TRANSFORMING INTO AN ELEMENTARY TECHNOLOGY SPECIALIST: STORIES OF CHANGE

By

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Abstract

The experiences of elementary technology integration specialists in a Midwestern school district were explored through narrative case studies as these educators transitioned from classroom teaching to roles as technology integration specialists. Four specialists participated in the study, two who had recently assumed this position (novices), and two who served in the specialist role for more than ten years (experienced). Including novice and experienced participants allowed the researcher to elicit narratives relative to current as well as historical perceptions of the processes that affected decisions to pursue a role as a technology integration specialist role. Experienced participants' narratives were explored to uncover perceptions of ways in which their professional identities have changed over time. A mixed methods research design was employed. The primary design was qualitative: case studies incorporated the results of semi-structured interviews as well as teaching observations. Over a five-week period, each participant engaged in a cycle of setting weekly instructional goals (referred to as a "mindset checklist") and post-instruction journaling about their experiences, then setting new and/or revised instructional goals. These goals were used to construct personalized observation protocols, used by the researcher as the basis for teaching observations. Interview transcripts were analyzed using the constant comparative method. Quantitative elements were incorporated to provide additional information relative to participants' self-theories of ability (mindset) and self-efficacy pertaining to instructional technology. Analyses revealed a key technology beliefs pattern: participants who expressed (through their narratives) and subsequently demonstrated (during instructional observations) the belief that their technology integration knowledge and skills would improve through sustained effort scored higher on a quantitative technology perseverance assessment, and also demonstrated greater perseverance while teaching when they

encountered instructional challenges or barriers. Participants who expressed and manifested a belief in improvement through sustained effort also appeared to experiment with and implement a greater variety of instructional technologies. Both novice and experienced specialists reported encountering similar challenges and barriers to fulfilling individual as well as role specific goals for technology integration, such as a vague, outdated curriculum, and insufficient time to research and integrate new instructional technology. Participants indicated that professional role commitment, perseverance, and motivation were linked to role clarity, opportunities to engage in continuous, meaningful curriculum monitoring and updating, and sufficient time to study, prepare, and collaborate with classroom teachers in order to implement new instructional technology developments effectively.

For Bart, Don and Laura, who support and believe in me

For Reagan, my greatest inspiration and teacher

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I would like to recognize and thank the technology integration specialists who allowed me into their professional lives; I honor them with the highest regard. They shared their thoughts, feelings, and experiences without question. I truly appreciate their time and dedication.

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Chapter One: Introduction

"If we teach today as we taught yesterday, we rob our children of tomorrow" (Dewey, 1916, p. 36). Technology integration along with 21st century learning (*incorporating skills such as digital literacy, critical thinking, problem-solving, creativity, and collaboration across all academic areas*), are both becoming predominant goals in school districts across the nation. No longer do educators speak of technology as the latest fad; the push to prepare students for the 21st century has resulted in more technology in the classroom and has transformed the way teachers prepare and deliver instruction (Bellanca & Brandt, 2010; Ertmer, Ottenbreit-Leftwich, 2010; Silva, 2009). Technology literacy is now considered a critical skill set for a 21st century graduate. Integrating technology is a current feature of curriculum and instruction in K-12 settings as well as in post-secondary education (International Society for Technology in Education (ISTE), 2016). To provide sustained assistance relative to attaining its 21st century learning goals, the school district that I describe later in this study has assigned a technology integration specialist to each of its seven elementary schools. Previously, these specialists were identified as "computer teachers." However, the confluence of expanded role expectations, wider variety of technology devices and applications, and adoption of high stakes 21st century learning goals, has resulted in retitling these educators as "technology integration specialists." The specialists had all served previously as classroom teachers in the school district. This study details their stories of change as they developed new professional role identities, and investigates how their perceptions of beliefs and self-theories appear to relate to their new professional identities.

Clearly, with the rapid proliferation of instructional technology, technology integration specialists experience profound changes in their professional role identities. According to van

Veen & Sleegers (2009), teachers' professional identities encompass constructs such as self-theories, job motivation, teaching responsibilities, and subject pedagogy. These identity components continue to develop as the individual gains knowledge and skills through professional experiences (Beijaard, Meijer & Verloop, 2004; Kelchtermans, 1993; Rodgers & Scott, 2008). Day et al. (2006, p.221) elaborated the importance of educators' sense of identity as "key to their capacities to sustain their commitment within all their professional life phases:" the personal, the situated, and the professional. In the context of the current study, the professional phase encompasses teachers' technology integration beliefs and professional lives situated within the school context.

The school district whose specialists participated in this study added a technology integration specialist to each of its seven elementary schools in the year 2000. The role incorporates two categories of professional responsibilities: direct instruction to all students; and consultation/collaboration with every classroom teacher (e.g. specific technology integration issues as well as technology integration professional development). To facilitate achieving professional goals and responsibilities, the technology integration specialists who participated in this study had access to a wide variety of hardware (desktop and laptop computers, iPads, mini-drones, Spheros, and the like) as well as software (both free and proprietary). In addition, the district regularly provided professional development opportunities (e.g. iPad iCamp, organized iPad User Group meetings, Office 365 training, and iPad User Group meetings), as well as four district professional development days used for collaboration with their colleagues and used for choosing in-district technology learning sessions.

Two recent district-level actions might be interpreted as an ongoing commitment to high quality professional expectations: technology standards for all classroom teachers, based on the

ISTE standards (International Society for Technology in Education (ISTE), 2016) (currently under development), and standards for technology integration specialists (by the end of the 2016-2017 school year). The latter action could also affect the curriculum for which the technology integration specialists are responsible.

In additional to domain-specific and professional environment factors, professional role identity has been linked to self-efficacy, motivation, commitment, resilience, and job satisfaction (Day, Stobart, Sammons, Kington, Gu, Smees, & Mujtaba, 2006). Teacher self-efficacy, founded on social cognitive theory (Bandura 1977, 1982), is conceptualized as an internal belief system pertaining to what individuals think they can do, and how competently they can perform (Teo, Lee & Chai, 2008; Skaalvik & Skaalvik, 2016; Tschannen-Moran, Anita, & Hoy, 1998). Research has shown that people with, for example, low self-efficacy will magnify problems and over focus on perceived personal shortcomings. Self-efficacy appears to possess situation specific features, so one's self-efficacy can be influenced if there are perceived challenges/barriers in the professional environment that seem to make tasks more difficult to implement and complete successfully. These challenges/barriers, such as workload and time pressure, have been named as leading to teacher stress and possibly contributing to leaving the profession (Skaalvik & Skaalvik, 2016). Additionally, Skaalvik and Skaalvik (2014) noted that novice as well as veteran teachers have reported experiencing the same stressors, such as workload and time pressure; however, senior teachers reported needing increasingly more time to recover from stress. Across all levels of experience, they found that self-efficacy significantly predicted work engagement. Given the present school district environment detailed in this study, investigating the technology integration specialists' self-efficacy could prove beneficial.

An increasing body of empirical research suggests that *implicit theories of intelligence* are linked to cognitive and affective outcomes relative to learning and personal development (Blackwell, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Hall, 2013; Sorensen, 2016; Spitzer, & Aronson, 2015). "Individuals with a fixed mindset believe that their intelligence is simply an inborn trait—they have a certain amount, and that's that. In contrast, individuals with a growth mindset believe that they can develop their intelligence over time" (Dweck, 2010). In an educational environment, a teacher's mindset could affect goal setting as well as goal attainment. Research has shown that "*performance goals* create a context in which outcomes (such as failures) and input (such as high effort) are interpreted in terms of their implications for ability and its adequacy. In contrast, *learning goals* create a context in which the same outcomes and input provide information about the effectiveness of one's learning and mastery strategies" (Dweck & Leggett, 1988, p. 261). Grant and Dweck's (2003) found positive effects of learning goals on one's motivation and performance. Even more germane to the current study, learning goals were predictive of mastery-oriented coping and more effective processing of setbacks. Since mindset appears to be a key predictor of goal orientation it would be beneficial to explore the mindsets of the technology integration specialists participating in this study.

It is reasonable to assume that technology will continue to advance, that teachers will need to use an increasingly wide variety of technology, and that teachers' beliefs/motivations might shape their ability to integrate ever evolving technology, it might be of value to explore the lived experiences of novice as well as veteran technology integration specialists. Their stories of transformation from a primary identity as a classroom teacher into a primary identity as a technology integration specialist might provide insights into the factors that affect an ongoing transformation process.

Problem Statement / Research Questions

It is reasonable to speculate that rapid proliferation of educational technology will become a regular feature of 21st century classrooms. Thus, integrating new technologies will also become a relatively permanent expectation for all teachers, despite systemic barriers and challenges. How teachers respond to these challenges and opportunities might be shaped by deeply held internal variables, particularly beliefs and self-theories, rather than solely by specific knowledge and pertinent skills. Therefore, this study will address the following questions as they pertain to elementary technology specialists and their integration of technology in the classroom:

1. How do elementary technology integration specialists describe the processes that shaped their decision to pursue this new professional role? How do they describe their commitment to the role?
2. What beliefs appear/become important during this process?
3. In what ways might their identities have changed as they commit to this new career?
4. In what ways do they describe their perseverance and ongoing motivation?

Theoretical Framework

This study is framed around the narrative teachers construct as they transition to, develop, and maintain a professional role identity as a technology integration specialist. Bell (2002) states that a narrative framework "allows researchers to understand experience", it also "lets researchers get at information that people do not consciously know themselves." He adds that a "narrative illuminates the temporal notion of experience, recognizing that one's understanding of people and events changes" (p. 209). Each narrative will inform us about the individual's

understanding and sense-making of the process of becoming a technology integration specialist as well as their internal self-beliefs. Narrative work in the field of education has primarily focused on teacher education, examining the ways in which teachers' narratives shape and advise their practice (Bell, 2002; Conle, 2001; Connelly & Clandinin, 1990). Therefore, if a teacher's mindset and self-efficacy are perceived as shaping day-to-day choices made in the classroom, it is reasonable and timely to explore the relationships between and among these constructs in relation to technology integration and how this might inform the teaching practice of technology integration specialists.

Overview of Research Design

Qualitative methodology of narrative inquiry was selected as the primary design for the current study, given its value in uncovering insights into real-life events as the participants experience them. Yin (2011) suggests five key features of qualitative research: 1) Studying the meaning of people's lives, under real-world conditions. 2) Representing the views and the perspectives of the people in the study. 3) Covering the contextual conditions in which people live. 4) Contributing insights into existing or emerging concepts that may help to explain human social behavior. 5) Striving to use multiple sources of evidence rather than relying on a single source alone (pp. 7-8).

Narrative inquiry, the study of the human experience, is a means by which the participant articulates his or her personal experience in the form of stories (Connelly & Clandinin, 1990; Daiute, 2013; Mertens, 2015). A narrative study provides an "explanation and analytic approach for understanding narrating as an activity of critical and creative sense making about the environment as well as about the self" (Daiute, 2013). Utilizing narrative inquiry produces

stories that reveal the influences on and the processes by which participants become technology integration specialists.

The study included two self-theories as pertinent to the participants' professional role identity transformation and continued development: *implicit theories of intelligence* (*mindset*), and self-efficacy. It is hoped that experiences articulated by elementary technology integration specialists might reveal insights about the relationships between and among mindset, self-efficacy and technology integration.

Potential Significance of Study

An underlying principle of the current research is that eliciting, exploring, and evaluating teachers' stories of change might provide clues regarding teachers' professional role identity transformation as well as their engagement with technology integration, and possibly the subsequent quality of their role enactment.

This study has the potential to assist future educators by providing initial insights into narratives and underlying self-theories that might enhance or limit teachers' ability to engage in professional role identity transformation pertaining to technology integration.

Key Terminology

Constant Comparative Method – a qualitative research method allowing the researcher to move in and out of the data collection and analysis process through multiple iterations to ultimately assist with pattern identification

Mindset – personal beliefs about oneself relative to attributes, such as intelligence, talents, and personality. Note: The term *mindset* will be used as synonymous with *implicit theories of intelligence* for the remainder of this study

Motivation (Goal, Autonomy, Cognitive) – Goal: motive for either mastery/learning goals or performance based goals; *Autonomy:* motive for being in charge of one's own behavior with intrinsic liveliness; *Cognitive:* motive for ongoing desire for understanding and knowledge

Narrative – written and oral expression of time-ordered event representations; lifelike accounts of experience or knowledge; conversations developing into narrative-like accounts

Narrative Identity – personality differences and beliefs transpired through stories people share about their experiences

Narrative Inquiry – a research process involving design of data collection and analysis of narratives

Professional Identity – the ways an individual represents his or her professional self through self-image, self-esteem, job-motivation, task perception, and future job perspective

Self-Efficacy – one's belief in one's ability to succeed and can impact how an individual approaches goals and challenges

Organization of the Dissertation

Following chapter one, I include a literature review in chapter two, which positions my study within the following areas of research: technology integration beliefs, teacher professional identity, narrative research, self-efficacy, mindset, and motivation.

Chapter three provides the methodology, which includes the justification for the design, methods and procedures chosen for this study.

Chapter four will present and discuss the findings of the study.

Chapter five will include a contextualizing discussion, conclusions, and directions for future research in this area.

Chapter Two: Literature Review

An implicit question embedded in the current research is whether analyzing and evaluating technology integration specialists' narratives about the experience of changing professional responsibilities might uncover patterns of change in role identity. The following review explores the extant research literature relative to the study's theoretical framework, (narrative research) key aspects of professional role identity, starting with general teacher identity and more specifically exploring two pertinent self-theories (mindset and self-efficacy). These cognitive-affective variables are explored in contexts of particular interest to the current study: teacher motivation and technology integration beliefs.

Narrative Inquiry and Identity

As described in Chapter One, the current study employed narrative inquiry as its primary theoretical framework. The relationship between teachers' narratives and their professional identity seems to be a sound theoretical basis for exploring teachers' professional identities (Clandinin, 2003; Daiute, 2014; Gee, 2000). Narrative could also be considered an effective means for understanding human experiences (Clandinin 2003; Daiute, 2014; Gee, 2000).

Daiute (2014) explains narrative design, "People use narrating all the time in daily life…Researchers can learn from such interactions, sampling narratives during spontaneous interactions in life or in research settings. Researchers can also build on such natural narrative processes—practices, features, and functions of everyday narrating—to design data collection and analysis" (p. 31). This natural approach to narrative design was utilized in this study.

Teachers' knowledge is linked to their personal lives and is not separate from their professional lives, additionally, this knowledge is viewed in terms of narrative formations (Beauchamp & Thomas, 2009; Clandinin, 2003). "Some of the complex factors involved in this

link are the interplay of emotion as a part of the self and identity, the narrative and discourse aspects of the self and the shaping of identity, the role of reflection in understanding the self and identity, and the connection between identity and agency" (Beauchamp & Thomas, 2009, p. 180). The teachers' narratives constructed in this study are reflect both personal histories and social professional knowledge contexts.

A review of research focusing on *narrative identity* revealed four theoretical positions (structural, cognitive, phenomenological, and ethical) to demonstrate evidence of predicting well-being (Adler, Lodi-Smith, Philippe, & Houle, 2016). The current study used narrative identity in a structural form, which is concerned with building identity elements. In their review, Adler et al. (2016) mention McAdam' theory of narrative identity (McAdams & McLean, 2013), which suggests that "narrative identity is one of three primary domains of personality, along with dispositional traits and characteristic adaptions" (p. 143). Dispositional traits are labeled as the Big Five traits of agreeableness, conscientiousness, extroversion, openness to experience, and neuroticism (emotional stability), which all assist with characterizing one's personality differences (Adler et al., 2016; Steel, Schmidt, & Schultz, 2008). One of the domains of personality is narrative identity (Adler et al., 2016). In this domain, personality differences emerge through stories people share about their experiences. "Whether describing a difficult experience or a turning point, narratives communicate not just the events that are central to the life an individual but the meaning these events hold for the narrator" (p. 144). Last, characteristic adaptations "represent the overarching motivational, social-cognitive, and developmental processes, as well as other aspects of personality that are important to an individual at a given moment. They represent the parts of personality that are contextualized within a given time, place, or social role" (Adler et al., 2016, p. 144). The narratives about the

technology integration specialists in this study described a turning point and provided opportunities for exploring and revealing aspects of the self.

Teacher Identity

Teacher professional role identity is the foundation of this dissertation. The term *identity* in this study refers to the ways a teacher represents his or her "professional self" through self-image, self-esteem, job-motivation, task perception, and future perspective (Kelchtermans, 1993, pp. 449-450): *Self-image* – describing yourself through your career story; *Self-esteem* – how effective you are as a teacher; *Job-motivation* – what makes you stay in your position; *Task perception* – how you define your job; *Future perspective* – expectation for the future development of your job. *Identity* in this study is also thought of as a construct that is in a constant state of development or evolution (Beijaard et al., 2004; Kelchtermans, 1993; Rodgers and Scott, 2008). Kelchtermans' (1993) seminal study of primary school teachers and their professional biographical profiles resulted in two recurring themes. The first theme was stability in the job situation by having tenure or maintaining the status quo. The second theme was vulnerability through judgment by others; i.e. as teachers felt more vulnerable they tended to become more passive and conservative with their teaching. Taking Kelchtermans' (1993) foundational study into consideration, how would excess vulnerability affect teacher agency and the contexts of teaching? *Teacher autonomy/agency* is defined as one's ability to have control and pursue the teaching goals that one values (Biesta, Priestley, & Robinson, 2017). According to Beijaard, Meijer, and Verloop (2004) "more attention should be paid to the role of context in professional identity formation and to what counts as professional in teachers' professional identity" (p. 126). Figure 1 displays the key mediating influences on the formation of teacher identity.

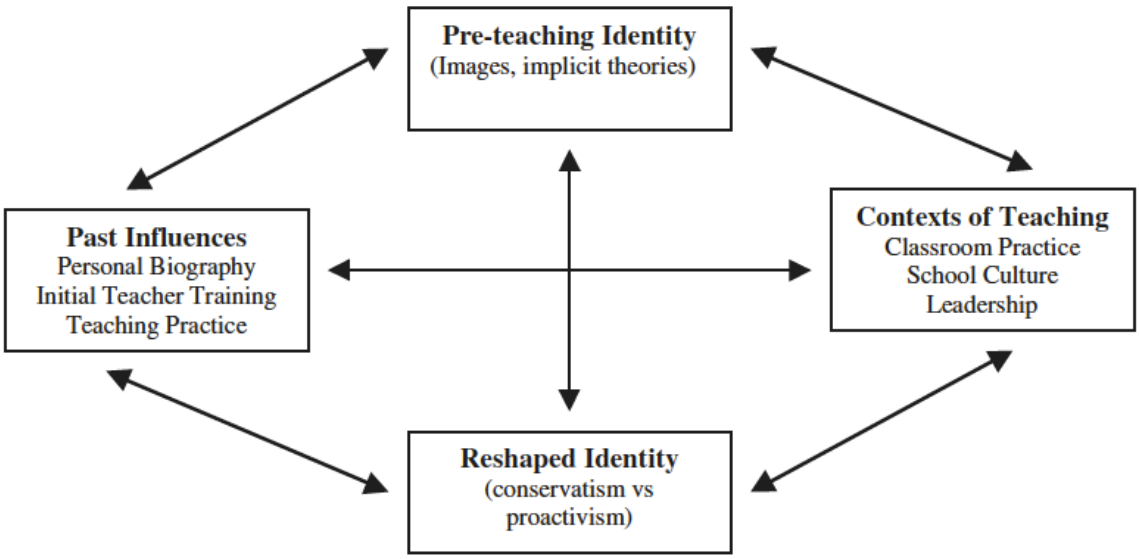

Fig. 1 – *Teacher identity influences* (Flores & Day, 2006).

These identities are deconstructed and reconstructed over a period of time based on the strength of teachers' past influences, pre-teaching self-theory of ability (*mindset*), and teaching contexts (Flores & Day, 2006). As cited by Hamman, Gosselin, Romano, and Bunuan, (2010), Rodgers and Scott (2008) reported that:

> "teacher identity has become a common theme uniting previously divergent teacher research areas (i.e., beliefs and attitudes, life history and personal narrative) that shares one or more of these basic assumptions about identity: (a) identity is influenced by context, (b) identity is formed through relationships, (c) identity is changing, and (d) identity involves meaning making" (p. 1350).

Empirical research findings support that self-efficacy, motivation, commitment, and job satisfaction contribute to teachers' professional identities (Day, Stobart, Sammons, Kington, Gu, Smees, & Mujtaba, 2006); however, there is a lack of systemic empirical research which explores teachers' professional role identities situated in the landscape of technology integration.

Self-Efficacy

Self-efficacy is one of the two self-theories of interest to this study. Extensive research suggests that self-efficacy can influence educational achievement, including that of educators (Bandura, 1977; Zee & Koomen, 2016). For example, an individual with high self-efficacy would express the belief that one can overcome failure during times of setback (Bandura, 1977, 1982; Teo, Lee & Chai, 2008; Sewell and George, 2009; Skaalvik & Skaalvik, 2016; Tschannen-Moran, Anita, & Hoy, 1998). Individuals whose sense of self-efficacy is relatively low would tend to express the belief that events are beyond their control. Furthermore, they are likely to give up easily in the face of failure. Contrary to this, those individuals who have a high sense of self-efficacy look past failure and embrace challenges. Sewell and George (2009) list several characteristics of highly efficacious individuals:

- choose to participate in their learning
- expend more effort in their learning
- seek more challenging learning experiences
- persist longer when faced with difficulty
- cope serenely in the face of adversity
- recover from failure more quickly
- are more motivated to learn
- achieve higher goals in learning
- use a variety of learning strategies
- quickly discard a faulty strategy
- attribute success to ability and strategic effort
- attribute failure to inappropriate strategy use

In contrast, those with low self-efficacy can be passive, avoid complex tasks, are less motivated to learn, and perceive that failure is unavoidable (Bandura, 1977; Sewell & George, 2009). Additionally, teachers with perceived low self-efficacy experience higher stress due to higher difficulties in teaching, such as work overload, class management, etc. (Betoret, 2009).

Klassen and Chiu (2010) examined the relationships between self-efficacy and job satisfaction with teachers (N = 1,430) in elementary and secondary settings. They also considered teachers' gender and teaching level, and two types of job stress (workload and classroom stress). Their findings indicate that elementary teachers expressed higher levels of self-efficacy than secondary teachers, and teachers of the youngest students in the elementary setting manifested higher self-efficacy than those with older students within elementary schools. Also, it has been documented that teacher self-efficacy increases in early to mid-career but declines in the late career stage, similar to the professional life phases detailed by Day et al. (2006). Taking gender into consideration, Klassen and Chiu found that females had higher workload stress and stress from student behaviors. Overall, the teachers who had greater workload stress had greater self-efficacy and job satisfaction. Would one's low self-efficacy and stress lead to teacher burnout? It is possible according to Friedman (2000) who delineates:

> "professional self-efficacy discrepancy may serve as a powerful and helpful approach to understanding burnout, and may point to some key factors in its amelioration. Professional self-efficacy discrepancy assumes that common work pressures gradually erode professionals' belief in their ability to organize and implement the actions required to produce a given set of attainments" (p. 597).

Teachers enter the profession with certain beliefs and anticipations about their jobs, and at some point, question their own performance expectations with regard to various tasks (Friedman,

2000). In this self-efficacy discrepancy approach, teachers might encounter difficulties in four domains: 1) tasks, such as educational objectives, 2) relations with students, 3) organizational tasks, and 4) relations with administrators and colleagues. "Given the rapid changes related to modern technologies, teachers often feel out of touch with developments in the field" (p. 602). Friedman (2000) recommends that improved functioning in the task domain might reduce stress and burnout, plus, improved training might also provide endurance to work-related stressors.

In a meta-analysis of 43 studies involving 9216 teachers, Klassen and Tze (2014) tested the strength between self-efficacy and personality, and student achievement and teaching performance. They found that teacher self-efficacy and personality were both significantly associated with teaching effectiveness: self-efficacy $r = .12$, $p < .01$; personality $r = .08$, $p = .02$. In fact, the researchers suggested that the relationship between self-efficacy and teacher performance is substantial and should be taken into consideration further investigations for self-efficacy training and interventions. One should keep in mind, however, that self-efficacy may rise and fall over the course of a career (Klassen & Chiu, 2010).

In a literature review focused on 40 years of teacher self-efficacy (TSE) research, Zee and Koomen (2016) categorized the TSE studies into the following overarching areas: theory and measurement of TSE, consequences of TSE, and outcomes of TSE and classroom ecology. As cited by Zee and Koomen (2016), Woolfolk Hoy, Hoy & Davis (2009) developed a process-oriented framework to understand the TSE outcomes at various levels of the classroom environment. In this framework, TSE holds "various types of consequences for a range of classroom processes at both student and teacher levels, including instructional actions, behavioral expectations, and emotional classroom dynamics" (Zee & Koomen, 2016, p. 986). As cited by Zee and Koomen (2016), the TSE outcomes framework resembles the CLASS

framework developed by Pianta, LaParo and Hamre (2008), which is the leading framework on the quality of classroom processes, and is the model Zee and Koomen (2016) used for their heuristic model involving the associations among TSE and the quality of classroom processes, students' academic adjustment, and teachers' well-being. The relationships in this model are shown in Figure 2.

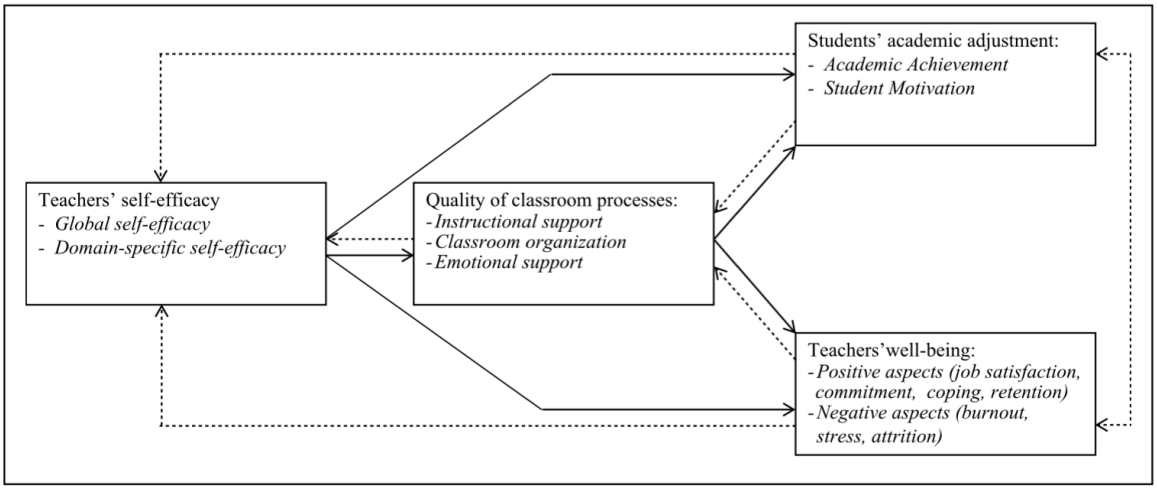

Fig. 2 – *Heuristic model of teacher self-efficacy in relation to classroom processes, academic adjustment, and teacher well-being*. *Note.* The dashed lines represent connections that did not appear in Zee and Koomen's (2016) study.

Zee and Koomen (2016) mentioned the recent growth of self-efficacy studies linking TSE and technology, focusing on pre-service teachers (Sang, Valcke, van Braak & Tondeur, 2010; Teo, Lee & Chai, 2008). Although a limited number of TSE and technology studies have employed samples of practicing teachers (Hermans, Tondeur, van Braak & Valcke, 2008); however, the conclusions are the same for studies involving both elementary and secondary teachers, "…for technology and computer use in the classroom to move forward, teachers need to perceive themselves as self-efficacious, especially in using computers and technology" (p. 996).

In a mixed-methods case study, Haney, Lumpe, Czerniak and Egan (2002) examined the relationships between elementary teachers' (n = 6) science self-efficacy beliefs and their ability to effectively implement science instruction. They used the Science Teacher Efficacy Beliefs Instrument (STEBI), developed by Riggs and Enochs (1990), to identify teachers' science context and capability beliefs, and also conducted pre and post classroom observations, as well as interviews, to obtain feedback about lesson goals, activities, classroom culture, and reflections on teaching experiences. These teachers completed the STEBI, as well as a science contexts beliefs instrument, prior to participation in a two-week long science professional development program. The interview questions provided further evidence of the teachers' beliefs through prompts such as: *What do you think it takes to be a good science teacher? What are your strengths and weaknesses as a science teacher?* and *How do you deal with challenges and obstacles?* The STEBI means/scores ranged from personal self-efficacy low (41) to personal self-efficacy high (56). The instruments, observations and interviews provided evidence relative to coherence between teachers' self-reported beliefs and instructional behaviors (Haney et al., 2002). For example, in a study conducted by Pan and Franklin (2011) results revealed significant positive correlations ($r = .302$, $p < .05$) between teachers' self-efficacy scores and the amount of technology they utilized in classroom instruction.

