie, 4th Grade Teacher).

This is the school’s iPad but I use it for (observations); I’ve really been trying to focus on Excel for the last couple years because there are so many things with RTI that we’re trying to do (Justin, Principal).

At least three times a week I’ll work on the computer with my math intervention kids…Use a typing tutorial; they have to use 30 minutes of their computer lab time working on keyboarding skills (Taylor, 4th Grade Teacher).

I think for kindergarten level learning the keyboard skills and then letting them figure out how to type sentences; you really have to do more in a computer lab so that everybody can be going at one time (Ann, Kindergarten Teacher).

Read-alouds in the classroom -now, I just don’t buy just a paperback book anymore. I just download it to the iPad; one of the things I just recently Googled, was I was showing the kids partial product, a way to solve a multiplication problem a different way. And I showed them, but I just thought it would be neat for them to see a child doing it (Grayson, 4th Grade Teacher).

We graphed something on Excel, something – they do the data collection as part of the math. We put it in Excel and then we instantly look at six different kinds of graphs because we just keep hitting a different one (Elana, 2nd Grade Teacher).

We have an email center, like it’s at literacy time that they get to go email their parents. And they love that, and then they get an email back. So they’ll be like, hey, can you check my email? (Claire, Kindergarten Teacher).

Yeah, I did a thing on bats and spiders and put a link on my wiki page. That’s for kids, so they could see different types of bats (Wanda, 2nd Grade Teacher).

None of that’s really carried over except for Google-ing things; This year, they do have a computer teacher so that kind of – I guess it makes me feel a little bit better about that (Kate, 5th Grade Teacher).

With cameras, we always do a geometry investigation where we go around the school and try to find any type of polygons or anything like that, and then they come back and put them on a slideshow and we do that. So they learn how to make a slideshow in PowerPoint (Shauna, 5th Grade Teacher).

**Adult Learning (formal):**
| AL | The (technology) professional development is like 45 to 1 teacher ratio. So it was real easy to get lost and just get frustrated (Ann, Kindergarten Teacher).  
I’d like to sit by a really smart person. I mean just like we do in our rooms. At some point somebody had to help me learn it, but now I know that and I can sit next to somebody and help them with that (Claire, Kindergarten Teacher). 
The last couple things I’ve been to have been pretty big. I mean you have 20 people, 25 people with one presenter (Elana, 2nd Grade Teacher).  
I would say no more than 25 or 30 people in a room...I think the smaller the better or I get a benefit out of it because sometimes I tend to zone out or be, “Oh, let me just check my email while I’m listening to this” (Kate, 5th Grade Teacher).  
There’s a lot of people in there, and I guess I do kind of feel like I ask the person next to me more than the teacher (Shauna, 5th Grade Teacher).  
I’d probably would keep it the way it is just because it’s working, to some degree (Justin, Principal).  

**Adult Learning (informal):**  
It is not after school where you have things racing through your mind like, “I need to go let my dog out. What am I going to cook for dinner? I need to wash towels. I’m tired. I’m hungry.” (Shauna, 5th Grade Teacher).  
We talk about how we can use different tools and things like that. And so that – Those conversations end up being kind of a group of three or four of us talking (Tom, Principal).  
I’m going to learn as I go and that’s going to help me as a teacher. (Darcie, 4th Grade Teacher).  
I really need one-on-one time for somebody to not tell me, but just step (take) me step-by-step, so that I kind of understand what it is, instead of someone just talking to me in a whole big group (Ann, Kindergarten Teacher).  
I need someone sitting down with me and showing me and practicing together. I’m a visual learner. You have to show me how to do something – you can’t give me a handout and tell me what to do (Wanda, 2nd Grade Teacher).  
So yeah, if it’s something that I want to know how to do, I’m going to Google it like crazy and look for it. That’s how I learn. Just like kids (Grayson, 4th Grade Teacher).  
I’d ask my friends mostly and my kids. I mean if it’s something like culture kind of stuff, music, that kind of thing, I’d ask my daughters (Claire, Kindergarten Teacher).  
I believe the best thing is if someone could show it to me. I need to see it, see somebody going through it (Elana, 2nd Grade Teacher).  
I’ll know how to do it just by watching people (Kristy, 5th Grade Teacher). |

| CLTR | **Culture (leadership/support/expectations): Lack of professional use**  
I just feel like if it’s not stated, teachers are going to forget it’s there or pretend to forget that it’s there (Grayson, 4th Grade Teacher).  
Some people (are) just not that curious about what the kids are thinking. They’re very centered on what they’re thinking and what their plans are (Elana, 2nd Grade Teacher). |
Barrier (Digital Divide):

If you’re one of those teachers that’s been teaching for a long time – this has always worked for you. If I teach this way I always get good results. Why would I change it? These kids are a lot more advanced -and to implement technology will be a lot easier for them than would be for an inner-city school (Darcie, 4th Grade Teacher).

Since I’ve grown up with technology I’m more apt to use it more frequently than someone who did not grow up with it, I guess, who wasn’t familiar with using computers - using technology (Kate, 5th Grade Teacher).

I think so because you know you don’t want them to get to middle school and just then be figuring it out. By then you really will have created a digital divide (Elana, 2nd Grade Teacher).

Barriers (Time & Other): Lack of professional use

Reading takes up a lot just because of the data that’s due. And math is getting there too (Grayson, 4th Grade Teacher).

I still have my two laptops but I haven’t really let my kids get on those. I guess at first I was afraid to let them use them. I was afraid they might mess them up or something (Ann, Kindergarten Teacher).

I don’t use my iPods. I wish I did. I honestly don’t know how to set them up so – I did them at Tinley Park, but then I didn’t do them a whole lot (Kate, 5th Grade Teacher).

Probably just the time factor. I always feel like I don’t have time… I need to teach this and not take time to teach them how to – like it took a long time to do the brochure because I had to teach them how to use Publisher. It kind of put us a week and a half behind everybody else, but they did learn Publisher (Shauna, 5th Grade Teacher).

I think resistance to change is still the number one issue just because they’ve
done it well for so long and it’s been effective (Justin, Principal).

Table 3: Coding Examples: a priori and naturalistic generalizations (Creswell, 2007; 2009)

From the preliminary coding of data, I migrated into a deeper phase of qualitative analysis comprised of looking for patterns or general themes that were consistent among the participants’ responses. Creswell (2007) says these analyses spiral, allowing the research to “enter with data of text…and exit with an account or a narrative” (p. 150). He also adds, that in case study research, the process of constructing themes involves both direct interpretation of the transcription (participant response) and classifying the data into categories, a process known as categorical aggregation (p. 156).

Findings

Creswell’s (2007) discussion of Dey (1993), on the process of learning qualitative research arguing that this occurs by actually conducting qualitative research was helpful in finding a similar connection with teachers learning to integrate educational technologies in the curriculum (p. 150). The following pages offer an in-depth look into teachers’ perspectives inherent in this case study and are separated by each of the primary themes to provide a more thorough analysis. I begin with representative statements by teacher participants that provide a composite picture of their reluctance toward ICT integration.

<table>
<thead>
<tr>
<th>Kindergarten</th>
<th>I still have my two laptops but I haven’t really let my kids get on those (Ann).</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>I like using the Wiki, I just think that it allows you to feel like you’re a part of the classroom and I know as a parent I totally appreciate that (Claire).</td>
</tr>
<tr>
<td>Second Grade</td>
<td>Yeah, I did a thing on bats and spiders and put a link on my wiki page. That’s for kids, so they could see different types of bats (Wanda).</td>
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<tr>
<td>Grade</td>
<td>Interview</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fourth Grade</td>
<td>I think technology enhances all of those (content) areas. I don’t think it’s required at this age (Elana).</td>
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<td></td>
<td>So utilizing this technology is not that big of a priority. I don’t feel like without it, my kids are going to suffer (Grayson).</td>
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<tr>
<td></td>
<td>We go in computer lab - they can turn the computer on and type a document (Darcie).</td>
</tr>
<tr>
<td></td>
<td>At least three times a week I’ll work on the computer with my math intervention kids…Use a typing tutorial; they have to use 30 minutes of their computer lab time working on keyboarding skills (Taylor).</td>
</tr>
<tr>
<td>Fifth Grade</td>
<td>I haven’t really – none of that’s really carried over except for Googling things….This year, they do have a computer teacher so that kind of – I guess it makes me feel a little bit better that I haven’t used so much technology (Kate).</td>
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<tr>
<td></td>
<td>I started using a levelized reading program in my classroom – they’re not amazing programs, but they’re things that are helping my kids in every day ways (Kristy).</td>
</tr>
<tr>
<td></td>
<td>I use a Wiki for a class list for parents, vocabulary words, calendar of the month, special events at the school, pictures, of course, of certain things that we’ve done in the classroom or at the school (Shauna).</td>
</tr>
<tr>
<td>Administration</td>
<td>Even our most resistant teachers are starting to use technology to some degree. Whether it’s just using the Internet more effectively or blogging and various things like that (Justin).</td>
</tr>
<tr>
<td></td>
<td>Our teachers use technology greatly, but not all of our teachers use it effectively with the kids (Tom).</td>
</tr>
</tbody>
</table>

Table 4: Teachers reluctance toward ICT integration

Interviews with these teacher-participants reminded me of my own experiences as an elementary school teacher, but it was these new perspectives from participants that helped form a composite picture of the perceived inhibiting factors of ICT integration.
that exist beyond the established or more common barriers associated with technology in education research (Woolard, 2010). These perceived barriers aided in the formation of themes and include: culture, time management/constraints, epistemological and therefore pedagogical perspectives, attitudes and beliefs (including efficacy and consequence concerns), and the digital divide that exists not only among digital immigrants (those not born in a digital era) and digital natives (those born in the age of ICT), but also among teachers and within the student population.

For many adult learners, as corroborated by the participants in this study, there is an increased association with visual learning as the preferred method of learning. This idea is well documented in the research on adult learning and development theory and supportive of Knowles’ (2005) assumptions about the importance of learning to be situated contextually and to be relevant to the needs of the learner. By seeing other teachers utilizing ICT in authentic ways, teachers feel they are supported in their efforts and they are more inclined to conceptualize how ICT integration need not be compartmentalized from teachers’ content instruction, but rather embedded throughout their practice. In addition to the participants’ adult learning perspectives, or the epistemological beliefs, espoused by participants, seven other themes emerged from my analysis and are outlined in Table 4. These themes serve as a composite picture of the holistic experiences of these 10 elementary school teachers and two administrators and are organized in such a way to facilitate understanding and future references to them. Each theme is accompanied by segments of participant responses captured during case study interviews that aid in defining the category and providing the reader with greater insight into teacher perspectives. Some categories are multi-faceted and the associated
text may evidence more than one domain. I have also embedded codes in segments for clarity, in particular, the multifaceted ones. The layout of Table 5, Coding Scheme 2, is consistent with the format of Table 3, Coding Scheme 1, where there are two columns representing Themes and Descriptions. In Coding Scheme 2, the column on the left contains the eight themes, labeled with parenthetical numbers, and how each of these themes presented itself in the research. The column on the right, are corresponding descriptions of each of the themes that are further supported by participant responses serving as examples of the associated theme.

CODING SCHEME 2

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
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</table>
| All participants reported that their primary method of ICT learning was informal, socially constructed, and situated contextually (ADULT LEARNING) (1) | **Teachers want to learn from each other in small groups or with individuals with whom they are familiar.**  
Teacher perspectives on the reliance of informal learning of ICT:  
I go to somebody who knows how to do it and has time to show me (Ann).  
Oh, my neighbor, he’s brilliant, he’ll come over and help us with stuff (Claire).  
I started talking to our tech coach and then another administrator came up to talk to me about Edmodo; so there was a group of us that kind of started talking (Tom).  
My husband helps me a lot because he knows a lot more than I do (Shauna).  
I’m always thinking in the back of my mind okay, this person is who I can go to if I need some help (Taylor). |
| Epistemological perspectives and reported learning styles of participants are seldom aligned with formal technology learning efforts (professional development) (EPISTEMOLOGICAL PERSPECTIVES) (2) | **Teachers have a desire to feel successful, respected and considered as individuals in their adult learning pursuits.**  
Teacher perspectives relevant to formal ICT professional development:  
We could say offer more professional development and all this. But to me, when you put a teacher in a room with 30 people, that’s not professional development (Wanda). |
| Reflective practices with ICT in regard to learning, integrating, and planning are minimal in elementary education (REFLECTIVE PRACTICES) (3) | Teachers report few opportunities to learn, practice, and reflect on the ICT learning experiences and integration.  
Teacher perception on reflective practices:  
I think that goes back to having time with the teachers just to talk, you know, “How do you use this? Oh, that’s a great idea, or Oh, I can do that.” Once I hear it, I go oh, that’s a great idea (Kristy).  
There’s more time to reflect on the classroom than on a professional development for myself (Taylor).  
I really don’t think there’s much (reflection). I don’t think there’s time for that. I really don’t. I probably could make time and I probably should make time because I do reflect at home a lot, just once I get home. But during the day, like after a lesson or after a PD or something like that, no, I don’t think so (Grayson). |
|---|---|
| A supportive school culture is imperative to ICT integration in elementary education (CULTURE) (4) | Teachers receive mixed messages of expectations for ICT integration from various stakeholders (administration, state/local/national government, teachers, parents and students).  
Teacher perception on school culture:  
You have a question and there’s nobody there to answer it (Elana).  
Most of them are of the mindset that this has worked in the past so we’re just going to do it again. They will only implement it if they have time to do it. It’s not planned and put in there (Taylor). |
But no talk of technology from others, and there’s seven of us. So out of seven, then including myself, three. It wouldn’t (be well received). Just because a lot of people just don’t get it…But if it’s not stated and no one’s there policing it, then it’s just going to fall by the wayside (Grayson).

But the people I know – we learned so much about technology, we learned so much in the hall, like somebody would say hey I did this today and it worked great. Cooperation is so important and we just don’t have time as teachers to do that (Kristy).

| High levels access, familiarity, knowledge, and use of ICT in personal life are not reliable indicators of ICT integration in elementary education. (PERSONAL ICT USE NOT INDICATOR OF INTEGRATION) (5) | Teachers who use ICT regularly in personal life may not integrate ICT with content learning. Evidence of limited correlation between ICT personal use and ICT integration: Significant Personal Use: My iPhone, I use it for email, I use it for Facebook. I read a lot of blogs. I use it for the weather a lot and news. I use it for recipes. I have a Kindle (Shauna). Lack of Integration: Because we don’t know that much, we don’t know how to integrate it as much. And it’s not a standard. It’s not something that we have to teach, and it’s not easy to integrate on a daily basis, or even a weekly basis. It’s easy to integrate in a type of project that you know is going to last this long, but it’s not easy to integrate within a daily basis (Shauna). Significant Personal Use: I have an iPhone, talk on the phone, text, I have a blog for my family which I haven’t written on in a while, but I do have one, Facebook, I’ll listen to iPod, watch TV, shop, bank (all online) –gps...I think I am more of a person that doesn’t like to read instructions and so I just like to figure things out, and so that’s kind of how I’ve done it, just kind |
of learned it as I’ve gotten my hands on it (Kate).

Lack of Integration: I haven’t really – none of that’s really carried over except for Googling things….This year, they do have a computer teacher so that kind of – I guess it makes me feel a little bit better that I haven’t used so much technology (Kate).

Significant Personal Use: When I get home I will check my email and then on my Blackberry I have my school email, (Facebook) that’s the third thing that you have to get on and check; I have an online bank account; I text (Taylor).

Lack of Integration: At least three times a week I’ll work on the computer with my math intervention kids…Use a typing tutorial; they have to use 30 minutes of their computer lab time working on keyboarding skills (Taylor).

