IMPROVING MIDDLE SCHOOL TEACHERS' SELF-EFFICACY: USING ACTION RESEARCH TO TRANSFORM INSTRUCTION TOWARD STUDENT-CENTERED LEARNING ENHANCED WITH TECHNOLOGY

by

DONNA JO DILLARD

(Under the Direction of Sheneka Williams)

ABSTRACT

Societal demands for educating students for college, career, and life readiness requires students' abilities to include problem solving skills, collaboration, and technology skills. The purpose of this qualitative action research case study was to investigate, develop, and implement effective instructional practices to increase teacher self-efficacy for using student-centered technology enhanced learning. This action research study sought to understand barriers and successes that teachers encounter when implementing student-centered learning enhanced with technology and how to increase teacher self-efficacy to transform instruction toward implementing this instructional strategy. Seventy middle school teachers completed pre-surveys, and nine teacher intervention participants completed interventions and interviews developed by an action research team. Eight of the nine intervention participants completed post-study surveys. Findings indicate that teacher self-efficacy change for teaching student-centered learning enhanced with technology was not easy, and divergent views emerged. After one cycle of data analysis and interventions, teacher self-efficacy for this instructional method slightly increased after observing successful lessons, having mastery experiences, and recognizing expectations for

educators with leadership support. Deficit thinking emerged in data regarding student ability for student-centered learning with technology as a practice only for accelerated and gifted students. Teachers indicated students with special needs or of average and below average abilities lack the ability to participate in this instructional method. Action research within a school contributes to developing teachers as leaders.

INDEX WORDS: student-centered learning, technology, teacher self-efficacy, 21st century learners, action research

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DEDICATION

I dedicate this dissertation to my precious family.

To my adoring husband Olin Dillard, for your never-ending support, encouragement, and love throughout this process. Thank you for your belief in me and your endless cooking, cleaning, and laundry detail while I read and wrote. You have so graciously taken care of me even in my times of exhaustion and not so pleasant moods. I love you.

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CHAPTER I

INTRODUCTION

The Challenge

Societal demands placed on educators to prepare young people for life beyond the K-12 setting presents quite a predicament in public education today. The rapid growth of modern technology increasingly drives how daily life tasks are conducted, from social communications to virtually every educational and business endeavor. The United States values the voice of local communities to determine the educational pathway for their children. With the influx of technological devices becoming a daily part of the lives of our children, school systems and local Boards of Education continuously struggle with decisions regarding what to do with technology in schools. In the urban school system where this study takes place, Technology and Information Management is one of ten strategic priorities of a 2010–2020 initiative.

Additionally, the school system's vision states that it "will become a system of world-class schools where students acquire the knowledge and skills to be successful in college and careers". As a result of this forward thinking initiative, the Board of Education approved and purchased a system-wide software program—a 24/7-classroom connection and information resource for students, parents, and teachers. Implementation of the program began in the 2012–2013 school year.

The technologically savvy principal leading the large urban Hilltop Middle School[1] (HMS) fervently supports the system's goal of increasing both teacher and student use of technology in classrooms. The system and school leaders' desired goal is for teachers to

[1] All names of schools and participants in this paper are pseudonyms.

embrace technology and enhance student-centered learning. Moreover, at Hilltop Middle School where this study took place, the principal's passion is to prepare students as productive 21st century citizens by increasing their engagement with the use of technology in the classroom. Based on observations, the principal recognized that teachers within the building appeared reluctant to embrace new technology and student-centered learning in their classrooms. The principal of HMS is a dynamic, positive, supportive, and innovative leader. He has high hopes for increasing the use of technology by the students and faculty. At the beginning of this study, pockets of technology engrossed teachers were implementing technology into their instruction regularly. Many others floundered and experienced difficulty putting the use of technology into practice. New teacher evaluation measures encourage teachers to implement student-centered learning enhanced with technology use in defined standards of 'instructional practices'. The principal was supportive of this study and the determined goal to increase student-centered learning enhanced with technology in the school building.

Within the context of this study, opportunities abound for students' use of technology to enhance their learning. Many devices are provided by the school system and students regularly bring their own. Internet access is increasingly available; however, many educators do not completely embrace the movement toward this more modern educational practice. Young people's lives are embedded with technological devices outside of the classroom, which might cause one to provocatively inquire if teachers' pedagogical beliefs should espouse this way of life into their classroom practices.

Purpose and Research Questions

The purpose of this qualitative action research case study was to investigate, develop, and implement effective instructional practices to increase teacher self-efficacy for using student

centered technology enhanced learning. In an effort to inquire deeply into this phenomenon, the following research questions guided this study: 1.) What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology? 2.) What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom? 3.) How can an action research team guide teachers to increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology?

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Context of the Study

This qualitative case study took place in a large, urban area in the United States. The school system in this study has experienced immense growth over the past 25 years. Within the school, veteran teachers who have spent their entire careers in the same location, work alongside new teachers from all over the U.S. Since the school system is large, organization is of utmost importance. Teaching and learning with the focus on learning is the cornerstone of all activity from the Board of Education to the pre-K students and everyone in between. Educators eagerly seek out this school system when looking for employment. Progressive, forward thinking initiatives are pursued while at the same time a sense of tradition is maintained and grounded in effective instructional practices. Thus, implementation of implausible educational whim type reforms is avoided.