Teachers might agree that technology is necessary and that it helps them in their personal lives; however, personal beliefs could inhibit willingness to learn how to integrate technology into professional activities pertaining to curriculum and teaching (Ertmer & Ottenbreit-Leftwich, 2010). It appears that teachers who implement and persist at using technology in the classroom manifest related motivation. In a study on computer technologies, Wozney, Venkatesh and Abrami (2006) found that teachers' "motivation to use technology for learning was substantially

related to self-reported use," and that their attitudes towards successful use of technology substantially predicted the degree to which the technology was being integrated (p. 195). It has also been found that teachers who expressed more confidence about computer technology also reported using more effective technology integration strategies than those teachers who expressed a less positive attitude (Teo, Lee & Chai, 2008). A similar study by Christenson (2002) pinpointed positive teacher attitude toward information technology as a factor that fostered positive attitudes in their students. Etmer, Ottenbreit-Leftwich, Sadik, and Sendurur (2012) used a multiple case-study research design to examine the similarities and differences of twelve K-12 classroom teachers' technology practices and beliefs. They noted that every teacher in the study said their attitudes and beliefs were not a barrier; however, five of the teachers indicated that one of the key influences on their technology integration was their own attitudes and beliefs. Etmer et al. (2012) also noted that the participants in this study were award-winning technology-users. Last, in a mixed methods case study exploring beliefs about the nature of knowledge and learning, technology integration, and effective teaching practices (N = 22 elementary teachers), Kim, C., Kim, M. K., Lee, Spector, and DeMeester (2013) found that participants who expressed more sophisticated beliefs about knowledge and learning were more likely to employ student-centered teaching practices and to provide more seamless use of technology as a tool for learning. "It is noteworthy that what teachers say they do (levels of technology use) was significantly correlated with both their beliefs about effective ways of teaching (conceptions on class discussions and teacher role) and their actual practices with regard to technology integration (lesson design and lesson implementation)" (Kim et al., 2013, p. 81).

During challenging times or when change is implemented, it is recommended to provide encouragement and support for teachers, as low self-efficacy beliefs and related behaviors might be manifested (Tschannen-Moran et al., 1998). Furthermore,

> "teachers can be warned that initial attempts to implement new strategies may temporarily lower their feelings of efficacy. Teachers need support and training to see them through the initial slump in efficacy beliefs as they attempt to implement new methods. They also need to see evidence of increased student learning before new, higher efficacy beliefs will take root" (Tschannen-Moran et al., 1998, pp. 238-239).

Mindset

Mindset is the second self-theory informing the current study. Mindsets are personal beliefs about oneself relative to attributes, such as intelligence, talents, and personality. According to Dweck (2006) some individuals believe that their intelligence is unchanging, meaning that one is born with a predetermined amount of ability and it is not possible to increase this ability. Therefore, one's performance is viewed as the key indicator of intelligence, which is also called the *entity* theory of ability, or a *fixed mindset* (Dweck & Leggett, 1988; Rhodewalt, 1994). In contrast, others believe that intelligence is more malleable. Over time, ability can grow through hard work, dedication and focused effort (Dweck, 2006). This phenomenon is referred to as an *incremental* theory of intelligence, or a *growth mindset* (Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin & Wan, 1999).

One's general outlook or optimism is generally regarded as an outcome of one's mindset. "Optimism fosters confidence in oneself and in the belief that one can succeed" (Forgeard & Seligman, 2012). Similar to a *growth mindset*, optimists acknowledge the occurrence of negative events but tend process them in a constructive manner; i.e. they view mistakes as learning

experiences. In contrast, the pessimists are perceived as similar to individuals who express a *fixed mindset*, in that they blame themselves for bad events, attribute luck to external events, and assume that their intelligence cannot be altered (Rosen, 2011).

How an individual reacts to failure is another feature of mindset. Those individuals indicating *fixed (entity) mindset* tend to describe a pattern in which failure is a setback, as well as an indicator of lacking competence or potential to succeed. Contrary to this belief pattern, those expressing a *growth (incremental) mindset* tend to describe failure as a learning experience, an opportunity to correct mistakes, and to increase one's ability (Blackwell, 2002; Duckworth & Eskreis-Winkler, 2013; Dweck, 2006; Dweck & Leggett, 1988). Pertinent to technology integration, a growth mindset might contribute to teachers' perseverance in a technology integration process.

Research results strongly suggest that if teachers want to promote success in the classroom, they need to teach their students to seek challenges, enjoy effort, and think of mistakes as learning experiences. Ricci (2013) agrees, "it is imperative that teachers develop a climate in their classrooms where failure is celebrated and students learn to reflect and redirect so that they can approach a challenging task in a new way or with more effort" (p. 69). Ricci recommends that teachers model the same attitudes towards growth and perseverance that they are trying to instill in their students. As quoted by Ricci (2013), Walt Disney also took risks despite the possibility of failure, "Around here…we don't look backwards for very long. We keep moving forward, opening up new doors and doing things because we're curious, and curiosity keeps leading us down new paths" (p. 69). Dweck (2006) agrees, "The passion for stretching yourself and sticking to it, even, (or especially) when it's not going well, is the

hallmark of the growth mindset. This is the mindset that allows people to thrive during some of the most challenging times in their lives" (p. 7).

Elliott and Dweck (1988) established a motivational framework for achievement situations in which an individual expressing a fixed mindset versus a growth mindset appeared to position the individual to focus on different goals and different internal factors in explaining subsequent performance. According to this framework, as shown in Table 1, when individuals indicated an entity/fixed theory, they tended to select *performance* goals, which have a high likelihood of success. A key impetus would be the individual's desire to avoid negative judgments. In contrast, when individuals expressed an incremental/growth theory of intelligence, they tended to select *learning* goals. Successful accomplishment of these goals required effort and had the potential to increase the individual's mastery of the pertinent task/subject.

Table 1.
Theories of intelligence, goal orientation, and behavior patterns in achievement situations (Elliott & Dweck, 1988)

Theory of Intelligence	Goal orientation	Perceived present ability	Behavior pattern
Entity (Intelligence is fixed)	Performance (Goal is to gain positive judgments/avoid negative judgments of competence)	High	Mastery oriented (Seek challenge; high persistence)
		Low	Helpless (Avoid challenge; low persistence)
Incremental (Intelligence is malleable)	Learning (Goal is to increase competence)	High or low	Mastery oriented (Seek challenge that fosters learning; high persistence)

In Elliott and Dweck's (1988) seminal study, fifth grade children (N = 101) were asked to choose from two boxes, either a performance task or a learning task. "As predicted, children more often chose the learning box (82.4%) when the utility of the knowledge was high, and the performance box (66%) when the importance of evaluation was high, x^2 (1, N = 101) = 22.35, p<.001" (p. 8). The results of the study suggest that children's achievement goals are critical determinants of behavioral and cognitive patterns.

This model was reviewed in Dweck and Leggett's *A Social-Cognitive Approach to Motivation and Personality* (1988), wherein the authors hypothesized the effect of an individual's theory of intelligence on goal orientation and behavior patterns in achievement situations. The *social-cognitive theory of motivation* they proposed involved two concepts, mindset and goal attainment. Dweck and Leggett (1988) found that individuals who were placed in similar situations would set different goals, and that one's mindset was significantly correlated with that goal. In an educational environment, a teacher's mindset could affect his/her goals and perceptions of attainment due effort and hard work. The researchers also found different outcomes based on whether the goal was categorized as a performance goal or as a learning goal; "performance goals create a context in which outcomes (such as failures) and input (such as high effort) are interpreted in terms of their implications for ability and its adequacy. In contrast, learning goals create a context in which the same outcomes and input provide information about the effectiveness of one's learning and mastery strategies" (p. 261). A consistent predictor of goal orientation appeared to be one's mindset (Dweck & Leggett, 1988; Grant & Dweck, 2003). Additionally, "the model could be extended to attributes outside of the self, hypothesizing that individuals hold implicit theories (*mindsets*) about the characteristics of other people, places, and

things" (p. 271). Knowing this, it is likely that teachers have developed mindsets about classroom technology integration.

In a mindset study with an adult sample, Rattan, Good & Dweck (2012) found that teachers displaying a fixed mindset labeled students as low ability more often than those teachers manifesting a growth mindset. Additionally, teachers labeled as having a fixed mindset were more likely to comfort students for their low achievement, and offer strategies such as assigning less homework, which would be likely to undermine students' improvement efforts. The students who received the comfort-oriented strategy were more likely to view the teacher as having lower engagement in the student's learning. Comfort-oriented feedback was also associated with students expressing lower motivation to learn course content.

In another foundational study, Erdley & Dweck (1993) tested the hypothesis that children (N = 232) "who believe that personality is a fixed quality (entity theorists) would make more rigid and long-term social judgments than those who believe that personality is malleable (incremental theorists)" (p.863). The findings indicated that individuals with a fixed mindset viewed traits as stable and enduring qualities; however, individuals with a growth mindset viewed traits as temporary labels for the witnessed behavior. The researchers question whether these findings are "relevant to the causes and consequences of stereotyping" (p. 877). The findings indicate that fixed and growth mindset individuals might have differing views about certain personalities lending themselves to being better/worse at technology integration.

A more recent mindset study, *Implicit Theories About Willpower Predict Self-Regulation and Grades in Everyday Life* (Job, Walton, Bernecker & Dweck, 2015) provides support for the academic connection to mindset. The college student participants' (N = 153) willpower theories were assessed, and their self-regulation and academic performance was then tracked.

Participants responded to an online questionnaire every Monday for five weeks, and they also were asked to release their college academic records. The findings indicated that students faced with high demands and a heavy course load who expressed the thought that willpower was constant (was not depleted after strenuous mental activity) used better time management, less unhealthy eating, and less impulsive spending. In addition, these students earned higher grades than participants who expressed the belief that willpower was limited.

A more current study explored technology in association with a growth mindset: *Brain Points: A Growth Mindset Incentive Structure Boosts Persistence in an Educational Game* (O'Rourke, Haimovitz, Ballweber, Dweck & Popović, 2014). *Refraction* is the name of the educational game in which participants (N = 15,000) are offered incentives "brain points" that promote a growth mindset by "directly incentivizing effort, use of strategy, and incremental progress" (n.p.). Two versions of *Refraction*, a game designed to teach fraction concepts to elementary students, were developed, a control version with a neutral view of intelligence, and an experimental version, which "teaches and rewards growth mindset behavior by leveraging the game's narrative and incentive structure" (n.p.). "Refraction has been successful at attracting elementary school students, and has been played over 250,000 times on the educational website BrainPOP since its release in April 2012" (n.p.), see Figure 3 from the BrainPOP website.

Fig. 3 – *Student starting point for Refraction in order to save animals stuck in space by applying fraction concepts* (BrainPOP, 2012)

The researchers concluded that children who played the growth mindset (experimental) version of the game were more persistent than those who played the control version (Z=-9.04, p<0.0001, r=0.07). This study's results suggest that game-based learning can promote a growth mindset (O'Rourke et al., 2014) rather than direct teaching or therapeutic interventions.

It appears that mindset research has been limited primarily to studying children and youth, and on dependent variables such as personality, motivation, and general academic achievement (Blackwell, 2002; Erdley & Dweck, 1993; Hall, 2013; Job, Walton, Bernecker & Dweck, 2015; Spitzer, & Aronson, 2015; Sorensen, 2016; Trzesniewski, & Dweck, 2007). However, in a recent study, Powers (2015) investigated if and how a series of growth mindset interventions might change faculty perceptions about their instructional practices. Powers created a mixed methods growth mindset intervention at a community college. Intervention faculty (N = 9) were trained to present six sessions encouraging students to adopt a growth mindset. Intervention students (N = 208) completed pre-intervention and post-intervention surveys. The comparison faculty (N = 9) and students (N = 223) did not experience the growth mindset intervention. Faculty also completed personal interviews about their experiences. According to the researcher, results were significant; "all nine intervention faculty members

changed their instructional practices and planned to embed growth mindset as a fundamental aspect of future courses...All of the faculty participants reported changes in students, including increased engagement and increased help-seeking behaviors" (Powers, 2015, p. 116).

Last, it is vital to mention the 2016 National Education Technology Plan, which mentions the importance of educators acting as co-learners relative to technology-based tools, expressing a growth mindset, natural curiosity with the content, engaging in problem solving, and becoming co-creators of knowledge (U.S. Department of Education: Office of Educational Technology, 2016).

Motivation

Motivation provides a conceptual bridge from the self-theories to goal orientation and related behavior patterns. Weiner's (1985) seminal research and development of *attribution theory (of motivation and achievement)* focuses on the origin of an individual's motivation. He found that successful individuals tend to attribute their success/failure to the amount of effort (an internal factor), while unsuccessful individuals tend to attribute their success/failure to the difficulty of the task or luck (an external factor). Weiner's work could be viewed as a precursor to the subsequent development of the previously mentioned mindset theory.

Because motivation is a many faceted phenomenon, I will focus on three areas of motivational research: goals, autonomy (teacher agency), and cognition.

Goal theory. As cited by Richardson and Watt (2016), Butler (2007) states that achievement goal theory was the foundation for a survey design to discover what teachers desired to achieve during instruction. Teachers self-reported four types of goal-oriented behavior:

- Mastery goals – a desire to learn and enhance teaching skills; learning goals

- Ability-approach goals – demonstrating superior teaching ability
- Ability-avoidance goals – avoid displaying failure; performance goals
- Work-avoidance goals – minimal effort; getting by with doing as little as possible

Those teachers with mastery goals were associated with help seeking positive instructional practices (answering student questions), in contrast, those with ability-avoidance goals displayed negative instructional practices (avoiding student questions) (Butler & Shibaz, 2008, as cited by Richardson & Watt, 2016). As a part of their jobs, teachers are required to construct content goals on a regular basis. Whether or not teachers achieve their goals could affect their overall professional identity through feelings of competence, mastery and accomplishment.

Teachers' achievement goals are also associated with the classroom environments they create, so that if one created mastery/learning goals vs. performance based goals, the classroom environment would reflect this. This was reported in a study on *Goal structures: The role of teachers' achievement goals and theories of intelligence,* where Shim, Cho, and Cassady (2013) found that teachers' achievement goals and mindsets were associated with the goal structures they created in their classrooms.

Autonomy. A teacher who experiences *autonomous motivation* perceives his or her self to be in charge of their own behavior, and tend to experience feelings of liveliness. Contrary to this, those who experience *controlled motivation* perceive themselves to be controlled by others, and as a result experience feelings of exhaustion (Richardson and Watt, 2016; Roth, 2014). For example, teachers with controlled motivation might take large amounts of motivational time to try to outperform other teachers because they wish to please the administration or avoid shame, which leads to a decreased well-being (Roth, 2014). In a subtype of autonomous motivation, *intrinsic motivation*, teachers will perform activities because they are interesting, fun, or are

related to student development or well-being (Roth, 2014). "This sense of autonomy at work may enable teachers to withstand periodic disturbances and obstacles, and may prevent deleterious experiences leading to low vitality and exhaustion" (Roth, 2014, p. 8). There could be educational advantages to researching teachers who possess autonomous motivation.

Cognitive. *Cognitive motivation* refers to the ongoing desire for understanding and knowledge. Individual who express this type of motivation will desire challenge, curiosity and exploration **(**Alzoubi, Al Qudah, Albursan, Bakhiet, & Abduljabbar, 2016). This type of motivation could also be referred to as having a growth mindset (Dweck and Leggett,1988) and a valuing of learning goals instead of performance goals. See the previous section on Mindset. This type of motivation could also be identified as self-efficacy. Social cognitive theory was the foundation for teacher self-efficacy (Bandura 1977, 1982), and extensive research suggests that self-efficacy can influence educational achievement, including that of educators (Bandura, 1977; Zee & Koomen, 2016).

Technology Integration and Beliefs

The teachers participating in the current study are serving as technology integration specialists. Discussing research on technology beliefs along with discussing the current state of educational technology is essential to providing a foundation for the current study.

Millennials have grown up with a variety of technological devices in their hands (personal game devices, mp3 players, smart phones, iPads, wearable technology), and it appears that this intimate connection to technology has profoundly affected their expectations for effective learning (The Council of Economic Advisers, 2014). With technology implementation becoming routine for many schools across the country, administrators and educators alike are discovering the effects these tools can have on students' success (Kenny & McDaniel, 2011).

Since the release of the first iPad in 2010 more school districts are using iPads in elementary classrooms to enhance teaching and learning (Culén & Gasparini, 2011; Reid & Ostashewski, 2011). An important implication for current educators is that teaching and learning needs to be reconsidered and perhaps reframed in order to accommodate this tech-savvy generation.

In a study focusing on uses of iPads in pre-school settings, Jahnke & Kumar (2014) found that iPads were used for providing multimodal learning, stimulating creative thinking, improving reading and writing skills, and simulating real world experiences. Plus, "the iPad made it easier for the teacher to use language skills in a way that was more complex…" (p. 84). According to Murray and Olcese (2011), the iPad "has potential to not only extend what can be done in classrooms but also strive for better connection to learning theories…" (p. 47).

In addition to the widely-touted learning advantages attributed to iPads, expanding Internet availability offers a suitable environment for integration. In the most recent educational technology report published by the National Center for Educational Statistics (NCES) (Gray, Thomas & Lewis, 2010), 97% of teachers in the United States reported having access every day to one or more computers in their classrooms, and 54% of those teachers reported having the option to bring more computers into their classrooms. Also nationwide, Internet access was reported as available for 93% of the computers in the classroom every day and 96% for those computers brought into the classroom (Gray, Thomas & Lewis, 2010). The percentage of students who have access to electronic learning devices is most likely higher today than at the time of the report. In addition, the report may not account for the fact that some students provide their own devices (Project Tomorrow, 2014). It is estimated that the ratio of students with devices in the classroom every day is now close to 1.7 (students) to 1 (device) (Gray et al., 2010). Interestingly, this estimated national ratio is the same as the ratio reported in the state of

Kansas (Kansas Digital Learning, 2016). Regardless of the number of devices purchased by school districts, the NCES reports that only 40% of students reported using computers 'often' and only 29% 'sometimes' during instructional time (Grey et al., 2010). It is apparent that U.S. education systems have invested in providing access to technology devices; however, the extent to which teachers support technology integration has yet to be ascertained or explored systematically.

"Although the conditions for successful technology integration finally appear to be in place, including ready access to technology, increased training for teachers, and a favorable policy environment, high-level technology use is still surprisingly low" (Ertmer, 2005, p. 25). There appear to be barriers to the use of educational technology that could affect teachers' technology integration. Hew and Brush (2007) examined empirical research published between 1995-2006, cataloging approximately 120 technology integration barriers (see Figure 4). They found that, during that time frame, the most common barrier was 'resources': access to technology, time, and support for technology.

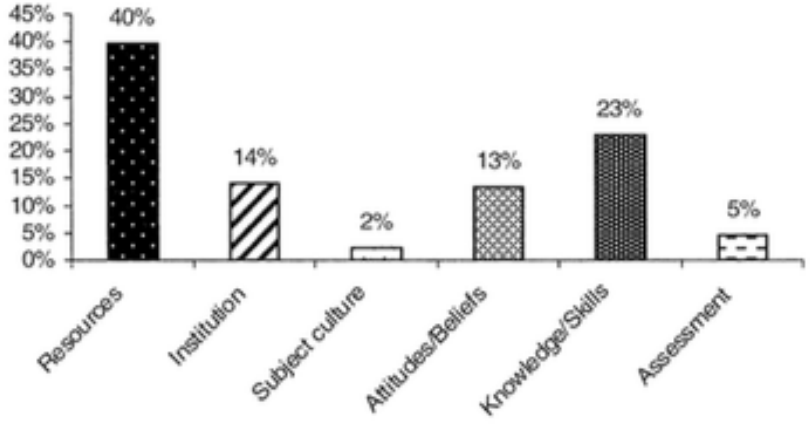

Fig. 4 – *Relative frequencies with which barriers were indicated* (Hew & Brush, 2007).

According to Project Tomorrow (2014), Gray et al. (2010), and Kansas Digital Learning (2016), access to technology is quickly fading as a resource barrier, leaving time and technology support

as the leading contenders. The second most frequently mentioned barrier was lack of technology skills and negative attitudes/beliefs (Hew & Brush, 2007). In a case study of 18 elementary school teachers' perceptions of the barriers to using technology, Kopcha (2012) found that time was mentioned as the biggest challenge when using technology within instruction. More recently, it was found that new educators indicated that they felt comfortable with using technology in the classroom; however, these individuals also indicated that they were overwhelmed by the amount of content to cover. They cited a lack of time to create and implement technology-based lessons as a barrier (Brenner & Brill, 2016). Ertmer (2005) suggests, "…it is imperative that educators increase their understanding of and ability to address teacher beliefs, as part of their efforts to increase teachers' technology skills and uses" (p. 37).

Despite increasing access to 21st century technology, it seems that feelings of intimidation might prevent some educators from feeling comfortable with technology use as an aid to instruction. Researchers (Aldunate & Nussbaum, 2013; Cherry, 2014) use the term *technology anxiety* to describe the phenomenon that occurs when teachers are not provided appropriate training for devices. They assert that some technology anxious educators have not utilized the technology purchased by their school districts, and are hesitant or even avoid using technology in which they do not consider themselves an expert. Cherry (2014) used a technology anxiety scale with a sample of Minnesota teachers (N=187) and discovered a negative correlation between technology anxiety and technology integration.

Summary

The literature review explored research pertinent to professional identity, teachers' technology integration beliefs as well as research on self-theories, specifically mindset and self-efficacy and their connection with motivation. One goal of this study was to use the self-theories

(mindset and self-efficacy) as key aspects of the identity transformation process for the elementary classroom teachers who became technology integration specialists. Another goal of this study was to use the participants' narratives to assist with corroborating the literature review regarding technology integration beliefs, and to explore the degree to which the participants' decisions to change roles is reflected in the technology integration beliefs they identify.

Narrative inquiry and identity. Narrative identity also produced themes related to this study. One major theme is that the use of narrative and identity studies complement one another (Beauchamp & Thomas, 2009; Clandinin, 2003). Additionally, narrative identity can be thought of as a domain of one's personality, and in this domain, personality differences transpire through stories people share about their experiences (Adler et al., 2016). The narratives about the technology integration specialists in this study described a turning point and provided opportunities for exploring and revealing aspects of the self.

Teacher identity. In the discussion about teacher identity, one theme that developed from the literature review was that professional identity refers to the ways a teacher represents his or her professional self through self-image, self-esteem, job-motivation, task perception, and future perspective (Kelchtermans, 1993), and it is in a constant state of development or evolution (Beijaard et al., 2004; Kelchtermans, 1993; Rodgers and Scott, 2008). These identities are deconstructed and reconstructed over a period of time based on the strength of teachers' past influences, pre-teaching identity (*mindset*), and teaching contexts (Flores & Day, 2006). It is also important to note that one's professional identity contributes to teacher self-efficacy, motivation, commitment, and job satisfaction (Day et al., 2006). In this study, motivation can be viewed through one's goals, autonomy, and cognitive motive.

Self-efficacy. Another one of the major themes to emerge from the review was that teachers' who report strong self-efficacy perceive themselves as capable of overcoming failure and embracing challenges (Bandura, 1977; Bandura 1982; Teo et al., 2008; Tschannen-Moran et al., 1998), and teacher self-efficacy is associated with teacher well-being (Woolfolk Hoy et al., 2009; Zee & Koomen, 2016). Additionally, teachers with low self-efficacy experience higher stress due to higher difficulties in teaching (Betoret, 2006), plus these teachers are less satisfied with their jobs (Klassen, 2010). Teacher self-efficacy increases in early to mid-career but declines in the late career stage (Klassen and Chiu, 2010). It is important to note that teacher self-efficacy and personality were both significantly associated with teaching effectiveness and positive changes in student achievement (Haney et al., 2002; Kagan 1992; Klassen & Tze, 2014; Rosenthal & Jacobson, 1968).

There is a recent growth of self-efficacy studies linking teacher self-efficacy and technology, and most of this research has involved preservice teachers (Sang et al., 2010; Teo et al., 2008; Zee & Koomen, 2016). It is especially noteworthy that a very limited amount of teacher self-efficacy and technology studies has occurred with elementary teachers (Hermans et al., 2008). In the context of the proposed study, teachers who display self-efficacy relative to technology integration might be more willing to learn how to integrate technology into curriculum and teaching (Ertmer & Ottenbreit-Leftwich, 2010), along with using more effective technology integration strategies (Teo et al., 2008). Similarly, those teachers who have a positive attitude towards using technology instill the same attitude within their students (Christenson, 2002). During challenging times or when change is implemented, it is recommended to provide encouragement and training for teachers, as low self-efficacy beliefs and related behaviors might manifest (Tschannen-Moran et al., 1998).

Mindset. Another theme to emerge from the literature was one's achievement goals are critical determinants of behavioral and cognitive patterns, and a consistent predictor of goal orientation is one's mindset (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Grant & Dweck, 2003; Job et al., 2015). Additionally, findings suggest that a growth mindset increases one's ability as well as one's perseverance (Blackwell, 2002; Duckworth & Eskreis-Winkler, 2013; Dweck, 2006; Dweck & Leggett, 1988; O'Rourke el al., 2014). Optimism and pessimism are both aspects of mindset (Forgeard & Seligman, 2012; Rosen, 2011), and how one reacts to failure is another aspect of mindset (Blackwell, 2002; Duckworth & Eskreis-Winkler, 2013; Dweck, 2006; Dweck & Leggett, 1988; Rosen, 2011). Those who express a growth mindset, for example, view mistakes as learning experiences, and those who express a fixed mindset view mistakes as setbacks (Blackwell, 2002; Duckworth & Eskreis-Winkler, 2013; Dweck, 2006; Dweck & Leggett, 1988; Ricci, 2013; Rosen, 2011).

Pertinent to technology integration, game-based learning can promote a growth mindset (O'Rourke et al., 2014), and our 2016 National Education Technology Plan desires for educators to express a growth mindset (U.S. Department of Education: Office of Educational Technology, 2016).

Motivation. Motivation in the literature review provided a conceptual bridge to the self-theories: mindset and self-efficacy. Because motivation is a many faceted phenomenon, this study focused on three areas of motivational research: goals, autonomy (teacher agency), and cognition. One dominant theme is that, similar to mindset, one's learning goals and performance goals are connected to motivation (Richardson & Watt, 2016; Shim et al., 2013). Additionally, teachers who expressed controlled motivation were connected to a decreased well-being, and those teachers who expressed autonomous motivation (intrinsic motivation) performed activities

because they are interesting, fun, or were connected to a strong well-being (Roth, 2014). Cognitive motivation refers to the ongoing desire for understanding and knowledge and individuals who express this type of motivation will desire challenge, curiosity and exploration **(**Alzoubi et al., 2016), which is similar to expressing a growth mindset and strong self-efficacy.

Technology integration and beliefs. Many themes are present in the literature review about technology integration beliefs. One emerging theme to consider involves reconsidering teaching and learning in order to accommodate this tech-savvy generation (Culén & Gasparini, 2011; Kenny & McDaniel, 2011; Reid & Ostashewski, 2011; The Council of Economic Advisers, 2014). There also appear to be barriers to the use of educational technology that could affect teachers' technology integration (Ertmer, 2005; Hew and Brush, 2007) and the most current barriers being time to implement/research and technology support (Brenner & Brill, 2016; Gray et al., 2010; Kansas Digital Learning, 2016; Kopcha, 2012; Project Tomorrow, 2014). Another barrier to emerge was technology anxiety, which occurs when teachers are not provided appropriate training for devices and avoid using the new technology (Aldunate & Nussbaum, 2013; Cherry, 2014). Additionally, one's belief in one's ability to succeed, or self-efficacy, had a great impact on the amount of technology utilized in classroom instruction (Pan & Franklin, 2011). It was also found that teachers' beliefs (Christenson, 2002; Etmer et al., 2012; Ertmer & Ottenbreit-Leftwich, 2010; Teo, Lee & Chai, 2008) and motivation (Wozney et al., 2006) significantly affected their technology integration use.

Conclusion

With technology integration as a current feature of curriculum and instruction in K-12 settings as well as in post-secondary education (International Society for Technology in Education (ISTE), 2016), and considering it is reasonable to speculate that rapid proliferation of

educational technology will become a regular feature of today's classrooms, I consider it beneficial to study mindset and self-efficacy in relation to the educators' stories about their transformation into technology integration specialists. I have concluded that, to date, there have been no studies conducted that look at the lived experiences of elementary teachers as they transform into technology integration specialists, their mindsets and their self-efficacy beliefs.

The next chapter introduces the methods for analyzing and evaluating teachers' identities and self-theories in relation to technology integration in order to address the research questions: How do elementary technology integration specialists describe the processes that shaped their decision to pursue this new professional role? How do they describe their commitment to the role? What beliefs appear/become important during this process? In what ways might their identities have changed as they commit to this new career? In what ways do they describe their perseverance and ongoing motivation?