Attitudes and beliefs (including epistemological and pedagogical perspectives, efficacy and consequence concerns, and ICT perceptions) are key indicators that inform a teacher’s paradigm and therefore ICT integration in elementary education (ATTITUDES & BELIEFS) (6)

Teachers’ epistemological perspectives inform their learner-centered beliefs and pedagogical practices, and the extent to which they believe their contributions will make a difference in student learning influence ICT integration decisions.

Teacher perception of ICT integration and influence of beliefs:

Because this world’s getting more and more centered around technology. These kids are going to have all kinds of projects on it. They already have cell phones so through technology, they’re going to be completing a lot of assignments. When they get into the workforce, they’re going to be doing work with technology. Like me now, they’re going to have their bank account online. There are just all kinds of endless things that they’re going to be needing it for (Kate).

Some people (are) just not that curious about what the kids are thinking. They’re
very centered on what they’re thinking and what their plans are (Elana).

I don’t know if it’s more by choice or more by frustration that I don’t jump in and do more (Ann).

To me, if kids want to communicate, they can call each other or see them at school. They don’t need to go on the computer and put something out there that’s going to hurt their feelings. They don’t think sometimes what they do or say (Wanda).

**Time constraints represent single most significant perceived inhibitor to ICT integration in elementary education (COMPETING PRIORITY-TIME) (7)**

Teachers perceive the availability of time as the determining factor for the extent to which they integrate ICT.

Teacher perceptions of time constraints:

People who are resistant to technology are going to be like you are putting another thing on my plate that I’m going to have to do. I think that’s how some teachers feel like we’re having to intervene with students, we’re having to do this with students and that with students, and all I wanted to do was teach students, and now I have to do one more thing (Kristy).

I feel overwhelmed and (wonder if it’s) relevant. Like, it’s great, but how am I going to do it on a daily basis in my classroom (Shauna).

Some days some things are lacking because you don’t have enough time. There isn’t enough time (Darcie).

I been teaching a long time, I consider myself a fairly proficient teacher and I still feel that way, very overwhelmed. More overwhelmed than I did ten years ago (Elana).

The *Digital Divide*, though based primarily on perception, does exist on multiple levels in elementary education, but it is not synonymous with age or teaching experience. (COMPETING PRIORITY-DIGITAL DIVIDE) (8)

There exists a perceived dichotomy between technology knowledge, access, and proficiency among teachers and students, but one that defies the notion of digital immigrant vs. digital native.

Teacher perception of the digital divide:

You get teachers like that, that they’re just so comfortable in their way of teaching
that they’ll look at that and go, “What in the world is she doing? That is not going to work. How is she going to do that?” (Grayson).

I think sometimes in this day and age, since I’m younger, I probably am far more advanced with technology than older people probably and so sometimes professional development can be kind of boring (Kate).

It was interesting coming to a building where (the teachers) were further along in some areas, but as far as student use, they were behind...And so you have a couple teachers that were really good at getting the students to use the technology. But very, very few and far between (Tom).

Some of the people I would consider the best in technology are older teachers. It’s the time. I would say that, honestly, because a lot of those teachers are older and they have older children and they just have time to play and figure out how to do things. I think that’s so important, just getting in there and figuring it out (Kristy).

Table 5: Classification of themes that emerged from direct interpretation and categorical aggregation (Creswell, 2007).

Emerging Themes

My interpretation of the data and the eight associated themes are arguably assumptions, represented in the construction of general categories, but through bracketing, I suspended my presuppositions in order to work directly with participants’ perspectives and to convey their perceptions of ICT integration. The validity and reliability of this study is further increased by the use of member checking, to review my findings and look for a correlation to their experiences as captured in the face-to-face interviews. Furthermore, an outside auditor reviewed the transcriptions, coding, and theme construction to increase researcher reliability and credibility (Creswell, 2007;
The specific role of the auditor was to examine the data, compare it against the researcher’s findings and look for areas of researcher influence. The consistency of themes derived in this data analysis correlate with empirical research in the domains of adult learning and ICT integration in elementary education (Woolard, 2010).

Synthesis of Research Findings

Using these two schools as a single case study, I investigated teachers’ perspectives of ICT integration in a suburban school district when barriers of access, familiarity, professional development and support are seemingly absent. This research provided a pragmatic means for conceptualizing the underlying factors leading to teachers’ reluctance to integrate ICT in elementary education.

Because these schools created the case study, a comparative analysis was never intended and furthermore, the intermediate school was selected in order to include the Fifth Grade teachers, a grade level often associated with the formative elementary schooling years. After completing the interviews and conducting the data analysis it became more evident that a comparative analysis of the two schools was not warranted. The administrator and the three teacher-participants who taught Fifth Grade were housed at their respective elementary schools the previous year and the data they provided was consistent with the perspectives of those who teach at Tinley Park Elementary.

The comparative analysis that took precedence, however, was the degree to which participants used ICT in their personal and professional lives. There was no apparent or perceived correlation between the degree to which a participant engaged with ICT in her or his personal life and the amount of ICT that was integrated into the curriculum. How
teachers perceive ICT for themselves, and even their students, was not indicative of a paralleled perception of integration in regard to student learning. In the comment below by Wanda, a Second Grade teacher, who reports an active use of ICT in her personal life, does not necessarily equate ICT use as integral to her perspectives on teaching and learning.

They’re a lot more advanced technology-wise, I think. But I think they lack a lot of just – everything’s not always about a computer, to me. There’s a lot of stuff where I think kids can get a lot just by learning from each other and talking and having a teacher work one-on-one, instead of just getting on a computer. I think there are tons of learning games and things like that. But I think sometimes teachers get so caught up in it that they kind of forget about getting up and having a regular conversation with the kids.

Wanda’s remarks are insight into another dichotomy that exists between how participants perceived their own learning styles (epistemologies) and what manifested in their learner-centered beliefs and subsequent pedagogical practices. For teachers like Wanda, the values placed on learning experiences, what she calls “regular conversations”, reflect her paradigm and the perception of ICT as impeding this process.

The views expressed by Wanda and the other participants, like Kristy, below, offer a glimpse into the influence teachers’ attitudes and beliefs have on forming the school culture.

I think technology has to be integrated in the curriculum. It absolutely has to be integrated in what you do. Most teachers see it as a separate entity.

If the comments of Kristy, a Fifth Grade teacher, resonate with other teachers in the school, then the teachers continually face more challenges that may manifest as a form of silent resistance. For Grayson, who teaches Fourth Grade, it is often a matter of following similar paths as those with whom you teach. Her comment below confirms
that school culture is influential in her decision to not to actively pursue ICT integration when she does not see her peers actively pursuing it.

I do think it’s very important. I rank that high for me. But because you may have some that don’t think that is the highest, and with my personality, you kind of do what the norm is like.

As I have outlined in this data analysis, the culture, that includes support and expectations, is integral to the understanding the gestalt of the role teachers’ attitudes and beliefs serve to influence their reluctance toward ICT integration. These themes were unanimous among teachers and administrators, who argued that part of their struggle lies in autonomy and being honored as professionals. Elana, a Second Grade teacher, notes this relevance when she states her perception of her school’s principal, Justin,

I don’t think he cares. I mean honestly I think if I’m using it great, and if I’m not, the kids still know what they’re supposed to know at the end of the year. It doesn’t matter to him.

For Kindergarten teacher, Ana, a similar perspective is offered that incorporates her attitudes and beliefs regarding the implications for what she would experience if the school culture were to be different. The excerpt is significant and worthy of noting because it shows how she would perceive the actions of her principal, Justin, is he were to insist she integrate ICT in her classroom instruction. Her remarks also demonstrate how such efforts would communicate a since of distrust in her professionalism, and more specifically, challenging her knowledge and experience.

You could either look at that at micromanaging and really putting pressure on you I would have to think, “I feel like I’m a professional. I feel like I do my job really well. I feel like my children are learning. And I’ve done everything that I could as far as this and this and this. But you’re going require me to (integrate technology).” I just feel like it’s just one more thing. And I know on the one hand you would think, (Justin would say), “I’m just doing my job making sure that you’re doing your job.”
If it takes that to get people to embrace using technology in their classroom as much as they can, I would hate it. I would hate to think that I would be…I wouldn’t be forced to (integrate technology) because clearly if they spend the money on it and get you professional development, even though professional development to me is not effective, that they would expect you to use it. But if (Justin) wanted to see if I would do a dog and pony show with my kids on technology I think I’d have to check out. I really wouldn’t, but that would just feel like - “Holy crap!”

Ann’s words are indicators of the inner struggles teachers face when it comes to teaching and learning with ICT. The themes that emerged from this analysis show, that while teachers may have overcome the established barriers of access, familiarity, professional development and support that are known to impede ICT integration, there are other factors including epistemological perspectives, attitudes and beliefs, and supporting school culture, that are significant to understanding teachers’ reluctance to integration in elementary education.

Before a seamless integration of information and communication technology (ICT) can connect elementary education with the digital economy, and before changes can come to the next generation of students entering the workforce, teachers’ reluctance toward integration must be understood. If teachers hold epistemological perspectives that do not include ICT as integral to knowledge construction for their students, then personal ICT use, hours of professional development, advanced degrees, support and access to new technologies will likely reveal little change in teacher practice.

The challenge arises with the new adult learner in the 21st Century, who can learn a language, calculus, organic chemistry, how to play an instrument, videography, sewing, construction, and how to develop new technologies with the aid of untrained “instructors” when and where they choose. The social context in these environments is continually at work in all of the new learning situations, where scaffolding exists informally; moving
the learner in and out of practice at her discretion until the learning is successful. Robin Usher (Usher in Illeris, 2009) expounds on a similar issue as a matter of personal autonomy and social empowerment, relating experience, pedagogy and social practice with experiential learning and postmodern perspectives. The idea behind the study is that learning and experience are interactive and without the ability to build on previous experiences and prior knowledge, the self-empowerment efforts of these individuals remain stagnant (Usher in Illeris, 2009).

To help draw the connection between the digitally connected society and ICT integration in elementary education, I thought I would use an analogy for my research on teaching and learning with educational technology to one of serving food in a school lunchroom. I recognize this comparison may be somewhat ironic, but it is no less appropriate to the context of my research site. In any given lunchroom in Anytown, USA, students are directed toward someone who distributes the lunchtime meal. Irrespective of teachers’ perceptions and food preferences, they are not consulted for their culinary opinions and they serve no role in the preparation of the meal. Students and teachers alike may have an abbreviated, previously selected choice of food items, but by in large, everyone who is served in the cafeteria receives the same general selection. Teachers may accept this lunchtime ritual as a day-to-day tradition that all must accept for students to participate in throughout the formative years of public education. Teachers have some autonomy in that they may select, but they, like their students, must either make a selection or bring in their own food.

Outside the school day, however, teachers have more autonomy and recognize the options that exist for them to make informed decisions about what they eat. Assimilative
and assembly line models are not the norm when cooking at home, but teachers may take
the initiative to consider: cost, preparation and cooking time, serving sizes, dietary
considerations, the occasion, and perhaps most importantly, taste, when preparing meals
for themselves and others.

There are some teachers, and other adults of course, who view cooking as an art,
who may have received formal training and may be more appropriately described as a
chef. For many though, cooking involves a pastime or heritage, where recipes, strategies
and anecdotes are shared among friends and passed down through family lineages.
Learning to cook, for the average adult, arguably occurs when it is convenient or when it
is needed. These experiences are likely unforced, voluntary activities that are situated
contextually and conducted in social environments.

Novice cooks may feel inhibited by the pressures of learning how to follow basic
culinary instructions, including deciphering new terminology (mince, sauté, fold). But
unlike those who learned to cook in the decades before the Internet, adults, like several of
the participants in this study voiced, are wired into and supported by a network of people
on listserves, Pintrest, and Facebook that may include a neighbor next door or a famous
culinary artist around the world. Utilizing the help of others through the methods above
or connecting asynchronously through YouTube, people can discover new recipes, share
perceptions, and anecdotes (tips, tricks and reviews); whenever and wherever they
choose.

This accessibility and immediacy of knowledge is more than a convenience or
luxury for the elite’s social interaction, it is quickly replacing previous epistemic
perceptions for how and when learning occurs. The question remains, what correlation
does one’s online persona and “digitally infused” life transfer to her epistemological beliefs and pedagogical practices with ICT integration in elementary education?

**Contextual Relevance of Case Study**

Site selection was integral to creating a purposeful study that would be conducive to understanding the perspectives of K-5 elementary schoolteachers who are reluctant toward ICT integration when the common barriers are seemingly absent. It is for this reason that I chose a Tinley Park Elementary School and Rooney Intermediate School that are located in a suburban school district with an established district-lead technology initiative. Having a system-wide technology initiative meant that the extraneous variables were minimal and the focus could be placed on hearing the perspectives of teachers who, by most accounts, would have no overly apparent reason for not integrating ICT in their content instruction.

**Theme Discussions**

Despite the prevalence of ICT supporting structures in the district, the participants in this study expressed a plethora of factors that they perceived inhibited their ICT integration efforts. While the ideas and opinions are personal and independent from other participant perspectives, they do provide the gestalt of the apparent phenomenon in this case study. In this section I discuss each theme as it relates to current research.

**Correspondence of Themes with the Literature**

There is clear and compelling evidence from the list of themes mentioned above in Table 5, Coding Scheme 2, that teachers want to learn in ways consistent with newer theories of adult learning and leadership. The manifestation of these newer theories, as outlined in the review of the literature, follows in the footsteps of Engeström’s activity
theory and Wegner’s communities of practice (CoP), to develop theoretical frameworks centered on developing learning communities. As evidenced in the work of Snyder and Dillow (2009), the expectation such learning communities is for knowledge to be shared by the individual to the larger community in an effort to advance learning for all participants. As another emerging theory in the digital revolution, the authors’ instructional-design theory rests in the understanding and critical analysis of design theory and formative research. Design theory, according to Snyder & Dillow, aligns itself with targeted outcomes or goals and means of attaining those goals. The second component of this theory is formative research, which was originally targeted for adult learners in informal learning scenarios. Formative research, according to Reigeluth and Frick (1999), as cited in Snyder and Dillow (2009), becomes operational under the auspices of reflection on the intricacies of existing theories. This analysis, or formative research, in turn allows for the creation of new design theories or improvement of existing theories. Examples where formative research was implemented include: collaborative problem solving, teaching and learning for understanding, elaboration theory, and as a model for the design of motivational instruction. Central to Snyder’s and Dillow’s (2009) argument for using instructional-design theory is the theoretical framework, which encompasses three essential tenets: learning communities, adult learning theory, and constructivism (2009).

**Adult Learning**

Because learning is socially constructed and is arguably conceived best among like-minded individuals in informal learning environment, it is not surprising to see the rise of Communities of Practice (Illeris, 2009; Wenger 1998; 2006). Shafer (2003) posits
this process whereby “individuals develop ways of thinking and reframe their identities and interests in relation to the community” (p. 2198). Shafer and others agree that because different groups have varied ways of knowing, epistemologies, individuals who make up these groups wish to learn from those with whom they are familiar and situate that learning contextually in small groups or one-on-one (Belenky, 2000; Cranton, 2006; Plair, 2008). This reliance on informal learning was a consistent thread that was woven throughout the conversations with participants. Teachers and administrators both expressed a desire to work cooperatively and voluntarily with other with whom they felt comfortable (Kegan & Lahey, 2009; Gordon & Patterson, 2006; Tondeur et al., 2010).

One can clearly see that when the focus shifts from meeting an isolated need, such as ICT training, to supporting the individual and collective growth of teachers that Mezirow (2000) contends is a primary goal of education.