The knowledge gap that this action research case study attempted to discover was what

lies in the hearts and minds of classroom teachers regarding 21st century teaching and learning, and how group facilitation of a team led through inquiry, transformation of teachers' beliefs and practices might be foundationally changed. With initiatives in place from a variety of administrative entities for teachers to use student-centered learning with technology in their instruction, are teachers in general prepared for 21st century teaching expectations, or are they devoted to and intensely connected with traditional teacher-directed instructional strategies?

Data Collection of the Challenge

This study commenced based on conversations with the principal regarding the use of technology and student-centered learning as an area needing improvement that he recognized within the school. To inform this study, data supporting the principal's concern was collected. Numerous documents were gathered such as the State Department of Education's (2012) Teacher Keys Effectiveness System standards, the system wide Bring Your Own Device guidelines, and other informational texts regarding 21st century learners' needs (student-centered learning with technology). The documents collected validated the gravity for research regarding this phenomenon.

Likewise, to clarify the challenge from the local/school perspective, the principal was formally interviewed regarding his perspective on the problem. Recording the interview, and then having the interview transcribed through a transcription service allowed me to listen, read, and understand his personal and professional aspect of the issue. For example, when asked where his inspiration for promoting the use of technology in the classroom derived, he eagerly explained, "First of all, we're preparing our students for the 21st century work place and that's just so prevalent; everything you do these days in any job is technology connected." The principal also expressed that educators would be doing a disservice to our students if they failed

"to incorporate technology as tools for learning, for solving problems, and for working together." The principal views Internet accessibility, lack of enough devices, and teachers breaking out of their traditional practices as barriers to students' overall success.

Additionally, the Local School Technology Coordinator (LSTC) answered questions regarding the use or lack thereof of technology utilization in classrooms. Her role in the school includes tremendous responsibilities for supporting the system, school technology, and information management strategic priorities. The LSTC fosters the success of students by facilitating the development and implementation of a shared vision for the comprehensive integration of technology that leads to school improvement. The LSTC evaluation standards include:

1) The LSTC creates and supports effective digital-age learning environments to maximize the learning of all students and models and promotes digital citizenship.
2) The LSTC facilitates instructional planning using state and local school district curricula and standards, effective strategies, resources, and data to support teachers as they address the differentiated needs of all students.
3) The LSTC assists teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students.
4) The LSTC conducts needs assessments, develops technology-related professional learning programs, and evaluates the impact on instructional practice and student learning.

The LSTC performance standards clearly demonstrate the expectation for transformation in our state and school system for teachers to implement the use of technology with a focus on

the students' learning. Due to the LSTC's role at HMS, her knowledge of how technology is used in the school is valuable. Working closely with faculty, students, and staff, she is extremely knowledgeable of teachers' instructional practices in their classrooms. The LSTC is in constant communication with teachers, administration, and students. Any and every technology question or dilemma is sent to her. She also supports instruction via providing opportunities through professional development for teachers.

System wide expectations also warranted this study within HMS as described in the document data collected from the school system's website, which includes:

- Bring Your Own Device (BYOD) Information Flyers for students and teachers.
- A Parent Resource Flyer regarding the 24/7 electronic resource for students and Families.
- 2010-2020 Ten (system) Strategic Priorities.
- Information Management and Technology Priority.

To understand this challenge of practice from a system level, the district Director of Instructional Resources and Support contributed information to this study. The Director expressed, "We've seen that digital resources isn't the golden key for student success, yet they [students] can do so much more with technology. It's just a matter of getting teachers comfortable with using it." He also expressed that accountability measures for teachers are intense, and often when trying something new, we see results dip before seeing a rise. Teachers are not comfortable with taking a risk for a dip, so they maximize what they already do and avoid making changes. He shared his excitement regarding technology rich instructional resources already in place for teachers and that, with time and seeing student-centered learning with technology utilized successfully elsewhere, he believes that teachers will become more

comfortable with this modern instructional strategy.

In order to understand the issue from a broader perspective, document data from the State Department of Education was obtained regarding teacher implementation of student-centered learning with technology. Goals explicitly stated in teacher evaluation system expectations (school district and state evaluation standards are the same) support this study. For example, Instructional Planning, Performance Standard 2 (State DOE, 2012) is an expectation that the teacher plans instruction using state and local school district curricula and standards with effective instructional strategies, resources, and data to address the differentiated needs of all students. A "Teacher Self-Assessment Checklist" (p. 19) for this standard also includes, "Plan a learner-centered environment that allows for student choice, flexibility, and independence" (State DOE, 2012). Another Instructional Planning objective states, "Determine available technology resources and integrate technology into instruction when it is value-added" (p. 19).

Equally important, the Instructional Strategies Performance Standard 3 Fact Sheet cites research in regard to student achievement. "Integrating technology has also been associated with better academic performance" (State DOE, 2012, p. 22) references a 2002 study conducted by Scott Day in which students fared better academically after learning in a student-centered technology lab setting. Information provided in this document indicates that not one single method is an end all for teaching and learning, yet it requires teachers to connect learning to authentic life experiences ensuring that learning is student-centered.