Chapter Three: Methodology

The focus of this study was to explore the following research questions as they pertain to elementary technology specialists and their integration of technology in the classroom:

1. How do elementary technology integration specialists describe the processes that shaped their decision to pursue this new professional role? How do they describe their commitment to the role?
2. What beliefs appear/become important during this process?
3. In what ways might their identities have changed as they commit to this new career?
4. In what ways do they describe their perseverance and ongoing motivation?

A particular consideration was to explore self-theories as an aspect of changing professional role identity. The following provides more detail about the direction of this study.

This chapter provides the rationale and design of the study. It includes the following sections: research context; research design; sampling/participants; research protocol; data collection methods; data analysis; and credibility and validity.

Research Context

The research context for the study involved two environments: the school district, and the researcher's emerging role within the district.

School District

The Teaching and Learning Department staff (curriculum director and three coordinators) within the participating school district identifies district goals each year for building-level administration to use to develop their own goals. For the 2016-2017 school year, the teaching and learning staff selected the self-theory of mindset (Dweck, 2006) and 21st century learning as

two primary goals. It should be noted that prior to goal setting, three of the elementary principals had conducted voluntary book studies with their staff using Dweck's (2006) book, *Mindset: The new psychology of success*, and had recommended the book to other principals as well as to the Teaching and Learning Department staff during a Teaching and Learning Building Leadership (TLBL) team meeting[1]. In particular, mindset theory's potential effects on learner engagement made mindset a logical choice for a district goal. The second district goal, 21st century learning, involved improving technology integration in all (K-12) classrooms. Therefore, widespread interest in and commitment to improving mindset and technology integration made the study especially timely.

According to the Kansas State Department of Education (KSDE, 2016), the district's student population of approximately seven thousand consisted primarily of students self-identifying as white (82.03%). Similar to other school districts in this part of the state, a small proportion of the student body self-identified as Hispanic (8.81%) or African American (2.96%) (Note: Other is listed at 6.46%). The district's overall socioeconomic status was middle – upper middle class. Only 14.68% of the students were categorized as economically disadvantaged. As of 2015, the district reported a graduation rate of 97%.

An aspect of the elementary technology integration specialists' roles featured the opportunity to impact the learning of every student in the buildings they served. In particular, their rotating schedules promoted collaborating with teachers at all grade levels, within every classroom; i.e. every student in their schools. According to the elementary principals, this opportunity has created a new role expectation: that technology integration specialists would

[1] The TLBL meetings occur on a monthly basis in order to collaborate regarding all curriculum and teaching current topics/goals. All building administrators attend these meetings organized by the Teaching and Learning Department staff.

foster a growth mindset relative to technology integration for students and for classroom teachers. These changes represented a profound transformation of the technology integration specialist role. The sum of these conditions created an ideal situation for using a narrative case study to explore identity transformation as these professionals developed from classroom teachers to technology integration specialists. Listening to the stories of success and failure while trying to implement technology during direct instruction as well as to collaborate with classroom teachers led me to want to discover more about why some teachers continued to persevere to learn and integrate new instructional technology even when confronted with mistakes, unknown technological challenges, and possibly being viewed as a novice in this domain. The elementary technology integration specialists were the perfect candidates for this study since they use technology daily for instruction.

The Researcher's Emerging Role as Technology Integration Coordinator

Since July of 2015, I have functioned as one of the Teaching and Learning Department coordinators for the participating school district in this study, and have assisted with the annual district goal planning. Specifically, my role is the technology integration coordinator. One of my responsibilities is to assist the elementary technology integration specialists with their professional development, goal planning, and curriculum implementation. The sum of these conditions created an ideal situation for using a narrative case study to explore identity transformation as these professionals develop from classroom teachers to technology integration specialists.

Research Design

Case Study

The contexts described above made a case study design a promising option to accomplish the purposes of the proposed research (Stake, 2005; Thomas, 2011), which involved technology integration specialists' role identity transformation. A case study design should be considered when (as cited by Yin, 2013): "(a) the focus of the study is to answer "how" and "why" questions; (b) you cannot manipulate the behavior of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context" (Baxter & Jack, 2008, p. 545). All of these listed factors were considered for this study; specifically, the research questions are "how" and "why" questions, behavior was not manipulated, I believed the self-theories could relate to identity, and the boundaries are not clear between identity transformation and the self-theories of interest.

The elementary technology integration specialist's narratives had the potential to contribute to this inquiry. Numerous researchers have defined 'case study', therefore for the purpose of this study I will use the definition offered by Thomas (2011):

> Case studies are analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods. The case that is the subject of the inquiry will be an instance of a class of phenomena that provides an analytical frame—an object—within which the study is conducted and which the case illuminates and explicates (p. 513).

An additional consideration for using a narrative case study design was its flexibility. "One of the strengths of the case study approach is its methodological eclecticism; a variety of

methods may be used, including those that generate quantitative data" (Marshall & Rossman, 2016, p. 19). This adaptability allowed me to use a blend of quantitative and qualitative data in the process of making meaning from each participant's story.

Researcher's Role

In my current role as the district's technology integration coordinator I had the opportunity to build ongoing professional relationships with the participants. According to Thomas (2011), case study selection criteria include the researcher's familiarity with the case along with other criteria. Having the opportunity for naturally occurring interactions with the participants is also viewed as beneficial in qualitative case studies (Marshall & Rossman, 2016). Since I was designated as the professional development coach for the teachers in this study, I was very familiar with their roles, their curriculum, and their personalities. This relationship had the potential to promote full and authentic narratives.

Sampling/Participants

The research population consisted of all seven elementary technology integration specialists. All of these individuals were offered the opportunity to participate in the study. The population completed a demographic survey (see Appendix 2). Results were used to select the research sample: two technology integration specialists who were within 1-3 years of assuming the specialist role, and two who had held their positions for at least ten years. Selecting these four individuals on the basis of varied levels of experience facilitated comparing/contrasting stories of identity transformation, as well as the relationships among specific factors of interest: mindset and self-efficacy.

A formal invitation was emailed to all seven of the possible participants who represent all of the elementary technology specialists in the participating school district. The email contained

information about the purpose of the study, criteria for participation, possible benefits and risks, the right to withdraw, assurance of anonymity and confidentiality, and the consent form. This information was provided to the possible participants so they had an opportunity to make an informed decision about whether or not to participate in the study.

Individuals who responded to the email and indicated an interest in participating received a follow up email with information on submitting the consent form through the district's inner-office mail, and a link to an online form containing the demographic survey, the mindset instrument (ITIS), and the technology self-efficacy instrument (MUTEBI) (See Appendix 2, 3 and 5).

The demographics (See Table 2) assisted with selecting two participants who were new to their positions and two who had remained in their positions for more than twelve years.

Table 2.
Demographic Data of Population

Pseudonym	Yrs Tech Specialist	School Enroll	Age	Highest Degree	How did you become a technology teacher?
Diana	1	511	39	Masters	I was ready for a change.
Sandy	2	577	44	Masters	I was ready for a career shift.
Toni	13	433	46	Bachelors	I jumped at the chance.
June	12	484	58	Masters	I volunteered.

The narrative "stories" are organized in Chapter 4 with the two new technology specialists followed by the two who have remained in their positions for over ten years, thus I have organized the tables with their pseudonyms with the same organization. For the sample, the goal was to have two sets of individuals who were similar in their demographics, especially with the number of years they had remained in their positions. I did not select Linda or Jerry due to the numbers of students in their buildings, and Mary was not similar to the other participants in years of experience. Even though Linda, Jerry, and Mary completed the ITIS and MUTEBI

instruments, I did not include these data in the tables or in the data analysis. However, I did provide all participant data for the demographic reporting. I wanted the sample to have similar demographics in order to compare and contrast the qualitative data that was free of demographic outliers, such as a first-year teacher to the district or a teacher in their last year before retirement. Based on the need to have participants with similar demographics, I selected Diana and Sandy for the new technology specialists with one/two years of experience, and I selected June and Toni for the technology specialists who had served in their roles for twelve/thirteen years. Phone calls were made to these four participants, to arrange a one-on-one interview and observation date and time, as well as to complete the mindset checklist (See Appendix 12). During this phone conversation, the participants were asked if they had any questions concerning the interview/observation process or the study.

Research Protocol

This section provides detail about the research process. The duration of the study's data collection spanned approximately three months, from the start of IRB approval in December, 2017, when phase one starts; to February, 2017 when participants responded to phase six. The research was conducted in seven phases. The research phases are outlined in Table 3, and elaborated below.

Table 3.
Details of research phases[2]

Phase	Activity	Data
1	Relationship building through ongoing collaboration (population)	Field notes, e-communications, demographic survey, ITIS, MUTEBI
2	Semi-structured interviews (sample)	Transcribed Stories
3	Goal-setting for 5 weeks of technology integration/mindset (sample)	5-week mindset checklist
4	Observation (sample)	Case study field notes
5	Face-to-face follow-up interview I (sample)	Case study field notes, Mindset checklist, Member checks regarding phase 2 narratives, phase 4 observations
6	Follow-up interview II email based on data analyses (sample)	Case study field notes
7	Inter-rater review of narrative coding and patterns, agreement of conclusions	Case study notes

Phase One: December 2016-January 2017

I continued collaborating with the population of seven technology integration specialists in order to work together effectively. All seven specialists completed three quantitative instruments: Demographic Survey (Swartz, 2016); *Implicit Theory of Intelligence Scale* (ITIS) (Abd-El-Fattah & Yates, 2006); and an adapted version of *Microcomputer Utilization in Teaching Efficacy Beliefs Instrument* (MUTEBI) (Enochs, Riggs & Ellis, 1993). As described above, the data collected via the demographic survey were used to analyze commonalities and contrasts, leading to identifying a sample of four specialists to participate in research phases 2-7. Because the primary contrast among these individuals was the number of years they had served in the specialist role, this variable was used to identify the four participants invited to continue in the study. Specifically, two specialists were in year one/two of service, and two specialists were

[2] The population was n=7, and the sample was n=4.

in their twelfth/thirteenth year of service. This sample is referred to as the study's participants. (See Appendices 2, 3 & 5 for the demographic survey, ITIS, and MUTEBI).

Phase Two: January 2017

Semi-structured, transcribed, individual interviews were conducted with all four participants. Prompts focused on eliciting descriptions of the processes that shaped the participant's decisions to pursue, enter, and to continue in the career of a technology integration specialist (see Appendix 7). Their stories helped to uncover themes relating to their perceptions of how their identities had changed as well as the possible interactions with self-perceived mindset and technology self-efficacy.

Phase Three: January 2017

A structured form of journaling, titled the Mindset Checklist (see Appendix 12), was used to help participants keep track of their technology integration goals, related activities, setbacks, and successes for a five-week period spanning January 2, 2017 through February 2, 2017. This checklist is titled 'Mindset' because of the district goal. An example of one participant's completed mindset checklists is provided below in Figure 5.

Week	Mindset Goal	Setbacks?	Success/Effort
1 Week of: Jan 2	Use the website, "Hour of Code" with 1st Grade.	• After practicing a few basic coding blocks, the game inserted a "repeat" block which was confusing for them, proving to be difficult to master.	• High level of interest and every student was on task working at their own pace.
2 Week of: Jan 9	Use Office 365 with 4th Grade to print a picture of a bug for their science project.	• In trying to keep students safe from inappropriate content, the filters limited the selection of pictures available.	• By the end of class each student had successfully searched, saved, and printed their picture.
3 Week of: Jan 16	Through the use of the board game, Bloxels, 3rd grade students worked collaboratively to create a video game on the iPads.	• The game directions are very vague. I finally found a video online that described it well. • Too many options within the game proved to be overwhelming for some students.	• Students were very excited to create their own game and they were engaged throughout the class period. I did not have any behavior management issues. • Students were excited to play each groups game
4 Week of: Jan 23	Have 2nd grade learn to code Sphero's through the Lightning Lab app and shapes made out of tape on the carpet.	• Wi-Fi connection was not always strong which meant some iPads and Sphero's would not pair quickly. • Students would forget to "aim" the Sphero before clicking "start" to watch their coding. They would have to start again and aim it every time they wanted to see the Sphero move using the coding they provided.	• Students who typically are quiet in class were smiling and taking an active role in the is project. • Students were excited and animated when they accomplished the goal of coding one line of the square accurately.
5 Week of: Jan 30	Through the Do Ink Green Screen App and iMovie, 5th grade students performed commercials for their music program and turned them into iMovie's that will be shown to parents at the musical.	• Students came unprepared and taping took quite a bit of time. • Finding the correct background for each commercial in front of the green screen was time taxing.	• The finished commercials are amazing! • The commercials look more authentic with specific background. • Through both iMovie and Do Ink, it was friendly to piece segments together when many takes were required.

Fig 5. *An example of a mindset checklist (Sandy). Each goal was selected first, setbacks and success were recorded after the week had concluded. Participants were instructed how to complete the checklist when it was emailed to them.*

Phase Four: January 2017.

The researcher conducted a fifty-minute teaching observation and debriefing with each participant. The participants were instructed to think of the researcher as a 'fly on the wall' in an attempt to not interfere with their teaching performance. An observation protocol was created to reduce subjectivity and assist with remaining focused on the goals of the study (see Appendix 17). Observations were focused on each participant's technology integration goals as stated in the journal-like checklist mentioned in phase three. It was assumed that since the observation occurred during the five weeks that the mindset checklist goals took place, that one of their goals

would be viewed. The researcher also noted behavioral indicators of mindset and self-efficacy (see Appendix 18-21 for field notes). A five-minute post-observation debriefing included the participant's evaluation of the lesson. Semi-structured prompts included eliciting how much of "stretch" the lesson was for each participant. These activities were also used to provide triangulation of the data (narratives, quantitative self-assessments, observations, and debriefing).

Phase Five: February 2017

Each participant completed a face-to-face follow-up interview of approximately 30 minutes. This interview served two purposes: to elicit additional details that would elaborate narratives; and as a member check to review and confirm the transcript from the phase two interview, the observation notes, and the mindset checklist.

Phase Six: February 2017

The participants were asked two additional follow-up questions through email: Despite challenges, what keeps you motivated? What is your expectation for the future development of your job? These questions were based on patterns that appeared during their phase 2 interview responses. The patterns consisted of motivational challenges and how these might be related to their future job expectations, for example: a vague curriculum, not enough time to teach the curriculum, no time to research new technology, etc.

Phase Seven: February 27, 2017

I met with a colleague working in another school district to assess the accuracy and reliability of my coding and data analysis. We discussed the type of coding used, we examined

patterns, and achieved agreement on the conclusions and core category/phenomenon of the study[3].

Data Collection Methods

This study utilized six data sources. Three were quantitative: 1) the demographic survey; 2) the *Implicit Theory of Intelligence Scale* (ITIS) (Abd-El-Fattah & Yates, 2006); and 3) an adapted version of *Microcomputer Utilization in Teaching Efficacy Beliefs Instrument* (MUTEBI) (Enochs et al., 1993). Three were qualitative: 4) three semi-structured interviews (initial and follow-up interviews, and emailed questions); 5) the mindset checklist (Swartz, 2016); and 6) the classroom observation (Swartz, 2016). Each data source and its uses are described below.

Quantitative

Demographic survey. As mentioned in phase one, the data collected via the demographic survey were used to analyze commonalities and contrasts, leading to identifying a sample of four specialists to participate in research phases 2 - 7. The demographic survey asked ten questions via an online Office 365 Form. Questions were chosen to be on the survey in order to assist with the sample selection, such as 'Years of experience as a technology teacher'. The survey was also reviewed by an inter-rater in order to check for content validity. Because the primary contrast among these individuals was the number of years they had served in the role, this variable was used to identify the four participants invited to continue in the study. Specifically, two specialists were in year one/two of service, and two specialists were in their

[3] The final step in the coding process is *selective*, in which the researcher will identify the core category and identify categories that require more explanation. "The core category represents the central phenomenon of the study" (Corbin & Strauss, 1990, p. 14).

twelfth/thirteenth year of service. This sample is referred to as the study's participants (see Appendix 2 to view the demographic survey).

Implicit Theory of Intelligence Scale. The online ITIS was used in the current study. It contains 8 statements on a six-point Likert scale (from 1-strongly agree to 6-strongly disagree) that can be sorted into three categories: 1) mindset, 2) effort, 3) and learning goals. The study conducted by Blackwell, Trzesniewski and Dweck (2007) provided evidence for reliability in all three categories: 1) The mindset: internal consistency reliability was .78, and the test-retest reliability over a 2-week period was .77. 2) Effort: the test-retest reliability over a 2-week period was .82. 3) Learning goals: the test-retest reliability over a 2-week period was .63 (Blackwell et al., 2007).

For the purpose of identifying the participants' perceptions of their mindsets, each participant completed the *Implicit Theory of Intelligence Scale* (ITIS), (Abd-El-Fattah & Yates, 2006). The ITIS has encountered alterations by either using the general or self-theory categories of statements to fit the needs of the researchers who have applied this instrument (Blackwell, 2002; Blackwell, Trzesniewski, & Dweck, 2007; De Castella & Byrne, 2015; Dweck & Leggett, 1988; Erdley & Dweck, 1993; Palazzolo, 2016). The most recent ITIS is available online http://community.mindsetworks.com/my-mindset?force=1. The results of this instrument were used to assist with understanding the participants' mindset as they described their identity transformation from classroom teacher to technology integration specialist.

Self-Efficacy. Initial exploration of participants' self-efficacy regarding technology integration was operationalized through use of an adapted version of *Microcomputer Utilization in Teaching Efficacy Beliefs Instrument* MUTEBI (Enochs, Riggs & Ellis, 1993). This study uses an adaptation of the MUTEBI (see Appendix 5). This self-report instrument of twenty-one

items consists of two subscales: *Personal Self-Efficacy* (PE) scale, relative to using the microcomputer for effective instruction, and *Outcome Expectancy* (OE) scale, beliefs pertaining to the respondent's role in learners' acquiring competence in use of microcomputers. This instrument rather than a general self-efficacy trait instrument was selected for the current study based on the assertion that "These scales were consistent with Bandura's (1981) theory" (Enochs et al., 1993, p. 258), relative to defining self-efficacy as a situation specific construct. Internal consistency (alpha) reliability was reported as satisfactory for a self-report instrument (Outcome Expectancy =.91; Personal Self Efficacy =.78). "Two questions determined additional validity: (a) How long have you been using microcomputers in science teaching, and (b) In your use of microcomputers, do you consider yourself a nonuser, novice, user, expert, or past user? These questions served to cross validate the two scales" (Enochs et al., 1993, p. 259). These two questions have been altered to fit the needs of the study and are a part of the interview questions (see Appendix 7). Additionally, the term 'microcomputer' was replaced with the term 'technology' within the MUTEBI instrument used in this study. Participant scores on the instrument's sub scales were used to provide insight into the participants' current self-efficacy state as technology teachers, and were incorporated into the semi-structured interview protocol as mentioned above.

Qualitative

Semi-structured interviews. As described above, the primary data source consisted of three one-on-one semi-structured interviews. In Interview I (Phase 2), each participant described the processes that shaped the decision to become a technology integration specialist. In order to provide a comfortable atmosphere, each personal interview was held in a location the teacher selected. I asked each teacher for permission to audiotape the interview for transcription

purposes. The interview was semi-structured to allow for a more conversation-type of dialogue to promote eliciting a rich, authentic background narrative. The semi-structured interview protocol is provided in Appendix 7. Interview II was conducted following the observation. A semi-structured format was used for these interviews. Themes emerging from the analyses of all data collected to that point were used to generate prompts. Interview II included a member check to review and confirm the transcript from Interview I, observation notes, and the mindset checklist. Interview III was conducted via e-mail. Participants responded to two additional questions: Despite challenges, what keeps you motivated? What is your expectation for the future development of your job? These questions were based on patterns that appeared during their phase 2 interview responses. The patterns consisted of motivational challenges and how these might be related to their future job expectations, for example: a vague curriculum, not enough time to teach the curriculum, no time to research new technology, etc. More detailed analyses are provided in Chapter Four.

Mindset checklist. Another data source was the mindset checklist, (given this title due to mindset being a district goal), which asked the participant to briefly state a technology goal for each week, for five weeks, list any setbacks due to challenges, and describe the success/effort per goal (see Appendix 12). The checklist was used to generate ideas regarding how each participant's mindset and self-efficacy might be demonstrated in instructional practices: Do the teachers list challenges or high tech-related learning goals? Do post-instructional reports indicate bouncing back from setbacks? Do reports suggest that the participant enjoys exerting additional effort? (Dweck, 2006; Sewell & St George, 2009). This checklist assisted with triangulating the data as described earlier and it assisted with understanding how each teacher might have a different mindset and self-efficacy based on their technology teaching experience level.

Observation. In order to reduce subjectivity and keep me focused on the goals of the study, I created an observation protocol (see Appendix 17). The observation protocol assisted with triangulation analysis of the themes present in the study including mindset, self-efficacy, motivation, and technology integration. During each observation visit I told each teacher I wanted to be a 'fly on the wall' in an attempt to not let my presence influence their performance. I also observed the participants teaching a technology lesson. I did not request that the teachers use one of the lessons mentioned within their mindset checklists; I assumed that since the observation occurred during the five weeks that the mindset checklist goals were articulated, that I would be viewing a technology/mindset goal from an instructional perspective.

Data Analysis

This study employed *triangulation* (Marshall & Rossmann, 2016) to assist with corroborating the data collected during each phase of the study. Marshall & Rossmann (2016) define triangulation as "the act of bringing more than one source of data to bear on a single point" (p. 262). The authors also mention that conducting a study that has more than one method of data collection will greatly strengthen its worth. The data sources in this study were the quantitative pieces: the demographics, the ITIS and MUTEBI instruments; and the qualitative pieces: the one-on-one interview, the observation, the post-observation interview, the mindset checklist, and the follow up interview.

By using the demographic survey, I discovered more about my participants in terms of their similarities; the goal was to find two participants who are new to their roles as technology integration specialists, and two who have remained in their professions for more than 10 years. Having two sets of similar technology integration specialists allowed me to compare identities and discover patterns in the data.

The ITIS provided quantitative evidence regarding the participants' 1) mindset, 2) effort, 3) and learning goals (Blackwell, Trzesniewski & Dweck, 2007), while the interview responses, the observation and the types of goals within the mindset checklist, provided the quantitative view. This study examined effort and goals in relation to role identity. The importance to mindset to goal orientation was confirmed through previous research (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Job et al., 2015). All of these data were employed to provide insights relative to participants' mindsets, as well as to uncover less explicit themes.

By using the quantitative results from the MUTEBI instrument, and the qualitative results from the interview responses, the observation and the types of goals within the mindset checklist, I discovered themes relating to the participants' professional role identities. The interview questions relating to self-efficacy were: *How long have you been using technology in your teaching,* and *Do you consider yourself a nonuser, novice, user, expert, or past user* (Enochs et al., 1993). Other self-efficacy related questions focused on participants' comfort level with technology and how effective they perceived themselves to be at teaching technology. The participants who self-reported self-efficacy scores also appeared to be more capable of overcoming failure and embracing challenges (Bandura, 1977; Bandura 1982; Teo et al., 2008; Tschannen-Moran et al., 1998); thus, the self-efficacy results uncovered themes related to teacher professional role identity, such as job motivation and expectations for the future development of the job (Kelchtermans, 1993).

This study used a *Constant Comparative Method* (Corbin & Strauss, 1990; Glaser, 2002) to assist with pattern identification. This method allowed me to move in and out of the data collection and analysis process through multiple iterations, until I witnessed saturation, a repetition of patterns/themes. To fully examine the data collection and assist with understanding

emerging themes, three types of coding were utilized: *open*, *axial* and *selective*. *Open coding* is the initial process of intuitively identifying key ideas and patterns within the data. When new ideas emerged, they were noted and all data were categorized and assigned a code (Corbin & Strauss, 1990; Marshall & Rossman, 2016). The next step in the coding process, *axial coding*, allowed the researcher to group categories that contain comparisons around axes. The goal with axial coding is to look for causal relationships (Corbin & Strauss, 1990; Marshall & Rosman, 2016). The final step in the coding process is *selective*, in which the researcher identified the core category and identified categories that required more explanation. "The core category represents the central phenomenon of the study" (Corbin & Strauss, 1990, p. 14). Corbin and Strauss (1990) suggested asking the following questions to identify the core category: "What is the main analytic idea presented in this research? If my findings are to be conceptualized in a few sentences, what do I say? What does all the action/interaction seem to be about? How can I explain the variation that I see between and among the categories" (Corbin & Strauss, 1990, p. 14)? Using the coding phases allowed me to identify and understand emergent themes in the data.

The interviews with the participants were audio taped, transcribed and then coded (as described above) by the researcher to identify and explore patterns, which were used to address the research questions.

Credibility and Validity

Triangulation was used to provide evidence pertaining to the study's credibility. Yin (2013) suggested that of the four types of triangulation (data source, analyst, theory/perspective, and methods) that data source and methods strengthened a case study. This study used multiple data sources in order to create quantitative and qualitative results for pattern comparison.

This study used a recursive framework during data collection to contribute to the validity of the qualitative research (see Figure 6). Cho & Trent (2006) suggested that, "informants in a research process that values a recursive validity are involved throughout the inquiry, not just during often brief data collection and even more cursory member checks, and their perspectives are valued both seriously and over time" (p. 334). This study utilized member checks for each portion of qualitative data collected (see Phase five within Data Collection) as well as peer debriefing to obtain reactions to the coding and its analysis.

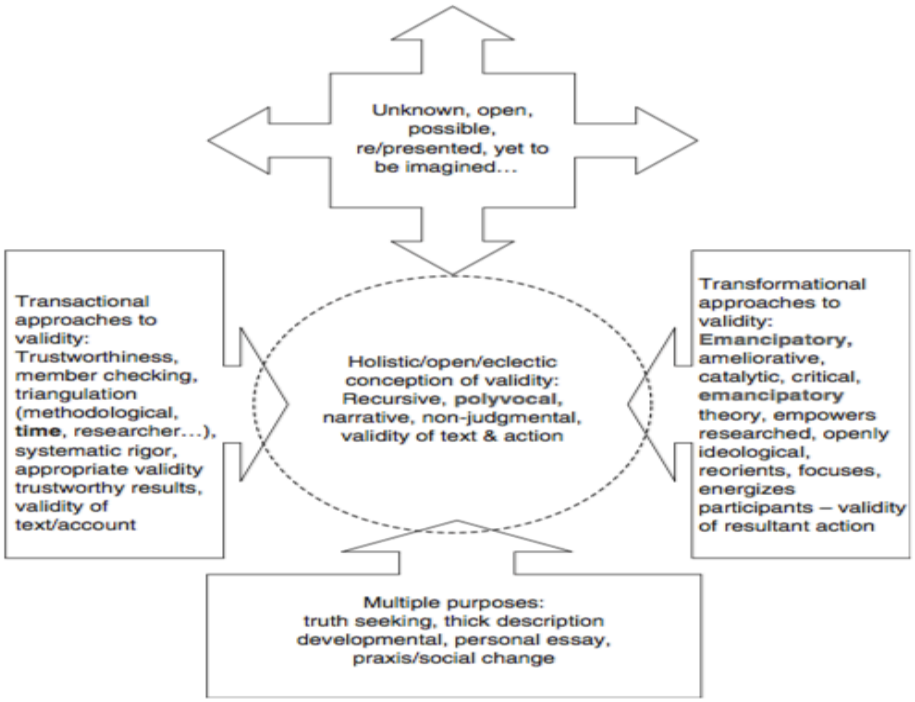

Fig 6. *An alternative framework for understanding validity in qualitative research* (Cho & Trent, 2006).

The survey, instruments and the interview protocol are provided in the appendices to view the starting point for the dialogues in order to corroborate the data gathered from the instruments. Overall, this study utilized multiple data sources for triangulation and a recursive framework method to increase the credibility and validity.

Chapter Four: Findings

Chapter 4 is designed to present a view of the research process and its findings. Postulating that educational technology will continue to advance and integrating new technologies will be a regular feature of the 21st century classroom, the purpose of this study was to analyze narrative stories of elementary technology integration specialists as they transformed from being regular classroom elementary teachers. How the technology integration specialists respond to these challenges and opportunities might be shaped by deeply held implicit beliefs and self-theories, rather than solely by specific knowledge and pertinent skills.

This study addressed the following questions as they pertained to elementary technology specialists and their integration of technology in the classroom:

1. How do elementary technology integration specialists describe the processes that shaped their decision to pursue this new professional role? How do they describe their commitment to the role?
2. What beliefs appear/become important during this process?
3. In what ways might their identities have changed as they commit to this new career?
4. In what ways do they describe their perseverance and ongoing motivation?

Chapter 4 is organized with the following sections: data collection and analysis process, data analysis procedures, the participant's "stories" (Diana[4], Sandy, Toni, and June), and summary of findings.

[4] Note: pseudonyms were used to provide participant confidentiality.