While the research participants spoke in great detail in regard to the nature of knowledge, the influence of these perspectives are evident on their beliefs about the ineffectiveness of formal technology professional development. All participants communicated in some way about their need to be considered as someone who has specific learning needs and desires, which are not often taken into consideration when technology professional development and implementation are concerned.

They need to be engaging and have an effective way of helping facilitate my learning of whatever it is that we’re learning…I would allow some user-friendly time -to just sit there, because that’s the only way you can learn lots of things, is to just get on there and do it (Taylor, 51, teaches Fourth Grade with 29 years of experience and a M.Ed.).

I think I am more of a person that doesn’t like to read instructions and so I just like to figure things out, and so that’s kind of how I’ve done it, just kind of learned it as I’ve gotten my hands on it, I guess (Kate, 28, teaches Fifth Grade, six years of experience and a M.Ed.).
I just need to see it. You know, I’ve never had – the ones I’ve been to it’s always kind of been like a printout of steps how to do it, like from a PowerPoint, but I’ve never – I would love for them to give us opportunities to go visit a classroom that does it. I need to see it (Shauna, 28, teaches Fifth Grade, six years of experience and a M.Ed.).

Most of the training teachers in this study received is considered formal learning and was conducted after school hours. Because the teachers at each of these sites attend the professional development together, it was not surprising to find a disconnect between what teachers perceived was beneficial to her or his learning expectations and what was being offered by the school or district. The limited connection between participants’ epistemological perspectives and formal professional development experiences is well illustrated by Kristy, a Fifth Grade teacher at Rooney Intermediate, who says,

I really feel like they do advanced or beginning. There are people who are sort of like me in the middle. I don’t know that our needs are always met. We know how to generally use the programs, what we need is implementation. I guess if there was a glitch in the system it would be the idea of implementation, workshops for implementation.

A perspective similar to Kristy’s view is evident in the remarks of Wanda and Claire, when they state,

There were not a lot of advanced in the professional development; they were kind of like me -they know a little bit. You have some that don’t even know how to turn it on. At the time, the presenter was going around helping people that had no clue how to set up a wiki, when some of us already had a wiki page. We just wanted to add some new links to it. So we were just kind of sitting around thinking, maybe there should be another workshop for people that don’t even have this. It’s like intervention for kids, you don’t want to put a high reader through an intervention with a low reader because you’re trying to help that low reader. It’s the same way with adults. I get intimidated with somebody that’s really – like this presenter who is really good with technology. If I’m in a workshop with her, I know that she’s going to know a lot more than I do and I’m not going to ask questions like I would if it was someone that was like me, at my level (Wanda, Second Grade teacher).
Other workshops I’ve been to are fine, like you know, they’re more suitable for large groups, but I don’t know that technology is. You know, the presenter can put up stuff on the overhead and you know, I know how to read so I can do that. And I know how to take notes - so, I would say it’s the technology professional development that doesn’t work. And I guess I do feel inadequate with technology so I’m not one that if I were in a big technology workshop I wouldn’t stand up and ask a question. I would probably just say, “Oh, excuse can you come over here please?” (Claire, Kindergarten teacher).

As noted, Kristy’s words echoed among the participant responses and their perspectives were indicative of how teachers’ in this study perceived the incompatibility between their technology learning experiences and their own beliefs on knowledge construction. This provides clear evidence of how this paradigmatic and epistemological framework influences participants’ learner-centered beliefs and associated pedagogical practices.

This data is juxtaposed with the participants’ reported learning styles that included many of the same words and phrases of experiential learning (e.g. hands-on, I need to do it, get in there and try it, show me, experiment, play with it, let me see it, figure it out). This type of learner is well illustrated by the participant comments below,

You just have to use it over and over and just push stuff and see what happens. I guess I don’t really use any online tutorials or anything. I just kind of figure it out as I go, so over a period of time I guess I’ve learned it. And I just – I’ll watch other people do it, learn things, so I’ll know how to do it just by watching people (Shauna, Fifth Grade teacher).

The typical way I’m going to learn to use technology is to watch someone else do it (Justin, Rooney Intermediate Principal).

Most of the experiences were negative maybe just because of my take on it. For someone else it might have been useful, but for me – it makes me identify with the kind of learner I am. And I’m really more of a hands-on learner. And I really need one-on-one time for somebody to not tell me, but show me step-by-step, so that I understand what it is, instead of someone just talking to me in a whole big group (Anna, Kindergarten teacher).

I believe the best thing is if someone could show it to me. Like I need to see it, see somebody going through it (Elana, Second Grade teacher).
They need to be engaging and have an effective way of helping facilitate my learning of whatever it is that we’re learning (Taylor, Fourth Grade teacher).

I know I’m more of a hands-on learner. I need to do it and touch it instead of just hear it (Ann, Kindergarten teacher).

This epistemological perspective is significant for adult learners as it directly influences their perception of teaching and learning. Participants provide insight into how teachers transfer their perspectives and beliefs for their own learning to their teaching practices for student learning.

There’s a lot of people in there, and I guess I do kind of feel like I ask the person next to me more than the teacher or the – you know, whoever’s doing it because they’re being pulled in all different directions. So I mean, a small group for anything is better. For teaching, for teaching kids to adults I think. I mean, I think small group’s better for everything (Shauna, Fifth Grade teacher).

It would be better if we could maybe break off into different groups (during technology professional development), kind of like the differentiation we’re supposed to do in – we’re not supposed to do, but we should do in the classroom, where we’ve got all learners in the classroom and we’ve got to figure out a way to reach all of them at different levels (Grayson, Fourth Grade teacher).

I don’t think it’s a technology issue. I think it’s an underlying what you count as teaching and learning issue. I know if you get people to get there on one subject area, you can usually pull them along on all the others (Elana, Second Grade teacher).

Well I definitely think it’s important to keep learning. I’ve always said if I don’t feel like I’m learning, I need to quit. I think that I have to look at how I learn and what I am gaining from this information to then use it with my kids. I have to look at how I process this information to see how the kids might process this information. I have to get on their program and then I have to give the kids time to explore the program, so in that way I think my own learning definitely shapes the way that I do things with my kids (Kristy, Fifth Grade teacher).

**Theme One: Adult Learning Correspondence with the Literature**

When learning a new educational technology, teachers, who themselves are adult learners, want to know how to use the technology, but more importantly, they espouse a need to have a voice and for the learning experience to be contextually relevant to their
classroom practice. Likewise, these same learners have a need to feel successful and therefore request time to learn, practice, and implement these technologies. This idea is articulated well by Elana’s sentiments below.

Just the time. I mean it is a total time sucker. You can sit down to find something for your unit, and be sucked into all the looking and two hours have gone by. And then there’s the part of just the time to learn it. I don’t always have time.

As teachers are met with opportunities to learn ICT, there is a concomitant need to feel empowered by that experience and to believe their efforts to integrate ICT will make a difference in the educational experiences of their students. Elana’s concerns convey tenets of learning in adulthood where Knowles et al. (2005) assert that learning should be meaningful and relevant to the needs of the learner. His assumptions about adult learners also suggest that adults have a need to know why they are learning something (2005). Because the participants in this study are part of a district-wide technology initiative, it was no surprise that they did not express confusion as to why they were receiving technology related professional development or why they were provided with the ICT devices from the district. What they did express, however, was that their individual needs were not being met.

Much of the pervasive adult learning theory, as discussed in the review of the literature, is often in opposition to the education teachers receive. Empirical evidence, interviews with 10 teachers and two administrators supported in this study, clearly shows that teacher education is often not contextual, is infrequent, and assumes the adults are prepared to learn and adopt the content and learning style presented at that moment in time (Kotyk, 2010). In fact, all of the participants in this study expressed a desire to learn from peers and family members when and where it was convenient.
The data reveals that socially constructed knowledge forms a supportive network from which individuals may carry out content instruction independently, and then return to their peers for ongoing reflection and refinement. As discussed in the review of the literature, Communities of Practice (CoP), from the work of Lave and Wenger (1991) and are likely an ideal venue for these informal dialogues on epistemological and pedagogical beliefs to occur. According to Wenger (in Illeris, 2009), COP is where common needs, inquiry, interests, and collaboration can occur in the context of one’s occupation; where learning is connected to the everyday experiences of adults. These communities form a major construct throughout much of the literature on effective teacher education for ICT because they established social networks of like-minded individuals who operate voluntarily in context-specific situations; where we know most learning occurs (Illeris, 2009; Krumsvik, 2008; MacDonald, 2004; Stevenson, 2004; Vavasseur, 2008). It is also within these informal learning communities where teachers confront their unique epistemological and ontological perspectives through constructivist principles (Howard, 2000; Krumsvik, 2008; MacDonald 2008; Stevenson, 2004).

Though these communities are often representative of a similar collective perspective, it is imperative that we not forget Freire (1990) who reminds us that these groups are not isolated or formed apart from the individuals who create them. Brookfield (2005) and Mezirow (2000) further illustrate this point and argue it is individuals’ habits of mind that form their belief system and the lens by which they see the world. Associated attitudes and beliefs are significant and indicative of the participants’ paradigm about contributing factors for their reluctance to adopt ICT integration. Though each participant regarded some form of obstacle that impeded her or his ICT integration
efforts, some of the participants attributed their reluctance to the perception of ICT and what they constituted as the most important contributor for student learning. One can see from Grayson’s contention, below, what her attitudes and beliefs toward ICT integration in content are, and how she perceives them as inhibiting her from moving toward implementation.

And yes, some can easily throw in your technology with the math and reading, and say, “Hey, you know, I’m doing all of it.” But the problem is the time to plan that out is the problem. Yes, I personally think, I mean if I could just integrate technology into every single subject, I would. You know? I kind of almost wish I could take a year off and do that (Grayson).

Like Grayson, Justin, an advanced technology user, by his own admission, is driven by his attitudes and beliefs regarding his role as his school’s educational leader. For Justin, the decision to not mandate ICT integration for his teachers is tied closely to his belief that it will result in a decrease of teacher practice and teacher morale.

If it comes down to me mandating it I don’t think teachers are going to be as effective, and not only with technology. I think that their teaching is going to be knocked back a notch if all of a sudden they think, my administrator doesn’t appreciate what I’m doing with these kids. I think that’s going to be a huge blow to their moral; I think it’s going to be a huge blow to their class management. I think it’s going to be (negative) all the way around (Justin).

Justin’s paradigm influences his decisions and guides him, as the educational leader, to support the teachers in his school in a way that empowers them. Like Justin, and the other teachers mentioned above, the following two comments offer additional insight into how teachers’ perception of their milieu may inform their practice. The first segment is from Darcie, a fifth grade teacher with 11 years of experience, a M.Ed and an affinity for ICT in her personal life.

I don’t think I feel I can go to anybody on this grade level and say help me with this. Would you like to do this project with me on technology? I don’t think that
would happen. I think if I did come up and say I’m doing this, this, and this with technology, I don’t think they would. You know how some people are (Darcie).

Participants’ perceptions of their peers are significant for this study because, as Taylor, a fourth grade teacher with 29 years of experience, posits below, it is likely more indicative of how teachers’ perception extend beyond the school culture and are shaped by their beliefs about how technology influences the construction of knowledge.

There was a time period when people didn’t even use their computers in their room, and probably still don’t know. Like my brother, he’s real closed-minded.

**Theme Two: Epistemological Perspectives**

The segment below beginning with my interview with Tom, Tinley Park Principal, reveals how this process of discourse and constant reflection is important to addressing epistemological perspectives, because it begins to unfold informally among professionals seeking a better understanding of how their attitudes and beliefs influence pedagogical practices. Two additional teachers provide evidence in support of Tom’s paradigm.

You know, first of all, the tools we’re using today are not going to be the tools that are available when they get out of school. But just, this age, (the students) are so inquisitive. We’ve got to teach that desire to get in there and try something new, or that desire to get in there and use tools that access information. And so I think that’s got to be just kind of part of everyday life. And it is, for them. I mean they’re not afraid of anything. So I think too many times we get in their way (Tom).

The kids need to be engaged and interacting with each other, sharing their values and thoughts and strategies. They need feel it’s okay to give different strategies and thoughts about their learning (Wanda, Second Grade teacher).

I think integrating technology is crucial. I think if you don’t use technology in the classroom, you are completely ignoring what kids are having to deal with and not respecting who the kids are today (Kristy, Fifth Grade teacher).
Theme Two: Epistemological Perspectives – Correspondence with the Literature

In her dissertation on teachers’ perspectives for ICT integration in literacy, McIntyre (2011) focused on a population of teacher who also had high levels of ICT access for integration. Her contention is that teachers’ pedagogical beliefs are what mediate ICT integration, supporting Zhao et al. (2002), arguing that the closer an ICT “aligns with pre-existing pedagogical beliefs, the likelier a teacher is to integrate it into instruction” (p. 192). While I agree with some of McIntyre’s (2011) contentions, such as her belief about the difficulties of time constraints and increasing the attention placed on ICT professional development that focuses on integration, I do not concur with her findings that pedagogical beliefs are determining factors for integration (p. 194). What I do find, however, is that teachers’ ICT integration barriers are rooted in the adult learner’s beliefs about the nature of knowledge for herself or himself. The incongruence is too significant to accept McIntyre’s (2011) conclusion as correct, because it suggests that teachers who adopt constructivist principles for teaching and learning and those who also have high levels of technological proficiency in their personal lives would be actively pursuing ICT integration. My research concludes that another way to expand this perspective is to consider that a teacher, who believes that knowledge is constructed from one’s experiences, is likely to capitalize on many diverse and authentic experiences that connect students with the world they know and with the world they need to know to be successful in their future endeavors.

If the nature of knowledge, being socially constructed from the participants’ experiences, were not inclusive of interactions with ICT, then it is likely that their reluctance was not relegated to personal use and familiarity or breadth of professional
development. More technological devices and more staff development would likely yield similar results for the teachers in this study. The participants, who maintain traditional paradigms of teaching and learning, may perceive the integration of ICT contentiously and believe it to be disconnected from the goals and objectives of education that they argue are salient to their pedagogical beliefs. These long-standing habits of mind trace their routes to the Industrial Revolution and the mass schooling efforts of Mann (Christensen et al., 2008; Collins & Halverson, 2009; Stubblefield & Keane, 1994).

According to Buel and Fives (2009), belief factors are significant indicators of teachers’ development of pedagogical practices. In a study by Mouza and Wong (2009) the authors attribute teachers’ pedagogical beliefs to a disconnect between educator’s one-shot technology learning experiences, that includes associated learning theories, with integration of the technology in their classroom practice. This study is consistent with that of Buehl (2003) and Ravindran et al. (2005), as cited in Buel and Fives (2009), that found teachers’ epistemological beliefs, which they discuss as teachers’ beliefs about the source of knowledge, as determining both cognitive engagement and teachers' self-perception in teaching and learning situations.

The connection of epistemological perspectives to the literature is apparent and highly significant to what is known about adult learning and development. The relevance of the nature of knowledge on teacher practice, as discussed in the review of the literature, is pertinent to any teaching and learning theory because it acknowledges the individual’s experiences as being unique as to how it may determine the degree to which ICT integration occurs in an elementary classroom. One reason teachers may not adopt ICT integration practices may be attributed to
their habits of mind and existing ideology that have created a perspective on knowledge that is static, unwavering from their previous beliefs about teaching, and not stable or inflexible to accept new thinking models (Buel & Fives, 2009).

This idea is well illustrated by Derry (2009) in his remarks on the conceptual model of epistemology when he states

Unlike animals which evolve human beings also develop, and in this process of development, through which whole new needs and capacities are created including new ways of thinking about the world, acting in it and on it, education plays a crucial role (p. 506).