Finally, teacher evaluation Performance Standard 8, Academically Challenging Environment, includes the descriptor, "The teacher creates a student-centered, academic environment in which teaching and learning occur at high levels and students are self-directed learners" (State DOE, 2012, p. 53). Teacher evaluation standards encourage and expect teachers

to implement practices that are student-directed using technology when practical. Collection of and reviewing the document data gave "pertinence to the issues and [research] questions" (Stringer, 2014, p. 141). Collectively, data documents, interviews, and discussions were instrumental in confirming the necessity for an investigation into educators' practices of student-centered learning enhanced with technology.

Conceptual Framework

This action research case study is framed through the lens of social cognitive theory. Social cognitive theory is a foundational theory of behavior change emphasizing self-efficacy. Dr. Albert Bandura (2001), a psychology professor at Stanford University, developed the social cognitive theory, which was used to study how people perceive themselves as capable to change or influence events in their lives and produce results. Self-direction and self-motivation are central points of the social cognitive theory. Social cognitive theory (SCT) is the cornerstone of this study's conceptual framework model (see Figure 1). For the purposes of this study, SCT merits the conceptualization that eliciting personal change in teachers led by a group of teacher leaders or a school leader (principal) requires personal validation along with a clear vision. Believing in teachers' capabilities first allows for a welcome reception of ideas and interventions necessary for change. Higher levels of self-efficacy, therefore realized deep within teachers, contribute to continuous change and pedagogical improvements.

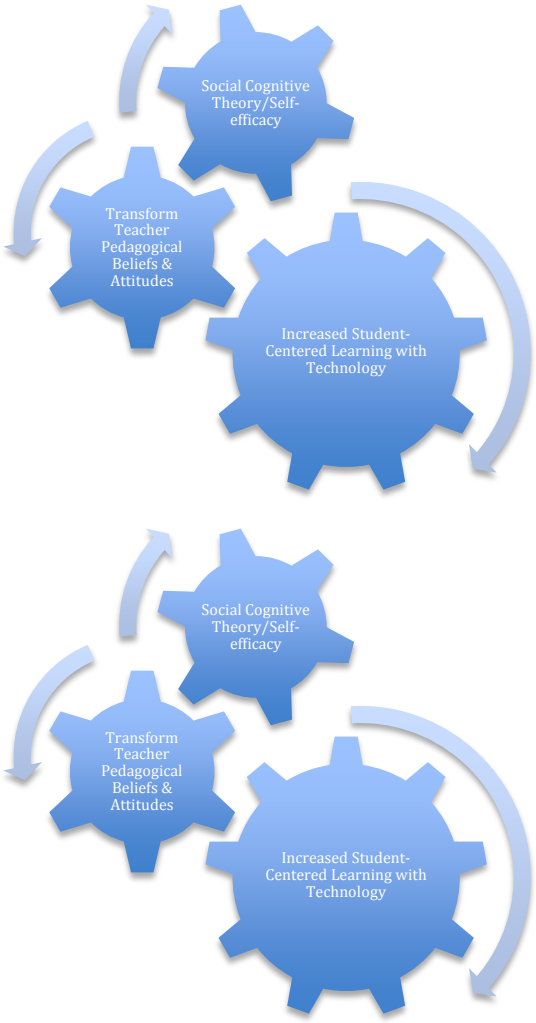

Figure 1. Social cognitive theory/self-efficacy.

Significance of the Study

Leadership skills developed in conjunction with enabling teachers to increase their self-efficacy for implementing this instructional method. As a group facilitator in this project, this researcher was afforded the unique opportunity to strengthen professional skills of inquiring, listening, collaborating, problem solving, and communicating. The school is a social system "characterized by an interdependence of parts, a clearly defined population, differentiation from its environment, a complex network of social relationships, and its own unique culture" (Hoy &

Miskel, 2013). Leading an action research team within HMS through the process of identifying a problem or challenge of practice, collecting data, researching, planning interventions, analyzing data, and continuing through the cyclical process of look, think, act (Stringer, 2014), contributed to the enhancement of personal leadership growth.

Effectively facilitating meetings and a variety of projects is necessary in school settings today. Generating buy-in, participation from others, and enabling people to accomplish goals was a valuable experience gleaned through this study (Bens, 2012). Most importantly, the knowledge gained from this endeavor offered guidance to inspire, to support, and to facilitate change by making difficult decisions as a leader of any organization. Leading an organization through change requires staying focused through adversity and exhibiting empathy with naysayers (Fullan, 2011). The knowledge gained from this study can inform leaders within similar settings how to initiate change toward 21st century teaching and learning for our students' overall success.

Definition of Terms

21st Century Learner. "These new 21st century learners are highly relational and demand quick access to new knowledge. More than that, they are capable of engaging in learning at a whole new level. With the world literally at their fingertips, today's students need teachers and administrators to re-envision the role of technology in the classroom" (Blair, 2012, p. 8).

Constructivism. "…the idea that learners construct knowledge for themselves—each learner individually (and socially) constructs meaning—as he or she learns" (Hein, 1991).