Data Collection and Analysis Process

Data collection and analysis occurred simultaneously in order to help me identify themes and to help determine when the point of saturation had been met as described in Chapter 3 according to the *Constant Comparative Method* (Corbin & Strauss, 1990; Glaser, 2002). I was able to ask follow up questions when preliminary data analyses revealed possible themes (Corbin & Strauss, 1990; Glaser, 2002). All data were stored on a password protected computer which only I have access, and all paper forms of documents collected during the study were stored in a locked cabinet. The information will be secured for three years and then it will be destroyed.

Using SPSS, I reverse coded negatively worded items to produce consistent directionality of total scores for the technology self-efficacy instrument (MUTEBI) and as well as sub scale scores for Outcome Expectancy (OE) and Personal Self-Efficacy (PE). Items relating to OE evaluated the participants' beliefs with regard to teacher responsibility for students' ability/inability to utilize technology in the classroom (Enochs et al., 1993). Items relating to PE assessed the participants' beliefs in their own ability to utilize technology for effective instruction (Enochs et al., 1993). Table 4 displays examples of the types of OE and PE statements used in this study (see Appendix 5: OE statements are items 1 to 7; PE statements are items 8 to 21).

Table 4.
Outcome expectancy (OE) and Personal Self-Efficacy (PE) Statement Examples

OE	PE
If a student shows improvement in using technology, it is often because the teacher exerted a little extra effort.	I am continually finding better ways to use technology in my classroom.
If students are unable to use technology, it is most likely due to their teacher's ineffective modeling.	When students have a difficulty with technology, I am usually at a loss as to how to help them.

Next, I listed each participant's OE and PE sub scale scores in order to examine possible patterns for outcome expectancy and personal self-efficacy (see Table 5) (note: higher scores represent greater self-efficacy for OE or PE). The OE were so consistent that I did not discuss or analyze these scores in the study. The PE generated a somewhat greater range of self-efficacy scores. The PE mean was 54.75, the median was 54.5, with a range of 11 points. Therefore, a score of 49 is described in this study as a low PE and a score of 60 is described as a high PE when compared with the mean. The raw data for the technology self-efficacy MUTEBI instrument can be viewed in Appendix 6.

Table 5.
Outcome expectancy (OE) and Personal Self-Efficacy (PE) Sub-Scale Scores

Pseudonym	OE	PE
Diana	23	51
Sandy	23	59
Toni	25	60
June	22	49

The mindset instrument, *Implicit Theory of Intelligence Scale* (ITIS), provided yet another view of participants' self-theories. Since the participants were trained on mindset throughout the school year, as it was one of the district goals, I cannot verify the validity of their overall scores. It is a possibility that the participants were providing responses they knew were growth mindset related, or it is also possible that their responses were accurate. Table 6 displays the ITIS scores. A respondent who scored 48 points would be assessed as presenting a perfect

Table 6.
Sum of scores from the ITIS

Pseudonym	ITIS
Diana	31
Sandy	43
Toni	30
June	32

growth mindset. In the current study, the ITIS mean score is 34, the median is 36.5, with a range of 13 points. The raw data for the ITIS can be viewed in Appendix 4.

After the surveys were completed, I invited the participants to participate in the qualitative portion of the study. In order to compare professional role identities between new technology specialists with those who remained in the profession for more than ten years, I selected two new technology specialists (Diana and Sandy) and two veteran technology specialists (Toni and June). The rest of the data collection included one-on-one interviews and classroom observations with Diana, Sandy, Toni and June, who agreed to participate in the qualitative portion of the study. In addition to the interview and observation, they each tracked their personal mindset goals relating to technology for a five-week time period on the mindset checklist (see Appendix 12).

The interview protocol consisted of questions related to the topic of this study and were used to gather responses to the research questions. See the Table 7 to become aware of the *key questions* reported on within each "story" in this chapter. At the beginning of each interview,

Table 7.
Key interview questions reported in each "story"

Phase	Q#	Question
2	1	Your position at work is a very specialized one; tell me about your story as a technology teacher…The process that shaped your decision to pursue, enter, and remain in the career of teaching technology.
2	8	In your use of technology during teaching, do you consider yourself a novice or an expert? To better frame this question, on a scale of 1 to 100 with 1 being novice and 100 being expert, what number do you give yourself?
5	*F	Suppose you went to a conference or you had been researching about a very exciting technology idea and when you asked the administration or district technology department if you could integrate the technology, you were denied. How would this affect your drive/motivation? What keeps you motivated?
6	*FE	Despite the barriers/challenges with having a technology position, what keeps you motivated? Thinking about this motivation, what is your expectation/anticipation for the future development of your job?

*F – Follow-up face-to-face questions; *FE – Follow-up email questions

the participants were told the interview would be audio recorded for transcription purposes. The teachers were also informed of confidentiality procedures, the right to withdraw, how data would be protected, stored, and later destroyed. During one-on-one follow-up interviews these four teachers were asked to verify the transcribed interview, as well as the observation notes and mindset checklist. The average duration of the original interviews was 30 minutes and the average time for the follow-up interviews was 15 minutes. The interview protocol can be viewed in Appendix 7.

The observations enabled me to visualize the type of technology implemented with which to compare and contrast their mindset goals from their mindset checklists. The post-observation question of, *how much of a stretch was this lesson for you?* provided one more piece of mindset data by allowing me to know if the participant was trying something new and embracing change (growth mindset), or if the participant was doing something that they were very comfortable with due to a possible fear of change (fixed mindset). The observation occurred during the five-week time period that these teachers were tracking their mindset goals relating to technology integration.

While the observation was a quick snapshot of the instruction and related learning activities, which occurred in these teachers' classrooms on a regular basis, the mindset checklist provided a five-week glimpse at the types of activities the teachers were implementing (See Appendix 12) by displaying goals, setbacks, and the effort they self-assessed as putting into each goal. For example, if the specialist wanted to try to implement new technology in the classroom (growth mindset) they would mention this as a goal, discuss any setbacks they encountered while implementing the technology, and then comment on the type of effort exhibited along with desired results.

Data Analysis Procedures

As mentioned previously, four teachers agreed to participate in the qualitative portion of the study: Diana, Sandy, Toni and June, who I interviewed and subsequently observed their technology instruction with students. In addition, each participant completed a 5-week mindset checklist which detailed their goals for trying something new, any setbacks they encountered while working towards their goals, and their perceptions of associated effort. Data analysis started with the coding process described in Chapter 3. *Open coding* is the initial process of intuitively identifying key ideas and patterns within the data. When new ideas emerge, they are noted. Thus, all data are categorized and coded (Corbin & Strauss, 1990; Marshall & Rossman, 2016). The first themes I identified I assigned a color to assist with pattern formation. Through the participants' dialogue I was able to identify themes relating to two self-theories: mindset and self-efficacy; and themes relating to barriers/challenges: time (not enough time to research technology), a vague curriculum, too many technology options, technology challenges (when technology fails or when an idea is turned down). The next step in the coding process, *axial coding*, allowed me to group categories that contain comparisons around axes. The goal with axial coding is to look for causal relationships (Corbin & Strauss, 1990; Marshall & Rosman, 2016). It is possible that the self-theories and barriers/challenges somewhat appear to relate to the participants' perceptions and future motivation. The final step in the coding process is *selective*, in which I identified the core category and identify sub categories that require more explanation. "The core category represents the central phenomenon of the study" (Corbin & Strauss, 1990, p. 14). It is also a possibility that motivation with regard to future perspective, the expectation for the future development of your job, is the core category and central phenomenon

of this study (Kelchtermans, 1993). I discuss more of the core category within the Chapter 5 discussion.

The following narrative summaries assisted with highlighting the themes and category formation. I begin the narratives with the new technology specialists, Diana and Sandy, followed by, Toni and June, who have remained in their positions for more than ten years. Each story is organized according to the research phases displayed in Table 8.

Table 8.
Details of research phases

Phase	Activity	Data
1	Relationship building (population)	Field notes, e-communications, demographic survey, ITIS, MUTEBI
2	Semi-structured interviews (sample)	Transcribed Stories
3	Goal-setting for technology integration/mindset (sample)	5-week mindset checklist
4	Observation (sample)	Case study field notes
5	Follow-up interview I F2F (sample)	Case study field notes, 5-week mindset checklist, Member checks regarding phase 2 narratives, phase 4 observations
6	Follow-up interview II email based on data analyses (sample)	Case study field notes
7	Inter-rater review of narrative coding	Case study notes

Diana's Story

Diana is a first-year technology integration specialist who recently transitioned from being a regular elementary classroom teacher. Her mindset (ITIS) score was slightly lower than the other participants, possibly due to being a first-year technology teacher. Diana's personal self-efficacy score on the MUTEBI instrument was also somewhat lower than the other participants whose PE scores were eight to ten points higher. Diana's phase 1 data is displayed in Table 9.

Table 9.
Phase 1 Data for Diana

Phase	Activity	Data
1	Demographics	First-year technology teacher
1	ITIS	31
1	Self-efficacy	OE=23; PE=51

In phase 2, examining Diana's one-on-one semi-structured interview responses, she said she was a regular elementary classroom teacher for fifteen years and was "looking for a change" and was ready "to take on a challenge" when she accepted her new role as a technology integration specialist. Diana is a first-year technology integration specialist who is going through the transformation of learning new content, researching new technology, and experimenting with a vague curriculum. Diana shared that she was not afraid to try out new technology in the classroom, such as coding on the iPads, however, she "gets a little scared sometimes." She described having a love/hate relationship with technology. When asked how she thought this affected her teaching she said:

> *In my planning, it probably affects that the most because I want to stay safe and I want to do basic fundamentals because that's what I know, but when, like second semester, I'm excited to try some new things that I've been working on shaping up myself…Like coding with the primary kids scared the daylights out of me before winter break, and I've had enough time to process and now I'm really excited about it. So, I think for me just processing it all and understanding a little bit better is really helping me to change my ways a little bit* (Diana).

She described concerns about performing well and succeeding at her new job, and because of this she indicated that she spent a lot of extra time exploring new ideas for integrating technology. She described her preparation as "mostly trial and error on different things." She

ranked her comfort level with technology as a "6" (on of a scale of 1-10 with 10 as "mostly[5] comfortable"). Diana said that she hoped to keep growing as she takes college classes "and experiment and learn and try new things." This was also reflected in her response to being either a technology novice or expert. She responded, "Novice, definitely. My first-year in this position I would definitely say novice," and rated herself as between 45 and 50. When asked how she thought her self-rating affected her teaching, she responded:

> *I think that it probably hinders it a little bit knowing that I wasn't as comfortable as other people are. I mean when you are in the classroom you use technology as much as you can but you have so much you have to teach and computers being available. You aren't really forced…but you didn't really have to use it, you were just strongly encouraged, and now I'm I guess for lack of a better word, I'm kind of forced to use it every day because that's my job. That's been scary but it's been really good for me (Diana).*

Even though her perception of personal self-efficacy might be relatively low, she described herself as continuously researching new ways to teach technology through regularly exploring newsletters and blogs, attending conferences/workshops, and reaching out to her colleagues for advice. Diana said that this drive for learning is self-initiated and not imposed by the school district. The key barriers/challenges Diana named were working with a vague curriculum and not yet knowing all of the grade levels' technology skills/knowledge levels. She attributed the latter situation to her lack of experience as a first year technology integration specialist.

Moving to phase 3 of the study, on Diana's 5-week mindset checklist she listed new lessons she attempted with her classes, working through any setbacks, and finding the success/effort with each goal. She also briefly evaluated each lesson and mentioned what she

[5] "mostly comfortable" is a direct quote from the interview questions and refers to the highest level comfort instead of using terminology such as "very comfortable"

would do differently next time. At the bottom of Diana's checklist, she added some additional information:

> This entire school year has been a mindset change for me. Each of the goals above are things that I have never done before. I was nervous for all of them. I tried to make sure I understood each program/game before I explained it to the kids, however they always seem find something that I may not have an answer to. All were a success and I am excited to build on them next year (Diana).

For phase 4, when I observed Diana's classroom, she chose to teach a lesson on coding with a kindergarten class of twenty-two students using iPads. This lesson was one of her goals for the school year, which is also mentioned on her 5-week mindset checklist (see Appendix 6). The students started class by listening to Diana's instructions and demonstration of a coding app called Tynker (Tynker, 2017), and then the students were instructed to find a partner, get an iPad from the teacher, and practice the levels of Candy Quest problem solving within the coding app Tynker (Tynker Candy Quest, 2017). Diana walked around to assist the students and provided feedback such as, "Good job! Keep working" and "Can I show you another command?" or "Good job! Can you finish another one?" At the end of the class Diana asked the students to put the iPads away. As Diana closed the lesson, she checked for understanding through the use of directed questions about coding vocabulary: "Please tell me what a command is?...Please tell me what coding is?" After the students left the classroom I was able to ask her one follow up question, *how much of a stretch was this lesson for you?* Diana responded, "The whole coding piece with kindergartners I was nervous to do. I was worried that they can't read the more complex commands." This setback was also mentioned on her mindset checklist, "Some kindergarteners had a difficult time reading some of the words in a few of the games. Their

partners were able to help them, though." Regardless of this setback, Diana also commented on the satisfaction from trying this lesson with younger students and plans to build on the lesson for next year.

For phase 5 of the study, during Diana's follow-up interview to confirm the accuracy of the data I had previously collected, I had the opportunity to ask additional questions. I prefaced my first question with a scenario (see Table 7), Diana responded that her motivation would be dampened a bit because most likely the technology being presented or researched had an excellent purpose. I also asked Diana, *what keeps you motivated?* To this she said she has strong internal motivation that keeps her interested in researching such things as grants for technology purchases, and that she is interested in being an advocate for piloting new technology and implementing change. One could interpret that Diana's personal beliefs provide her with the drive to persevere.

Phase 6 of the study gave me the opportunity to ask Diana follow-up questions through email communication. The key interview questions were mentioned earlier in this chapter (see Table 7). Diana stated that the students are her main motivation. Mentioning the future of her job, Diana said that change occurs in any educational occupation and "…part of dealing with change is being flexible. I anticipate that no matter the change in my role I would adjust and see how I can make it the best for kids."

Sandy's Story

Sandy is a second-year technology integration specialist who, similar to Diana, is going through the transformation of learning new content, researching new technology, and experimenting with a vague curriculum. Her ITIS score was the highest of all four participants.

Sandy's personal self-efficacy score on the MUTEBI instrument was also the highest of all four participants. Sandy's phase 1 data are displayed in Table 10.

Table 10.
Phase 1 Data for Sandy

Phase	Activity	Data
1	Demographics	Second-year technology teacher
1	ITIS	43
1	Self-efficacy	OE=23; PE=59

Moving to phase 2 of the study, Sandy said she was a fifth-grade teacher for eight years and "was ready to do something different, I needed a change." Sandy continued to comment about the curriculum and student engagement:

> *I do like technology, I didn't like where it was when I first started because it seems that the focus was on typing and just Word, things like that. The kids were very bored. They did not like technology so in my mind I wanted to get them back to liking technology and then when we were given the opportunity to go to the conference…last year with iPad camp. Finding out how to make it fun for the kids and finding things that the teachers can use in their classrooms as well. I wanted them to get the love back and then when we found the coding that's where I see us going. Doing more things that they can use in the future and that they can actually use at home and identify with a lot more (Sandy).*

Sandy's responses to my interview questions regarding mindset provide evidence regarding her self-perceptions of a growth mindset in the area of instructional technology. She suggested, to all teachers, to keep an open mind and "be willing to learn anything, because you never know what you might like, what the kids might like, and how they can be utilized in the classroom." She admitted that when she first took her position as a technology integration specialist she felt like she needed to develop a deeper knowledge and skills base, so she said she took time to

research new educational technology trends. Sandy commented, "I got to be where I am today by asking around, asking for help from a lot of different people, going to the conferences…having the professional development with the other computer teachers and getting ideas and learning all those different things and then of course just a lot of time researching on my own..." Sandy stated that she was not afraid to try new content or ideas with her students, especially if she thought that the content would have future benefits for her students' learning and development. Similar to Diana, Sandy also used the phrase love/hate to describe her relationship with technology, however, Sandy expressed different reasons for this comment. "I love technology, when it works. It truly is like a love-hate relationship because there's so many times where the Internet is down or Wi-Fi isn't working, things like that and you have to come up with plans on the fly, which I'm getting really good at." Sandy described spending time preparing for each lesson. She rated her comfort level with technology at a "7" (on of a scale of 1-10 with 10 representing "mostly comfortable"). Sandy indicated that she derived this rating because she thought that she still had much to learn, as well as that she "improved" her abilities from last year. I asked Sandy how she thought her personal self-efficacy score affected her teaching, and she commented:

> *I think it does affect my teaching because sometimes I'll feel like I don't know enough about a program or a device and so I might not be willing to go further into lessons because I don't feel like I have answers that the kids are going to need, if I introduced it to them. So, but at the same time I'm the type of teacher who will say, "I don't know, let's figure that out" so they can explore and help me find the answer. I'm good with that. So, I'm getting better at that (Sandy).*

Similar comments were also reflected in her rating herself as either a novice or expert technology user. Sandy responded with an "80" because even if she starts off "as a novice" she will always do the research to assist with her comfort level. Sandy's barriers/challenges are technology issues, such as when technology fails, and having a vague curriculum. She recognizes that teachers in her building do not have the time to research or experiment with new technology so she will assist them, "I've learned if I can give them ideas at their grade level, how to use this and they get it to use it right away then they are more apt to use it."

In phase 3, Sandy's 5-week mindset checklist was full of various setbacks with her lesson goals, but it equally mentions the success/effort that transpired. For example, in week 3, Sandy's goal was to have students use the board game Bloxels (Pixel Press Technology, 2015) to create their own video games using the Bloxels app on the iPads. She described her setbacks being vague game directions and having too many options within the game, which "proved to be overwhelming for some students." A similar technology issue/setback was mentioned with another technology lesson, which I observed during phase 4, "Wi-Fi connection was not always strong which meant some iPads and Sphero's would not pair quickly." Her reflective comments within the success/effort column revolve around high student engagement and project accomplishments.

The phase 4 observation of Sandy's classroom started with Sandy informing me that the coding app she wanted to use in the lesson had "disappeared" from the iPads overnight and she would have to start class by instructing the students to download the app onto the iPads again. This setback took ten minutes away from the lesson, however the rest of class proceeded as expected and Sandy was able to quickly bounce back. This coding lesson is also mentioned in Sandy's 5-week mindset checklist. Sandy started class by instructing the second graders to get

the SPRK Lightning Lab app (Orbotix, Inc., 2017) from the Self Service[6] icon and she displayed this process for them in order to assist. After the class had the needed app, Sandy proceeded with the mini-lesson on how to use the app with the robotic Spheros (Sphero, 2010) and explained the purpose of the tape on the floor, "You are going to code your Sphero to go on one side of the tape on the floor." She showed how to name the project, save it, and pick the needed commands. Next, she displayed the process for manipulating the speed, the length of time, and the possible sounds the Sphero could make while traveling along its coded destination. Sandy followed the mini-lesson with, "I'm gonna need your help to get the Spheros connected to your iPads, will you help me?" and "When yours says 'connected', bring it to me." She also explained that they were going to work with a partner to code their Spheros, so not everyone's iPad will get 'connected' since there were only enough Spheros for them to share. Once the students were in their groups and in separate locations in the room, Sandy reminded them to name the project and save it, as she walked around to monitor the groups. The students successfully coded the Spheros after many attempts at trial and error. At the end of class Sandy asked the students to put the Spheros and iPads back on their chargers. She also elicited feedback from the students, "Thumbs up if you liked what you did today, or sideways for so so," to which all of the students gave a thumbs up. After the students lined up and left class, I asked Sandy a post-observation follow up question, *how much of a stretch was this lesson for you?* She responded, "Pretty much a stretch because of the up-front work with having to get the app from Self Service, but the rest of it was not." She also noted another coding lesson setback, "Students would forget to "aim" the Sphero before clicking "start" to watch their coding. They would have to start again and aim it every time they wanted to see the Sphero move using the coding they provided." Regardless

[6] The Self Service icon is controlled by the district's technology department as a way to monitor all of the apps used in classrooms.

of the setbacks, Sandy found success/effort with the coding lesson, noting that "students were excited when accomplishing the goal of coding…"

During phase 5, to confirm the data I had collected was accurate, I had the opportunity to ask a couple of follow up questions. Using the scenario from Table 7, Sandy responded, "It would affect it." She would take time to think about what she could do to change the minds of the administration or technology department, additionally she would ask, "what can I do to have a compromise?"

In phase 6, I asked Sandy about motivation, she said she enjoys seeing the student engagement when they are experimenting with a new technology. Additionally, she stated, "knowing there are many skills that are essential with technology…" it is important "…to get as much technology in their hands to keep them exploring and curious…The students are truly engaged and learning authentically which is what makes all the research behind the scenes for me worth it." Mentioning the future of her role, Sandy said she would continue to monitor business/industry to see what is needed for our students. Also, she suggested that technology is continually changing, therefore teachers should stay updated and also attend professional development/conferences to remain effective.

Toni's Story

Toni is in her thirteenth year as a technology integration specialist. Her ITIS score was the lowest of the four participants. Toni's personal self-efficacy score on the MUTEBI instrument was the highest of all four participants. Toni's phase 1 data is displayed in Table 11.

Table 11.
Phase 1 Data for Toni

Phase	Activity	Data
1	Demographics	Thirteenth year technology teacher
1	ITIS	30
1	Self-efficacy	OE=25; PE=60

For the phase 2 semi-structured interview, Toni responded that she had previously been a fourth and fifth-grade teacher in another school district. Next, she took a job as a half-time literacy learning coach and a fifth grade teacher in a different school district, and then took an elementary teaching job in the participating school district for this study. While being a regular classroom teacher in school A in the participating school district, she found out about an opening for a technology integration specialist at school B. At the time, school B was to have one-to-one devices with the ratio of 1 student per 1 computer. Toni remarked about her excitement towards taking the job at school B, "I said 'Hey!' I raised my hand. 'I might be interested in that.' I talked to (another teacher) and that's how I became the computer teacher, and I really like it, I mean, there's pros and cons, it's a different job than the classroom teacher…but I like it." Toni has adapted to the changing times and has learned to take advantage of having a vague curriculum to incorporate new ideas and technologies that she researches on her own. Her comments on the interview questions regarding mindset show that there are some elements that are holding her back from achieving all that she is capable of doing. When describing her current relationship with technology she commented:

> *I feel like I know a lot about technology… I mean, I feel like I am not way up there. I used to really be, I feel like I used to be very, very involved and be learning the very top, and know exactly what's going on in the world of technology education, but I feel like I kind of almost backed off of that a little bit because I feel like I haven't...I don't know, I haven't...I would come and I would bring an idea and it just would get shot down* (Toni).

Her comments here show an inner struggle, but regardless of this she still advises others to try "more of a project based" approach in the technology classroom and "try to do something more that involves the kids, gives the kids ownership and makes them really push towards learning it."

Toni regularly researches ideas for using technology by using a variety of sources, "…there's PD at school…I've gone to conferences, I've went online, I follow certain people on Facebook, on Twitter, you know, different social media…collaborate with other teachers." She feels that, "as an educator we're always "on", we always have to just be continuously looking at new things, what's out there and technology especially changes so fast…" Toni rated her comfortably level with technology at a "10", which is mostly comfortable, and mentioned that it "doesn't mean that I know everything for sure…I think there's so much stuff out there and everything changes so fast in technology. I just feel like I feel comfortable with it. Like I could learn about it and be fine. I'm not scared of it…" When rating her tech-savviness, Toni said she was somewhere in between 1-100 and gave herself a rating of "65." She explained that while she is comfortable with technology, and she is confident with her technology knowledge, there is still a lot of technology out there that she does not know. Toni's technology barriers/challenges are not having enough time to conduct the type of classroom project-based activities or differentiation that she would like to attempt, and having a curriculum that is so full of areas that need to be taught that it is difficult to add in new ideas. To overcome some of these challenges, Toni applied for a grant to get some Ozobots (Ozobot & Evollve, 2016) for her students to practice coding, and even though there is a time crunch, she plans to incorporate coding into the curriculum. To assist with differentiation Toni created some tutorials about using Microsoft Word so the students could create some documents without the need for teacher led instruction, thus giving her more time in the classroom to move on to more exciting content.

For phase 3, Toni's five-week mindset checklist covered a range of goals such as differentiated technology instruction, to attending a conference, and also researching Ozobots (Ozobot & Evollve, 2016). All of her goals contained setbacks as well as comments about her

success/effort. For example, for her differentiated instruction goal, she commented that not all students were on the same level when learning about Microsoft Word basics, so she created video tutorials using Screencast-O-Matic (Screencast-O-Matic, 2017), a free online screen casting tool, in order to cover the steps of setting up and creating a Microsoft Word document for writing a book report. She said it was easy to share the link with the students, and because they were working on their own projects at their own pace, everyone benefited. Toni's checklist notes the success with this goal, "The students who I targeted benefitted because they got extension time. I was free to help those that needed it." Another of Toni's goals was to explore and gather information about Ozobots (Ozobot & Evollve, 2016). She had never used robots in class, but ordered some for her students, and while waiting for her order to arrive Toni noted her effort and excitement on the mindset checklist, "Ozobots are not in yet but I have looked at several sites: Pinterest, various educator blogs and the Ozobot site. The Ozobot site has a ton of activities. I found out you can code using Blockly on the Ozobot site and then upload it to your little Ozobot robot. Love that!"

At the start of Toni's classroom observation, for phase 4, the students were split up so that half of them were to receive a green screen lesson using iPads while the other half practiced their coding skills on the laptops, and then halfway through class time the students would trade places. In a previous class session, the students had been video recorded giving their book reviews in front of the green screen and all of the recordings were saved on one or two different iPads. Toni instructed the students getting the green screen lesson to grab an iPad and sit near her at the front of the classroom while she air dropped their video recordings onto their iPads. Once the students had their videos they were instructed to listen to the video while waiting for the other students to get their videos air dropped. Toni gave a mini-lesson on how to add a video

to the app Green Screen by Do Ink (DK Pictures, 2017) and how to put a picture in the background that related to the students' book reviews. As she demonstrated each step of the process the students practiced on their iPads. She had to redirect the students' attention a few times and used these phrases: "Eyes on me", "Here we go", or "One, two, three, eyes on me." Toni would also ask instructional questions such as, "Do you see how to save it to the camera roll?", throughout the tutorial. Some students needed personal assistance from Toni, while others assisted one another. This was the last class of the day so at the end of class time Toni said, "It's time to shut down…I need some helpers…You did a nice job today," and the students helped to clean the room by putting headphones away, sweeping the floor, and using wipes to clean the tables. After the students left class, I asked Toni the post-observation follow up question, *how much of a stretch was this lesson for you?* Toni responded that it wasn't much of a stretch for her but instead her student's behavior seemed to be an issue. This setback was mentioned within Toni's mindset checklist. She noted that there was an issue with the app Reflector (Squirrels, 2017) not connecting to the projector and therefore was not able to display the green screen tutorial the way she had intended. Thus, in some classes she noticed behavior issues. Regardless of this setback, Toni also said the students enjoyed getting to choose an image to represent their book reports.

During phase 5, to confirm the data I had collected was accurate, I had the opportunity to ask Toni a couple of follow up questions. For my first question about motivation after being turned down, Toni said this would be frustrating and it would ultimately affect her drive. Toni also added that she feels the technology department has changed for the better.

For the phase 6 communication, I asked, *what keeps you motivated?* Toni responded that seeing her students positively react to the class activities and witnessing their motivation and

engagement is enough to keep her motivated. Similar to Sandy, Toni is internally driven by a desire for high student engagement and it is possible that her personal beliefs are related to this motivation. Her future expectation of her job is to collaborate more often with the teachers in her building to reach almost a total integration in the classroom.

June's Story

June is in her twelfth year as a technology integration specialist. Her ITIS score was the second highest when compared with her colleagues. Contrary to this, June's personal self-efficacy score on the MUTEBI instrument was the lowest of all four participants. June's phase 1 data are displayed in Table 12.

Table 12.
Phase 1 Data for June

Phase	Activity	Data
1	Demographics	Twelfth year technology teacher
1	ITIS	32
1	Self-efficacy	OE=22; PE=49

During the phase 2 interview June said she had been teaching for over thirty years and had held various elementary positions during that time. Before June took the job as a technology integration specialist she was a fifth-grade elementary teacher. June guessed that around eighteen years ago the district decided that paraprofessionals could no longer be elementary technology teachers, so all of the buildings hired from within to replace the paras with classroom teachers who had an interest in being technology integration specialists. June volunteered to move into the new position and said, "I'm always looking for what's the next thing to keep growing with…I knew nothing about technology. I was at point zero. I did not play on a computer at my house...so I just said this is another growth thing and I can see how technology can help and motivate and that's where the future is going to be, so I asked to try it." June also

commented that technology is always growing and changing so she has continued to adjust her lessons based on what her students know and then compare this with what she thinks they need to know to be successful in their regular classrooms. She has learned to adapt to using a vague curriculum, giving grades to all students, and "jumping in feet first" with no initial professional development offered by the district. When describing her current relationship with technology she said that she did not hate technology or she would have changed her job a long time ago. June also offered:

> *There are times that I get very frustrated in the fact that…as a user I'm very good at adapting around technology glitches but when technology glitches happen and I'm the leader of a bunch of 5 year olds and they're crying because it doesn't work it can turn into a very frustration level and it makes you stay up at night waking up in the middle of the night just going "I don't know how to fix this" and I don't know how to keep my kids motivated and happy…* (June).