For Derry (2009) and others, teaching and learning with ICT is a matter of creating more learning opportunities that are aligned with, or challenge, teachers’ beliefs about knowledge construction. This is significant because it helps us understand why teachers often utilize teaching strategies that mirror their own learning experiences and/or their beliefs about how, when and where learning occurs (Dunn & Rakes, 2010; Judson, 2006; Mouza & Wong, 2009; Schibeci et al., 2008).

**Theme Three: Influence of Reflection on ICT Learning and Implementation**

Because teachers are not consistently adhering to a program or initiative for an extended period of time, despite the continuation of the technology initiative, it is my belief is that education is positioned to maintain the status quo by minimizing opportunities for teacher-reflection and, therefore, prohibiting lasting change from occurring (Christensen et al., 2008).

This cacophony of mixed messages is further compounded by a financial crisis in that may further compound an excuse-driven educational system that influences teachers’ self-perception in regard to efficacy and consequence concerns. Freire (1970) considers it a matter of self-depreciation, a connotation I would normally liken to an inferiority
complex, but one which he says is more reminiscent of “characteristics of the oppressed” (p. 63). In fact, there are myriad connections in this study to Paolo Freire’s critical pedagogy theory, conscientization or “pedagogy of the oppressed” in which he posits that learning is enmeshed within social practice (Freire, 1970, Horton & Freire, 1990; Sawchuk, 2003). As Freire (1970) asserts, “humans exist in a dialectical relationship between the determination of limits and their own freedom” (p. 99). This idea is salient to my research and in the understanding of the lived experiences of teachers who may exhibit that sense of hopelessness that often inhibits growth (Woolard, 2011). This may manifest in a dialectical tension between feelings of inadequacy, failure, or an inability to effect change and the autonomy to create, explore, and relate personal experiences. When one is allowed the freedom and space to develop, there are associated social and emotional connections that can be empowering and that have an ability to liberate one from the fear of being limited by their lack of familiarity or experience. This idea is expressed best using the words of Ann, a Kindergarten teacher.

The other people in the grade level, I really don’t see them using the technology that much in instruction. I see them using the technology more in presentations for the parents.

Evidenced in the comment by Ann, one can see how teachers, like other adults not working in education, are social beings who derive motivation and pleasure from knowing what their peers are doing. Though Ann may not see how her peers are using ICT in innovative ways from visiting their room, if they indeed are, her perception is indicative of a culture, which she does not perceive as using ICT. Her paradigm, like that of other participants evidenced in the comments of Claire and Kristy seen below, is highly influential on her attitudes and beliefs and, therefore one’s pedagogical decisions.
We certainly have strong personalities on our team. I think that there has been some frustration on our team that people – now not with me – that people aren’t using more technology, but who am I to judge anybody? I think as a co-worker we need to support each other more and not judge each other (Claire, Second Grade teacher).

It was very difficult for us to have opportunities for us to share. In many ways, depending on who you choose to be in those cohorts is so important, because if it’s somebody that’s very driven and very competitive, they will tend to keep the knowledge to themselves so that they can use it and other people don’t know they have it.

Like one teacher on our team got an iPad because she was part of this cohort group. Well we didn’t even know she had that iPad for four months, and we just sort of found out through the grapevine that it was to be used through all the people on our team.

But then we would try to go get it – so it became a very tense relationship, and I would think that when you think about systems that do have professional knowledge, I would think that that would be a crux of initiating. Teachers are competitive and they want to be the best at what they do (Kristy, Fifth Grade teacher).

These attitudes and beliefs may reinforce a teacher’s current epistemological beliefs and further separate her, ideologically, from those who may be pursuing ICT integration.

Because learning is enmeshed with social consciousness and not constructed in isolation as Brookfield (1986) and Kolb (1983) remind us, it is important to consider the influence of the social context on school culture, that shared vision, and how it may influence teachers’ decisions to integrate ICT in their content instruction (Ayman & Korabik; Gordon & Patterson, 2006; Kegan & Lahey, 2010).

The power of perception is important and, as participants in this study believed that their peers were not actively pursuing ICT integration, as noted here, the lasting effects are challenging to overcome.

I don’t know of anyone that’s done anything great with technology. I truly haven’t heard anything (Shauna, Fifth Grade teacher).

But no talk of technology from others, and there’s seven of us. So out of seven, then including myself, three may talk about it (Grayson, Fourth Grade teacher).
As noted above, individual perceptions are diverse and the basis for creating school culture. There were differences in the participants’ perceptions of their professional milieu, but those differences were relegated to a lack of integration all together or a perfunctory use of the ICT in ways that they believed were unauthentic. It is for these reasons that the influence of reflection on ICT learning and implementation is integral to this study and to understanding teachers’ reluctance toward ICT integration.

**Theme Three: Influence of Reflection on ICT Learning and Implementation - Correspondence with the Literature**

From the examples provided above, it is clear that teachers in this study are involved with learning opportunities and that personal beliefs about teaching and learning influence their perception of the learning experience. Kolb (1983), Schön (1983) and Brookfield (1986) are but a few theorists who stress the importance of learners to reflect on their experiences in order to best utilize new knowledge or experiences. These participants in this study, however, expressed their beliefs that they have limited structured professional opportunities for reflection on how to bridge ICT training to integration.

I think that goes back to having time with the other teachers just to talk, you know, how do you use this? Oh, that’s a great idea, or Oh, I can do that. Once I hear it, I go oh, that’s a great idea (Kristy, Fifth Grade teacher).

There’s more time to reflect on the classroom than on a professional development for myself (Taylor, Fourth Grade teacher).

I feel overwhelmed and (wonder if it’s) relevant. Like, it’s great, but how am I going to do it on a daily basis in my classroom (Shauna, Fifth Grade teacher).

I know they do a fairly good job of offering lots of tech opportunities, but after I’ve already gone to five different things and I’m still on beginner level, why would I want to try something new that I still feel uncomfortable with the first
four or five? It just sets you up for failure every time (Ann, Kindergarten teacher).

Because these participants argue the focus of the professional development is not on meeting their specific needs, they believe it contributes to their reluctance toward ICT integration. Whether teachers’ perceive their lack of integration stemming from their learning experiences or the culture that surrounds them, it is likely that their beliefs about teaching and learning are influencing more of their practices than what has been addressed in previous research. Buehl and Fives (2009) posit that teachers who hold traditional, static, epistemologies are less inclined to participate in reflective practices and to see themselves as valuable contributors of knowledge among peers. The primary reason for this contention is that teachers who maintain that the construction of knowledge occurs from a source of authority are less inclined to challenge existing teaching structure or question alternative approaches. This notion is consistent with my discussion of Brookfield (1986), Cranton (2006), Mezirow (2000) that focuses on the transformation of teacher practice occurring when adults are empowered to move beyond their current understanding, free to challenge assumptions and try on new ideas. Without opportunities to reflect, however, adult are bound by their perceptions that may limit their opportunities to effect change among fellow teachers or have change occur within a school.

**Theme Four: School Culture on Influencing ICT Integration**

As these teachers report limited and disconnected ICT use, it becomes evident that the grade level and school culture may be influenced greatly by teachers’ perception of ICT integration. Nine participants in this study expressed a belief that the school culture may not be supportive of their efforts.
Again, if I had the support of somebody here in my building, I could ask them how can I implement technology into the curriculum? When you have one person who’s servicing four schools – and he’s always said that his main focus is going to be on middle school, where do I get that support from? (Darcie, Fourth Grade teacher)

There’s some teachers that use it a lot more than others. I think they want some to shine more than others or do things to make it seem that you need to be using it more. Some are using it and not sharing ideas. Everybody’s got a lot going on and trying to think through their own class and what’s best for their kids (Wanda, Second Grade teacher).

When we had the tech coaches then you could go to them and say “I want do this kind of a project, or I’m studying this, what could I do with it?” You know what technical piece would make this better. Well we don’t have that anymore or you have a question and you don’t know have any answer and there’s nobody there to answer it. Now we have techs, a classroom teacher who’s getting paid a little extra money to come and to help with technology. I mean you know there’s no time for no one. I mean how’s that going to happen? (Elana, Second Grade teacher).

This is significant in regard to finding lasting change because it returns the focus back toward teachers’ attitudes and beliefs as being a significant influence on their shared vision, and therefore, ICT integration efforts (Leonard & Leonard, 2006). This idea is well documented in the literature on leadership and is most significant, as mentioned previously, because it enables schools to access the full potential for learning (p. 222).

These decisions are not relegated to one area and, therefore, it is not possible to make a definitive argument as to what will be the “next big thing” in a sea of growing reform efforts. Despite the lack of continuity among participant perspectives on a single inhibiting factor for ICT integration, it is clear that the participants perceive the district and their local administrator as having expectations for its use, as demonstrated in the examples below by two Kindergarten teachers:

They pour so much money into it of course they expect you to be completely onboard with utilizing it in every aspect of your daily instruction as much as possible. And it’s not like they check up on you and make sure you’re doing all
those things, but it’s certainly put out there (Ann).

Yeah, I think he has expectations for me to be using it. But finally, and I would say very fair expectations, it’s not – he’s very fair (Claire).

The participant remarks above are not unique in this study or relegated to Kindergarten, as contradictory language is used regularly when teachers speak in terms of implementation and leadership expectations. While participants conveyed a sense of expectations for technology use, no teacher felt obligated to integrate ICT and furthermore, expressed there were no articulated measures of accountability for its use.

In other words, despite the perceived expectations of their administrators, these teachers do not feel compelled or obligated to integrate ICT in their content instruction.

While participants did agree there were no expressed ICT integration requirements or accountability measures for ensuring its use, the expectations for 21st Century learning, espoused by local and government agencies, are recognized. These initiatives and programs are easily identifiable because they taught *best-practice* educational rhetoric and calls for reform, as evidenced in the No Child Left Behind Act of 2001 or in President Obama’s recent Educate to Innovate campaign.

Most reform efforts are also familiar because they are juxtaposed with an influx in high-stakes accountability measures pressuring schools to show measureable gains through such means as Annual Yearly Progress (AYP) benchmarks. As a result, districts, like this one, adopt *research-based* programs/series and join initiatives that are further reducing teachers’ autonomy and leave many behind, struggling to catch up. Teachers perceive the revolving door of curricular focuses and adopted programs as complicating their efforts to ever get ahead. Darcie, a Fifth Grade teacher with an Administrative Certification herself, captures this perspective well in her comments below.
You have to be really careful when you give things to a district. The more things that fail, the least likely the teachers are willing to embrace it.

For many schools, this shift from leadership to management is education’s trend for resisting transformation (Christensen et al., 2008; Wise & Jacobo, 2010). This is particularly true in the digital age where initiatives and adopted programs are short lived, and consistently replaced the next school year by a new or revised series. With each subsequent reform effort that fails to bring lasting change, teachers are left struggling to define their roles as professionals and seeking a desire to feel empowered as individuals.

These highly structured programs tout high rigor and are consistently procedural or scripted. A concomitant component to many of these adopted series and initiatives are experts who conduct “how-to” teacher training sessions and who enter teachers’ classrooms to demonstrate (or model) their prescribed method of instruction. Some might call it “teacher-proofing” while still others may simply subscribe to the notion that streamlining education throughout the United States is the pragmatic solution to increasing teacher and student accountability in the race to the top. In either regard, the highly structured and often mandated curricular focuses of public education have all but removed teachers’ ability to be innovative or to customize learning for their students because there are scant opportunities for critical inquiry, critical thinking, and critical reflection (Wise & Jacobo, 2010).

**Theme Four: School Culture on Influencing ICT Integration – Correspondence with the Literature**

In 2012 we are also at a critical crossroad, one intersected by expectations for digital literacy and educative environments that are historically unwelcome to change. With the right leadership styles and collective efforts of those responsible for teaching
and learning, there are opportunities to ameliorate current leadership practices in responsive ways in order to mirror the global society and create a shared vision within our schools (Leonard & Leonard, 2006). Such changes will embody leadership that is: distributed, focused on individuals and adaptive, as Heifetz (1994) suggests, in addressing the specific and contextual needs of individuals.

The following excerpts were taken from participant interviews to illustrate the role of perception regarding school culture. Ann, a Kindergarten teacher with 25 years of teaching experience says,

We talk about stuff and there are a couple of teachers that are about where I am (with technology), but we all just share the same frustration.

Wanda, a second grade teacher with 17 years experience and an earned Ed.S., regards a disconnect she finds in both technology proficiency and epistemology, which she bases primarily on age, when she states,

All these new people are coming from college. All of them have this technology stuff and know all this stuff. I feel I’m old-school.

While these initial remarks come from teachers who were not born in the digital era, a perception of school culture and influence, as shown below by Kate, a digital native who has taught for six years, are not relegated to age or level of experience. In other words, a teacher’s willingness to integrate ICT is more likely influenced by school culture than her age.

I know at least two of the four of us definitely use technology more so than others probably. Me not included, I guess, probably (Kate).

In regard to school culture as being highly influential on teachers’ reluctance toward ICT integration, as evidenced above, results from this study confirm that even teachers who had technology in education courses in college, or hold advanced degrees in technology-
focused programs may be more influenced by their milieu than their academic experiences. This connection is best illustrated by the remarks of two Fourth Grade teachers who had extensive graduate-level course work in technology in education.

One thing I want to learn to do is use the one IPod that I’ve never used and the other one I only used this year, and you know we’ve had them for three years. I would love to do stuff like that, but we just haven’t had time (Taylor).

I really do think using the technology would be easy to do. But because of so many other things that you feel like in your day, you have to get done, that’s something that I would have to do outside of class, and at this moment, I just don’t have any extra time outside of schoolwork or my work to do that at home (Grayson).

While the leader’s aptitude is argued as being influenced by reflection and commitment to the holistic development of the organization, Afshari et al. (2008) suggests, the principal is the critical change agent in schools. It is important to note, however, that the two administrators expressed teacher autonomy and choice in how they would or would not integrate ICT, which is well aligned with Svedberg (2010). All teacher-participants corroborated this finding and communicated how ICT integration was perceived by the administration as important, but not a necessity for their instruction.

Because teachers are missing critical components necessary for igniting change, including a shared vision, they are not invested in school improvement or assisted in their efforts to overcome barriers to ICT integration (Kegan & Lahey, 2009; Leonard & Leonard, 2006; Thousand & Villa, 2010). As these leadership changes take effect, school leaders can expect increased capacity in teachers’ job satisfaction, commitment to collaboration and to the organizational goals that include effectively integrating ICT in elementary education (Ayman & Korabik, 2010; Crippen, 2005; Nguni et al., 2006; Svedberg, 2010; Tondeur et al., 2010; Zemblas, 2010).
Theme Five: Personal ICT Use Not an Indicator of Integration

Regardless of age, gender, ethnicity or level of education, the participants in this study reported to be actively engaged with ICT in their personal lives. This technology use, albeit at varying levels of use and complexity, is illustrated in Table 6 below and offers a quick glimpse into the digital society these teacher-participants engage in when they are not in a formal school setting.

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Grade level or position</th>
<th>Personal ICT use* (in addition to home computer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann</td>
<td>K</td>
<td>Cell, text, email, internet, photo sharing, online banking &amp; shopping, GPS</td>
</tr>
<tr>
<td>Claire</td>
<td>K</td>
<td>Cell, text, email, internet, iPod, photo sharing, blog, online shopping, vacation planning, YouTube, GPS</td>
</tr>
<tr>
<td>Elana</td>
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<td>iPhone, text, email, internet, photo manipulation &amp; sharing, internet, listserv, Facebook, games, online banking &amp; shopping, vacation planning, home organization, greeting cards</td>
</tr>
<tr>
<td>Wanda</td>
<td>2</td>
<td>Cell, text, email, internet, research, Facebook, photo sharing, Pinterest, YouTube</td>
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<tr>
<td>Darcie</td>
<td>4</td>
<td>iPhone, iPad, games, text, email, internet, Facebook, Twitter, YouTube, photo sharing, GPS</td>
</tr>
<tr>
<td>Grayson</td>
<td>4</td>
<td>iPhone, iPad, games, text, email, internet, Facebook, online shopping, YouTube, GPS</td>
</tr>
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<td>Taylor</td>
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<td>Justin</td>
<td>Admin</td>
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</tr>
<tr>
<td>Tom</td>
<td>Admin</td>
<td>iPhone, iPad, text, email, internet, Facebook, twitter, sharing, GPS</td>
</tr>
</tbody>
</table>

* Participants’ personal ICT use as reported during the interview.