Cyber Bullying. "…the act of harassing someone online by sending or posting mean messages, usually anonymously" (Dictionary.com, 2016).

Digital Citizenship. "…a person who develops the skills and knowledge to effectively use the Internet and other digital technology, specially in order to participate responsibly in social and civic activities" (Dictionary.com, 2016).

Digital Immigrants. "…the generation that grew up before these [digital] technologies" (Prensky, 2003).

Digital Natives (Net-Generation, ikids). "…the generation that grew up with digital technologies" (Prensky, 2003).

Screenager. "A person in their teens or early twenties who has an aptitude for computers and spends much time on the Internet" (Oxford Dictionaries, 2016).

Self-Efficacy. "Perceived self-efficacy concerns people's beliefs in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives" (Wood & Bandura, 1989, p. 364). Generally, people with higher self-efficacy are more likely to successfully carry out a course of action to complete a goal than a person with low self-efficacy.

Sexting. "The sending of sexually explicit messages or images by cell phone" (Merriam-Webster Dictionary, 2016).

Social Cognitive Theory. Social cognitive theory is a foundational theory of behavior change emphasizing self-efficacy (Bandura, 2001), or how people think of themselves in relation to making a change or influencing their lives to produce results.

Student/Learner-Centered Learning. "Student-centered learning is a broad teaching approach that encompasses replacing lectures with active learning, integrating self-paced learning programs and/or cooperative group situations, ultimately holding the student responsible for his own advances in education" (Nanney, n.d., p. 1).

Teacher-Directed Instruction. "Teacher-directed instruction, common in the nation's public schools, produces a standard product by relying on standard practices—lectures, teacher-centered discussions, and paperwork" (Schweinhart & Weikart, 1988, p. 218).

Technology. In this study, technology includes devices that students most commonly use in the classroom today, such as iPhones, iPads, iPods, other tablets, laptop computers, desktop computers, Chrome books, and video cameras.

CHAPTER II

LITERATURE REVIEW

This chapter presents the foundation of this action research case study with an in-depth examination of the theoretical framework. The literature review process investigated similar ideas, thoughts, notions, and explorations related to student-centered learning enhanced with technology, teachers' self-efficacy, and instructional practices. The library system of The University of Georgia offered a plethora of data for this inquiry. Databases searched included EBSCO, ERIC, ProQuest Dissertations, Science Direct, and Galileo for on and off-campus periodical access, as well as Google Scholar Internet searches. Interlibrary loans, hard copy journals from the main campus in Athens, Georgia, as well as books purchased through Amazon were also accessed for supplemental data. Additionally, the Georgia State Department of Education, Georgia School Board Association, Georgia School Superintendents Association, and the school district where this study took place were instrumental in providing document data.

Social Cognitive Theory and Self-Efficacy

Bandura explains: "Perceived self-efficacy concerns people's beliefs in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives" (Wood & Bandura, 1989, p. 364), suggesting that people are motivated not only from within, but by external environments. Courses of action originate in thought. Established cognition then presents a template for action in a person's generation of proficiencies within (Bandura, 1997). Self-efficacy, at times, is misconstrued with self-esteem. Self-esteem conventionally references people's belief about their overall individual worth (Gist & Mitchell,

1992); however, self-esteem in relationship to completing a specific task has been likened to self-efficacy.

Bandura asserts that humans' actions are based on "triadic reciprocal causation" (Wood & Bandura, 1989), otherwise stated as three interactions of human behavior to include cognitive and other personal factors, and environmental factors. Environmental factors include events and relations with others in a given situation. Personal factors are simply individual attributes such as drive, determination, inclination, and inherent traits. The cognitive element pertains to personal beliefs, setting goals, and the level of analytic thinking. No single factor is directly proportional to another, indicating that people are both products of their surroundings and builders of their environment.

The three elements of human behavior contribute to modifying or changing personal beliefs. Bandura asserts that self-efficacy can be built up in four ways (see Figure 2). First, through mastery experiences, or completing a series of successful tasks confidence is strengthened. Secondly, vicarious experiences or modeling, which includes observing success in others, noting what their actions were, and then mimicking strategies observed. Thirdly, social persuasion or sincere encouragement motivates people to strive for self-improvement. And finally, from evaluation of physiological states, indicating that emotionally and physically healthy people have higher levels of self-efficacy (Bandura, 1977).