Her comments here possibly display the inner struggle June has with not feeling like she is an expert when technology fails to operate. She continued to comment about the type of technology being introduced in her classroom, suggesting that if she were to provide students with new technology to explore it would overload them, and mentioned that she chooses to not explore new technology, "I honestly think there's maybe too much technology being thrown at too young of kids and so I don't go and explore it because it's kind of like putting the cart before the horse." On a scale of 1-10, with 10 being mostly comfortable, June rated her comfortability level with technology at a "7" and said she arrived at a "7" because she is comfortable with knowing the grade level of her students and her experience with what they need to achieve. In rating her tech-savviness, June gave herself a "60" and responded:

> *Well, I consider myself to be an expert because like I said I want to make sure I feel comfortable with it, now do I know everything about that app, no way, but do I know enough for a 5-year-old a 6-year-old, definitely…For the things that I don't feel an expert at…I don't think anybody could say they're an expert at all technology…There's too much out there…I don't take the time to learn how to do other things because there's so many choices and none of them appeal to me personally* (June).

To contradict June's comments to Question 8, she also mentioned that she will attend different technology conferences, "I usually will attend one just to make sure I'm exploring new ideas and then I pick and choose which ones I think my building's wanting me to do…" June's technology barriers/challenges might involve: not having enough class time, having a fear of new technology and a fear of technology glitches, not desiring to incorporate new technology in the classroom, working with a vague curriculum, and knowing that there is a rapid change in educational technology. To overcome a couple of these challenges, June has attempted to try some multimedia projects with her classes but also commented, "I found that when I do those projects it's hard because you have an hour and then you have to wait a whole week before you go to the next step on that project and for 7 year olds that's a really long wait or if they've missed a day and they're a day behind there's no time to make it up…"

June's mindset checklist included using a word cloud app, using an online dictionary, and using Audacity to record students' readings. All of her goals contained setbacks involving technology glitches, behavior issues, or classroom management. For example, June wrote that several students started crying when she could not fix their word clouds, apparently, there was a technology glitch and not all of the words would appear within the word cloud. Contrary to this, June also reported success with the app, "They enjoyed changing the fonts, colors and direction

of the word cloud." In another example, June tried using the Audacity sound software so her students could record their voices while reading the Pledge of Allegiance. She listed her setbacks as, "Too many options in this software. Too many students too close together so others' voices overlapped. Using it in smaller groups and not a whole class setting would be better." June wrote that the success/effort with this goal was to "use another sound software that has less options available," which might not be considered a success, but does offer an idea for the future. June provided some additional information at the bottom of the mindset checklist, "Looking for a new technology for them was the most challenging part. Me not being able to give them suggestions to try made me feel like a bad teacher. Spending a lot of time asking others what they would use for the sound recording."

June's observation involved a third-grade class working on keyboarding skills and also a Microsoft Excel tutorial with student practice. After the students took their seats and logged onto the computers, June stated goals for the day and then rang a bell for the students to start practicing their keyboarding skills using the software Type to Learn. She walked around to monitor, and assisted some students. When fifteen minutes had passed, June rang a bell and told the students to stop their keyboarding practice. June handed each student a form, which contained a data set, and then displayed on the projector how the students can create a spreadsheet and use the numeric keypad to insert the numbers from the paper she handed to them. The data included how many letters were in each student's first name and last name, from this class, from a range of 1 to 10. She instructed the students to input their data and walked around to assist and monitor their progress. The rest of the class observation continued in the same fashion with June displaying one or two steps of the Excel project at a time and then having the students complete the same steps on their own. The steps included: the location of the cells,

rows and columns; the location of spell check; how to make the spreadsheet bigger; how to create, title, and size a graph/chart; and how to change the background color of the graph/chart. The students who finished their steps with ease would talk to their neighbors when finished or would click on other tabs within Excel for discovery. The students who were stuck on a step would raise their hand and wait for June to assist. At the end of class June instructed the students to leave their charts up on the computer screens so she could check their work. After the students lined up and left, I had the opportunity to ask June the post-observation follow up question, *how much of a stretch was this lesson for you?* She responded, "Not much because I have done this lesson before. It was more difficult to remember how to do some of the features because I don't do it all the time." June's 5-week mindset checklist did not include the observed lesson, since it was not one of her goals.

During the phase 5 follow-up interview, to confirm the data I had collected was accurate, I had the opportunity to ask a couple of follow up questions. I asked about an idea being denied. To this June responded, "(some people) have a passion…and it builds up their frustration. They need to learn to separate the 'wishes' from the 'have to haves'." I also asked June, *what keeps you motivated?* To this she said that knowing she is doing her job by assisting with the other teachers' needs and by following her principal's goals for the position will keep her motivated. Unrelated to the question, she added that, "Rule followers will not go rogue." As indicated by her comments, it seems that June's motivation is external and is possibly related to the future development of the job, which the district plans to alter.

Phase 6 provided yet a closer look at June's thoughts about motivation and her future role. June wrote that technology is a "life skill" and is important for all to learn these skills. She

is expecting the district to tell her what to alter with the curriculum along with communicating any needed software or professional development.

Summary of Findings

The four elementary technology integration specialists described the processes that shaped their decision to pursue career of teaching technology in a similar fashion; they all were looking for a change and chose to accept the transition from being regular classroom teachers into becoming technology integration specialists. Toni and June mentioned different reasons for why they have remained in their careers for more than ten years. Toni believes that teachers always need to be "continuously looking at new things" and witnessing her students' engagement keep Toni motivated. Contrary to this, June reported that she has remained in her career by doing what she felt was expected of her; she has respected the wishes of her colleagues and the principal, and does not introduce new technology or embrace change. As the participants discussed, they all had previously been regular elementary classroom teachers prior to transforming into technology integration specialists. Each specialist teaches every student in the school due to a rotating schedule, which allows for the elementary students to have a "Tech Time" experience one per week.

Through their interviews, Diana, Sandy, Toni and June shared career transitions. The additional data from the ITIS, the MUTEBI, the 5-week mindset checklist, and the observation assisted with identifying emergent themes (to be elaborated on in Chapter 5), which included: technology integration beliefs, barriers/challenges, and motivation.

Technology Integration Beliefs. Diana and Sandy, even though they are relatively new to their roles, have strong beliefs in sharing new technology with their students. Toni, being a technology integration specialist for over ten years, shares the same belief as Diana and Sandy in

that she wants her students to be exposed to a wide variety of new technology. June, like Toni, has been in her role for more than ten years, however her technology beliefs are different from the others. June feels that sharing too much technology could overload the students, and because of this she chooses to not share or experiment with new technology. Therefore, June's lack of motivation to use technology is connected to her lack of use (Wozney et al, 2006).

Barriers/Challenges. As the participants discussed, there are some barriers/challenges associated with being a technology integration specialist. Diana, Sandy, Toni and June all commented that their curriculum is vague and at the same time is full of content, thus they do not have much space/time to integrate new 21st century technologies (Hew and Brush, 2007). As the district's technology integration coordinator, I can confirm that the curriculum is vague. For example, one of the third-grade standards is for 'students to demonstrate creative thinking, construct knowledge, and develop innovative processes using technology'. However, to demonstrate this standard, the curriculum states for 'students to be comfortable using web-based tools to convey knowledge'. Most would agree that 'demonstrating creative thinking, etc.' might contain more elements for demonstration of knowledge besides being 'comfortable' using web-based tools. This curriculum has not been revised in the past seventeen years, which some might consider this ironic for a technology curriculum. The process to update the curriculum will occur in the fall of 2017. When undergoing this process, I will remind the specialists about their comments regarding the curriculum being too full of content, thus not allowing room for new emerging technologies, as this can be altered. Additionally, as another barrier/challenge, all of the participants mentioned not having enough time to research new technology (Brenner & Brill, 2016), and Diana and June are overwhelmed by how many technology options are available to research. Having technology that does not perform correctly (technology glitches)

was mentioned only by June, which might be due to her technology attitudes/beliefs, however the other participants said technology failure is an expected part of the job. It is possible that low personal self-efficacy and fixed mindset might contribute to a fear of performing poorly (Dweck & Leggett, 1988). June might have connected her view of technology glitches to a fear of negative judgments about her performance, when she does not know how to fix a technology error. Another barrier/theme transpired at the end of data collection. Both Toni and June discussed being turned down by administration for technology ideas they had researched and had also seen at conferences. Since Toni and June have been in their positions for over ten years, they have had more experience than Diana and Sandy, and as a result, I wanted to know more about this barrier/theme of being turned down for a technology idea, and how it possibly affected the motivation with the future development of the job (Kelchtermans,1993).

Motivation. To follow up with their future motivation, I questioned the participants about whether or not their motivation would be affected if they were turned down for having a technology idea. All participants said this would affect their motivation, except for June. In June's interview, she shared a story about someone else receiving an award for an idea that June had requested to do in prior years. However, in the face-to-face follow up interview, June commented that it was important not to try new technologies that your building does not request you try. The final follow-up question relating to motivation asked, *what is your expectation for the future development of your job?* (Kelchtermans,1993). Both Diana and Sandy mentioned that change happens, and especially since technology is rapidly changing, we should deal with the change by being flexible. In addition, Sandy suggested that teachers be given the opportunity for professional development in order to stay updated. Toni responded, "…it would be great if my role could be total integration in the classroom…maker space…but I don't see that

happening yet." June mentioned that she would want to know what to add and delete within the curriculum along with having time to plan and prepare for the changes. Additionally, June would expect the district office to purchase the needed supplemental materials.

Through these findings, it is apparent that the specialists' self-efficacy, motivation, commitment, and possibly job satisfaction had contributed to their professional identity (Day et al, 2006). More discussion on the future development of the participants' roles/identities will be reviewed within Chapter 5.

Chapter Five: Discussion

This study used a narrative inquiry framework in a primarily qualitative design to explore professional role identity changes and developments as a group (N = 4) of elementary classroom teachers transitioned to (N = 2) or continued in (N = 2) the role of technology integration specialists. The study focused on technology integration beliefs, mindset, self-efficacy, and motivation as key mediators of the teachers' enactment of their professional role. The use of both quantitative and qualitative data (self-report assessments, interviews, weekly goal setting and journaling, and observations of instruction) provided an integrated picture of the participants' technology integration experiences, identity changes, and professional developments.

The study focused on the following research questions:

1. How do elementary technology integration specialists describe the processes that shaped their decision to pursue this new professional role? How do they describe their commitment to the role?
2. What beliefs appear/become important during this process?
3. In what ways might their identities have changed as they commit to this new career?
4. In what ways do they describe their perseverance and ongoing motivation?

In this chapter, I discuss the findings and contextual data as they relate to each research question. Next, I review the major findings and offer analyses and interpretations of the data presented in Chapter Four, followed by a discussion of possible implications of the study, and possibilities for future research.

Research Question 1. How do elementary technology integration specialists describe the processes that shaped their decision to pursue this new professional role? How do they

describe their commitment to the role? All of the teachers in this study were once regular elementary classroom teachers who chose to become technology integration specialists when the opportunity presented itself. Findings evidence relative to effects of participants' past influences and self-theories on their current professional identities is consistent with the research findings described in Chapter Two (e.g. Flores & Day, 2006).

Research Question 2. What beliefs appear/become important during this process? Consistent with Haney et al. (2002), the data analyzed in this study revealed a connection between the beliefs teachers expressed and their instructional patterns. Additionally, consistent with the findings of Ertmer (Ottenbreit-Leftwich (2010), Wozney et al. (2006), and Teo el al., (2008), the participants' beliefs appear to be linked to the ways in which they integrated technology into direct instruction. Sandy's and Toni's high PE scores, interview responses, observations, and mindset checklists reflect their willingness and motivation to try new technology. I assume that Diana most likely had a low PE score because it was her first year in this role, however, just like Sandy and Toni, Diana expressed willingness and motivation to try new technology in the classroom. In contrast, it is possible that June's low PE score may be linked to her choice of avoiding the use of new technology in the classroom.

The teachers' self-theories: their self-efficacy and mindset, appeared to relate to the experiences they chose to provide for their students. This finding is consistent with Pan and Franklin (2011) who noted that higher self-efficacy scores were associated with a greater amount of technology utilized in classroom instruction. Similar to the studies of Christenson (2002); Etmer et al. (2012); Ertmer and Ottenbreit-Leftwich (2010); Teo et al. (2008); and (Wozney et al., 2006) the interview data, the mindset checklists and the observations confirmed the teachers' expressed orientation towards growth and perseverance to learn and integrate technology.

Additionally, consistent with the findings of Brenner and Brill (2016) and Kopcha (2012), the teachers expressed time as one of their biggest barriers to implementing new technology.

Research Question 3. In what ways might their identities have changed as they commit to this new career? As a reminder of the literature review content, the term *identity* in this study referred to the ways a teacher represents his or her "professional self" through self-image, self-esteem, job-motivation, task perception, and future perspective (Kelchtermans, 1993, pp. 449-450). Consistent with Day et al. (2006), the findings suggest that engaged specialists showed an integrated profile blending self-efficacy, motivation, and commitment. These individuals included job satisfaction as a key aspect of their professional identities. One's beliefs can affect one's identity. The specialists who are new to their roles, Diana and Sandy, vary in their identities even with only one year of experience as a difference. Time has also altered the identities of the teachers who have been specialists for more than ten years. Toni and June vary drastically from one another.

The participants' identities have changed in various ways as they have committed to this new career. Diana, Sandy and Toni expressed higher self-efficacy relative to embracing challenges and enjoyment of trying new technology regardless of the setbacks, which is consistent with the findings of Bandura (1977); Bandura (1982); Teo et al. (2008); and Tschannen-Moran et al. (1998). In contrast, it appeared that June had not embraced many challenges. Her narratives, goals, and observed instructional practices reflected continued dissonance with her personal self-efficacy beliefs, which, similar to the findings of Ertmer and Ottenbreit-Leftwich (2010), could possibly inhibit her future willingness to learn how to integrate new technology into her teaching.

Research Question 4. In what ways do they describe their perseverance and ongoing motivation? Through their stories, the specialists communicated barriers/challenges as well as dialogue expressing their self-efficacy and mindset. Consistent with the findings of Aldunate and Nussbaum (2013) and Cherry (2014), each one of the specialists mentioned not feeling comfortable and slightly anxious with not knowing all there is to know about a program, device, or an application. This discomfort could be viewed as another barrier/challenge. Additionally, they each expressed having a love/hate relationship with technology; they enjoyed the content, but were frustrated when an unexpected issue occurs, such as a technological glitch. How the specialists continue to overcome this technology fear or discomfort suggested their perseverance. Diana, Sandy and Toni mentioned researching, experimenting, playing, challenging themselves, having open minds, and exerting more effort when it comes to overcoming feelings of discomfort associated with their content area. Therefore, regardless of the setbacks, they continued to persist. In contrast, June mentioned that she has chosen to not overwhelm herself with too much technology because there are too many choices. She also mentioned not owning a mobile phone and choosing to not research technology in her spare time. Additionally, June expressed that there was too much technology being introduced to students at too young of an age. There appears to be a pattern: by reducing her technology use, June has reduced the need to embrace challenges as well as the need to persevere to learn new technologies.

As noted in the Chapter 4 findings, Diana and Sandy were new to their roles, whereas Toni and June each had served as technology integration specialists for more than 10 years. Toni's and June's job-motivation and job-satisfaction, similar to Kelchtermans' study (1993), has kept each from desiring to return to the professional role of classroom teacher. Toni expressed being motivated by and committed to the students, the content, and researching new

ideas/technology to engage her students. This is consistent with Roth's (2014) findings regarding autonomous/intrinsic motivation. June said she was motivated by knowing that technology skills are life skills all students should have, and is also committed to doing what her principal and co-workers wanted her to do, which also consistent with Roth's (2014) findings about controlled motivation. Diana and Sandy were new to their roles and they indicated being motivated by and committed to their students and keeping their students engaged and interested in new technologies. They linked their motivation to their decisions to pursue this new role.

Discussion of Major Findings

As mentioned in Chapter Four, a few themes emerged as I utilized a *Constant Comparative Method* (Corbin & Strauss, 1990; Glaser, 2002) for pattern identification. The first overall theme was identified as the following: the participants' self-theories, mindset and self-efficacy, plus their barriers/challenges all related to their future motivation, which lead to the core category and second theme. Figure 7 displays the identity transformation themes discussed within this study, which lead to the findings regarding the future development of the job.

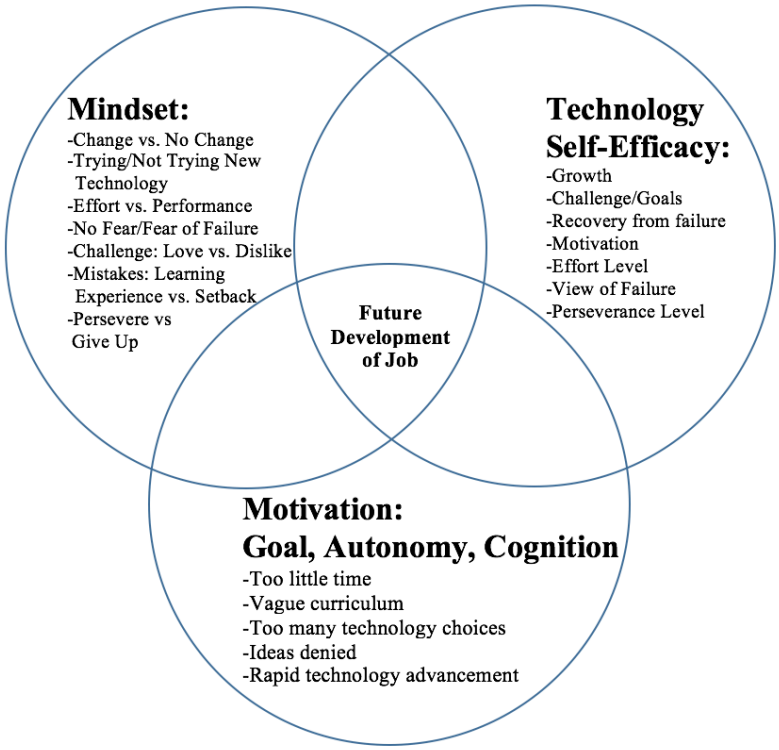

Fig. 7 – *Findings: Identity Transformation Themes* (Dweck, 2006; Sewell & St George, 2009; Swartz, 2017).

Looking to the future, participants who expressed a self-perceived growth mindset along with a high self-efficacy might be at an advantage. Educational technology will most likely continue to advance, and as it does, technology specialists will have to be accepting of this change and resulting challenge. The barriers/challenges tested the participants' self-theories and appeared to be directly related to their motivation. For example, Diana's quantitative results (self-efficacy and mindset) were both below the mean, which make her appear to have some fixed mindset qualities and relatively low self-efficacy. However, it is important to consider that she was serving in her first-year technology specialist. Because her qualitative data displayed her positively motivated attitude toward future change, one might expect that in time her self-theory scores will improve.

"The core category represents the central phenomenon of the study" (Corbin & Strauss, 1990, p. 14). The second overall theme and core phenomenon that emerged in the study was the following: the participants' self-theories and motivation were related to their expectation of the future development of the job. Figure 8 shows the future developments of the technology integration specialist role, which is also displayed as the center of Figure 7.

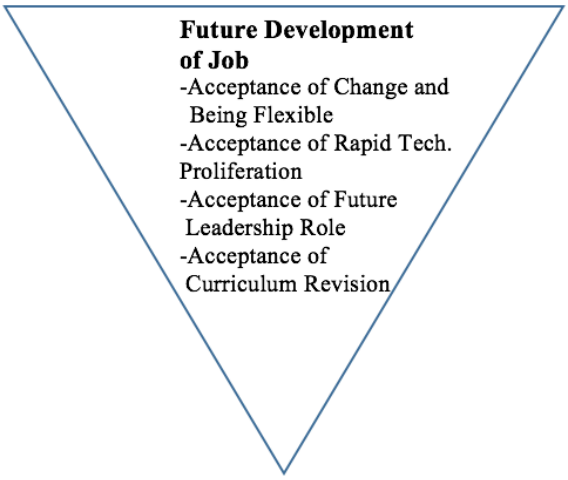

Fig. 8 – *The future perspective of the participants' jobs and core phenomenon of the identity study;* (Kelchtermans, 1993; Swartz, 2017).

Within the narratives, the participants detailed the job-related barriers and challenges, such as their beliefs about the curriculum and too many technology choices. It is a hope that these items do not lead to teacher burn out. Using a growth mindset, these barriers/challenges could be used as motivation to lead to future change; to assist with curriculum change, for example.

Conclusions

Looking back at the significance of study mentioned in Chapter One, an underlying principle of the current research is that eliciting, exploring, and evaluating teachers' stories of change have provided clues regarding teachers' professional role identity transformation as well

as their engagement with technology integration, and possibly the subsequent quality of key outcomes such as: teacher collaboration, and students' learning. The following will discuss the study's overall results, strengths, limitations, and unique features.

It is important to mention this study portrays a case study snapshot of four elementary technology integration specialists during the 2016-2017 school year when mindset and 21st century learning were the district goals. A narrative case study allowed me to make meaning from each participant's story while at the same time investigating the results of the self-reported quantitative data. One strength of this case study approach was its methodological scope; a variety of methods were used to generate the data (Marshall & Rossman, 2016). My current role as the district's technology integration coordinator provided me the opportunity to build ongoing professional relationships with the participants. According to Thomas (2011) case study selection criteria includes the researcher's familiarity with the case along with other criteria. I was aware of the district goals as well as some prior knowledge of the participants due to assisting our elementary teachers with iPad integration the current and previous year. I also had the opportunity for naturally occurring interactions with the participants, which is viewed as beneficial in qualitative case studies (Marshall & Rossman, 2016).

Diana, Sandy, Toni and June had all transformed their identities from serving as elementary classroom teachers to the role of technology integration specialist. The term *identity* in this study referred to the ways a teacher represents her professional self through self-image, self-esteem, job-motivation, task perception, and future perspective (Kelchtermans, 1993). One's identity is then influenced by: 1) pre-teaching identity (mindset), 2) contexts of teaching (classroom practice/leadership), 3) past influences (personal narrative), and leads to a reshaped identity, which is deconstructed and reconstructed over a period of time (Flores & Day, 2006).

As technology changes and advances, so will one's professional identity, since one's identity is in a state of constant evolution (Kelchtermans, 1993; Rogers & Scott, 2008). The future perspective (expectation for the future development of their jobs) has been discussed in this study; each participant mentioned future perspective with slightly different viewpoints. Diana and Sandy are ready for change and understand the importance of being flexible. Toni is also ready for change and views herself assisting teachers within their classrooms, rather than the students coming to her room for "Tech Time". June is ready for a curriculum change but did not mention a role change.

Strengths. An advantage of this predominately narrative study was that it also utilized a mixed method design in order to select the participants and to employ a wide variety of data. I was able to use triangulation to compare the quantitative instrument findings with that of the qualitative narratives, observations, and mindset checklists. The quantitative data was "complementary" to the qualitative data (Mertens, 2015, p. 305) in that I was able to seek clarification from the participants during the interview process and to ask about their mindset and self-efficacy results. Overall, the study was complex in its design; however, it enabled a wider variety of patterns, which led to richer findings.

Another strength of this narrative study was not only having the opportunity to interact with the participants as a "participant" in their professional lives as the technology integration coordinator, but also having a similar opportunity as an "observer" who was researching their identities.

Limitations. The goal of discovering patterns and complexity within this study would be difficult if attempted to be replicated by other researchers, in that the participants are unique to this study, as it is with any/all case study research, and they are unique to the district with which

they are employed as elementary technology integration specialists. Additionally, the timing of the participating district to have curricular goals relating to mindset and 21st century learning, made the climate of this study especially focused.

Another limitation was not studying the participants' personalities along with the other variables. Having personality data to compare/contrast with the other data might have deepened the findings and added yet one more conceptual bridge between the self-theories and motivation.

Contrary to what the literature regarding narrative case studies reports about the researcher's familiarity with the case and the participants (Marshall & Rossman, 2016; Thomas, 2011), the creditability of some of the reported data in this study could be at risk for *social desirability bias* resulting in an internal threat to validity due to my dual role as a participant and an observer. *Social desirability bias* is defined as a type of response bias in which the participants might answer questions or react in a way that they feel will be favored by others for social approval as an "impression management mechanism" (Krumpal, 2013, p. 2030). In this study, for example, observations could be viewed as a limitation if the teachers purposely created lessons that contained ample examples of technology integration for social desirability. In addition, participants had been fully aware of mindset because of the district goal and mindset-related professional development activities, so the ITIS data could contain error due to social desirability and responding the way they were trained to respond. In contrast, mindset could also contain a positive ripple effect. For example, during a recent technology integration specialist collaboration session during professional development time, I encouraged the specialists to share a 21st century technology they believed had contributed to a positive and engaging change in their classrooms. In one example Toni was very excited to show how she had started to use Ozobots (Ozobot & Evollve, 2016) in the classroom, which was one of the mindset goals she

indicated on her mindset checklist (see Appendix 15). It is likely that because of this collaboration meeting encouraging change and new technology ideas, Jerry[7] recently displayed for me his collection of Ozobots (Ozobot & Evollve, 2016) given to him by his building's parent association. In our conversation, it was apparent to me that Jerry was very excited to use the new technology with his students. Thus, a positive ripple effect with embracing change and new technologies has taken place.

Other limitations were the span and scope of this study. The span of this project was limited in that it occurred over a few months, and its scope was limited since the participants of interest are the district's elementary technology integration specialists instead of the entire population of elementary teachers. These two factors might limit the validity of research findings.

Instead of focusing on all of the teachers in our district, I chose to narrow my study to the district's seven elementary technology integration specialists, since one of my responsibilities is to assist these educators. These educators were once classroom teachers; their transformation into choosing to become technology educators was a major focus, as well as whether their mindsets and self-efficacy played key roles within this transformation. The elementary technology integration specialists interact with every student in their schools; this is a larger interaction than most of their colleagues, which was another reason why I narrowed my scope. These considerations instigated this study.

Unique Features. Previous research has addressed the variables of interest that formed the core phenomenon of the current study (Beijaard et al., 2004; Flores & Day, 2006; Kelchtermans, 1993; Rodgers & Scott, 2008). However, their findings are limited by research

[7] Jerry was only in phase one of this study.

designs and operationalization of key variables. The previous research studies are either quantitative or qualitative and they do not employ mixed methods or triangulation of the data. In contrast, this dissertation used self-reported quantitative data, qualitative narratives, semi-structured interviews, and observations shaped by participant goals. I was also able to blend three motivation theories: goal orientation (using the mindset checklist), autonomy/agency (using narratives and observations), and cognitive (using quantitative self-reported data, self-analysis of goal attainment, and narratives).

A uniqueness of this study was the analysis strategy of using qualitative narrative to acquire identity transformation data, and use multiple interview probes. As a researcher, I was able to deepen my knowledge of the participants' experiences and find motivations and fears buried within their stories. The use of narrative was a "sense-making process" (Daiute, 2014, p. 15), which assisted with discovering the previously mentioned patterns, themes, and overall core phenomenon.

Another unique element of this study was the ability to triangulate the data by using the participants' self-reported data (instruments and mindset checklist) along with their personal narratives and objective observation data. Studies which utilize triangulation greatly strengthen the worth of their findings (Marshall & Rossmann, 2016).

An unexpected finding resulted in the need to update an approximately seventeen-year-old elementary technology curriculum. The district Teaching and Learning Department will initiate a curriculum change starting in the fall of 2017. This update will utilize data collected from the middle school principals who asked their staffs to report on what 21st century technology skills they expected of incoming sixth grade students. It will also look at other elementary technology curricula from local schools and those nationwide. Additionally, the

district is in the process of finalizing K-12 teacher technology standards to be adopted prior to the start of the 2017-2018 school year. These standards will also assist with revising the elementary technology integration specialist curriculum.

Another unexpected finding involved the participants knowing that they were being studied. As previously mentioned, I organized a collaboration session, which encouraged the specialists to share a 21st century technology they felt had contributed to a positive and engaging "change" in their classrooms. This resulted in Jerry's motivation to ask the parent organization to purchase Ozobots (Ozobot & Evollve, 2016) for his class. A Hawthorne effect had occurred, the participants knew they were being studied and acted differently because of it (Franke & Kaul, 1978), however this was a positive effect with embracing change and incorporating new technology. In another example, Toni found out that 3D printers were going to be purchased for every elementary school. I was with Toni when she approached her principal about requesting that the 3D printer be placed in her room so she could be responsible for its use, upkeep, as well as with training other staff members about its operation.

Implications

This study has the potential to assist future educators by providing initial insights into narratives and underlying self-theories that might enhance or limit teachers' willingness to engage in professional role identity transformation, in this instance, technology integration.