Table 6: Participants' Personal ICT Use

Despite the breadth of these personal pursuits, there remained a significant reliance on social interaction and reliance on ICT for daily functions. This pervasive personal use
stands in contrast to the teachers’ admissions of little classroom integration. This dichotomy was made manifest in teachers’ perceptions of their own beliefs and practices on teaching and learning and the school culture. This includes the system of support, pervasive ideology, norms (curricular mandates, leadership and expectations from local stakeholders (district and local administration, colleagues, students and their parents).

The problem is often not that adults do not use new technologies. In fact, the participants in this study echo what research shows as regular ICT use for adults that included: email, smart phones, laptops, digital cameras, gps, Facebook, YouTube, blogs, online photo galleries, eBay, electronic calendars and online newspapers, to name a few (Christensen et al., 2008; Collins & Halverson, 2009). There are now billions of websites and as many web searches performed by people around the world each day (Google, 2010). The plethora of knowledge available, the sharing of information, and who owns that knowledge is quickly changing who the experts are and to whom the participants are turning to for information (Wilen-Daugenti, 2008).

For those who have adopted this technological lifestyle, it is no mystery why these participants are digitally connected, as they represent a small fraction of Facebook’s 400 million active users that may log on in any given day (2012). Though not all of the participants choose to use Facebook as their digitally connected outlet, they are actively using other ICT for acquiring information and communicating or sharing that knowledge and its construction with other people. This idea of knowledge being socially constructed is not new in the digital era, but one that has persisted for decades in the writings of educators, sociologists, and psychologists (Dewey, 1938, Freire, 1970, Brookfield, 1986, Mezirow, 2009).
Facebook, YouTube, Twitter, and even the less well-known list serves and forums that are content specific, promote opportunities for people to interact with others in an informal environment. It is within these hosting sites, where information that is available, accessible and regularly tested and adapted by those within the community. Accessibility to knowledge in this manner is a new construct to individuals not born in the digital era, but perhaps surprisingly, the participants in this study showed that age was not a deterrent for participation in the digital era.

These teacher-participants are representative of a growing number of adults who are finding that learning is no longer relegated to formal classroom instruction, where an individual dispenses information. This change in the contextual nature of learning ushers in with it a restructuring of attitudes and beliefs that are influencing these adults perceived learning styles and preferences. YouTube is a great example of how this trend of learning and social networking is growing more popular. It is reported that, “more video is uploaded to YouTube in one month than the 3 major US networks created in 60 years” (2012). With the breadth of access to information, it is no wonder that the global society is becoming increasingly more reliant on ICT to blur geographic borders.

One might assume that sites like Facebook and YouTube are generally geared toward the younger, digital native, generation, but YouTube states on its website that their target demographics are users between 18-54 years old (2012). While this range does include a sizeable percentage of digital natives, many of these users in this age category are identified as digital immigrants under the basic definition. With a growing population of adults adopting the paradigm shift toward digital literacy, it was important for this study to include participants of varying ages. As indicated in the participant
demographics, the teachers and administrators in this study were from 28-55 with an average age of 41. This average age is indicative of those born before the ubiquity of technology, but the significant use of technology reportedly used by the participants in their personal lives, took precedence over their chronological age. In other words, the age of the participants was not a relevant factor or additional variable, that would pose as a potential barrier, for consideration when attempting to understand the presumed phenomena that influences teachers’ reluctance toward ICT integration. Evidence of such a technology savvy educator is presented in Chapter Four by multiple participants including Elana, age 46, who teaches second grade, Kristy, 40, who teaches Fifth Grade and Justin, who is 51 and is principal at Tinley Park.

It is worth pointing out that these teacher-participants also represent the demographics of elementary school teachers in the United States (NCES, 2010, p. 21). The demographic information collected includes gender, ethnicity, age, education level, number of years of teaching experience, number of years at the selected site, and teaching assignment. While this study was not intended to be generalizable to a larger population, it was imperative to contextually situate the study, look for patterns that emerged and then to compare these themes against existing data.

**Theme Five: Personal ICT Use Not an Indicator of Integration – Correspondence with the Literature**

Though much of the research on ICT integration focuses on the obstacles and limitations that prevent teachers from effective implementation, my quest was to understand the experiences and perceptions of teachers who have overcome the more common barriers of access, familiarity, professional development, and support, but who
are not actively pursuing ICT integration in their classroom instructional practice (Woolard, 2011). The findings in this study are consistent with what we know from the literature and empirical evidence from the National Council for Educational Statistics and the U.S. Department of Education, showing that despite an influx of ICT including: hardware, software, and therefore access, many teachers find it difficult to catch up to the demands of expected technological proficiency for themselves and their students (Chapman et al., 2010; Schibeci et al., 2008). Though the research participants indicate using technology in their personal life, they also gave various reasons for why they do not integrate technology into their classroom teaching.

Examples of participant responses that indicate a limited amount of ICT integration in content instruction or ICT use that is separate and apart from curricular foci is evidenced below by three Fourth Grade teachers in their response to how they used technology in their classroom.

I use the iPad for read-alouds in the classroom now, I just don’t buy just a paperback book anymore. I download it to the iPad, and if the kid wants to read it, I’ll pull out my iPad (Grayson).

The students have to use 30 minutes of their computer lab time working on keyboarding skills (Taylor).

For instance, in the morning when I come in we turn on Pandora and listen to light, classical music (Darcie).

In separate studies by Byrom & Bingham (2001) and Wilmore & Betz (2000), the degree to which ICT was integrated was determined by the active support of principals (Afshari et al., 2008). Gordon and Patterson (2006) found similar evidence of leadership perceptions and further the argument with evidence of the cyclical nature of instructional leadership programs in colleges and universities that perpetuate the single person at the
mentality (p. 208). This is an important consideration because, as Gao et al. (2010) suggest, Generation Y students are more knowledgeable about ICT integration than older students and should be better prepared at implementing technologies in their content instruction. According to Pashiardis (2009) though we are rife with change, this period is marked by a gap between theory and practice.

While all of the participants discussed the curricular requirements for teaching their respective grade levels and how they were to follow the prescribed series or educational program incorporated within the district guidelines, there was not evidence of a connection between expectations and integration. Teachers commented on how they were given explicit expectations and accountability measures for teaching these programs, and each administrator confirmed how lesson plans and walk-throughs were incorporated to ensure teachers were in compliance as indicated previously in Theme Four: School Culture on Influencing ICT Integration. Despite having clear expectations for content instruction, there was a lack of clear guidelines for ICT integration that was understood by both teachers and administrators, which some participants may have used as rationale for their lack of integration. In light of what is understood in the literature, the lack of ICT integration compared with high levels of personal use by teachers is surprising by most accounts, but consistent with what the results of Gao et al. (2010), Sugar and Wilson (2005) and Judson (2006). With teachers either unprepared or unwilling to adopt or adapt their beliefs about teaching and learning, it is impossible to use personal ICT use as a remedying factor to promote ICT integration in elementary education.
Theme Six: Attitudes and Beliefs

The attitudes and beliefs of the participants in this case study are evident in all aspects of the data. They are echoed among participants and, in some cases, may give voice to a widely-held belief that elementary school teachers do not perceive themselves as being considered as professionals. This concept is multifaceted and will also transfer to a belief that teachers may also not perceive themselves as unique individuals, in particular when they are in a learning experience, grouped with teachers from diverse socio-cultural backgrounds, epistemological perspectives, habits of mind, and paradigms that happen to teach the same grade level, discipline, or area of specialization (Brookfield, 2005; hooks, 1994; Minnich, 2005). Evidence of this phenomenon was captured in this study speaks primarily to the influence of epistemological perspectives on the participants’ practice. The first comment from Kristy, 40, and a Fifth Grade teacher with 18 years experience, appears at first glance to discuss models of professional development, but it her remarks at the end of her quote that reveal the deep seated influence of her beliefs on knowledge acquisition that inform her perception of the learning experiences she is in.

We’re not with those upper level teachers very often, so a lot of times we’ll go to a session and we’ll talk about how to use things with a first or second grade class, and this is a “for instance” because I teach fifth grade, but it gets very frustrating because I don’t feel like that’s going to benefit me and my classroom…Effective instruction to me is much more than just curriculum. It’s recognizing with the differences in learners.

Not unlike Kristy, Grayson, 37, who teaches Fourth Grade, reveals how her beliefs about teaching and learning are filters for how she wants to learn and what she values in the learning experience when she states,
You need to know kind of who your audience is going to be. So I think that would be helpful to kind of – or if you don’t want to do a survey, but just some kind of way find out the level of your audience. And then, at that point, I mean finding out what the needs are. And then making sure that you have the right things there for them and not just talking to them and giving them handouts (Grayson, Fourth Grade teacher).

Though both participants are clearly referencing their own experiences in professional development, they reveal how their attitudes and beliefs, relevant to epistemological perspectives, are inseparable. It is through the words of Elana, 46, who teaches Second Grade, however, that the intrinsic nature of learning, reminiscent of Knowles (2005) assumptions about adults’ readiness to learn, is evidenced.

There’s an attitude component and I think this is kind of overlooked these days. You have to want to be a learner at the end of the instruction.

If learning how to effectively integrate ICT in elementary education were a matter of choice, then the participants in this study, by their own admission, would be implementing. It is with these participant perspectives, their attitudes and beliefs, that a compelling argument is made that the focus for preparing teacher-learners to implement ICT in elementary school is relegated to completing an objective rather than providing them with opportunities for critical reflection and examination of their epistemological perspectives (Brookfield, 2005; Cranton, 2006; Mezirow, 2000; 2009).

Theme Six: Attitudes and Beliefs – Correspondence with the Literature

Because teachers’ epistemological perceptions, and associated ideology, may be incongruent with their milieu, it is arguably necessary that teachers have an opportunity to confront their belief systems. Listening to Elana describe the process of transformation, shown below, resonated with the ideals expressed by Brookfield (1986,
2005) and Mezirow (2000, 2009) when it comes to having an opportunity to confront one’s epistemological perspectives.

Yeah, it’s almost like an ah-ha moment. And you can’t get people in the ah-ha moment, you can only provide the circumstances in which it could occur.

Well if you can just get them to notice what kids are thinking in one area, it’s usually so interesting or engaging or exciting, that you’re interested in other areas. Some people don’t get there, they’re just not that curious about what the kids are thinking. They’re very centered on what they’re thinking and what their plans are. They think they’re kid oriented. But they’re kid oriented in that they get to decide what they think that the kids need. And they may be working really hard and long. It’s not that they don’t care. I think most people are doing their absolute best at the things that they do. There are some exceptions, but most people, as Ruth Parker says, they haven’t had an opportunity to learn (Elana, Second Grade teacher).

What Elana describes is central to Brookfield’s (2005) ideology critique and Mezirow’s (2000) disorienting dilemma because it is a situation in which an individual confronts her or his values, beliefs and assumptions. This is a very complex issue and one that Cranton (2006) says is difficult because an individual’s frame of reference or habits of mind is so deeply ingrained and seldom brought to the surface. Though this discovery and awareness can be challenging, it is also potentially liberating as it provides opportunities for people to transform their belief system as Elana does when she recognizes how imperative students’ knowledge construction is to her pedagogical practices. In other words, teachers need the chance to explore their assumptions about knowledge in order to change their practices.

This idea is important to consider because even with available technologies, teachers in this study were reluctant to integrate ICT in their instruction. This finding is inconsistent with McIntyre’s (2011) research where she explained that teachers were more likely to integrate technology when it was easily accessible. From my research and
with what is consistent with empirical research on adult learners’ attitudes and beliefs, the influence of ones’ perspectives, or habits of mind, inform their personal decisions as Cranton (2006) and Mezirow (2000) assert and their pedagogical practices that Ottenbreit et al. (2010) and Levin and Wadmany (2008) confirm.

**Theme Seven: Competing Priorities - Time**

What these participants provided by way of their perspectives throughout the interviews is clearly a testament to the complex life of these educators and the dichotomy between their personal and professional use of ICT. As participants have unique attitudes and beliefs about their teaching practice, it is evident that they are influenced by their milieu. This is particularly significant because of the implications it holds for impacting teachers’ reluctance for ICT integration when all participants perceive time as the single most contributing deterrent for implementation. Excerpts from participant responses provide insight into this phenomenon.

You have to try to fit technology in. Some days some things are lacking because you don’t have enough time. There isn’t enough time (Darcie, Fourth Grade teacher).

Well there’s our required 90-minute literacy block, so… most of my day is taken up with required stuff. Then by the time you add lunch and specials – it’s hard to squeeze everything in (Claire, Kindergarten teacher).

We don’t have a lot of extra room for teaching computer or doing fun stuff. We’re required to do all this other stuff. So we have to pick and choose, pretty much (Wanda, Second Grade teacher).

It sounds awesome to incorporate technology in the classroom, but then it takes time to do it (Kate, Fifth Grade teacher).

While increasing one’s knowledge has the potential to liberate and increase autonomy, it can also have deleterious effects when an individual feels powerless to make changes. As indicated in the literature review, changing teacher practice is a complex
task that requires time to think and process ICT as a seamless integration, one that is not separate and apart from content instruction.

As far as the team getting together and trying to get technology integrated – I don’t know what else we could integrate. I don’t know what else we could fit into a day (Ann, Kindergarten teacher).

I would love to integrate technology, but just with so many other required things, and just to have a personal life. It’s so hard to – I would love to do it, but I just, I feel like I just don’t have enough time in the day to sit there and plan something out like that (Grayson, Fourth Grade teacher).

Teachers can be empowered with autonomy and free to challenge assumptions and beliefs through an interpretive process, that includes the trying on of new ideas in order to transform praxis (Brookfield, 1986; 2005; Cranton, 2006; Kolb, 1983; Merriam et al, 2007; Mezirow, 2000; 2009; Tennant & Pogson, 2002). In these experiences, adult learners, teachers, socially construct knowledge by engaging in: the experience, discourse, on-going reflection and experimenting with concepts in new and authentic settings (Brookfield, 1986; Cranton, 2006; Kolb, 1983; Mezirow, 2000; 2009). There is no a quick fix for lasting change to occur, but a need for renewed focus in overcoming the incompatibility between the actions of education and the educational goals for adult learners (Levin & Wadmany, p. 235).

**Theme Seven: Competing Priorities – Time – Correspondence with the Literature**

We know from the literature that teachers face a number of competing priorities in today’s elementary classrooms that are long-standing traditions of schooling in America (Chen, 2010; Christensen et al., 2008; Collins & Halverson, 2009). At the top of most teachers’ greatest struggles are the increasing demands of research-based programs, initiatives, annual yearly progress monitoring and intervention, among others, which require more of the teachers’ time and attention than ever before (Mouza & Wong, 2009).
As participants in this study argued a lack of time was the leading factor for their reluctance to integrate ICT in their instruction; Vavasseur (2008) contends it is part of a growing phenomenon that focuses on the operational functions of ICT for teacher training. As with other attitudes and beliefs, teachers’ perspective on the availability of time is subjective and often reflective of their views about teaching and learning (Ertmer & Ottenbreit, 2010).