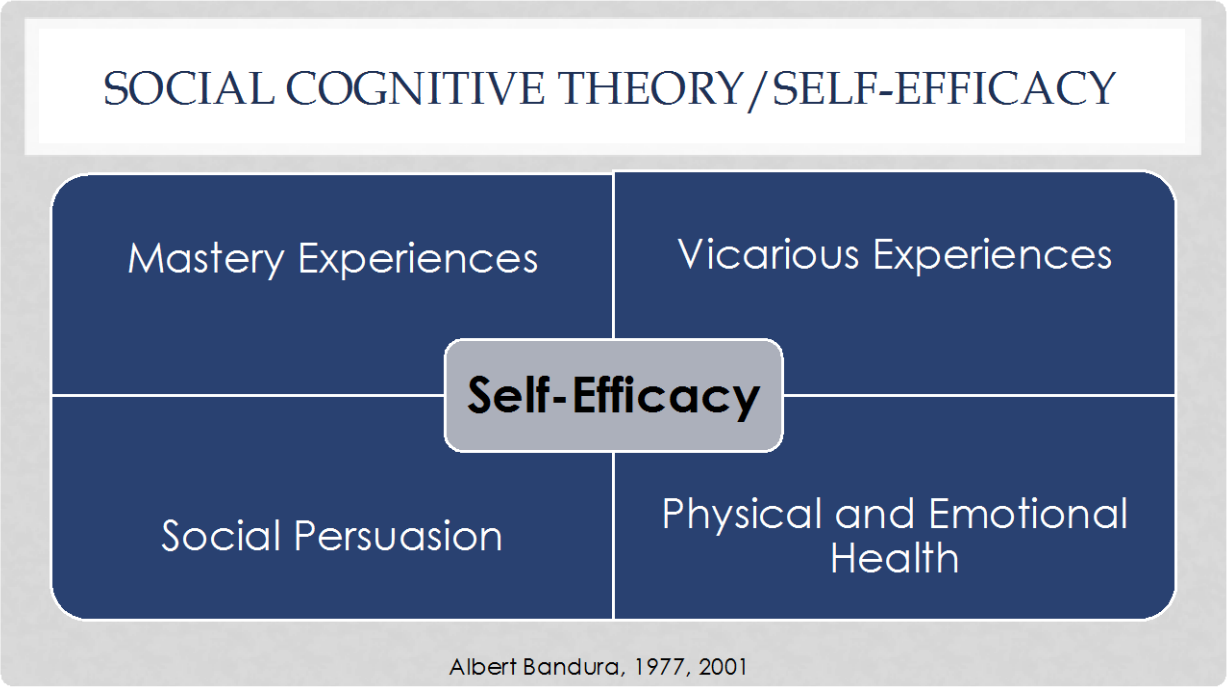

Figure 2. Social cognitive theory/self efficacy (Bandura (1977, 2001).

Furthermore, this theory indicates that improving one's self-efficacy will enable one to make positive changes in their behaviors. If a person in an organization is encouraged, given opportunities to succeed, placed with other high-performing people, and given a reasonable work schedule and workload, they will learn to self-direct, self-motivate, and perform more efficiently; thus, benefiting all stakeholders within the organization. People are more receptive and less fearful of changes required in the workplace when self-efficacy is strengthened (Wood & Bandura, 1989).

Moreover, Bandura asserts that technology development proposes a new social opportunity in which people influence others in their own personal development. Social media networks allow for a plethora of best practice ideas, social norms, beliefs, and social activities to circulate abundantly. Therefore, due to advancements in technology and the use of social media, the idea of "think globally, act locally" is attributed to renewing a sense of self-efficacy in people (Bandura, 2001).

Other Self-Efficacy Constructs

Stajkovic and Luthans (2002) posit an important construct relating to social cognitive theory, self-efficacy, and motivation for the workplace. The authors bring to light the technology component and possible reduction of human capital in organizations' paradoxes with the need for human interaction benefits and meeting competitive demands. They also point out that the typical approach to solving problems within an organization is to concentrate on the negative aspects in an attempt to overhaul issues. Stajkovic and Luthans explain, "We have concentrated too much on what is wrong with employees and managers, their dysfunctions and weaknesses (e.g., how to motivate inept employees, resistance to change, cope with stress) rather than emphasize and build on their strengths. We would argue that self-efficacy (or self-confidence), drawn from social cognitive theory, is the pervading psychological mechanism for positively motivating human resources" (p. 126). Increasing one's self-efficacy, therefore, can positively impact both work performance and work motivation.

As applied to this study, framed in the social cognitive theory, the hypothesis held that teachers' pedagogical beliefs and values transformation to increase student-centered learning enhanced with technology would occur as a consequence of their heightened self-efficacy.

Teacher-self efficacy. Ertmer and Ottenbreit-Leftwich (2010) liken self-efficacy belief change processes for pre-service teachers to Bandura's theory of self-change by providing opportunities for teachers to practice and master techniques, allowing for observation of experienced teachers, and by social persuasion or convincing educators of the importance of student-centered pedagogy. Regardless of teachers' technology knowledge, their confidence is critical for accomplishing instructional goals with the use of technology. For teachers to reach a level of confidence necessary for changing pedagogy to student-centered learning with

technology, the most effective way is to provide them with opportunities for personal mastery. Secondly, teachers would benefit from vicarious experiences and persuasion (Ertmer & Ottenbreit-Leftwich, 2010). Ertmer and Ottenbreit-Leftwich assert, from research review, that teacher pedagogical beliefs influence what is practiced in the classroom. If teachers lean toward more traditional beliefs, their methods of instruction will continue with a lower level of technology use. Whereas, more constructivist thinking promotes higher technology use levels prompted by student-centered instruction.

With this in mind, improving teachers' self-efficacy for increasing student-centered learning enhanced with technology through a transformation of teacher pedagogical beliefs is possible through pre-service teacher education programs and professional learning for experienced teachers. Changing teachers' pedagogical beliefs is essential for school and classroom reform for 21st century learners. By encouraging teachers to learn more about student-centered learning, technology tools, and setting goals, they will be encouraged to pursue the role of a facilitator of learning rather than a lecturer. Motivation for change will also come from observations of talented teachers, and by all means through observations of student engagement and student success (Ertmer & Ottenbreit-Leftwich, 2013).