In the near future, the participants' professional identities will be reshaped because of the change to their teaching contexts: classroom practice and leadership (Flores & Day, 2006). As previously mentioned, the district Teaching and Learning Department will initiate a curriculum change starting in the fall of 2017 to be complete by the spring of 2018. In the near future, the district also plans to alter the position description of an elementary technology specialist making

one of their leadership responsibilities to provide ongoing support and professional development for co-workers. Sandy and Toni have embraced this responsibility and have already instigated professional development ideas with their administrations. It is important to note that the participants' professional identity in this study possibly contributed to their self-efficacy, motivation, commitment, and job satisfaction (Day et al., 2006).

Similar to altering the curriculum, finding time to research new technologies could be a part of their professional development time next year. It is possible to have reoccurring meetings in order to have time to share ideas with one another. As technology teachers, there are 21st century avenues for holding virtual meetings, for example, to report on new findings. These meetings could reduce the feelings of being overwhelmed by new technologies.

As 21st century educational technology continues to rapidly change, it will be important to investigate how this change affects our technology specialists' beliefs and overall well-beings. Zee and Koomen (2016) discuss teachers' well-being including the positive aspects: job satisfaction, commitment, coping, and retention, as well as the negative aspects: teacher burnout, stress, and attrition. One goal is for our specialists to perceive themselves as self-efficacious with using computers and technology in order to minimize stress and burnout, however, if the rapid change in educational technology continues at its current rate how can school districts best assist their employees? Friedman (2000) suggests to improve functioning in the task domain of professional self-efficacy conceptualization to help reduce stress and burnout. "Improved training both before and during one's career may enhance endurance against work-related stressors, and gain resilience" (p. 602). It is also suggested to provide workshops and in-service training, join peer-professional help groups, build strong relationships with co-workers, and learn about stress management. Besides these options, Friedman (2000) also suggests that a

"reduction in stress may be gained by defining more realistic, achievable goals in teaching" (p. 605). With the wide variety of educational technology available online and made available in the classroom, setting realistic and achievable goals is good advice for elementary technology integration specialists.

More studies are needed at the elementary level focusing on self-theories, technology specialists, and teacher motivation/burnout, as well as studying professional role identity transformation over time.

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Appendices

Appendix 1: IRB Approval

APPROVAL OF PROTOCOL

December 7, 2016

Cindy Swartz
swartzc@ku.edu

Dear Cindy Swartz:

On 12/7/2016, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Transforming into an elementary technology teacher: Stories of change
Investigator:	Cindy Swartz
IRB ID:	STUDY00140258
Funding:	None
Grant ID:	None
Documents Reviewed:	• Consent Form.docx, • Initial Email Consent.docx, • HSCL_Initial_Submission_Form_Swartz.pdf, • TECHNOLOGY INTEGRATION SURVEY.docx, • Interview Questions.docx, • Mindset Checklist.docx, • Demographic Survey.docx, • MINDSET SURVEY.docx

The IRB approved the study on 12/7/2016.

1. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at https://rgs.drupal.ku.edu/human_subjects_compliance_training.
2. Any injury to a subject because of the research procedure must be reported immediately.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity.

Continuing review is not required for this project, however you are required to report any significant changes to the protocol prior to altering the project.

Please note university data security and handling requirements for your project:
https://documents.ku.edu/policies/IT/DataClassificationandHandlingProceduresGuide.htm

You must use the final, watermarked version of the consent form, available under the "Documents" tab in eCompliance.

Sincerely,

Stephanie Dyson Elms, MPA
IRB Administrator, KU Lawrence Campus

Human Research Protection Program
Youngberg Hall | 2385 Irving Hill Rd | Lawrence, KS 66045 | (785) 864-7429 | research.ku.edu/hrpp

Appendix 2: The Demographic Survey

Participant First & Last Name:_____

This questionnaire is part of a research study of elementary teachers' mindset and technology integration. All of the data collected from this questionnaire will be used for research purposes only. For confidentiality, your name will be removed from the data when it is analyzed and included as a part of the research.

1. Sex (circle one): Male Female
2. Age: _____
3. Average number of students in your classroom: _____
4. Years of teaching experience: _____
5. Years experience as a technology teacher: _____
6. Did you choose to become a technology teacher, or did your principal choose to place you in the position? Briefly explain.

7. Highest education degree held (circle one): Bachelors, Masters, Specialist, Doctorate
8. Years technology experience for personal use: _____
9. Years technology integration for classroom use: _____
10. Average number of days in a month technology is integrated in your classroom:

    _____

Appendix 3: The Mindset Instrument (ITIS)

Participant's Name:_____

This survey is part of a research study of elementary teachers' frames of mind and how they relate to technology integration. All of the data collected from this survey will be used for research purposes only. For confidentiality, your name will be removed from the data when it is analyzed and included as a part of the research.

As you read each statement, think about how closely it fits what you really think. There are no correct answers – the right answer is your authentic, honest reaction.

Please select ONE response for each of the statements below.

1. No matter how hard you try, you cannot change your intelligence very much.
   - o Strongly disagree
   - o Disagree
   - o Disagree a little
   - o Agree a little
   - o Agree
   - o Strongly agree

2. I like my work best when it comes to me easily.
   - o Strongly disagree
   - o Disagree
   - o Disagree a little
   - o Agree a little
   - o Agree
   - o Strongly agree

3. You can learn new things, but you cannot really change your basic level of intelligence.
   - o Strongly disagree
   - o Disagree
   - o Disagree a little
   - o Agree a little
   - o Agree
   - o Strongly agree

4. I like my work best when I can do it really well without too much trouble.
   - o Strongly disagree
   - o Disagree
   - o Disagree a little
   - o Agree a little

- Agree
- Strongly agree

5. When something is hard, it just makes me want to work on it less.
   - Strongly disagree
   - Disagree
   - Disagree a little
   - Agree a little
   - Agree
   - Strongly agree

6. If I make a lot of mistakes, I know I am not learning very much.
   - Strongly disagree
   - Disagree
   - Disagree a little
   - Agree a little
   - Agree
   - Strongly agree

7. I like my work best when I can do it perfectly without any mistakes.
   - Strongly disagree
   - Disagree
   - Disagree a little
   - Agree a little
   - Agree
   - Strongly agree

8. To tell the truth, when I work hard, it makes me feel as though I'm not very smart.
   - Strongly disagree
   - Disagree
   - Disagree a little
   - Agree a little
   - Agree
   - Strongly agree

The ITIS was adapted from: Mindset Works. (2011).

Appendix 4: The Mindset Instrument (ITIS) Data

	1	2	3	4	5	6	7	8
Jerry	Strongly disagree	Disagree	Strongly disagree	Disagree	Strongly disagree	Strongly disagree	Disagree	Strongly Disagree
Diana	Strongly disagree	Agree a little	Disagree	Agree	Disagree	Agree	Agree a little	Disagree
Linda	Strongly disagree	Disagree	Strongly disagree	Disagree	Disagree	Strongly disagree	Agree a little	Disagree
June	Disagree	Agree	Disagree	Agree	Disagree	Disagree	Agree a little	Disagree
Toni	Strongly disagree	Agree	Disagree	Agree	Disagree a little	Disagree	Strongly agree	Disagree
Mary	Strongly disagree	Agree	Strongly disagree	Agree	Disagree	Strongly disagree	Agree a little	Disagree
Sandy	Strongly disagree	Strongly disagree	Strongly disagree	Agree a little	Disagree	Strongly disagree	Disagree	Strongly disagree

	1	2	3	4	5	6	7	8
Jerry	6	5	6	5	6	6	5	6
Diana	6	3	5	2	5	2	3	5
Linda	6	5	6	5	5	6	3	5
June	5	2	5	2	5	5	3	5
Toni	6	2	5	2	4	5	1	5
Mary	6	2	6	2	5	6	3	5
Sandy	6	6	6	3	5	6	5	6

Appendix 5: The Technology Integration Instrument (MUTEBI)

Participant's Name_____

This survey is part of a research study of elementary technology teachers. All of the data collected from this survey will be used for research purposes only. For confidentiality, your name will be removed from the data when it is analyzed and included as a part of the research.

Directions:
The purpose of this survey is to explore your views about integrating technology into classroom teaching. For each statement below, indicate the strength of your agreement or disagreement by selecting one of the five choices.

Below is a definition of technology integration:

Technology integration:
Using any technology device as a tool to support students as they construct their own knowledge through the completion of authentic, meaningful, real-world tasks.

---

1. When a student shows improvement in using technology, it is often because the teacher exerted a little extra effort.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
2. When students' attitude toward using technology improves, it is often due to their teacher having used the classroom technology in more effective ways.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
3. If students are unable to use technology, it is most likely due to their teachers' ineffective modeling.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
4. The inadequacy of a student's technology background can be overcome by good teaching.
    - Strongly disagree
    - Disagree
    - Uncertain

- Agree
- Strongly agree

5. The teacher is generally responsible for students' competence in computer usage.
   - Strongly disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly agree
6. Students' technology ability is directly related to their teacher's effectiveness in classroom technology use.
   - Strongly disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly agree
7. If parents comment that their child is showing more interest in technology, it is probably due to the performance of the child's teacher.
   - Strongly disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly agree
8. I am continually finding better ways to use technology in my classroom.
   - Strongly disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly agree
9. Even when I try very hard, I do not use technology as well as I do other instructional resources.
   - Strongly disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly agree
10. I know the steps necessary to use technology in an instructional setting.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
11. I am not very effective in monitoring students' technology use in my classroom.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree

- Strongly agree

12. I generally employ technology in my classroom ineffectively.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
13. I understand technology capabilities well enough to be effective in using them in my classroom.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
14. I find it difficult to explain to students how to use technology.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
15. I am typically able to answer students' questions which relate to technology.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
16. I wonder if I have the necessary skills to use technology for instruction.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
17. Given a choice, I would not invite the principal to evaluate my technology-based instruction.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
18. When students have difficulty with technology, I am usually at a loss as to how to help them.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree

19. When using technology, I usually welcome student questions.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
20. I do not know what to do to turn students on to technology.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree
21. Whenever I can, I avoid using technology in my classroom.
    - Strongly disagree
    - Disagree
    - Uncertain
    - Agree
    - Strongly agree

The Technology Integration Survey was adapted from: Enochs, L. G., Riggs, I. M., & Ellis, J. D. (1993). The development and partial validation of microcomputer utilization in teaching efficacy beliefs instrument in a science setting. *School Science and Mathematics*, *93*(5), 257-263.

Appendix 6: The Technology Integration Instrument (MUTEBI) Data

Item #	Jerry	Diana	Linda	June	Toni	Mary	Sandy
1	Uncertain	Disagree	Disagree	Disagree	Uncertain	Uncertain	Disagree
2	Agree	Agree	Disagree	Uncertain	Agree	Agree	Strongly disagree
3	Disagree	Uncertain	Disagree	Uncertain	Disagree	Uncertain	Uncertain
4	Agree	Disagree	Agree	Agree	Agree	Agree	Agree
5	Uncertain	Uncertain	Disagree	Disagree	Agree	Uncertain	Uncertain
6	Disagree	Disagree	Strongly Disagree	Uncertain	Agree	Disagree	Agree
7	Disagree	Agree	Agree	Disagree	Uncertain	Agree	Agree
8	Agree	Agree	Strongly Agree	Agree	Strongly Agree	Agree	Strongly Agree
9	Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
10	Agree	Agree	Strongly Agree	Agree	Agree	Agree	Strongly Agree
11	Disagree	Strongly Disagree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
12	Disagree	Strongly Disagree	Strongly Disagree	Uncertain	Strongly Disagree	Strongly Disagree	Strongly Disagree
13	Agree	Agree	Strongly Agree	Agree	Strongly Agree	Agree	Agree
14	Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
15	Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree	Strongly Agree
16	Uncertain	Agree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
17	Disagree	Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Uncertain	Strongly Disagree
18	Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Disagree
19	Strongly Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree
20	Disagree	Strongly Disagree	Strongly Disagree	Disagree	Strongly Disagree	Disagree	Strongly Disagree
21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree

Appendix 7: The Interview Protocol

Interview Questions:

1. So, your position at work is a very specialized one; tell me about your story as a technology teacher? (Process that shaped their decision to pursue, enter, and remain in the career of teaching technology, etc.)
2. If you were mentoring a new elementary technology teacher, what advice would you give about integrating technology?
3. Describe your relationship with technology now.
4. On a scale of 1-10, with 10 as mostly comfortable, how comfortable you are with technology. (4b) How did that happen?
5. On a scale of 1-10, with 10 being the most effective, how effective do you feel you are at teaching technology?
6. How have you explored ideas for using technology? Have these been mostly district initiated? (6b) Can you think of some explorations you have tried for your own learning? (6c) Some of the questions on the technology survey suggested _____; how do you feel this affects your teaching?
7. When did you first start incorporating technology within your teaching? (7b) How long have you been using technology within your teaching?
8. In your use of technology during teaching, do you consider yourself a novice or an expert? (8b) To better frame this question, on a scale of 1 to 100 with 1 being novice and 100 being expert, what number do you give yourself?
9. What are some of the goals that you set for yourself this year? (9b) For each goal, on a scale of 1-10, with 1 being easy and 10 being challenging, how achievable are your goals?
10. With mindset being one of the district and building goals, what are your personal mindset goals? (10b) What are your opinions about mindset being one of the district goals? (10c) Your results of the mindset survey were_____; how do you feel this affects your teaching?
11. What else do you think I need to know about technology integration?

Appendix 8: The Interview Results (Pseudonym: Diana)

Interview #1- Diana

1. Okay so interview number one, my first question is; your position at work is a very specialized one, so tell me about your story as a technology teacher? Maybe tell me a little bit about the process that shaped your decision to pursue, enter, and remain in your career so far.

"Well mines probably pretty unique, I was in the classroom for 15 years and…I was looking for a change of any kind and the principal came to me when this position opened just this past year and thought that I would be a good fit for it and I decided to take on the challenge. I was pretty excited about it. So, nothing that I planned for but something I was really excited for."

2. If you were mentoring a new elementary technology teacher, like lets say next year you had a student teacher or something like that, what advice would you give about integrating technology?

"That's a great question actually. I've had a lot of student teachers in my time and the one thing that I would give them, something that I have had to learn this year, is just not to be afraid to try something new and give the kids the benefit of the doubt. Like, they are going to be able to figure it out no matter how scared I might be to try something new with them, like they pick it up really fast and probably faster than me. So that's my advice was not be afraid to try something new. A hurdle I've had to get over this year."

3. And my third question, describe your relationship with technology now.

"We are at a love hate relationship. I love trying the new things, I love seeing the kid's face when they get to experiment and do new stuff, new apps, new programs, and create, so that part is really exciting. But as a person that has just done technology in the classroom, which hasn't been a ton...It gets me a little scared sometimes and makes me spend a lot of time messing around and playing, which I really enjoy. But it has definitely been a love hate relationship, more love than hate though."

4. My fourth question, On a scale of 1-10, with 10 being mostly comfortable, how comfortable are you with technology?

"I would say coming into this school year I would probably say a 5 and I would say now that this school year is half over, I would probably move myself up to maybe a 6, and I am hopeful that I will keep growing as I take classes and experiment and learn and try new things."

(4b) And how do you think, I mean as far as if you had an example from like the start of the school year until now, because of that rating that you have given yourself, that 5 to the 6, can you think of some experiences that would help you to give yourself that label of moving from a 5 to a 6?

"Just being around it all the time and trouble shooting different problems that's probably been my biggest one when kids bring me computers and they're like, "What's wrong with it?" and I look at it and I'm like "Hmm, I'm not really sure but let's find out." And just playing and experimenting with things and then the kids have really taught me a lot too. I would say that's probably helped just trouble shooting and hearing from my co-workers and things."

5. Okay my fifth question, same thing again, kind of on a scale of 1-10, with 10 being the most effective, how effective do you feel you are at teaching technology?

"I would say in the things that I'm choosing to teach them, I would say I'm probably about an 8, because I feel like I spend a lot of time...learning what I'm going to teach them and finding ways to have them understand it the best. My biggest challenge has been the grade levels and how to manage that and what they know and what they don't know already...but I feel like I spend enough time preparing for what I'm going to teach them that when it's time to execute my lesson I feel pretty good about it."

6. How have you explored ideas for using technology?

"I bounce ideas off of my team and then I have subscribed to a few different blogs and things that have helped me...and then really just taking time to Google things and search things and download apps and try them out. It's really just been mostly trial and error on different things. But my newsletters and blogs that I follow have been really, really helpful."

"And would you say that your ideas for this research, have any of them been district initiated or do you feel like it has been more initiated on your own personal choice?"

"I would say that I definitely followed up on several things that have been district initiated... through either the newsletters that they send out like TNL or you shoot over ideas when you get them… a lot of the trainings we have gone to have kind of opened some doors for some things for me to explore definitely."

(6b) Can you think of some of those ideas you did, like just recently you said you did some exploration with research and newsletters and blogs and Googling things. Is there an example you can give me of something that you've recently looked at and you thought "Oh that's kind of fun"?

"I like Ask-a-Tech-Teacher newsletter that comes out. The most recent one they sent out for the beginning of the year like 68 popular websites and apps and things and I was able to find some really good coding activities for some of my younger kids that have never coded before, so that was really fun. I had no idea my kindergarteners could code, and they've done amazing."

(6c) Some of the questions that I noticed on, there was two technology, one was a mindset survey I sent out earlier and then I also sent out a technology survey and so some of the questions on that technology survey suggested that, kind of similar to what you said around statement number 4 like you still felt like you were kind of growing in the area of technology and being around the tech. How would you feel this affects your teaching overall?

"I think that it probably hinders it a little bit knowing that I wasn't as comfortable as other people are. I mean when you are in the classroom you use technology as much as you can but you have so much you have to teach and computers being available. You aren't really forced, I guess, I don't know if I like that word, but you didn't really have to use it you were just strongly encouraged and now I'm I guess for lack of a better word, I'm kind of forced to use it everyday because that's my job. That's been scary but it's been really good for me."

"I don't know if I… Did I answer all of that correctly?

"Yes, yeah that's great, thank you."

7. When would you say you first started incorporating technology within your teaching since you've been teaching for, you know, 15 years prior to this experience?

"Regularly...Let's see I've been at XXX, this is my 10th year. I would say regularly the last 5 years... on a more consistent basis than years prior. Before I was… My first 7 years we didn't really have access to any technology so it wasn't available."

"So then you'd say you've been using predominately technology just like within the last 5 years."

"Yeah, I mean when I first came to XXX we had the computer carts and stuff but...half of them didn't work super well and availability was rough so I mean we used them but not like we have over the last few years with tests and projects and things."

8. In your use of technology during teaching, would you consider yourself a novice or an expert?

"Novice definitely. My first year in this position I would definitely say novice."

(8b) To better frame this question, on a scale of 1 to 100 with 1 being novice and 100 being expert, what number would you give yourself?

"Oh gosh...such a range...I don't really know that anybody is a complete, I mean I know you can be an expert but just technology is always changing. I would probably say, I'm going to go with 50, maybe 45, 45 to 50. I would like to see myself be in that expert category over the next couple of years as I take classes towards my degree and learn more with the kids and stuff like that."

9. Yeah, and that kind of follows up to my next question. What are some goals that you've set for yourself this year?

"This year for me personally because I'm new to this position and coming from the classroom my goal is to see where everybody's at as far as I don't know what they did last year, I mean I know what my fourth graders did, but I don't know what they did in first grade and second grade. So my goal is to know where they're at with their skills and my goal is to take a couple of workshops this spring, and then I'm looking at probably 8 to 10 hours this summer again. I did 8 hours last summer. And I would eventually like to work towards some type of certification, I just don't know what that would be yet, what would best fit for this job."

(9b) And for some of these goals, and I'll just kind of go back and mention some of the ones that I wrote down, for each of these goals that you mentioned, on a scale of 1-10, with 1 being easy and 10 being challenging, how achievable do you think each of these goals are?

"So the first one you mentioned was seeing where all the grades are with their individual skills, how would you rate that one on 1 to easy to 10 being a challenging type of goal?

"...I would probably say it's going to be an easy one to reach just because by that time I will have completed the year I will know where everybody has ended this year and what I can do with them next year. Coming in this year I had no idea what they've done so i was kind of, I had nothing, or I knew nothing about what they've done. So I think that's going to be a really easy one to achieve."

"So would you give it more of like, if 1 is the easy and 10 is challenging, so where would you think, if you had to give it a number classification?"

"...I would say that it would probably be like a 1 or a 2 for sure, because it will be...I mean...yeah."

"Going to some workshops was another goal, and then possibly of course you know following through with some of the ideas that you get from those, how would you label that one as far as easy or challenging?"

"...The workshops i think would be easy so i would definitely say a 1. I've already got a couple on the calendar that I like and we are going to I Pad camp so I think those are going to be very achievable. They hours this summer, I would probably say, since I want to work towards some type of certification, I really need to find out what my certification is first, what the state would require of me. I know some things coming up down the pike I just haven't heard what so I need to look to see what would be best. So I would say like a 4… as far a achievability."

"Yeah, I'll just kind of lump the two of those together, because they kind of go hand and hand."

"They do. I mean I would like to take my classes that would support whatever certification I get, I just need to figure out what would be best."

10. With mindset being one of the district and building goals, what would you say are some of your personal mindset goals?

"That's been a big topic for me coming from the classroom. My mindset has definitely changed… in a great way. I've had to be very open. I was, I don't want to say I was scared of technology, but I was very hesitant to try new things, you know, being uncomfortable is never a good feeling, but I've really came out of my box and opened up my mindset, I guess, to… that's its not so scary that I can do it and i think that's, I mean it's really been a big mindset change for me, and also just adjusting and changing your mindset of your schedules and your planning and your responsibilities. That's been a really big adjustment for me also, but a good one."

(10b) And for those two that you kind of mentioned to me, what are your opinions about, just in general I'm just kind of curious, what are your opinions about mindset being one of the district goals?

"I think it's a good thing. I very much think it's a good thing. There's a lot more people who have fixed mindset then I think we're aware of and with everything changing with new curriculum and new technology, lots of new everything, expectations and standards and state requirements...you have to have a growth mindset. And that's a struggle for some people to get out of that or get out of your fixed mindset I guess."

"Yeah in fact, kind of speaking of that… the results of your mindset survey were, on just a few of the questions, kind of leaning towards more of a fixed mindset, but I suppose it could be because of possibly your change in your role, because I know your, it's obvious that you're going through a lot."

"Mhmm, it's a big change."

(10c) So how do you feel that affects your teaching?

"...In my planning it probably affects that the most because I want to stay safe and I want to do basic fundamentals and because that's what I know, but when, like this second semester I'm excited to try some new things that I've been working on shaping up myself, you know like coding with the primary kids scared the daylights out of me before winter break, and I've had enough time to process and now I'm really excited about it. So I think for me just processing it all and understanding a little bit better is really helping me to change my ways a little bit."

11. And my last question, what else do you think I need to know about technology integration in your classroom?

"I'm really working hard...in my classroom...I think, I don't know if this will effect what you are doing, but I think for my classroom specifically compared to other peoples classroom that its my first year so I'm really trying to figure out like the states standards and figuring out how to incorporate those and then hearing what other people are doing and how much time to spend on things and a balance act between all of that and, well do I really do everything that's on my state standards or do I… yeah, I think also my biggest struggle, and I don't know if this really has anything to do with what you're, what this is about but, I feel like for a new technology teacher there's little resources available like as far as like everybody does their own thing in all the 7 schools. There's no long range plan, there's no shared resources, there's no scope and sequence, so I really felt, and that's part of my fixed mindset, like i was...because coming from a classroom where you have all of that… you know, so, just note that I'm really working hard to sort all of that out and create some of that stuff myself."

Appendix 9: The Interview Results (Pseudonym: Sandy)

Interview #4- Sandy

1. So I have 11 questions and the first question is pretty basic, it says, your position at work is a very specialized one; tell me about your story as a technology teacher? So the process that shaped your decision to pursue, enter, and remain in the career of teaching technology.

   "Okay, so I was a fifth grade teacher for 8 years and I was ready to do something different, I needed a change. This position became available and I thought it'd be fun to work with all the different ages and it would be good actually for a resume, to have worked with all levels of kids. I do like technology, I didn't like where it was when I first started because it seems that the focus was on typing and just Word, things like that. The kids were very bored. They did not like technology so in my mind I wanted to get them back to liking technology and then when we were given the opportunity to go to the conference, conferences, even last year with I Pad camp. Finding out how to make it fun for the kids and finding things that the teachers can use in their classrooms as well. I wanted them to get the love back and then when we found the coding that's where I see us going. Doing more things that they can use in the future and that they can actually use at home and identify with a lot more."

   "Yeah that makes sense."

2. Okay, question number 2; if you were mentoring a new elementary technology teacher, do kind of like a, almost like a student teacher, what advice would you give about integrating technology?

   "In just this classroom?"

   "Just your classroom."

   "Okay…I would give the advice of that should be the focus of what they do. I would say don't be close minded keep your mind open to anything and be willing to learn anything because you never know what you might like, what the kids might like, and how they can be utilized in the classroom."

3. Okay, Describe your relationship with technology now.

"I love technology, when it works. It truly is like a love-hate relationship because there's so many times where the Internet is down or Wi-Fi isn't working, things like that and you have to come up with plans on the fly, which I'm getting really good at. When it does work I see the kids are so into it and they're so focused and on task the entire time and then I see the kids who usually don't thrive, I see them thrive and that's what keeps me going to be honest."

4. So, on a scale of 1-10, with 10 being mostly comfortable, how comfortable are you with technology.

"Probably a 7."

"Okay, and why is that?"

"…I know I still have a lot to learn, there's a lot of stuff I don't know but I have improved myself a lot."

(4b) How would you say you got to being a 7?

"Okay, so when I first came in, of course I was a fifth grade teacher so I didn't know much about technology. I got to be where I am today by asking around, asking for help from a lot of different people, going to the conferences, you know, having the professional development with the other computer teachers and getting ideas and learning all those different things and then of course just a lot of time researching on my own and learning things."

5. And this is kind of a similar question, on a scale of 1-10, with 10 being the most effective, how effective do you feel you are at teaching technology?

"I'd probably say a 7 again. I have a lot of growth to come on still…but I've come a long way. I feel like the kids, are, they buy in and they're completely engaged so when they're learning, they're learning all the time so, I do like that."

"Okay and this next question just has a few different parts to it."

6. So how have you explored ideas for using technology?

"I've done a lot of research on the Internet. I do a lot of trying to find lesson plans. Other people's comments when they've tried something, a lot of Pinterest ideas like that…trying to integrate it and then trying to find ideas of how the classroom teachers can use it because I just don't want it to be something that they use in here. It needs to be something their teachers can use as well. So, really just on the Internet a lot and again talking with my peers."

"And have all these different ideas, you know, the Internet, lesson plans, Pinterest, blog comments and all that, have these been mostly district initiated or initiated by you?"

"By me. To be honest I haven't done a whole lot of district because it's outside of school time and we always have plans or other things going on…so its not that I don't want to its just I haven't had a lot of opportunity."

(6b) Can you think of some of those specific explorations that you've recently tried in the classroom, maybe give an example of one of them?

"Sure, I went to a lightening lab Spark app and on there they have ideas for teachers so it's like a tab for teachers, and they have all different ideas. Basically teachers can leave their lesson plans and then they also talk about what went well, what didn't go well and they also talk about the age level that they used with these kids. So, I found that very resourceful so this is actually where I got this project with the tape on the floor, so you tape a shape on the floor and then they code to get all away around the shape of it eventually. So that was one that I used from there."

"Okay, thank you."

(6c) Some of the questions on the technology survey that I gave you earlier in the semester, I think it was last semester actually, suggested that you still felt low in certain areas, how do you think this affects your teaching?

"I think it does affect my teaching because sometimes I'll feel like I don't know enough about a program or a device and so I might not be willing to go further into lessons because I don't feel like I have answers that the kids are going to need, if I introduced it to them. So, but at the same time I'm the type of teacher who will say, "I don't know, let's figure that out" so they can explore and help me find the answer I'm good with that. So, I'm getting better at that."

7. Okay and question 7; when did you first start incorporating technology within your teaching?

"So would that go back to fifth grade you think? Okay, so it started back in fifth grade when I taught fifth grade. My class was constantly turning in low homework grades for math so I decided that something's got to change and that's when I learned about the flipped classroom, and I completely, I ended up doing an action research for the university and then saw the huge improvement that it made and saw that the parents of the students loved it and so I just completely fell in love with it."

"That's awesome."

(7b) How long would you say you've been using technology within your teaching?

"Well something with like the flipped classroom I would say 4 years, but I've always been one to use technology so if you're talking about like the projectors and all that, as long as we've had them I've used them."

8. In your use of technology during teaching, do you consider yourself a novice or an expert?

"Is there nothing in between?" Definitely not an expert."

"So, maybe like in between?"

"I would say in between because even if I start off as a novice, I don't feel comfortable as a novice so I will always do the research."