Because time is multifaceted, and highly subjective, it is important to consider how multiple perspectives can exist in regard to competing priorities and how they may manifest as a lack of time to accomplish a task. Worth noting, time is continuously referenced as imperative in the literature on adult learning and development. Time is a necessity and best represented in the need for opportunities to experiment, try out, reflect, adjust and interact with others as knowledge is constructed (Brookfield, 1986, Cranton, 2006; Kolb, 1983, Mezirow, 2000; Schön, 1983).

According to Schibeci et al. (2008) learning to integrate ICT is a complex process. Buehl and Fives (2009) agree and contend that change in teacher practice may occur, but it does so over a period of time. One of the most intriguing aspects of the discussion on time is the dichotomy that exists among teachers within the same school who perceive time differently. This is most apparent in the ways teachers utilize ICT to work within the time constraints and those who perceive the availability of time as inhibiting ICT integration.

**Theme Eight: Competing Priorities – Digital Divide**

Though all of the participants spoke favorably of their school, each maintained a belief that there was not a supportive culture or allowance of time that would offset their
reluctance toward ICT integration in their respective schools. These perspectives were often manifested in the participants’ views on the prevalence of the Digital Divide among their colleagues. As evidenced earlier, there was not a clear division among the participants in regard to their personal technology use based on age, race, sex, or level of education. Despite the similarities inherent in the participants’ reliance, or at least integration of ICT in the personal lives, these disparities were perceived to exist based solely on the ages of others, as shown below,

There are some teachers that are much, much older and have taught much, much longer, you know they’re not doing as much as I am, but you know, these young people now can do so much (Claire, Kindergarten teacher).

I think at some point. I mean, since I’ve grown up with technology that I’m more apt to use it more frequently than someone who did not grow up with it, I guess, who wasn’t familiar with using computers or -using technology and computer and with things that are – iPods coming up and iPads, I’m more apt to be using that than somebody else who’s older (Kate, Fifth Grade teacher).

While this proved to be the pervasive belief among participants, Kristy, a Fifth Grade teacher, confirmed what the data revealed, which was there was no direct correlation between age and ICT integration; some older teachers are actively pursuing ICT integration and some are not.

Some of the people I would consider the best in technology are older teachers. It’s the time. I would say that, honestly, because a lot of those teachers are older and they have older children - they just have time to play and figure out how to do things. I think that’s so important, just getting in there and figuring it out.

**Theme Eight: Digital Divide Correspondence with the Literature**

Though these everyday uses of technology are often second nature to these elementary school teachers and administrators, the data is consistent with what we know about the lack of correlation between use in and integration in instructional content (Christensen et al., 2008; Collins & Halverson, 2009). Most of the participants in this
case study are, in fact, considered digital immigrants under the broad definition of the
digital divide and therefore represent a population that did not have modern\(^5\) technologies
in their schooling (Collins & Halverson, 2009). Apart from their teaching
responsibilities, these participants, regardless of age or education level, are, however,
actively participating in social-networks of individuals and groups that are wired into a
digital society. Teachers communicate with friends, family and colleagues, outside of the
school day, primarily through digital platforms that include text messaging, email and
social networking sites like Facebook.

The digital divide had no statistical significance in this study as it existed
primarily based on participants’ perception of themselves and their peers. As evidenced
throughout this study, it was the participants’ attitudes and beliefs about the digital divide
that existed and no participant divisions existed in this study in regard age, ethnicity,
grade level taught, experience or level of education.

\(^5\) Importance attributed to modern technologies as a distinct category because
various technologies have offered claims to revolutionize education since the
Industrial Revolution (Collins & Halverson, 2009; Daugenti; 2009).
CHAPTER V: DISCUSSION AND IMPLICATIONS

This case study answered the research question - *Why are teachers reluctant to integrate information and communication technology when the established barriers of access, familiarity, professional development, and support are seemingly absent?*, and made apparent that teachers are reluctant to integrate educational technologies for many reasons including their epistemological perspectives regarding teaching and learning, their desire to learn informally with friends and peers, their attitudes and beliefs about a supportive culture, the lack of availability of time, and the disconnect they perceive in professional development efforts that do not connect the ICT learning to their current classroom teaching practices.

These findings are easily connected to tenets of newer, constructivist adult learning and development espoused by various theorists who believe that adult learners are individuals with unique needs who utilize their experiences as a basis for constructing knowledge (Knowles et al., 2005; Kolb, 1983; Mezirow, 2000). These findings also diverge from what we know about adult learning, especially in regard to professional development for educators, suggesting that teachers’ informal learning has great effect and their epistemological perspectives filter their subsequent learning experiences. This is significant for adult learning because it disrupts previously held beliefs that adults will be transformed solely through the traditional, professional development learning experience; or, as this research shows that teachers are not less reluctant to integrate ICT in their content instruction when *the established barriers of access, familiarity, professional development, and support are seemingly absent.*
This contention can be further explained by answering the five additional research questions that guided this case study research.

Question 1: *In what ways do teachers perceive ICT use in personal life as preparation for curricular integration?*

I am able to conclude that the participants’ personal ICT was not synonymous with ICT integration. In fact, there was no correlation between the high levels of reported use to participants’ level of implementation or degree of reluctance toward ICT integration. Somewhat surprising perhaps was that each participant in this study reported a reliance on ICT for their personal use, and recognized its importance for the digital era that students inhabit, yet there was no causal effect between their beliefs and their practice.

These findings are in agreement with existing thinking on adult learning, as evidenced in the literature review of Chapter 2, in that the majority of teacher training is focused on how-to models of professional development that generally have a one-size-fits-all approach. This type of adult learning experiences is decontextualized and therefore does not correlate with best-practice methods for making learning relevant for learners that builds on their prior knowledge or experiences. While there is an agreement about current beliefs on adult learning, this study shows a pervasive dichotomy that exists between participants’ epistemological beliefs and their pedagogical practices. This is most apparent in the participants’ high-level ICT use for the personal lives and low-level implementation of ICT for their professional work.

Because this dichotomy is seldom, if ever, acknowledged in current adult learning theory, models of professional development tend to focus their efforts on teachers’
familiarity with ICT as being the most significant agent for changing teacher practice (Borthwick & Pierson, 2008).

The disconnect teachers experienced between theory and practice helped to answer my second guiding research question.

**Question 2: In what ways do teachers perceive technology-focused professional development as preparation for integration of ICT in instructional content?**

With the participants’ personal and professional beliefs being incongruent, it was evident that no amount of professional development, in its current state, would ameliorate teachers’ reluctance toward ICT integration.

The underlying rationale for this contention is due to our understanding of existing thinking on adult learning that shows how adults prefer to socially construct their knowledge, in context, with like-minded people when and where they deem it is most appropriate. This idea is supported both in the historical context, seen in apprenticeships, and in the communities of practice that provide learning informally for adult in their everyday interactions (Stubblefield & Keane, 1994; Illeris, 2009).

Though there is clear and compelling evidence in support of existing thinking on adult learning, this research shows that there is a gap in what is being used as a model for educating adults (teachers) and one that disrupts previously held beliefs. Participant responses from this case clearly show that these teachers desire to learn informally with peers of their choosing. The reasoning behind this was that the participants’ believed they experienced more professional growth and transformation when they could see first-hand how other teachers were integrating ICT in their content. All of the participants in this study expressed a desire to learn both hands-on and in small groups, but the majority of
their learning experiences did not match what they believed was their particular learning style. These participants support my contention that it is the epistemological beliefs of adult learners that influence their experiences as learners and also who they are as practitioners. This concept is paramount because, though teachers in this study report actively integrating ICT in their personal lives, their instructional beliefs about how they should educate students appears impervious to what they know about themselves as learners. In other words, the participants in this case study so steeped in the long-held educative traditions about how schooling works in the formative years that they are reluctant to attempt teaching and learning strategies that are dissimilar from what they hold true about the nature of knowledge.

Question 3: In what ways do teachers perceive accountability and administrative expectations of ICT integration as determining factors for implementation?

The participants who stated unanimously that ICT integration would increase with an increase in accountability answered this question succinctly. While no participant was in favor of increasing accountability for implementation, all of the participants expressed their belief that there was a direct correlation to their practice. As evidenced in Chapter 2, existing research on accountability and leadership supports this supposition and the connection between adult learners responding to requirements of change, but most of these changes are short lived because they are transactional approaches that are no less compulsory and therefore culminate in the detriment of teacher autonomy and lasting change (Kegan & Lahey, 2009; Leonard & Leonard, 2006; Thousand & Villa, 2010).
What we know about adult learning in this regard is significant because it addresses the idea that these adults are ready to learn at the time of training (Knowles et al., 2005). What we did not know, however, is that the participants’ believed they were operating with best-practice pedagogy and with their greatest intentions. The beliefs in this regard are well aligned with epistemology and pedagogy that are, again, disconnected because of theory and practice. All of the participants are accustomed to being held accountable for their teaching practices because of curricular mandates, district initiatives, standardized testing and emphasis on providing evidence of student progress. Interestingly, all of the participants expressed dissatisfaction in the notion of being held accountable to integrate ICT in their instruction. While all teachers believed that they were expected to use the technology they were provided, they felt they would be required to do more if they were held accountable for implementation. This too is significant because it speaks to the gap in adult learning knowledge that shows how teachers’ attitudes and beliefs are forever bound to their teaching and learning practices.

Because an adult’s ideology, her attitudes, values and beliefs, are what make her unique, it is not difficult to conceive how this would extend to one’s perception of ICT integration. This also led me to ask my next research question.

**Question 4:** *In what ways does teachers’ perception, including attitudes and beliefs, influence their integration of ICT?*

As indicated in the literature review and is apparent in empirical research, adult learning, particularly that in teacher training, would suggest that learners are highly influenced by their perception which informs their decision making. There would be no stretch in logic for one to conclude then that, adults, especially those in the dominant
culture, who espouse both an affinity for ICT and view ICT as an indispensable medium for life in a digital society, would be at the forefront of ICT integration when they have seemingly overcome the established integration barriers.

Despite my own presupposition and what others might conclude, this study showed that teachers may simultaneously hold high levels of affinity for ICT while maintaining attitudes and beliefs about epistemology (meaning the nature of knowledge) support, degree of relevance and even efficacy that manifest as barriers to ICT integration. The finding is highly significant because of the implications it has for influencing adult learning and development theory. Most specifically, this study shows the need to better understand how both affect and teachers’ beliefs about how and when learning occurs will influence teacher practice and their decisions regarding ICT integration.

While these participants had seemingly overcome the established barriers to integration I wanted to know what they perceived might further their reluctance toward implementation. The fifth, and final, guiding research question provided that opportunity.

**Question 5: What additional barriers to ICT integration in elementary education do teachers perceive?**

By leaving the door open to teachers’ personal perspectives on what they believed interfered with their ICT integration efforts, I positioned myself to understanding their lived experiences and how they informed their practice. It came as no surprise that the participants reported the lack of time as the leading deterrent for ICT integration. Consistent with what we know about adult learning and what is known about education in the United States, teachers are inundated with responsibilities and large class
sizes that some find confound their efforts for professional growth. As learners, these participants requested time to meet, to plan, to learn and interact with each other during the school day when it was most convenient, contextually relevant and appropriate for their particular learning needs. Most did not want to meet after school for trainings when they had competing commitments that often left them struggling to find opportunities for reflection. Without opportunities for situated learning and reflection, it is no surprise that the participants expressed time as the number one reason for their reluctance toward integration.

Though participants expressed an additional barrier to integration, this perception of time is no less a window into their attitudes and beliefs. Despite what has become the pervasive school of thought for adult learning, this study shows that time was not as much a factor for ICT integration as was the participants’ perspective of ICT as being an additional component that had to be worked into the confines of the school day. Were this the case, it would be understandable that the participants expressed they had no additional time in their day, but when they themselves utilize many of the same technologies seamlessly in their personal lives, it is more apparent that the barrier is not time, but their belief about teaching and learning with technology. In other words, their epistemology does not find value in or beliefs that these technologies are integral to their teaching practice or to student learning and achievement.

**Implications**

As participants’ attitudes and beliefs about the digital divide influence their world view, we also know from the literature that one’s attitudes and beliefs about knowledge and learning are formed by ones previous learning encounters. As adult learners exit
formal schooling environments, many espouse the preference for informal learning experiences yet their teaching practice and experiences in professional development within the educational system are in opposition to what they espouse as being their epistemological and therefore pedagogical beliefs.

This dichotomy implies a new digital division existing between the adoption of ICT use for one’s personal life and the reluctance toward ICT integration in elementary education. The significance of this division is unmistakable and unlikely to change until educators, themselves, become the situated focuses of the adult learning experiences. Below are the ideas of Kate, a digital native, who describes this emerging adult learning theme in regard to her ICT integration perception.

Since I’ve grown up with technology that I’m more apt to use it more frequently than someone who did not grow up with it.

Two additional comments by Kate, below, illustrate the incompatibility between her contention that ICT is important for student learning with a concomitant reluctance toward integration.

Because this world’s getting more and more centered around technology. These kids are going to have all kinds of projects on it. They already have cell phones so through technology, they’re going to be completing a lot of assignments. When they get into the workforce, they’re going to be doing work with technology. Like me now, they’re going to have their bank account online. I mean, there’s just all kinds of endless things that they’re going to be needing it for.

None of that’s really carried over except for Google-ing things….This year, they do have a computer teacher so that kind of – I guess it makes me feel a little bit better about that.

The implication is that digital natives will not replace their previous epistemological beliefs that are synonymous with traditional learning structures of formal schooling. In today’s modern society children have opportunities to read, write and
compute in their personal lives. Though these everyday tasks are customary, it would be abhorrent to consider recommending to stakeholders that reading, writing, and computing are tasks students can do while at home, and therefore there is no need to focus on those areas of study at school; especially not until after the formative elementary years when reading, writing and computing become more applicative toward real-world activities.

Though this argument is not logical, similar sentiments are made toward ICT integration and met with great resistance by many in elementary education. In other words, just because people may represent the younger generation and/or use technology in their personal lives, it does not mean they make use of technology at school.

All of the participants in this study, as evidenced in the discussion of Kate, shared similar beliefs on the importance of meeting the needs of all learners and stated that technology was integral, but there were still reasons each of them expressed as to why they were reluctant to adopt integration. The pervasive mentality was, if technology is not worked in, that is okay, we will do it another way. I never heard a learner-centered belief articulated as “I can't do what I do without technology being integrated” mentality or a “my students will suffer if they do not have these technologies” belief. In other words, participants I interviewed may not have identified the need to integrate ICT because they believed children had opportunities to develop technological skills outside of school.

Given the attitudes of teachers interviewed, consideration must be given to ways to confront their attitudes and beliefs. One likely reason this trend continues in education and teachers are reluctant toward ICT integration is because their epistemological beliefs are steeped in tradition, therefore, becoming a tacit part of their ideology. One way this
confrontation may occur is through confronting a disorienting dilemma or being given an opportunity to become aware of their outmoded beliefs and a forum in which to critique them. That is, until a need for technology’s use is created, it will remain separate and apart, decontextualized from the learning experience. When this occurs, then the risk, of technology for the sake of using technology, increases and will likely translate into a reoccurrence of the same, low-level ICT integration that perform the same teacher-centered processes that are not novel, but simply performed in a different way.

**Recommendations**

It becomes a product versus process paradigm or debate, where teachers must determine if what students learn is equally important as how students learn when considering how well they are preparing children for life in a global, digital society. The likely place for teachers to have these discussions is with individuals who allow them to confront their epistemological beliefs in a CoP. In these environments, teachers can explore with others the questions about ICT integration: What tool can I utilize to streamline this process? How can I help students connect their formal learning experiences with the informal learning they are accustomed to within their social interactions? Is this method efficient and if so, does it produce the type of outcomes most relevant for life in a digital society?