Student-Centered Learning and Technology

Hannafin and Land (1997) addressed student-centered learning environments enhanced with technology in the early 1990s. The authors posited that student-centered learning at that time had the potential to provide more personalized opportunities for students due to the influx of computers into schools. The authors recognized the differences between "traditional" teacher-directed methods and student-centered constructivist pedagogies. They explain, "Externally [teacher]-centered instructional methods, according to critics, fail to address the knowledge

requirements of a rapidly expanding technological society" (p. 167). Now, twenty years later, student's use of personal devices along with a plethora of school supplied devices, personalized (differentiated) instruction is highly attainable. The notion of making learning relevant was clear when John Dewey (1938) postulated the need for students to receive real life experiences in school. Twenty-first century schooling resonates this early constructivist conception.

Support for the Need for Technology in Classroom/SCL

A brief history of technology in schools indicating the correlation of technological devices in society implemented into the classroom is presented in Figure 3.

Then vs Now
How Technology in Schools has Changed Over Time

Year	Event
1900-1920	The one-room schoolhouse
1923	Classrooms begin incorporating radios into penmanship, accounting, history and arithmetic lessons
1930s	Overhead projectors, initially used for US military training, quickly spreads to school
1933	52% of school are using silent films and 3% are using films with sounds
1939	The first TV appears in a classroom in IA
1950	Headphones become popular in school language labs
1960s	Whiteboards are invented to replace the Chalkboard
1964	BASIC is developed at Dartmouth College with the intent of giving students a simple programming language that is easy to learn
1967	Texas Instruments develops the handheld calculator
1972	Scantrons are used to automatically grade multiple choice tests
1973	The Minnesota Educational Computing Consortium is founded. The organization popularizes school software such as Oregon Trail ('74) and Lemonade Stand ('73)
1984	Apple Macintosh computer is introduced. The ratio of computers to students in US schools is 1 92
1985	Touch typing software *Mavis Beacon Teaches Typing* is developed and popularized in schools
1988	Laptops are introduced and eventually utilized as teaching tools
1990	CD-ROMs became a predominant form of storage
1991	*SMART* boards are introduced in schools
2002	According to the National Center for Education Statistics (NCES), about 99% of American public schools have Internet access. About 35% had Internet access in 1994
2012	1.5 million iPads are used in US schools
2013	90%of students under the age of 18 have access to mobile technology

Figure 3. How technology in schools has changed over time.

Teacher Barriers/Obstacles

First-order barriers. Integrating technology into the K-12 classroom was deemed problematic for teachers and students during the initial inception of computers in the classroom. Ertmer, in 1999, explained the hesitation of teachers to use technology in the classroom discerning between first-order barriers, which are independent of teacher control (i.e., resources-hardware, software, Internet access; professional development and training; and support from school/system leadership) and second-order barriers, which are from within the teacher (i.e., attitudes and beliefs, knowledge and skills). Initially, first-order barriers, or lack of resources hindered integration of technology in the classroom (Hew & Brush, 2006; Kopcha, 2012; Pelgrum, 2001). However, scarcity of resources progressively changed as schools and systems worked to provide electronic devices and Internet access for more students. Many schools received grants, funding from a variety of sources, or as seen more recently, implemented a Bring Your Own Device/Technology (BYOD or BYOT) policy in which students bring their personal devices such as smart phones, tablets, or laptop computers from home. External barriers have continued to decline; technology use by young people is pervasive as conveyed by Marc Prensky (2010), "More and more young people are now deeply and permanently technologically enhanced, connected to their peers and the world in ways no generation has ever been before" (p. 2).

As recently as 2012, teachers who were recognized for winning awards for technology integration expressed little concern regarding external, first-order barriers, or resources such as support, access to devices, access to Internet, money, time, assessments, and blending technology with meeting state standards as problematic. As leaders of technology integration, the decorated

teachers' attitudes and beliefs in support of technology use ranked high (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

Second-order barriers. Teacher beliefs and attitudes about classroom instruction, management, and teacher-student relationships characterized by Ertmer (1999) as internal, or second-order barriers, profoundly affect the use of technology by teachers. Furthermore, internal barriers that teachers experience may have evolved from early frustrations caused by lack of resources. Obstacles for widespread implementation of student-centered learning are grounded in teacher self-efficacy, or lack thereof. Thus, increased teacher self-efficacy is vital for school transformation.

More importantly, higher teacher self-efficacy for a constructivist pedagogical belief advocating 21st century learning by teachers is required. Constructivism is not new to education and is considered a way of learning through creating meaning from experiences, in which knowledge grows and changes throughout a person's life. Learning is both social and personal. With technology ubiquitous in the United States and internationally, constructivist methodology is on the rise as information availability is endless. The need for critical thinking, problem solving skills, and collaboration for preparing students for the 21st century is unsurpassed (Ertmer & Newby, 2013).