(8b) To help better frame this question, on a scale of 1 to 100 with 1 being novice and 100 being expert, what number would you give yourself?

"Oh…with the technology that I'm using I would say like 80, but if its technology that I haven't used I would put it lower just depending on what it is."

9. Question 9, what are some of the goals that you set for yourself this year?

"I set the goal that I wanted K-5 to code. And then I wanted to get the kids to love technology again and understand why this coding and any kind of technology is important for them to learn, to put it into real life."

(9b) Okay, so for each of these goals, on a scale of 1-10, with 1 being an easy goal and 10 being challenging, how achievable would you say each of those goals are?

"So you want me to do individual?"

"Yeah. So for coding."

"So for coding for K-5, that's pretty challenging so, with the younger kids, so…what was the scale again?

"So the scale would be 1 being easy and 10 being challenging."

"Let's put and 8 on the coding."

"And then the student engagement?"

"That's pretty easy let's put a 2 on that one."

"And then I guess, I don't know real life, you had mentioned real life learning."

"Real life, that's, I would say a 4."

"Okay, thank you."

10. And let me see, question 10; with mindset being one of the district and building goals, what are your personal mindset goals this year?

"There again it would fall with the technology is becoming more…oh gosh I'm having a brain fart…just to become more knowledgeable about it and then that way I can raise my expectations for the kids and we can go higher with the level of skills and what not that they're using. I want to take them as far as we can go."

(10b) What are your opinions about mindset being one of the district goals?

"To be completely honest I love mindset but…I just think that's always been my mentality when I became a teacher. I mean, if we aren't doing that I don't feel like we are doing our job. Growth mindset is something we should be doing ~~everyday~~, so I've always bought into that and agree with it."

(10c) The results of the mindset survey suggested that you did have some areas that were a fixed mindset and others that were growth mindset, how do you feel this affects your teaching?

"I'm sure it does affect my teaching…I'm sure I pick things, when I want to do things, ill try and pick things that I need the growth mindset, because I feel like with the fixed why deal with it so much, so I'm sure when I pick like what we're going to teach and how I'm going to present the materials to the kids…depending whether I'm fixed or growth. So trying to be aware of that is probably something that I've been working on and need to do more of."

11. What else do you think I need to know about technology integration or you as a technology integration specialist?

"With the technology I think it's very effective with these kids because they, this is their world so if we can get the technology in with them I think it's just going to raise that bar for expectations and we can get to them a little bit easier. At the same time I've noticed that when people want to integrate and use technology it's nice to have ideas right off the bat and give them some information and knowledge so they don't have to do all the research, you know, especially classroom teachers is what I've learned if I can give them ideas at their grade level, how to use this and they get it to use it right away then they are more apt to use it but if I just show it to them and be like "Hey this is cool" and show it to them, they're not going to take the time to play around with it."

Appendix 10: The Interview Results (Pseudonym: Toni)

Interview #2- Toni

1. Okay, so first question; your position at work is a very specialized one; tell me about your story as a technology teacher? So, the process that shaped your decision to pursue, enter, and remain in the career of teaching technology.

"Well...I. was a fourth grade and fifth grade teacher previously in different, I mean I taught in City 1, I taught in City 2 and…Taught here and when we moved here I taught, I decided to move from City 2, I loved, I really liked City 2 but… and I was a...a..kind of like our SIS was I guess, SIS is kind of like similar to that I would do that half time in City 2. So, I was...I was a literacy learning coach and fifth grade teacher, so half and half. And…In City 2 and I really like that, I liked, I was kind of surprised that I liked kind of getting out of the classroom a little bit, but I didn't know for sure. But I came back and I taught at XXX and JXX and I had a pretty good rapport and…I started looking into, because… this school had one-to-one, had a one-to-one… when we opened, had one-to-one devices, and I was really excited about that, because...you know I had never worked with computers, but I explored, I thought I went to the university and took a couple classes, and on educational technology with XXX. She was the intern at the time and now she is, I think, something else at the university but… And I forget the professor's name but...and loved, I mean, all the ideas that we came up with it was great and started implementing them in the classroom and I loved using computers. I just loved it. We did all kinds of stuff with it, and… XXX decided she was not really interested in being the computer teacher here, so I said "Hey!" I raised my hand. "I might be interested in that." I talked to JXX and that's how I became the computer teacher so, and I really like it, I mean, there's pros and cons, it's a different job than the classroom teacher…I feel like, you know, but I like it, you know, a lot so."

"Okay, thank you."

2. If you were mentoring a new elementary technology teacher, what advice would you give to that person about integrating technology?

"An elementary technology teacher? Someone who does my job?

"Yeah"

"Well, number one I would say, you know, we as technology teachers are supposed to teach the basics of our programs and things like that but if you can find a way to not just teach, you know, this command does this and this command does that, and really kind of go maybe more project based kind of thing, that's a little bit easier. I think it sinks into their memory a little bit more...Does that make sense? Try to do something more that involves the kids, gives the kids ownership and makes them really push towards learning it."

3. All right, the third question...describe your relationship with technology now.

"I feel like I know a lot about technology, but I don't know, I mean, I feel like I am not way up there. I used to really be, I feel like I used to be very, very involved and be learning the very top and know exactly what's going on in the world of technology education, but I feel like I kind of almost backed off of that a little bit because I feel like I haven't...I don't know, I haven't...I would come and I would bring an idea and it just would get shot down. I bring an idea and like Skype, we didn't have Skype for like 3 years and I kept on going "We need Skype, we need Skype, we need Skype," Now I don't even, we don't even use it, and I should of but I mean there were ideas, I remember when the Japanese, you know, the earthquake happened. I had a friend in Japan that was willing to Skype with us and talk about the earthquake and we were doing, fourth grade was doing national disasters, I'm like "AHHHH, this is like awesome he's going to tell us all about it, dadadadada" and we couldn't get Skype and I was just like, and I feel like, like gosh why not, you know, that kind of thing so that's my thing technology now I guess I don't know if that's really what you were intending to, where you were intending to go, I don't know."

"No yeah, that's great."

4. On a scale of 1-10, with 10 being really comfortable, how comfortable are you with technology.

"Well I would say 10 but that doesn't mean that I know everything for sure, I mean I think there's so much stuff out there and everything changes so fast in technology. I just feel like I feel comfortable with it. Like I could learn about it and be fine. I'm not scared of it and that kind of thing. Does that make sense?"

(4b) So, how do you think that happened, how do you think you came to the point where you could say that "yes" you know, you're at a 10 with being comfortable?

"I think just playing around with it, using it in my personal life…I don't know, I mean I think I saw the benefit whenever I would do a few little tiny projects that, you know, how it benefitted the kids and how the kids were so engaged in it that it made me want to learn a little more, so, that make sense?"

"Yes, thank you."

5. And, kind of the same type of question, on a scale of 1-10, with 10 being the most effective, how effective do you feel you are at teaching technology?

"I would say I have room to grow, I mean I would say probably an 8. I definitely, I feel like, I mean I wish I could, I feel like have just such time crunch an I've got to get over that kind of thing. I've got to get over that mind block. I don't know. Whenever we do like, when I do large projects with the kids, which is what I want to do, you know, a lot of times I don't, I mean, I'm going to do like the ones like the project based learning kind of projects and the real, you know, I'd love to do that kind of thing but I feel like its just, there's just so…It's hard to do that in this job. It's difficult, you know, to keep that going for, you know, 5 weeks or 6 weeks because that's only 6 class periods so that

would be like a week, you know, in a regular classroom. So, I feel like I could expand on that."

"Okay, thank you."

6. How have you explored ideas for using technology?
"Well there's PD at school, there, I've gone to conferences, I've went online, I follow certain people on Facebook, on Twitter, you know, different social media…and talk kind of just back and forth to them, other teachers, collaborate with other teachers."

Have most of these that you just listed, you know the PD, conferences, online, Facebook, twitter, talking to other teachers, have these been mostly district initiated or initiated by you??

"Mostly by me. Some by the district though."

(6b) Can you think of some specific examples of explorations you've done and you've tried for your own learning?

"Maybe just recently or…"

"Recently, or…Well in the past I have, I remember the first time I got on…I kind of was introduced to collaborating via social media, is with something called Plerk…Do you remember Plerk? I don't know if you remember that or not. I like that so much better, it was before, I mean, Twitter was around and people liked Twitter, but I didn't like Twitter so much because it was hard for me to follow. Like I didn't have, I don't think at that time they had like the tweet deck and all that kind of stuff out, and so…but they had, it ran, it ran the conversation under neither the question and it was more like Facebook for education, I don't know, I don't know how to explain it, but, and I love, I mean I love that and there's a great group of people on there and you could ask a question and boom you'd have about 15 answers, you know, and there were places you could start looking, And I love that, you know, I don't know."

"That's a really good example, thank you.'

(6c) Some of the questions on the technology survey, remember I surveyed you awhile back, I surveyed you on technology and then also on mindset. And some of the questions on the technology survey suggested that you felt like possibly you still had some room to grow with technology education, how do you feel this affects your teaching?
"Well I think as an educator we're always "on", we always have to just be continuously looking at new things, what's out there and technology especially changes so fast so.

"Thank you."

7. When did you first start incorporating technology within your teaching?
"Hmm, probably, well, probably my first year of teaching. I taught back in, near…down by XXX actually at a little school named EXX Elementary and we had, I mean it was not the greatest school, you know, it's not, they'd have drive-by shootings, it was awesome that way, but I remember going into, we had a computer lab, we had two, actually we had two computer labs. We had one that a Para assisted in and they basically ran a program and the kids just stayed on it and she basically sat at the desk and was just like a babysitter. And then, I would take my kids into the computer lab and we'd run like Oregon Trail or I'm trying to think of some others, there were other like little games and it was all, I forget what she called it computers, but it was like basically, I think they were Apple but they were black with, you know, like the green screen kind of thing. Yeah.

"I remember that, yeah."

(7b) How long then have you been using technology within your teaching?
"Like ever since I've been teaching, you know, so what does that then, I'm 46 so then probably, what am I 22/23 years in, or something, 22.

"It goes so fast doesn't it?"

"I know I didn't think I was over the 20 mark yet, good gravy!"

8. Okay, question number 8; in your use of technology during teaching, do you consider yourself a novice or an expert?
"I would say in between. I don't know, I mean I know some things but not all things, does that make sense?"

"Mhmm."

(8b) To better frame this question, on a scale of 1 to 100 with 1 being novice and 100 being expert, what number do you give yourself?
"Ehh, 65. I guess. I mean I know a lot, like I said I know a lot of things, but there's a lot of stuff out there that I don't know."

9. Okay, question 9; what are some of the goals that you set for yourself this year? "Like the goals that you sent us on the mindset checklist, or?"

"Either that or also in addition."

"Well…I know for instance one of the things that was on the survey last year, the only thing I had like two parents comment on how they would like to see more coding in the classroom, coding. And so, and I…I agree, I mean there are so many things we are supposed to kind of hit. It's kind of hard, but… one of the things we did, I did, was I applied for a grant for PTA and I got Ozobots or whatever so those are, that's coming my way so I'm going to have to try to figure out how that all is going to run and I've…I tried to find, figure out what like, I went to a…a little…a coding workshop this summer and it was an hour of code workshop by XXX, I want to say that's her name, I follow her on Twitter, but she…she showed us other things other than just hour of code kind of stuff, and it was really cool a lot of the robots and makey-makey boards and all the things that she could do, I thought "Oh, this is perfect!" you know, this will be perfect, you know, to get. But…you know, there's a certain budget that I have and you know I only have like $150 why I can't go that far, so, anyone that's one of my goals this year, to kind of look into some coding things and trying to expand that a little more."

"Okay, what was, was there another goal besides coding, or was that kind of your…"

"Well, I also, last year…whenever I had my review…XXX and I talked about…that she's like "Well how can you differentiate within the classroom?" It's kind of hard, its just, it's just difficult with the time crunch but, but um…one of the things that we did, I did, we have to go over word processing things and in fifth grade when you're doing word processing, that 60% of the kids know how to do most everything that you, I mean, a large portion can kind of breeze through it pretty fast. And…so…I've created some tutorials just for Microsoft Word on some different commands and things like that basic commands that they should know and then, you know, how to do, work with margins, how to work with…just things like that, and the kids that, and then they have to create a word document on their own, and I know that's kind of, I mean that's kind of stale to tell you the truth to have to do that but if they can get that done in a few, you know, 1 or 2 class periods and then the kids that do breeze thought it they can do other things, you know and they can move on, so, but…I would, you know, we are going to go over that a couple of 2 or 3 class periods and then we're moving on to something else, so, we'll be more exciting."

(9b) For each of these goals, on a scale of 1-10, with 1 being easy and 10 being challenging, how achievable are each of these goals?

"So let's start with coding, one 1 to 10, easy or challenging?"

"Well I think the coding was more challenging because…I don't know, 9 I guess because it has taken a lot more effort to come up, you know, going to a workshop, you know applying for a grant, trying to find, figure out what little robots or what little this or that would work the best for our children, doe that make sense? And…and then…but, and then the differentiation, I mean I feel like I've done that before, some of that before, so I don't know if that's that hard, I don't know, maybe, what 5, I don't know.'

10. Okay, and with mindset being one of the district and building goals, what are your personal mindset goals?
"Oh gosh, I don't even remember, I think I wrote something down that we did at a staff meeting, gosh. It was probably, I mean, XXX is big on the SAMR model right now and I probably did something on the SAMR model, I imagine but I haven't done too much towards that, I mean, I feel like I kind of, I'm like one of those people that are kind of like squirrel, you know, yeah I get distracted I go "Oh, I'd rather, I'd like to do this, this would be something…" you know…and I shouldn't probably be like, I should probably be like, be the closer on some things, you know, but, I…I don't know, but that was one of them I think is trying to…move closer to I think, well remember, I don't know if you remember that she , when we got the, the sheet we are supposed to kind of give a general spot as to where we are at in the like overall, and that was kind of hard because I couldn't always see that as per project kind of and so it was hard, it was difficult for me to figure that out and to move out of that, you know, in my head. But…I don't know, I'd like to move closer towards you know moving up on the scale in that but sometimes it happens sometimes it doesn't, I don't know."

"Do you have any personal mindset goals?"
"Trying to continue to look for workshops that kind of thing or look for new ideas via social media that kind of things…I guess."

"No this is great, thank you."

(10b) Kind of another part to my question on mindset; what are your opinions about mindset being one of the district goals?

"As far as moving people towards their own personal learning, is that kind of what you're thinking? Or moving like trying to get out of a fixed, I think that's good I mean I think, I think it's good. I think some things…I think sometimes people get stuck especially, you know, I could see, not so much anymore but over my years as a technology teacher, I remember trying to get teachers to use technology, and think this is so cool you can do so many things, the kids love this, dadadadada, they're engaged, and there were older teachers, I'm not trying to pick on older teachers all the time but there are teachers who have been around for a long time that just kind of went "Yeah, not for me." And wouldn't even try and that just like frustrated me to no end, you know and I'm like "But it's cool", you can, you know, there's so many things you can do, you know."

(10c) Still also kind of with mindset; the results of the mindset survey that you took did show that you're not necessarily labeled with being, with having a growth mindset, it still suggested that you still have some areas that are fixed and still maybe some that are kind of a growth, how do you feel this effects your teaching?

"I don't know, I would say its good that I grow, but I mean, I think there's some, sometimes there's things I think I've been around long enough that I see, maybe its just because I've got some years on me in the education field, but I've seen things come full circle. Some things come full circle several times, you know, and some things are labeled as new and we've been doing them for years, you know, I mean project based learning, some of the things there, we've been doing, I, you know, for years. So, I don't know. I don't mean to be stuck on some things but there's some things I'm just like "Ahh" it's the same things, you know, or this or that."

11. Okay, and my last question; what else do you think I need to know about technology integration?

"Well you're the queen, what are you talking about! Queen for our district."

"I guess; I mean in your personal environment what else do you think I should know."

"Ehh, I don't know, I mean, that, I don't know, I don't know what to tell you, I mean I think it's difficult to get everything in like that's probably the non-growth mindset or whatever the fixed mindset, to be saying that to you. It's hard for me to wrap around, I need to break out of that shell, I know, but to break out of the 'we only had this amount of time'. I just don't know, I don't know how to do that, and maybe, maybe you could help me with that, I don't know. You know, to break out of that, and find some new things…anyway."

"Okay I think that's good."

Appendix 11: The Interview Results (Pseudonym: June)

Interview #6- June

1. Okay, so first question; your position at work is a very specialized one; tell me about your story as a technology teacher? So the process that shaped your decision to pursue, enter, and remain in the career of teaching technology.

"...I've been teaching for over 30 years and have held many positions...right before I was in technology class I was a 5th grade teacher and because I had done so many things I'm always looking for what's the next thing to keep growing with and the district decided Paras could no longer be the technology person and it had to be a teacher person."

"Do you remember like what year that was about?"

"...It's been at least 12 years ago, but probably longer than that because I think our 20th anniversary for this building's open it was probably 18 years ago probably if I had to guess."

"Okay thanks."

"And so at that time there was no district curriculum. It was just pretty much, get kids in here and experience technology. I knew nothing about technology. I was at point zero. I did not play on a computer at my house...so I just said this is another growth thing and I can see how technology can help and motivate and that's where the future is going to be, so I asked to try it. Like I said I didn't have to give grades for a couple years, I had no training, there was nothing offered by the district, it was pretty much jump in feet first and go for it and over time we've had many different changes...we've gotten to where we have curriculum, but it is kind of broad, it is kind of hard to know unless you work with kids at this age, what part they are stumped on and so things for me have never remained the same because I'm always having to grow with what my students do or don't know and what technologies are changing and then try and always match that with what do I think they need to so when they go to the classroom they can be successful by using that there because the teachers don't know how to teach technology in the classroom, they assume the kids know how to use it which is a silly assumption, though it's always growing and changing."

"Yeah thank you."

2. If you were mentoring a new elementary technology teacher, so let's say like a student teacher, what advice would you give to this person about integrating technology?

"I would say you need to do what your building goals are, because I feel like this position is to help what's not being covered in the rest of your building or things that they expect and so if you give kids too much overload of always doing safety, safety, safety, you don't get everything covered but if no one ever covers safety, that's a problem or if their other classes never cover something then you're there to fill in the gaps and always keep in touch with every time a principal changes. Definitely their technology view is going to change so always make sure you talk with your new leader, like we have a new

principal and I went in and asked him "What are you looking?" here's what I've been doing, what do you see you want me to do differently, because at sometimes the principal's will tell me things that I don't necessarily agree that, that's my function because that's what the building goal is, I have to change up my classroom and do what they say…so they might be on a real writing initiative where we end up doing way more creative writing than I would ever do, but I'm here to be part of the community so I can't be that…that road person, I've got to fill in the gaps , that's probably what I'd tell them is most important."

"Alright thank you."

3. And then question 3; describe your relationship with technology.
"Are you talking about with hardware, software or with the administration technology, how am I interpreting technology?"

"…Yeah just any relationship that you have, you know, with technology that you would use in the classroom and teach, what would your relationship be with that? So, would you say its, you know a love hate relationship or is it more love than hate as far as if you had a relationship with the technology?"

"I don't, I don't think about having relationships with non-human objects or non-alive objects…obviously I guess I don't hate it or I would have changed my job long ago. There are times that I get very frustrated in the fact that…as a user I'm very good at adapting around technology glitches but when technology glitches happen and I'm the leader of a bunch of 5 year olds and they're crying because it doesn't work it can turn into a very frustration level and it makes you stay up at night waking up in the middle of the night just going "I don't know how to fix this" and I don't know how to keep my kids motivated and happy and not want to, I think that's the biggest hardest thing is understanding as elementary kids they're so dependent on you of that level of comfort and if you overload them with exploratory things they don't like that with technology when they're learning something new and…those are the nights I wake up at night and I can't fall asleep is because something's wrong with the technology and I'm just brainstorming how can I make it successful for my class, so."

4. Okay, on a scale of 1-10, with 10 being mostly comfortable, how comfortable are you with technology?
"Probably at 7."

(4b) And how did that happen?
"How did I arrive at a 7? How did I pick a 7?"

"Yeah."

"…I think I'm comfortable in knowing, kind of my grade level of kids and just having the experience working with them and my experience in knowing what they need to overcome at their age level and I'm probably not at a 10 because I honestly think

there's maybe too much technology being thrown at too young of kids and so I don't go and explore it because it's kind of like putting the cart before the horse. I think middle school is more the thing where they have gotten more "I'm a learner, I can problem solve, my life's not destroyed" so I just have chosen in my own personal life not to overwhelm myself with technology, I don't even own a cell phone because I'm that just like, I hear too many things about, you now, cyber bullying and teen suicide's going up and I'm like "Okay, if I believe this what can I do to make a stance and my stance is, I don't need a cellphone, I have an I Pad I can figure things out, I have a landline" I don't know I just, I think sometimes people overkill something and sometimes I worry that in the elementary level they overkill technology for little kids so."

"Okay thank you."

5. And number 5, kind of the same or similar question; on a scale of 1-10, with 10 being really effective, how effective do you feel you are at teaching technology?

"8 ½…like I said I think I really tune in to where the kids are and what they don't know and don't just assume, so for example my kindergarteners came in and none of them had used a mouse before, they're the swiping generation and I think I'm pretty good at recognizing that and then realizing I'm very reflective of what I do every day and I go back and think "Okay for this group, that's not what they need" and I'm pretty good at researching that and I'm savvy enough to know yeah I'm probably not perfect and I'm missing the boat…maybe by not doing some other things I could be or especially if I have kids with extremely special needs that I don't know enough about other ways to do it like if a kid refuses to type I'm not as aware of apps to help them to learn how to talk type and things like that just because honestly it may be only one out of 500 kids and I figure that's someone else's job to help me with and if they can't help me I kind of just do the best I can, so that's probably why I don't give myself higher, is for the special need kids too."

"Yeah, yeah, yeah."

6. Number 6; how have you explored ideas for using technology?

"…Like I say I communicate with my building a lot to see what they're doing in different grade levels. I try to go to different conferences and think through in my building is that what I need, am I going to continue with that, you know, I Camp or Mace or watch the things online go to industry things. I usually will attend one just to make sure I'm exploring new ideas and then I pick and choose which ones I think my building's wanting me to do and I try to just keep going to them. Definitely try to network out and talk to other people across the district, you know, that I know use a technology I'm trying to develop…I have an idea right now and I'm torn between two apps that I want to try so before I pick one I'm going to go get someone else's suggestion, so I think that's how, yeah."

"Have these ideas, like going to your colleagues, going to conferences, you know, networking with district folks, have these been mostly district initiated or initiated by you? "

"…I'd say I've picked some and the district's picked some so it's kind of both, yeah I definitely think both. I think the hardest part is the ones that I pick and I go to and I, and you've got to remember I've done this for so many years and it's hard to get rid of old baggage on your shoulders that I'd go to conferences and then we'd immediately get back and we'd tell someone about this really cool thing all these school districts are doing, and they'd say "Oh no, no, no our system won't do that" and so you're all build up and had all these great ideas and then its torn down and then into a year later you get a teacher whose earning an award by doing the exact same thing you just asked to have done but you got denied and I think enough of that…hurts your feelings of the reality of it. It plays in to what you pick and choose to do, yeah so."

(6b) Can you think of some of, you know, the ideas that you've taken away from some of these things that you've tried recently in your classroom and share one of them?

"…I think trying to get more multimedia in, just trying to get kids to do different things, understanding videos and voices and that instead of maybe from 5 years ago where everything was more just either in Publisher or in Word or in Excel and trying to get them to that next thing of understanding about that they can be a creator and how their voice sounds and how to use cameras and how to make files with it the only problem with it is I found that when I do those projects it's hard because you have an hour and then you have to wait a whole week before you go to the next step on that project and for 7 year olds that's a really long wait or if they've missed a day and they're a day behind there's no time to make it up…it's a very time intensive thing when you're working with multimedia, that's the biggest hang-up is that only my oldest kids can handle that unless you just have a little snippet of just one thing that doesn't matter much like right now I'm thinking of my 2nd grade doing something and I'm really trying to break it down and how can they make it be just one day chunks that makes sense to them and that's the hard part."

(6c) Some of the questions on the technology survey awhile back that I had you take, I think I had you take 2 of them there was a technology related one and one on mindset and some of the questions of the technology part of it suggested that you do feel like a little bit low in some areas of tech but then comfortable in other areas; how do you feel this affects your teaching?

"…I don't know. I tend to be one, like I said when I'm teaching the younger kids I always try to make sure I understand the technology fairly well just like I just had a class left and as I'm looking around a group of 25 and one is almost in tears because they're screen went whack-a-doodle and all they did was hit a different view button and to them that a huge difference and for me to pause to go and problem solve and if I don't know an app then I feel really uncomfortable because everybody else asks me when this happens in the class and that's when other people get exploratory and they mess theirs up and so I feel like I have more behavior problems when I don't know something fully and I have more tears because they're upset thinking I don't want to help them which its really I do want to help you I just don't know how because I don't fully know the app and

they're not comfortable being explorers that way yet, you know, on a game maybe but when it comes to a project and they know its suppose to look a certain way it really upsets them and so I think as a teacher I'm more reluctant because I don't like that, I don't like seeing them cry, I don't like seeing them give up on themselves because they are not in growth mindset yet. I think I as a learner have a very growth mindset but I as a teacher want to be extremely comfortable so I can keep my kids comfortable so they don't want to shut down on me."

7. This is going to ask you to think back awhile, number 7; when did you first start incorporating technology within your teaching?

"It probably wasn't until I came to be a technology specialist because when we were in the regular classroom there was not enough materials and yes for my high flyers I would have them go and do, and I guess it matters what you call technology because back then we didn't have laptops, I mean, back then I guess you would consider technology as a video camera which I took this thing on economics because I have a business degree and the kids had to design a zoo and they had to go and explore and research on this which we did but then they had to do many things with it and they had to create the environment and they had to create and advertisement to get people to come and so we pulled in video cameras for that so I guess for the day that was technology because we didn't allow kids, everyone to have one on one or two on one. When there is one computer for the whole class that's a totally different use of technology than we have now. So, I guess I always kind of dabbled in it, what I could but it want my focus it was more of if this technology can make the earning enhanced I tried it, I just didn't do technology. And of course that all changed when I was asked to be this because that's all I did all day long."

8. And number 8; in your use of technology during teaching, do you consider yourself a novice or an expert?

"Well, I consider myself to be an expert because like I said I want to make sure I feel comfortable with it, now do I know everything about that app, no way, but do I know enough for a 5-year-old a 6-year-old, definitely… For the things that I don't feel an expert at I mean cause there's, I don't think anybody could say they're an expert at all technology, if so they're being insane. There's too much out there. There's always something more to learn so, it's almost like saying are you good at foreign language, well I'm pretty good at English, I'm pretty good at Polish or something but you don't know everything so…that's a hard question."

(8b) To better frame this question, on a scale of 1 to 100 with 1 being novice and 100 being expert, what number do you give yourself as far as knowing your technology use if you were to label yourself as a technology expert or novice, where would you be on that scale form 1-100?

"Probably 60."

"And why is that?"

"Because when I'm looking at technology as I think about how to do it for this age group of people and so I don't expand past that and I know there's way more out there that middle school, high school have the time frame to do in and I don't take the time to go learn how to do Photoshop, I don't take the time to learn how to do other things because there's so many choices and none of them appeal to me personally. I just do what I think is appropriate for my age group and so that's why I only pick 60 because I don't explore all the bells and whistles that they do in highs school and college."

"Okay, thank you."

9. And number 9; what are some of the goals that you set for yourself this year?
"Goals as far as what?"

"Oh, like your mindset goals."

"I'm on Keep this year and so that teacher evaluation…I guess my things this year, my goals this year was to make sure that I'm understanding what the state of Kansas wants from me and that how I can reflect the growth through what they want, because teaching is more than knowing technology and as a teacher I try to be well rounded and I'm a part of the teachers association so I try my professionalism…I try to be a team leader in the building so technology is one small part of what my growths are but then I have other areas that I know I need to go in. One of the district initiate is use growth mindset and I will pick at least 1 area every day that I talk to some group with about it and I try to get that vocabulary out with them so I kind of guess growth mindset has been a goal of mine just to get it out for the kids to understand and like personal examples, I challenge myself to do and the messages I have to give myself so that's been a goal for me this year is to add a vocabulary in for kids to start understanding they are in control of themselves as a learner and so."

(9b) For each goal that you set yourself, so like one, like understanding the Keep and the other one was like the Mindset, for each of these goals on a scale of 1-10, with 1 being easy and 10 being challenging, how achievable are your goals?

"…Probably a 5 for all the goals because I'm a person who looks very broad and I know if you set your goals so minor like I'm just going to learn how to do this one little thing that isn't a goal to me that's just more of an obstacle that you're going to meet, so I set my goals very broad and there's no way that I can achieve, I can't come at the end and say I'm 100% done with that goal because thats not the way I set goals. I set my goals very broad and so I'm just very realistic, I'm going to grow as much as I can. And in these goals that I can and it's not a done deal you just keep growing and growing and growing until you re-evaluate yourself at the end of the next year and say okay, what am I going to look for myself in this year, you know, am I going to, you know, and I totally change my goals, so I don't feel like I ever lose, but I don't ever finish because it's always, it's like in health, you're never done and fully healthy you just keep advancing until you make a new goal."