As educators, we are committed to ensuring literacy among early aged students because we realize the detriment and propensity students’ face of falling behind their peers, yet technological literacy is scarcely a priority. The question remains, how far behind are we willing to let the next generation get in a global society that is becoming increasingly more reliant on ICT for everyday interactions?
No participant in this study espoused wanting to learn with a large group setting, but rather in small, informal partnerships where they felt most comfortable. Constructivism is distinct in theory and practice, and as Elana posits her philosophy of student engagement,

There are expectations that students, regardless of where they are, get started— they're constantly moving forward— lots of discourse, sharing of ideas, using various talents to assist others.

The exciting part is that teachers do not have to embark on the iterative process of reflecting, modifying, trying out, ameliorating alone. As Justin, Tinley Park Principal, came to the realization during the interview teachers desire to learn from each other, there is a need for educators to work within a supportive culture where they can learn informally. Without opportunities to confront and critique one’s value and belief system, however, it is not likely that change will occur.

I feel like it’s just a matter of showing them where other people are being successful and having teachers share that, maybe that’s something with, with our um, our faculty, meaning we need to get together and just say, you know, how are you being successful with technology in your classroom?

My research shows that current models of teacher education and training address certain imperative aspects of ICT integration, but omit the most significant aspects of adult learning and development; namely the epistemological perspectives of the individual learner who operates within a community of diverse learners. Examples from participant responses are shown below to provide a context for this finding.

And you can’t have professional development when you have 47 people and each one at a different level asking for something. I know I would eventually learn it but I’m not going to learn it the way they do professional development here in such a large form (Ann, Kindergarten teacher).

I just need to see it. The ones I’ve been to it have always kind of been a printout of steps how to do it, like from a PowerPoint, but I would love for them to give us
opportunities to go visit a classroom that does it. I need to see it. I need to see how they do it and how the kids respond to it (Shauna, Fifth Grade teacher).

The current structure of ICT integration efforts spurred on by the district technology initiative supports the existing literature on current technology related professional development models and is evidenced in Figure 1 below (Borthwick & Pearson, 2008, Chen, 2011). At the top of this graphic is “ICT Integration”, which represents the ultimate objective of ICT professional development (PD). At the bottom of the graphic are both “Personal Use” and “Adult Learning (Formal PD)” that serve to complete what becomes the base of a triangle, pointing no less to ICT Integration as the apex, desired outcome.

![Figure 1: Current Integration Model](image)

While this illustration includes components that are arguably important to supporting teachers’ ICT integration efforts, nowhere in this design is an attention to the participants’ epistemological perspectives or their attitudes and beliefs. There is also a tendency with current models of professional development to work from a prescriptive,
or solutions oriented manner, as opposed to reducing the impact on change by addressing underlying concerns with teacher autonomy and expectations for professional growth. In other words, it is a technical or instrumental approach rather than one oriented toward eliciting meaning-making or contextual relevance.

What we know about adult learning and development, from this study, as discussed previously, is that an individual’s learning needs and desires influence their learning experience. My contention is that learners’ epistemological perspectives inform their pedagogical beliefs and associated teaching practices prior to any ICT considerations. By considering how adults learn and the environments in which they learn best, it is likely that these learners will receive the support they seek. All of the participants in this study talked repeatedly about their attitudes and beliefs on various subjects that ranged from why they used certain technologies in their personal lives to how they perceived others would react to their efforts to incorporate ICT in the instruction. Because attitudes and beliefs are inherent in everything one does as a learner and practitioner, and they make us who we are, it is advisable that principals and staff development personnel place more attention on this area.

**Recommendation: Alternative Approach to Adult Learning**

In the ideal adult learning environment, teachers will work collaboratively with a peer or peers with whom they find a connection, albeit grade-level, content interest, ICT use or personal affinity. As teachers engage in these informal learning experiences they have the opportunity to explore their attitudes and beliefs and confront epistemological perspectives that may be inconsistent with their existing frame of reference, in regard to the factors that they perceive led to their reluctance toward ICT integration. A graphic
for this idea is illustrated in Figure 2, depicting how ICT integration no longer becomes the situated focus of the learning experience, but rather a subset of a more integrated approach to supporting learners as they move in and out of the various experiences. Each unique venture is accompanied with an opportunity to formally or informally construct knowledge, independently or socially, while attending to the attitudes and beliefs that are integral to ones continued praxis.

It is important to note that the position of the arrows on this graphic do not represent a sequential order, but rather a recursive process whereby individuals confront their attitudes and beliefs, epistemological perspectives as they remain in a continuous reframing of their perspectives. I argue, too, that one’s attitudes and beliefs are precursors to any personal ICT use and therefore any associated curricular integration. The participants in this study, who all adopted digitally literacy for themselves, provide evidence for this contention and it is further supported by what is known about the barriers that inhibit ICT integration (including access and familiarity). Therefore, we can presuppose that an individual’s attitudes and beliefs inform their personal ICT use (familiarity). Likewise, the degree to which one utilizes ICT in her or his personal life precedes ICT integration that may lead to implementation in instructional content.
The graphic in Figure 2 therefore operates in a series of phases that may lead a teacher to integrate ICT in her or his instruction. Throughout this model the focus is on enabling factors that support teacher-learners as they move through continued reflection and refinement of practice with theory, or what Freire (1990) terms as praxis. With all participants in this study using ICT in their personal lives, it is understood that their attitudes and beliefs are supportive of that use. If a teacher has personal ICT use and attitudes and beliefs consistent with those technologies that are aligned with the teacher’s epistemology, pedagogical practices, then ICT integration can occur. If there is an incompatibility between a teacher’s personal use and integration then the enabling factor,
rather than being an inhibiting factor, toward implementation would be an adult learning situation.

This model shows there are two phases the learner may and likely will experience, one formal and one informal. Consistent with the literature, this study shows that teachers prefer to learn in informal and contextually relevant situation where they can construct knowledge socially (Brookfield, 1986; Kolb, 1983). While formal technology training is often pragmatic, it can be conducted in the more ideal, small informal learning communities. In a learner-centered adult education experience, teachers have the ability to learn and refine their practice because they are afforded opportunities to engage in meaningful learning experiences and have time to implement and reflect on their practices. During and following the learning experience, teachers confront their attitudes and beliefs and may transform their practice to include ICT integration. In any of the iterations this model could present, teachers need contextually relevant opportunities to think and challenge their existing beliefs about teaching and learning with other teachers.

This postulate includes tenets of Kolb’s (1983) experiential learning theory and Engeström’s (2009) activity theory, an expansive learning theory that supports the idea of learners being engaged in a process of knowledge construction in settings that are socially and contextually oriented. While these theories influence my beliefs, I find that they omit several key components that include ideology and Schön’s (1983) notion of becoming a reflective practitioner integral to this concept and one that extends beyond that of Kolb to reflection in, during, and on action. My position also relies heavily on the work of Mezirow’s (2000) Transformative Learning theory and Brookfield’s (1986; 2005) critical theory that support learner’s engagement in the internal process of
confronting ideological beliefs and assumption that may need to be disrupted in order for change and growth to occur. Without an understanding of who we are as individuals, and what our epistemological perspectives are, it is difficult to consider moving beyond the stages of reluctance toward ICT integration toward a practice of teaching that is more aligned with preparing students for life in a global society that relies on collaboration and digital literacy.

The findings in this research study represent significant elements necessary for understanding teachers’ reluctance toward ICT integration in elementary education that exist beyond the established barriers that inhibit ICT integration. The year 2012 marks a transition with the Presidential election in November and an opportunity to disrupt antiquated learning models that fail to address learners’ epistemological perspectives and associated attitudes and beliefs, that we know contribute to resisting change. Additional research is necessary in this field and the implications for this study are that it will likely lead to schools becoming agents of change that are socially and culturally responsive to the global digital society that connects people from all walks of life.

**Potential Solutions For Change**

Adult learning programs are subject to change as the growing needs and demands of the adult learners in a digital environment suggests. There are, however, new theories of adult learning that remain true to the basic tenets that have characterized adult learners for centuries: adults want to understand why they are learning, they desire to learn, experience is significant, adult learning is social and takes place inside and outside formal institutions. This era, like others before, will offer claims to revolutionize how people work and learn, and it is likely that this will come to fruition in ways we can yet imagine.
Technology’s growth is placing increased pressure on institutions to prepare students with the knowledge and skills necessary to succeed in the 21st century. Adult learning advocates should continue to capitalize on the growing technology influence by offering online, e-Learning, and blended opportunities for adult learners to receive an education. Even today, increased access to programs that accommodate adults’ individual lifestyles, the growth of adult learners in formal education institutions is on the rise. The University of Phoenix, the most successful online university, is but one example of how large institutions can host in excess of 380,000 students (NCES, 2010).

Aligned with an increase in digital learning platforms, the National Center for Educational Statistics (2009) survey of 1600 school districts across the 50 United States, yielded a 92% response rate, confirming the 2003 Census Bureau findings (2008), that 100% of public schools are connected to the Internet. Furthermore, by 2005 there were already in excess of 14 million computers for use in these schools (Census Bureau, 2008). Of those districts surveyed by the NCES, 84% reported to have acceptable use polices in place for students’ use of email and 76% for social networking sites (p. 3). Provided all schools were set up to accept these changes, equal access to new technologies, even as money for technology implementation becomes available, does not guarantee a transformation of teaching strategies and pedagogy. There is evidence of a growing prevalence of ICT in education and, with it, a change in the expectations of how teachers should provide learning opportunities through the use of educational technologies (Christensen et al., 2008; Collins & Halverson, 2009; Wilen-Daugenti, 2008; Moe & Chubb, 2009; Sawchuk, 2003; Selwyn et al., 2006; 2010; Sloman, 2002).
Though there is an influx of hardware, software, and infrastructure, many teachers are finding it exceedingly difficult to catch up to the demands of expected technological proficiency for their students (Chapman et al., 2010; ISTE; 2007; 2008; Schibeci et al., 2008). Teacher and administrators should utilize the ISTE technology standards, NETS requirements for students (2007), teachers (2008), and administrators (2009) that support integration and encourage growth beyond a basic understanding of ICT use and facilitation. With only a brief examination of the verbiage in the performance standard for students with the words: “creative and innovative”, “communication and collaboration”, “digital citizenship”, and “decision making”, it is clear that these terms speak to constructivist paradigms of teaching and learning (Kolb, 1983; Mertens, 2010).

The more relevant issues for many theorists, therefore, are less dependent then on the adults’ informal uses of technologies, as Kolb (1983) asserts, and more on how to present opportunities for adult learners to actively engage in the learning process (Mezirow, 2000; Mouza & Wong, 2009; Schibechi et al., 2008).

Additionally, teachers and those who support teachers should provide authentic opportunities for reflection on the learning experience to further integration and an awareness of the compatibility of ICT with classroom instruction. Matzen and Edmunds (2007) argue for an adoption of constructivist methodology for training and Mouza and Wong (2009) believe it is the contextualized and situational learning orientation that ignite change and increase teacher efficacy (p. 177). Regardless of the specific approach used, informal learning has proven to be a powerful means of educating adults and the learning theories that support the idea of informal learning add credence to an already impressive domain.
Future Research: Building on Current Understanding

In mainstream models of technology professional development there is limited opportunity for engagement in reflective practice. According to Kotyk (2010), training represents the most common form of adult learning for teachers and where the broader context and consideration of an alternative is often absent (Brookfield, 1986; Dunn & Rakes, 2010; Merriam et al., 2007; Mouza & Wong, 2009). From my research on ICT integration in elementary education, I contend that adult learners are being asked not just to change their practice, as the behaviorist might assert, but to: challenge ingrained traditions (ideology critique), transform their habits of mind, become reflective practitioners, be adaptive and culturally responsive in their praxis, work collaboratively, and do all of this while maintaining their individuality in their current teaching assignment (Brookfield, 2005; Freire, 1990; Kolb, 1983; Schön, 1983; Mouza & Wong, 2009; Merriam et al., 2007; Mezirow, 2000; 2009; Plair, 2008; Schibeci et al., 2008; Sugar & Wilson, 2005).

In a study by Glazer et al. (2009), one CoP fostered Collaborative Apprenticeships among elementary school teachers learning of ICT integration. These cooperative groups were led by experienced (mentor) teachers and designed to scaffold participants’ learning and challenge them to critically reflect on their values, beliefs, and assumptions (Howard, 2000; Krumsvik, 2008; MacDonald 2008; Stevenson, 2004). Robin Usher (2009), in Illeris, (2009), calls such work a matter of personal autonomy and social empowerment, relating experience, pedagogy and social practice with experiential learning and postmodern perspectives; where learning and experience are interactive.

When teachers have opportunities to see other teachers actively integrating ICT in
their classroom and time to process these experiences with their peers, it is arguably the only way, they will begin to see knowledge as being socially constructed and open to considering alternative ways of thinking (Brookfield, 1986 p. 216). Then, as these new perspectives place learning within the context of elementary education, teachers’ experiences become the focus of the continuing education and applicable to the lives of teachers (Brookfield, 1986; 2005; Cranton, 2006; Mezirow, 2000). Adding a critically reflective component will further encourage teachers’ autonomy and development by challenging an isolated awareness of ICT as mere devices and moving them toward active engagement and experimentation in the integration of ICT in new and authentic ways (Kolb, 1983). When this occurs, we can say that education has progressed beyond the assimilative, mass delivery models of teaching and learning and toward focusing its efforts on preparing all learners for life in a digital society.

Based on the evidence of this study and, what we know about adult learning theory, it is apparent that current practices by ICT advocates address relevant concerns that must be ameliorated; these include removing the established integration barriers, but they do little to acknowledge teachers’ deeply engrained epistemological perspectives that may further inhibit this paradigmatic shift of pedagogy. Woll (1984), in Brookfield (1986), offers another explanation, claiming one of the primary missing components is a shared vision on which the continuing educational experience is presented (p. 172). Plair’s (2008) discussion of traditional (object-focused) and short duration technology trainings are indicative of individuals at the apprehension stage, those who merely acknowledge the presence of the situation (technology). Comprehension, however, requires the individual to progress beyond acknowledge the presence of the object
(technology), and connect it in context, reflect on its use, and conceptualize the situational nature of the experience (Kolb, 1983; Mouza & Wong, 2009; Schibeci et al., 2008; Sugar & Wilson, 2005).

Who leads this enterprise of change is questionable as Afshari et al. (2008) suggests, the principal is the critical change agent in schools, while separate studies by Byrom & Bingham (2001) and Wilmore & Betz (2000), argue the degree to which ICT was integrated was determined by the active support of principals (Afshari et al., 2008). When educational organizations embrace a partnership mindset that focuses on key principles of effective leadership including: equality, choice, dialogue, respect, and reciprocity (Knight, 2007, p. 24) then leaders can begin the task of bridging the gap in situated autonomy, which is where individuals are and where they aspire to be (Tennant & Pogson, 2002).

By hearing the perspectives of elementary teachers who have overcome the established barriers, known to dissuade teachers from integrating ICT in their teaching, I now know that there are additional barriers that are as significant and often overlooked as barriers in the existing literature on adult learning and teacher education. This study provides the first step in ameliorating models of professional development and teacher training that do not consider teachers’ beliefs about teaching and learning and how those beliefs, and the beliefs of others, influence school culture and ultimately a teacher’s decision to pursue ICT integration in elementary education. Additional studies of teacher perspectives of ICT integration in elementary education will be helpful to understand the reluctance phenomenon. One study might include the notion that teachers, especially those who are digital immigrants, perceive that students will acquire digital literacy when
there is a need for them to have it, much like they had to learn to use and incorporate various technologies in their own lives.