In a study conducted by Rakes, Fields, and Cox (2006), teachers with strong foundations in technological skills were found to be more comfortable with technology integration than teachers without strong technological skills. Teachers with solid basic technology knowledge were more likely to use constructivist pedagogical methods of instruction. Teachers' use of technology in their own lives contributed to higher self-efficacy for implementation of higher

order thinking and learner-centered activities utilizing technology. The availability of computers (first-order barrier) was not a factor for increasing their use of technology.

Similarly, in a study by Ottenbreit-Leftwich et al. (2010), teacher values and beliefs related to student needs corresponded with constructivist pedagogy in that teachers used technology to encourage, engage, and motivate students to think on higher levels. Teachers implemented technology to benefit students in learning more difficult concepts. Consistently throughout the study, students needs guided decision making for planning student-centered instruction. Also, teachers' goals were to meet the needs of students to develop technology skills in preparation for their future. Teachers' strong beliefs in the importance of technology and student-centered pedagogy to benefit students illustrate the value in high teacher self-efficacy advancing learner-centered instruction with technology.

Accountability and high stakes testing. In addition to overcoming second-order barriers, teachers may presume that changing their pedagogical methods would be futile due to current teacher evaluations dependent on the outcomes of standardized testing and student achievement (Hew & Brush, 2006). Otherwise stated, teaching quick PowerPoint lecture type formats enables educators to cover large amounts of material in order to complete expectations of state imposed curricula. Accountability based on high stakes testing is a barrier for implementation of more constructivist pedagogical methods. Project based learning (PBL) is an instructional strategy in which educators learn how to engage students in multidisciplinary, student-centered learning. Students are able to learn the established curriculum via a method of completing a project (which could also be problem related), that is multidisciplinary, and student driven. With self-efficacy in mind, the need for pedagogical transformation for teachers to break away from the factory style, lecture-notes dependent, teacher-directed instruction to facilitating a

project or problem-based learning strategy is compelling. Understanding teacher self-efficacy and effective ways to change teacher pedagogy lays the foundation for conquering barriers, such as fears attributed to high stakes testing accountability.

In a 2007 qualitative metasynthesis of 49 studies regarding high-stakes testing and curricular control, researcher Wayne Au found that the teaching of content knowledge reduced and presented solitary increments or was directly related or aligned to tests. Pedagogical practices progressively turned to teacher-directed instruction. Test-taking skills and procedures in lieu of interdisciplinary content and student-centered instruction emerged (Au, 2007; Moss, 1994).

Considering the institution of schooling as an organization, curricular control in Au's (2007) study also proposed high-stakes testing as a construct for the constriction of the loose coupling between policymakers' goals and the events occurring in classrooms as a result (Burch, 2007). Au questioned the appropriateness of educational reforms based on high-stakes testing whether good, bad or indifferent for all stakeholders. Nevertheless, instruction that is condensed, fragmented, and teacher-directed culminated from high-stakes testing policies or top down decision-making.

Notably, Cuban (2013) references reports from researchers, policy makers, and teachers regarding the effects of standard-based curriculum, testing, and accountability measures in place for teachers since the 1990s. Moreover, since the No Child Left Behind Act of Congress (NCLB) in 2001, school practices and classroom teaching have been strongly influenced. Cuban stated, "All in all, these reports draw a portrait of highly teacher-centered lessons targeting curriculum standards and annual tests with diminishing student choice of activities, cross-disciplinary content lessons, project-based learning, and, in general, far less student-centered

teaching" (Cuban, 2013, p. 81). Student test scores as a measure of teacher effectiveness systematically propelled teachers to rigorous direct instruction and rote test practices.

Professional Development

Professional development or professional learning for educators is pivotal to reform education and improve instruction methods. Generally, school systems and schools strive to modify content standards, methods of accountability, or the control of how accountability is formalized to increase student achievement. The most valuable means for accomplishing this goal, however, is insight needed by administrators and teachers to enlist different methods of teaching and learning (Elmore & Burney, 1997).

Linda Darling-Hammond (1998) eloquently reflected on the 1996 National Commission Report on Teaching and America's Future. Her words hold true today. "What teachers know and can do makes the crucial difference in what children learn. And the ways school systems organize their work makes a big difference in what teachers can accomplish" (Darling-Hammond, 1998). Moreover, Darling-Hammond's suggestions regarding professional learning laid the groundwork for both pre-service and veteran teachers currently immersed in continuing education. For example, teacher education programs offering extensive and integrated models of practice, peer work on standards within content areas, building student-teacher relationships, and identifying and training teacher leaders are not only related to providing vicarious experiences for teachers; they are integrated into schooling today.

Theodore Kopcha (2012) explored teachers' technology integration and practices and their perceptions of barriers under situated professional development. Situated professional development occurs when teachers are given training with support based on the teachers' needs in their current classroom settings. In other words, teachers do not go to a workshop, learn

general teaching strategies, then return to their classroom and attempt to implement new practices on their own. In Kopcha's study, the mentor, who was not from the school, determined the needs of the teacher, provided training, mentoring, and established a community of practice for the teachers in the school. Barriers discovered through surveys and interviews included: lack of time, lack of skills and knowledge, beliefs (which grew stronger with practice), lack of vision, access, and professional development. The mentor participated in all of year one of the study, and during year two, served as a part-time facilitator.