"And what are some of the more technology related goals you might have set for yourself this year?"

"…Well at the beginning of the year they were totally different than after it started like I said kindergarteners came in and what I typically go over with them understanding vocabulary, understanding a keyboard, what I found out is they totally were way behind the scale from kids 2 years ago so my goals had to change as far as grade level goals what I'm going to do with them...as far as a new thing that I put in because technology is always changing you've got to look for the new thing happening, I think I tried to look at well where does the district want me to go with new things this year, are we going to keep using this like such as the filing system, are we going to still keep saying on the home drive or are we going to cloud? I had all my classes set up to teach all the kids about one cloud and then found out the district isn't doing that so then I had to take that off my goal list and go back to, because I'm not very familiar with one cloud, it was new to me, and same thing with like…which version of Word do they want me to use, you know, 365 or that and then I had to make a decision well what works in my community so I guess my goals are always look around my building and see what they want next to use in the classrooms and make sure that I'm trying to prep the kids so they are a little bit more successful in the classrooms with it."

"Thank you."

10. Kind of going back to the question about mindset; what is your opinion about mindset being one of the district goals?

"I think it should have started a long time ago. I think me as a personal learner I am a growth mindset learner…I take on challenges, I embrace them, I do it in my personal life, I do it as a learner but I know not all children are that way they like to be in the safe zone. So, I think it's something that we need to teach kids that they are in charge of their own learning, the huge monitor of how they, how it's going to affect them and…I think more needs to be done to help kids, so they aren't just lingerers but actually thinkers and problem solvers."

(10b) Your results of the mindset survey showed that you had you know, some growth mindset areas but then also some fixed areas, how do you feel this affects your teaching?

"I guess my view of growth mindset might be different than what I'm seeing other people because I again look at a statement and if it says "All people can succeed at dadada" I'm like well no all people can grow with it but not all people can succeed with it, to me that's just a semantic thing and they are questioning, because I think of my kids here in my special education program and I've got some who will not succeed at keyboarding, it just isn't age appropriate right now for them and it may not be age appropriate ever in their whole life. I don't think they can succeed at everything I think they can find things around it, I think they can find other opportunities to make a use of technology to what they want, but I kind of don't believe that everybody can do everything. I think everybody can grow and get better at something but I don't think everyone can succeed at everything, I don't believe that."

"Thank you."

11. And then my last question; what else do you think I need to know about your position and teaching technology?

"You as a what?"

"Oh, what else do you think I should know based on like the questions that I've asked you here, is there anything you think that I'm missing that I need to know about, about you teaching technology?"

"No…I think part of what you have to look at too is the person, where they fall as a person like I'm very much a rule follower, I'm not very egotistical I don't think people have to do it my way or you're wrong, and I think part of that plays into how you are as an educator and decision maker and I feel like that if I'm told no by someone on something then I need to not think that I know better and fight then harder or go behind their back and do something I'm not supposed to do like when I've asked if I could have some technologies and I was told no, I'm not one then to then fight for that and say by you're wrong and you need to look at this. I tend to be more okay I've asked now what can I do instead of that will still help my community and I think other people maybe have a different stance on that and that's okay that's just the way they're wired. I think that can make a huge influence on how you are as a technology person or choosing to use technology or not is how much you are a rule follower."

Appendix 12: The Mindset Checklist

This checklist will be completed over a five-week time period.

Directions:

- *Please recall 2-5 of your technology-mindset goals (related to work) and list them below, one per week (it is okay if the goal spans more than a one-week time span. For example: Week 1 – Utilize Office 365 with the students; Week 2 – same goal as previous week; Week 3 – use iMovie with the students; Week 4 – same as week 3; Week 5 – use the Seesaw app with the students).*
- *During the week, log if you had any setbacks due to challenges.*
- *At the end of each week, briefly describe your success/effort.*

Week	Mindset Goal	Setbacks?	Success/Effort
1			
2			
3			
4			
5			

Notes / Additional information about the contents above:

Appendix 13: The Mindset Checklist Data (Pseudonym: Diana)

Mindset Checklist

Participant's Name: Diana

Directions:

- *Please recall 2-5 of your technology-mindset goals (related to work) and list them below, one per week (it is okay if the goal spans more than a one-week time span. For example: Week 1 – Utilize Office 365 with this class; Week 2 – same goal as previous week; Week 3 – use iMovie with this class; Week 4 – same as week 3; Week 5 – use the Seesaw app with a colleague).*
- *During the week, log if you had any setbacks due to challenges.*
- *At the end of each week, briefly describe your success/effort. What worked, what did not work? What would you do differently next time?*

Week	Mindset Goal	Setbacks?	Success/Effort
1 Week of: Jan 2	Introduce Coding vocabulary and games to kindergarten and 1st grade		Overall a success! They certainly surprised me!
2 Week of: Jan 9	Continue Coding vocabulary and games with kindergarten and 1st grade	Some kindergarteners had a difficult time reading some of the words in a few of the games. Their partners were able to help them though.	I was so happy that I did this with my younger kids! I will try to build on this for next year.
3 Week of: Jan 16	5th grade students will take their research on a famous explorer and create a Glog in Glogster to share with parents at conferences	I was very nervous. I gave them very basic instruction on glogster. I wanted them to figure out a lot of the program on their own.	It was very successful. They really took the task head on and was not afraid to try new things. Some created a video or audio.
4 Week of: Jan 23	4th grade has been researching a Famous Kansan. They will take their research and put it into a brochure in Publisher. I have never created a brochure in Publisher before.	I made sure I was very familiar with the template first. They were a little frustrated with the formatting and struggled with where, when, how to type due to the layers of boxes.	In the end, this project was successful and I would do it again. I would change my instruction a little so the kids would understand the layering of the boxes in the template.
5 Week of: Jan 30	4th grade has been researching a Famous Kansan. They will continue to take their research and put it into a brochure in Publisher.	I made sure I was very familiar with the template first. They were a little frustrated with the formatting and struggled with where, when, how to type due to the layers of boxes.	(it took 2 class times for them to finish and print) In the end, this project was successful and I would do it again. I would change my instruction a little so the kids would understand the layering of the boxes in the template. The kids were very excited with the outcome.

Notes / Additional information about the contents above:

This entire school year has been a mindset change for me☺ Each of the goals above are things that I have never done before. I was nervous for all of them. I tried to make sure I understood each program/game before I explained it to the kids, however they always seem find something that I may not have an answer to. All were a success and I am excited to build on them next year.

Appendix 14: The Mindset Checklist Data (Pseudonym: Sandy)

Mindset Checklist

Participant's Name: Sandy

Directions:

- *Please recall 2-5 of your technology-mindset goals (related to work) and list them below, one per week (it is okay if the goal spans more than a one-week time span. For example: Week 1 – Utilize Office 365 with this class; Week 2 – same goal as previous week; Week 3 – use iMovie with this class; Week 4 – same as week 3; Week 5 – use the Seesaw app with a colleague).*
- *During the week, log if you had any setbacks due to challenges.*
- *At the end of each week, briefly describe your success/effort. What worked, what did not work? What would you do differently next time?*

Week	Mindset Goal	Setbacks?	Success/Effort
1 Week of: Jan 2	Use the website, "Hour of Code" with 1st Grade.	• After practicing a few basic coding blocks, the game inserted a "repeat" block which was confusing for them, proving to be difficult to master.	• High level of interest and every student was on task working at their own pace.
2 Week of: Jan 9	Use Office 365 with 4th Grade to print a picture of a bug for their science project.	• In trying to keep students safe from inappropriate content, the filters limited the selection of pictures available.	• By the end of class each student had successfully searched, saved, and printed their picture.
3 Week of: Jan 16	Through the use of the board game, Bloxels, 3rd grade students worked collaboratively to create a video game on the iPads.	• The game directions are very vague. I finally found a video online that described it well. • Too many options within the game proved to be overwhelming for some students.	• Students were very excited to create their own game and they were engaged throughout the class period. I did not have any behavior management issues. • Students were excited to play each groups game
4 Week of: Jan 23	Have 2nd grade learn to code Sphero's through the Lightning Lab app and shapes made out of tape on the carpet.	• Wi-Fi connection was not always strong which meant some iPads and Sphero's would not pair quickly. • Students would forget to "aim" the Sphero before clicking "start" to watch their coding. They would have to start again and aim it every time they wanted to see the Sphero move using the coding they provided.	• Students who typically are quiet in class were smiling and taking an active role in the is project. • Students were excited and animated when they accomplished the goal of coding one line of the square accurately.
5 Week of: Jan 30	Through the Do Ink Green Screen App and iMovie, 5th grade students performed commercials for their music program and turned them into iMovie's that will be shown to parents at the musical.	• Students came unprepared and taping took quite a bit of time. • Finding the correct background for each commercial in front of the green screen was time taxing.	• The finished commercials are amazing! • The commercials look more authentic with specific background. • Through both iMovie and Do Ink, it was friendly to piece segments together when many takes were required.

Notes / Additional information about the contents above:

Appendix 15: The Mindset Checklist Data (Pseudonym: Toni)

Mindset Checklist

Participant's Name: Toni

Directions:

- *Please recall 2-5 of your technology-mindset goals (related to work) and list them below, one per week (it is okay if the goal spans more than a one-week time span. For example: Week 1 – Utilize Office 365 with this class; Week 2 – same goal as previous week; Week 3 – use iMovie with this class; Week 4 – same as week 3; Week 5 – use the Seesaw app with a colleague).*
- *During the week, log if you had any setbacks due to challenges.*
- *At the end of each week, briefly describe your success/effort. What worked, what did not work? What would you do differently next time?*

Week	Mindset Goal	Setbacks?	Success/Effort
1 Week of: Jan 2	Create a way to not waste time of those students that excel in MS Word but have extended learning.	Not all students are finishing within the time given. Time Adjustments needed.	The students who I targeted benefitted because they got extension time. I was free to help those that needed it.
2 Week of: Jan 9	Explore new projects/uses of iPads.	Not a lot of information. Most knowledge gained was for personal use.	January 13 attend The KState iPad Conference
3 Week of: Jan 16	Explore using the Green Screen App to create a new background possibilities for book reports.	Reliable iPad mirroring tech…It was difficult to do this without mirroring tech through my computer. I started having issues with reflector disconnecting. Some classes…behavior issues.	The kids all created their backgrounds for use in the book reports. They liked getting to choose something they enjoyed.
4 Week of: Jan 23	Explore Ozobots: how they work.	No Ozobots yet…ordered first of January. Grrr…. The rep said they were out of one of the colors I had ordered.	Ozobots did not come in ☹
5 Week of: Jan 30	Explore Ozobots curriculum on their website. Look for ways you can use in the curriculum.	I would like to try some of these things out for myself using the robots. They haven't come in yet. Hoping they get here at the first of next week.	Ozobots are not in yet but I have looked at several sites: Pinterest, various educator blogs and the Ozobot site. The Ozobot site has a ton of activities. I found out you can code using Blockly on the Ozobot site and then upload it to your little Ozobot robot. Love that!

Notes / Additional information about the contents above:

Appendix 16: The Mindset Checklist Data (Pseudonym: June)

Mindset Checklist

Participant's Name: June

Directions:

- *Please recall 2-5 of your technology-mindset goals (related to work) and list them below, one per week (it is okay if the goal spans more than a one-week time span. For example: Week 1 – Utilize Office 365 with this class; Week 2 – same goal as previous week; Week 3 – use iMovie with this class; Week 4 – same as week 3; Week 5 – use the Seesaw app with a colleague).*
- *During the week, log if you had any setbacks due to challenges.*
- *At the end of each week, briefly describe your success/effort. What worked, what did not work? What would you do differently next time?*

Week	Mindset Goal	Setbacks?	Success/Effort
1 Week of: Jan4 -10	Use a Word Cloud App for second graders to use with Dr. Martin Luther King	For many students all of their words would not appear, so several students were crying when I could not fix that. Selecting, copying and pasting from Word to app was challenging, Saving it as a download to a picture file was new and tricky for them.	They enjoyed changing the fonts, colors and direction of the word cloud.
2 Week of: Jan 11 -18	Use a Word Cloud App for second graders to use with Dr. Martin Luther King	Still had tears when I could not get all of the words to appear.	This week we typed directly into the app. They were more successful at downloading and saving cloud to their files.
3 Week of: Jan 19 -25	Used an online dictionary to find out the meaning of the Pledge of Allegiance (Learners Dictionary)	Hovering mouse changed the entry word without them noticing. So STAND got changed to ONE NIGHT STAND thus a parent phone call was needed.	Liked the sound icons to hear the words. Good opportunity for partnership problem solving as to which definition was the one to write.
4 Week of: Jan 25 – Feb 2	Record student reading Pledge of Allegiance with inserts of the meaning of the pledge in Audacity	Too many options in this software. Too many students too close together so others voices overlapped. Using it in smaller groups and not a whole class setting would be better.	Use another sound software that has less options available.

Notes / Additional information about the contents above:

Looking for a new technology for them was the most challenging part.

Me not being able to give them suggestions to try made me feel like a bad teacher.

Spending a lot of time asking others what they would use for the sound recording.

Appendix 17: The Observation Protocol

Elementary Technology Specialist Pseudonym: Observation Date:

Technology	Growth Mindset	Fixed Mindset	Self-Efficacy
Empowered Educator	Intelligence is malleable	Intelligence is fixed	High effort for growth
-Learner	Love challenge	Dislike challenge	High challenge/ High goals
-Leader/Facilitator	Stick to it	Easy to give up	Persistent
-Citizen	Quick recovery fm failure	Don't bounce back	Quick recovery from failure
Learning Catalyst	Performance/Lrn Goal high	Performance/Lrn Goal low	Motivated
-Collaborator	Enjoy effort	Effortless teaching	Success from effort
-Designer & Analyst	Mistakes = learning exper	Mistakes = setbacks	Failure used wrong strategy
ISTE Standards for Teachers (2017 draft). Retrieved from: http://bit.ly/2gSyk0E	Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.	Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.	Sewell, A., & St George, A. (2009). Developing efficacy beliefs in the classroom. *The Journal of Educational Enquiry*, *1*(2).

Component of Lesson	What the teacher is saying	Time
Do Now/Warm Up		
Mini-Lesson		
Group work		
Individual work time		
Wrap-up		

Appendix 18: The Observation Field Notes (Pseudonym: Diana)

Kindergarten

Elementary Technology Specialist Pseudonym: D Observation Date: 1-19-17 9am – ~~10am~~ 9:30am

Technology	Growth Mindset	Fixed Mindset	Self-Efficacy
Empowered Educator	Intelligence is malleable	Intelligence is fixed	High effort for growth
-Learner	Love challenge	Dislike challenge	High challenge/ High goals
-Leader/Facilitator	Stick to it	Easy to give up	Persistent
-Citizen	Quick recovery fm failure	Don't bounce back	Quick recovery from failure
Learning Catalyst	Performance/Lrn Goal high	Performance/Lrn Goal low	Motivated
-Collaborator	Enjoy effort	Effortless teaching	Success from effort
-Designer & Analyst	Mistakes = learning exper	Mistakes = setbacks	Failure used wrong strategy
ISTE Standards for Teachers (2017 draft). Retrieved from: http://bit.ly/2gSyk0E	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Sewell, A., & St George, A. (2009). Developing efficacy beliefs in the classroom. *The Journal of Educational Enquiry, 1*(2).

Question: How much of a stretch was this lesson for you?
The whole coding piece w/ K I was nervous to do. Worry that they can't read the more complex commands.

Component of Lesson	What the teacher is saying	Time
Do Now/Warm Up iPad Tynker Lesson to Kindergarten Class 22 stu	+ Recording Started – Sts sitting in front of class for instruction on the projector. Talking about "Commands" – T shows them "Candy Quest" and where they will go to "code". – Sts excited as they see what the Monster can do after you "code" w/ "commands" – Sts instructed to find a partner and	9:00– 9:07
~~*MiniLesson*~~ Group Work	Get an iPad from T. + Recording Stopped – Sts go to various locations on the floor w/ partner to work on the coding. – T walks & assists the teams w/ their coding. "Can I share with you this command" said as she assists one team. – I took some pictures of the Sts working in teams	9:18

Group work	- Sts work through the levels of "Candy Quest" T- "Boys & Girls you have about 6 minutes" 9:21 -Sts are giggling and as they work through the levels I→W/one group "Good Job! Keep Working!" "Can I show you another command..." w/One group.	
~~Individual work time~~	- Sts - a couple of teams had trouble sharing the iPads and who would drag the commands - Sts - two of the groups sitting near me compared which level they were on. - Sts - Another group shouts "We're on level 10!" T- "Good job! Can you finish another one?" - T "We only have a minute left"... "maybe we can work on this next time	
~~Wrap-up~~	- Sts "oh my gosh Anthony... look at this!" - Sts Two other groups comparing levels "let me see!" as they look at the advanced levels and share with each other.	

T- "Class, Class" S- "Yes, Yes" T "Please turn off your iPad and bring it to me please"

S- sit up front for a Wrap Up

T- "Please tell me what a command is?"

- Sts respond...

T- "Please tell me what coding is?"

Sts "Lots of commands"

T- "Please tiptoe to the door..." 9:30

Appendix 19: The Observation Field Notes (Pseudonym: Sandy)

Elementary Technology Specialist Pseudonym: S Observation Date: 1-23-17 10AM 2nd grade

Technology	Growth Mindset	Fixed Mindset	Self-Efficacy
Empowered Educator	Intelligence is malleable	Intelligence is fixed	High effort for growth
-Learner	Love challenge	Dislike challenge	High challenge/ High goals
-Leader/Facilitator	Stick to it	Easy to give up	Persistent
-Citizen	Quick recovery fm failure	Don't bounce back	Quick recovery from failure
Learning Catalyst	Performance/Lrn Goal high	Performance/Lrn Goal low	Motivated
-Collaborator	Enjoy effort	Effortless teaching	Success from effort
-Designer & Analyst	Mistakes = learning exper	Mistakes = setbacks	Failure used wrong strategy
ISTE Standards for Teachers (2017 draft). Retrieved from: http://bit.ly/2gSykOE	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Sewell, A., & St George, A. (2009). Developing efficacy beliefs in the classroom. *The Journal of Educational Enquiry*, 1(2).

Question
- How much of a stretch was this lesson for you?
Pretty much a stretch because all of the up front work, the next was not.

Component of Lesson	What the teacher is saying - 24 stud.	Time
Do Now/Warm Up	- Teacher told me @ start that the App they wanted to use "disappeared" this morning - T gave kids a training on checking the correct Internet & getting the needed app from "Self Service - T "The Self Service is like the DeSoto App Store" "... we need to download an app in order to play w/ the Spheros today."	10:00
Mini-Lesson	- T Explains that the Apps are in alphabetical order. S - search for "SPRK Lightning Lab" - T "We did the Star Wars app ... what we are doing today is like that." T - Shows the start up of the app & to "Continue as Guest" & shows rest of set up for coding. T "You are going to code your Sphero to go on one side of the tape on the floor" T - shows seconds & speed w/in the coding app. T - shows sound	10:07 10:13

Group work 13 Spheros + 20 ipads students work in pairs	T - "Im gonna need your help to get the Spheros connected to your iPads, will you help me?" S- "Yes" T- Shows Bluetooth "when yours says "connected, bring it to me." S- "Mine just connected! Mine just connected Oh, mine connected!" S- Sts quietly talking to each other as they wait for Spheros T- "One two three, eyes on me!" S- "one two, eyes on you!"	10:17 10:20 10:22
~~Individual work time~~ Group Work	S- Team up & get Sphero & go to taped area on floor S- Name project, save, & pick their commands on the app T- Walks around to get some groups set up - other groups are working w/out T assistance. S- Giggles & Laughs from each group as they progress through & try diff. Commands for coding	10:26 10:28 10:37
Wrap-up	S- "Can I drive now... Let's put a diff sound... Checkmark... now I have to aim it... I'm trying to get it back on the line..." T- "I would work on your aim." "Start it so it will go away from you." S- "Yes!" -> one group, as they experienced success w/ Moving through one part of the tape on the floor.	10:40

→

T- "See, aiming is really important isn't it?" – to one group still programing

S- "I'm gonna try 4 seconds... ok, we have to aim it" They pressed play & the Sphero went too far.

→ The Sphero hit my foot, so I moved it on the start of the tape for them. "Thank you."

~~S~~ T- "So you are going a 2 seconds for 90, so what do you want to change? S- "the speed" "aim" "k"

T- "Oh that was so much better, wasn't it?!" "It was going to the side, how to we fix that"

S- "aim" T- "That's right" T "So go that way a little bit... your at 30, so you might want to increase your time.

T- "Bring Spheros back & Put the iPads on the chargers, please..." 10:50

T. Rings a Bell →

S- Talk quietly about what their Spheros were doing. Some use loud voices to describe.

T- "Thumbs up if you liked what you did today, or side ways for so so" 10:53

– All Ss held thumbs up

T- "Good Job Today... please stand up & push your chairs in." ..."Line Up" 10:54

Appendix 20: The Observation Field Notes (Pseudonym: Toni)

Elementary Technology Specialist Pseudonym: T Observation Date: 1-12-17
2:35pm - 3:35

Technology	Growth Mindset	Fixed Mindset	Self-Efficacy
Empowered Educator	Intelligence is malleable	Intelligence is fixed	High effort for growth
-Learner	Love challenge	Dislike challenge	High challenge/ High goals
-Leader/Facilitator	Stick to it	Easy to give up	Persistent
-Citizen	Quick recovery fm failure	Don't bounce back	Quick recovery from failure
Learning Catalyst	Performance/Lrn Goal high	Performance/Lrn Goal low	Motivated
-Collaborator	Enjoy effort	Effortless teaching	Success from effort
-Designer & Analyst	Mistakes = learning exper	Mistakes = setbacks	Failure used wrong strategy
ISTE Standards for Teachers (2017 draft). Retrieved from: http://bit.ly/2gSyk0E	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Sewell, A., & St George, A. (2009). Developing efficacy beliefs in the classroom. *The Journal of Educational Enquiry, 1*(2).

(?) How ~~much of a stretch was~~ this lesson for you?
T-response: Not much of a stretch – what was a stretch was the behavior piece.

Component of Lesson	What the teacher is saying 25 students	Time
Do Now/Warm Up T-Discusses the Background for the Green Screen image for the Book Review.	– (See recording) – Intro to plans – Students give artwork gifts to teacher because she was gone last class – Ss asked to sit up in front for a mini lesson	2:35-2:39 2:40 2:41
Mini-Lesson	– "Some of you... iPads.... go to another site... you have a choice... (OR) go to 2nd Grade links." – T - explaining the 77 games and options avail. – ½ class gets mini-lesson & other ½ work on the Hour of Code games (recording stopped) – Ss get iPads & other Ss sit at Computers	2:41- 2:45 2:46-2:48

Note: one student stayed after class to get personal attention/help on getting his picture onto the green screen. (3:35–3:38)

~~Group work~~ Mini-Lesson (contin-)	(Recording Part 2 started) "Eyes on Me..."	2:49-
	- Videos on iPads - T will send videos "air drop" to students' iPads - T shows students how to save it onto their iPads. Ss listen to their videos while others are getting their's "air droped"... "I like the way you guys are paying attention"	2:54
	(Part 2 stopped)	2:58
	Ss - watching videos (iv) playing Hour of Code while waiting for air drop.	3:00-
	(Recording Part 3 started)	
~~Individual work time~~	- T describes the image process of what & how to get pictures for their green screen project.	
	- Ss search for pictures.	
	- S asked "what do you do when you have your bkgd?"	
	- T shows the next step to save image	3:10
	(Recording Part 3 stopped)	
	- Ss now ready for putting image into Do Ink.	3:12
	- T "Here we go!" - T shows where the search button is, and how to find the Pink Oct. Do Ink.	
	- T "There are 3 layers... start w/ 1st layer... and hit the plus sign... Ss work on this,	3:15
~~Wrap-up~~	- T "That's better, right?" - shows a student a better image option.	3:18
	- (Part 4 stopped)	
	- T "Do you see how to save it to camera roll?" Ss share iPad # w/ Teacher & she logs which iPad # has which kid's video.	3:20-3:24
	- T assists 1-2 Sts. who had trouble w/ picture, and saving to camera roll.	3:24-3:27
Wrap-up	(Part 5 started) - T. "Time to shut down"	3:29-
	- Ashlyn introduced herself to me ☺	3:30

T "I need some helpers..." "You did such a nice job today."

→ Ss help clean up; put laptops away, sweep floors, get wipes out and clean tables.

T "I need to see you ready to go in 5, 4, ... 3... 2... "

Appendix 21: The Observation Field Notes (Pseudonym: June)

Elementary Technology Specialist Pseudonym: J Observation Date: 1-18-17 11:15 - 12:10 3rd Grade Class 26 students

Technology	Growth Mindset	Fixed Mindset	Self-Efficacy
Empowered Educator	Intelligence is malleable	Intelligence is fixed	High effort for growth
-Learner	Love challenge	Dislike challenge	High challenge/ High goals
-Leader/Facilitator	Stick to it	Easy to give up	Persistent
-Citizen	Quick recovery fm failure	Don't bounce back	Quick recovery from failure
Learning Catalyst	Performance/Lrn Goal high	Performance/Lrn Goal low	Motivated
-Collaborator	Enjoy effort	Effortless teaching	Success from effort
-Designer & Analyst	Mistakes = learning exper	Mistakes = setbacks	Failure used wrong strategy
ISTE Standards for Teachers (2017 draft). Retrieved from: http://bit.ly/2gSyk0E	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Dweck, C. S. (2006). *Mindset: The new psychology of success.* Random House.	Sewell, A., & St George, A. (2009). Developing efficacy beliefs in the classroom. *The Journal of Educational Enquiry, 1*(2).

- How much of a stretch was this lesson for you?
Not much because I have done this lesson before. More difficult to remember how to do some of the right click features because I don't do it all the time.

Component of Lesson	What the teacher is saying	Time
	*T uses a Microphone connected to classroom	
Do Now/Warm Up Talked about "Goals" today (Recording Started)	* Keyboarding Skills → Speed / Eyes on Monitor / Pinkie Stretch → Choose your goal for today * bell for end of discussion of goals. * Shows "Type to Learn 4" on projector and has some reminders – Green Checkmark for being done – "then you can play games." * Get headphones – 11:20 – 11:22	11:15 – 11:20
Mini-Lesson (Recording Started Again)	(Recording Stopped after Warm Up) * T assists ind. students with getting logged on / where to go / etc. – walks around for additional assistance. * T told them they have 3 more minutes @ 11:27 * Bell rings @ 11:30 to notify Sts. it's time to stop * T Handed out Data (on piece of paper) – * T Shows on Computer how to get to Excel & assists one Student w/ pinning Excel to taskbar.	11:23 – 11:30 – 11:32

Group work	– T showing on projector the cells on Excel – Cells are like Battle Ships w/ Numbers & Letters – "See if you can finish the rest of the A column" → (Recording Stopped as T walks around and assists) – "Are you like me when you make mistakes when you spell?" – T says to kids – and shows them the Spelling helper – T shows how to make columns wider	11:39 11:41 11:43
Individual work time	– T shows how to use the numeric keypad on the side of the keyboard, and directs Sts. to fill in Column B. – Sts then work on Column C – T walks around... – "You are a pretty good typer"... "You can click here or here... you have two choices." "I don't see any changes on yours, looking nice." – Comments made to Sts. – – T shows Sr how to make the spreadsheet bigger... easier to see	11:45 11:48
Wrap-up	– T shows Ss how to highlight some cells for a graph... Walks around to check Sts work. Sts who are done are talking to each other quietly. – T directs Ss to drag & highlight over the cells. Sts do this and then talk quietly as T answers a S question	11:50 11:53

T - shows Sts how to select "Insert" and "Graph" & "2D Bar Graph" - Sts Do this and then talk louder while waiting on teacher to answer questions from a couple sts. 11:56

T - shows Sts how to change the size of the chart & re-position chart - Rings Bell to stop the sts from talking 11:58

T - shows them how to change title in chart & asked them to discuss what to title it w/ a neighbor. Rings bell. Asks Sts to respond. "Good idea" "Another Good idea"... "I agree" 12:00

T - directs Sts to change the name of the Chart title. - and T walks around to check their work. Sts talk quietly while waiting for T to answer Ss questions. 12:04 12:05

T - Rings Bell - Tells some sts to change their background color of their chart back to the way She has hers. "We will have play day some other time, but not today." 12:07

T - shows sts how to change the color of the bars in the chart graph. Sts work on changing color. T. walks around to help st. One student gets up to help his neighbors, other sts near me talk because they are done. 12:09 12:11

T - shows Sts how to right click on bar to select a "pattern fill" instead of a solid color. Sts work on this & T walks around. Sts talk when finished. 12:13