Changing teacher practice is a complicated endeavor and compounded when an individual’s beliefs, even though they may be tacit, about the nature of knowledge are brought into question. It is likely that lasting change in teacher practice that includes ICT integration will come to elementary schools at some point in the digital era, but it will require an approach to teacher education that is more focused on the adult learner than the technology itself.
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Appendix A

Dissertation Interview Questions for Classroom Teachers

The purpose of this interview is to better understand the perspectives of classroom teachers and in what ways her or his personal and professional decisions are influenced by the presence of educational technologies.

Guiding Research Question:

What are teacher perceptions of information and communication technology (ICT) integration when a district technology initiative seeks to remove common barriers of access, familiarity, professional development, and support?

Questions with follow-up / probing questions:

1) Perhaps we can begin with you telling me about how you use technology in your personal life?
   - Do you have an active facebook page or blog? How do you use “it” (uploading pictures, video, chatting). High-speed Internet? Online banking?
   - If you do not have a facebook page or blog, how do you keep in touch with family/friends and update them with the goings on in your life (email, text, phone, etc.)?

2) In what ways do you approach learning a new form (or aspect) of technology?
   - Friends shared new uses, trial and error, web-based tutorial, Google-d it, PD?

3) How do you find technology use in your personal life influencing your teaching and learning with technology in your classroom?
• Is there a way you find your familiarity or interest in (a certain technology) that compels you to incorporate that into your teaching?

4) Tell me about a recent professional development session you attended?

• What stood out? What was something you took away? Tell me how it has influenced your practice? If you were helping to redesign this PD, what would you find most helpful to include?

• What role did you play in the PD? How was the session chosen? How engaged were you?

5) Looking back at this (or any tech PD), in what ways did it directly relate to your classroom instruction?

• What were some specific strategies for how to integrate ____ technology in your content or to use with a particular initiative/program?

6) How influential or important is the ratio of teachers/presenters in a technology professional development session to you?

7) In terms of ability grouping – where do you find you are most comfortable working (mixed, novice – expert)?

• Where do you see yourself on the proficiency scale?

8) Tell me about the expectations of 1) administration and 2) the teachers on your grade-level to integrate technology? Tell me how you feel or cope with these overt or unspoken expectations?

9) In what ways would your integration of technology be influenced if you knew someone would hold you accountable (observe you teach/check lesson plans)?
• How would you respond if you learned that this would be implemented during the next school year?

10) What do you consider to be effective instruction? Tell me about your most effective teaching strategies (lessons).
   • How do you define your role as a teacher and that of the students?
   • What would I see if I came in (at any time) to your classroom? What would you and the students be doing?

11) How proficient do you believe your students are with technology? How does that influence your decision to integrate technology more or less frequently?

12) What is your perception of students’ use of technology at school?
   • How do you perceive the role of (computers) in your classroom?
   • Where would you rate technology in terms of importance when compared with other instructional areas?

13) What is it about the technology or that makes it difficult or challenging to integrate?

14) Are there reasons you do not think technology would fit into your practice?
   • What else do you feel gets in the way of you integrating technology?

15) Tell me about any initiatives /programs are you required to teach/follow at your school?
   • What percentage of your day would you estimate you devote to this/these programs?
   • In what ways are educational technologies incorporated?

16) Do you wish you implemented technology more into your teaching?
• How long have you taught with these teachers (and at this school)?
• Is there something else you would like to share?

17) Tell me about the emotional side of teaching – or maybe – the emotional side of learning something that you are uncomfortable or unfamiliar with?

18) Do you believe reflective practices fit into your teaching and learning?
• How about in regard to your learning or implementation of technology?

19) How would you respond to an opportunity to work with a group of teachers on planning technology integrated lessons?

20) In terms of feelings/emotions- Describe to me how you feel when you’re in a technology PD?
• Do you feel motivated, discouraged – confused, inspired – empowered, deflated…?

21) If you were to advise or help restructure technology related professional development for your school/district – what would your ideal scenario look like?
• Who would attend? When? Where? What size? (It’s open to your creativity)
• How do you think this would influence your teaching practice or that of other teachers?
Appendix B

Dissertation Interview Questions for Administration

The purpose of this interview is to better understand the perspectives of two instructional leaders, school principals, and in what ways their personal and professional decisions are influenced by the presence of educational technologies.

Guiding Research Question:

What are teacher perceptions of information and communication technology (ICT) integration when a district technology initiative seeks to remove common barriers of access, familiarity, professional development, and support?

Questions with follow-up / probing questions:

1) Perhaps we can begin with you telling me about how you use technology in your personal life?
   
   • Do you have an active facebook page or blog? How do you use “it” (uploading pictures, video, chatting). High-speed Internet? Online banking?
   
   • If you do not have a facebook page or blog, how do you keep in touch with family/friends and update them with the goings on in your life (email, text, phone, etc.)?

2) In what ways do you approach learning a new form (or aspect) of technology?
   
   • Friends shared new uses, trial and error, web-based tutorial, Google-d it, PD?

3) How do you find technology use in your personal life influencing your role as principal and in your interactions with classroom teachers?
• Is there a way you find your familiarity or interest in (a certain technology) that compels you to incorporate that into your practice?

4) Tell me about a recent professional development session you attended, either with your teachers or for your own professional development?
  • What stood out? What was something you took away? Tell me how it has influenced your practice? If you were helping to redesign this PD, what would you find most helpful to include?
  • What role did you play in the PD? How was the session chosen? How engaged were you?

5) Looking back at this (or any tech PD), in what ways did it directly relate to your role as principal?
  • What were some specific strategies for how to integrate ____ technology in your practice or use with a particular initiative/program?

6) How influential or important is the ratio of teachers/presenters in a technology professional development session to you?

7) In terms of ability grouping – where do you find you are most comfortable working (mixed, novice – expert)?
  • Where do you see yourself on the proficiency scale?

8) Tell me about the expectations you have for the teachers in your school to integrate technology?
  • Are these expectations explicit?
  • What sorts of accountability measures are in place in this regard?
9) What are the expectations placed on you as a school principal to have your teachers integrating technology in their instructional content?
   • Are these expectations explicit?
   • Can you tell me about any accountability measures placed on you to meet these expectations?

10) In what ways would you believe the integration of technology be influenced if your teachers knew you would hold them accountable (observe you teach/check lesson plans)?
   • How do you think teachers would respond if they learned this would be implemented during the next school year?

11) What do you consider to be effective instruction? Tell me about an effective teaching strategies (lessons) you have observed recently.
   • How do you define the role of classroom teachers and that of her students?
   • What would you hope to see (at any time) in a teacher’s classroom? What would the teacher and the students be doing?

12) How proficient do you believe your teachers are with technology? How does that influence your decision to promote technology integration more or less frequently?

13) What is your perception of students’ use of technology at your school?
   • How do you perceive the role of (computers) in the teachers’ classroom?
   • Where would you rate technology in terms of importance when compared with other instructional areas?

14) What is it about the technology or that you find makes it difficult or challenging to for teachers to integrate?
15) Are there reasons you do not think technology would fit into the teachers’ practice?
   • What else do you feel gets in the way of their technology integration?

16) Tell me about any initiatives /programs you require or that your district requires teachers follow at your school?
   • What percentage of the day would you estimate teachers devote to this/these programs?
   • In what ways are educational technologies incorporated?

17) Do you wish your teachers implemented technology more into their teaching?
   • How long have you been a principal with these teachers (and at this school)?
   • Is there something else you would like to share?

18) Tell me about the emotional side of teaching – or maybe – the emotional side of learning something that you are uncomfortable or unfamiliar with?

19) Do you believe reflective practices fit into your teaching and learning?
   • How about in regard to your teachers learning or implementation of technology?

20) How would you respond to the idea of a group of teachers who wanted to work collaboratively on planning technology integrated lessons?

21) If you were to advise or help restructure technology related professional development for your school/district – what would your ideal scenario look like?
   • Who would attend? When? Where? What size? (It’s open to your creativity)
   • How do you think this would influence your teachers practice?
Appendix C

CONSENT TO PARTICPATE IN RESEARCH INTERVIEW

Dissertation Research
Lesley University

Co-Investigator: John Woolard

*Faculty Supervisor:
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*Faculty Supervisor is the official Principal Investigator under Federal Regulations

You are being asked to be a volunteer in a research study on elementary school teachers’ perspectives of technology integration when barriers of access, familiarity, professional development and support are seemingly absent.

Purpose:
The purpose of this study is an effort to better understand the complexity of teachers’ diverse personal and professional experiences with information and communication technology (ICT) and how these experiences influence the integration of educational technologies in K-5 elementary school classrooms. I propose that by hearing the voices of teachers who appear to have overcome the common barriers of technology integration (access, familiarity, professional development, and support), through a district technology initiative, I will gain a better understanding of the myriad factors that encourage or impede implementation. These new discoveries will add to the current body of knowledge and have the potential to inform future practices in regard to teacher preparation and professional development in the area of technology integration.

Exclusion/Inclusion Criteria:
In order to participate in this interview process, perspective research participants must meet all of the following criteria:

- Currently employed as a K-5 regular education classroom teacher
- Consistent, daily access to technology resources that may include: computers, iPod, digital cameras (video or still), and reliable Internet connectivity
- Participated in a minimum of 2 technology focused professional development sessions in the past 2 school years
- Access to an instructional technology coach or equivalent support personnel
- Familiarity and use of technology in personal or professional life that may include: email, computer (Mac or PC), digital recording devices
(camera), electronic devices (iPod, iPad, Kendall, or equivalent), social networks (Facebook, YouTube, Twitter, or other forum), blogs, SKYPE, GPS, document software (MS Office or equivalent) and the like.

- Participant considers either considers the integration of educational technology difficult/challenging or is comfortable/proficient with implementation

**Procedures:**
If you choose to participate in this study, your commitment will involve an initial face-to-face interview that will last approximately 60-90 minutes. During this time I will ask you a series of questions regarding your experience with teaching and with using technology both in your classroom instruction and in your personal life. This interview will be recorded digitally and I will also make field notes in a research journal. I consider you as a research participant during this pilot study and therefore expect that your responses will be honest and thoughtful. In addition to the interview session, you will be asked to provide artifacts or documents that will support this study. These documents might include: a class schedule, documentation of professional development, required/mandated curricular expectations, frequency of technology support, or example of teacher lesson plans. After I have completed the initial interviews I will begin my analysis by looking for themes that emerge across the responses. Each participant will have the opportunity, 1 week, to review and respond with feedback to my analysis. At that time I will use my data analysis, any documents collected, and the accompanying field notes to complete my overall analysis of the dissertation research. A copy of my final dissertation will be available to participants.

**Risks or Discomforts:**
The risks involved in this study are no greater than the risks involved in routine professional conversations.

**Benefits:**
It is unlikely that you will benefit from this study beyond knowing that you are furthering the understanding of teachers’ experiences with integrating technology in elementary education.

**Compensation to You:**
Research participants will not receive a monetary compensation, but may benefit from this study in regard to their influence on future technology related professional development offerings as a result of the researcher’s findings.

**Confidentiality:**
I am committed to confidentiality in this research study and will provide protection of participants’ privacy and personal information to the extent the law
binds me. While I am interested in the individual experiences of teachers, I will construct my data analysis and interview questions on group responses. Participant names will only be available to the co-researcher, John Woolard, and pseudonyms and participant code numbers will protect participants’ right to privacy, confidentiality and anonymity. All information, including audio recordings, documents, and field notes will be kept by the co-investigator and will only be made available, if necessary, to the principal investigator Dr. Judith Cohen.

**Costs to You:**
There is no cost to participate in this study other than one’s time. Interviews will likely be scheduled away from the school setting, but the participant has the option to have a phone interview to offset the cost of driving to the offsite location.

**Participant Rights:**
Your participation in this study is voluntary and therefore you are not obligated to participate. You may also choose, at any time, to withdraw your participation for any reason without penalty. By consenting to participate you are not giving up your legal rights and a copy of this consent form will be provided for you to keep. Any new information not disclosed in this form will be presented to as it arises and you will again have the choice to continue your participation.

**Questions about the Study:**
If you have any questions about this study you may contact me directly at jwoolard@lesley.edu or at (205) 862-5472.

**Questions about Your Rights as a Research Participant:**
If you have any questions about your rights as a research participant, you may contact:

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By typing your name below it means that you have read (or have had read to you) the information given in this consent form, and you would like to be included as a volunteer in this study.
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<th>Participant Name</th>
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<td>Signature of Person Obtaining Consent</td>
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Appendix D

Example of Field Notes

When I use the phrase- my research is looking at technology integration, several teachers immediately responded with "well I'm not very good at technology" or "then you don't want to interview me" - even had "I don't want to mess up your data"

Is it…technology as an add-on or an indispensable medium through which learning occurs?

Product vs process paradigm/debate. Not just what we learn but how we learn is important for life in a digital society

Age of participants: could have used some that are younger, but they fall outside selection criteria (yrs of experience, etc)

WHAT: -made efforts to keep focus on the participant's perspectives
HOW: Exercised caution /awareness during interview to resist temptations to lead participants in my questioning
WHY: Didn't want to frames questions in ways that would impart my opinion and potentially influence their response

Teachers need time/ opportunity to share, & examples, b/c
1) they don't believe others are doing it
2) they lean from peers
3) reduced authority
4) increased autonomy

Espoused meeting needs of all learners and said tech was integral, but there were still reasons for not integrating. Mentality..If tech doesn't work in, that's okay- we'll do it another way. (there was no apparent - I can't do what I do without technology being integrated- my student will suffer if they don't have ...b/c, while they can connect with students within their own classrooms and school, try would otherwise limited by the confines of their geography..perhaps this is relegated to tech being a novel approach to an antiquated tradition of teaching and learning)

Analysis
Do attitudes and beliefs manifest as barriers?
Belief that: I don't have time, inadequate,

Discussion
Create a need- w/o a need for technology it's use is separate and apart- decontextualized from the learning experience. It then runs the risk of becoming technology for the sake of using technology (as some participants stated)
Support manifests itself in multiple areas—peer, admin, tech. Tech is very influential, but perhaps not as imperative as close-knit situational /contextual support.

Socially constructed knowledge forms a supportive network from which individuals may carry out content instruction independently, and then return to their peers for ongoing reflection/refinement.

It is then a community in practice.

Efficacy & consequence concerns were not stated or eluded to as reasons for teachers’ reluctance—(is that b/c they didn’t want to expose that vulnerability or is it not a significant factor or didn’t questions not provide opportunities for that exploration).

Initiatives/programs that stifle or complicate ICT integration.

Expectations are clear and accountability is evident for curricular foci but not for ICT—why would there be diverse levels of autonomy and teacher choice for delivery/pedagogical methods of instructional content? What does this tell us about tech perceptions?

Few discussions about LCB and creating real-world learning opportunities.

Do we distinguish between informal/socially constructed learning/knowledge?

Attitudes/beliefs appear to be overarching themes (not subsets) that informs one's world view.

If teachers truly believe they're expected to use tech, then what is the disconnect with implementation?

No one espoused wanting to learn with a big group of people, but rather in what might become a community of practice.

Cost/benefit analysis of using tech—in theory it's great/important, but not enough to change what I'm doing (???)

"always barriers", what do these adults do in their personal lives to circumvent these issues?

What does this tell me about teachers' reluctance to integrate?--

Reluctance is not synonymous with no integration—that's been a struggle at times for me.

Barriers real or perceived can inhibit integration.

Veteran teachers may see digital natives as lacking skills necessary for reaching/managing students w/o the aid of ICT.

Constructivism is distinct in theory and practice.
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ICT does not change the pedagogy b/c rooted in epistemological frame