By the end of the two years, teachers were more confident, exhibiting a higher self-efficacy for technology integration. Teachers initially expressed that they did not have time to plan and use technology; however, as the study progressed, teachers were able to plan for and incorporate critical thinking activities. Professional development and time were tools used for increasing teacher self-efficacy and pedagogical change. Positive change occurred through the practice of in classroom training based on teachers' needs (Kopcha, 2012). Effective professional development along with a clear vision, mentor support, and time provide support for teachers implementing student-centered learning enhanced with technology.

Implementing new professional development with a small group in a conscientiously managed pilot study type setting is beneficial (Guskey & Yoon, 2009). An action research team within a school could design a workshop type environment that "focused on the implementation of research-based instructional practices, involved active-learning experiences for participants, and provided teachers with opportunities to adapt the practices of their unique classroom situations" (p. 296). An action research team's embedded knowledge of the school is of great benefit to creating a successful learning environment.

Leadership

Finally, acquiring technological devices does not ensure increased student-centered learning or the use of technology. However, when teacher-leaders promote student-centered learning with technology, provide a clear vision, and plan to support teachers through pedagogical changes, school reform geared toward higher-level thinking and learner-centered instruction will occur. A Canadian province study by Sheppard and Brown (2014) uncovered the common theme that technology pervades students' worlds. Use of the Internet, YouTube videos, smart phones, tablets, educational websites, video chats, etcetera facilitated student learning. In schools with effective professional development, innovative, visionary, principal leadership, and distributed leadership practices, 21st century learning took place. Additionally, according to Sheppard and Brown (2014), students and their parents expected technology to be incorporated into the daily school life of young people. Teachers who were "technophobic" were under pressure to incorporate more technology. Technology use is prolific throughout every other aspect of students' and families' lives so why shouldn't technology blend in with schooling as well?

Concerns Regarding Technology in the Classroom

One concern deemed problematic with incorporating increased use of technological devices in the classroom pertains to digital citizenship. Students must understand how to use devices to establish a social community, display responsible behavior, and to think and act globally in a healthy manner. If technology is banned from the schoolhouse, how will students learn the appropriate and expected behaviors (Ohler, 2011)? Ohler describes young people as having two lives, one of which is embedded with technology, the other (school) where often technology is void. Educators can teach young people how to journey through the ever-growing

world of technology while in school. Due to the rapid advancement of technology, monitoring students' use as appropriate or not often correlates with teachers' lack of desire to use devices in the classroom. Teachers' frustrations increase when troublesome events such as cyber bullying and sexting occur in the classroom.

Larry Cuban, notorious for critiquing public school reform attempts for over thirty years, has consistently questioned decision-making regarding technology in the classroom by policy makers and system and school administrators (Cuban, 1986, 2001, 2013; Tyack & Cuban, 1995). Cuban (2013) asserts the well known research supported notion that within the school, teachers are the single most important factor impacting student success. Hence, teacher hiring, training, and continuous improvement have been the main focus for increasing student achievement.

Empirical Studies

Table 1 below outlines the key studies investigated for this literature review.

AUTHOR(S), DATE	TITLE	PURPOSE	METHOD(S)	SAMPLE	RESULT(S)	CONCLUSION(S)	IMPLICATION(S)
G. Rakes, V. Fields, & K. Cox (2006)	The influence of teachers' technology use on instructional practices	Does teacher use of technology in the classroom and for personal use relate to their use of constructivist teaching practices?	50 item survey- Level of Technology Implementation (LoTi)	186 fourth and eight grade teachers in a southern state, schools with 20%+ below poverty families.	Teachers w/ solid basic technology skills, comfortable with technology =more likely to use constructivist instructional practices.	Teachers' use of technology personally effects use in classroom; teachers need training, opportunities to practice, and support from administration to change pedagogy.	Future studies: explore the use of technology in constructivist classrooms and effects on student achievement; a teacher belief of personal ability to use technology is a significant factor in classroom practices.

A. Ottenbriet-Leftwich, K. Glazewski, T. Newby, & P. Ertmer (2010)	Teacher value beliefs associated with using technology: Addressing professional and student needs.	How/why teachers use technology enhance teaching & learning; understand teacher goals to create PD teacher support-increase technology.	Hermeneutical phenomenology viewed teacher practice-individual perspectives; Two phase case study: 1) studied each teacher, analyzed data; 2) focused on similarities and differences.	Eight practitioners recognized for tech integration, Michigan Consortium-Outstanding Achievements in Teaching with Technology.	Technology to address professional and student needs; all w/value belief of promoting student learning.	Technology use by teachers aligned with their value beliefs which is to benefit their students.	PD for teachers technology focus should have specific purpose that fits teachers' classroom instruction.
P. Ertmer, A. Ottenbreit-Leftwich, O. Sadik, E. Sendurur, & P. Sendurur (2012)	Teacher beliefs and technology integration practices: A critical relationship.	Understand teachers' pedagogical beliefs; classroom technology practices of teachers recognized for tech uses align; do barriers restrict integration.	Multiple case-study design. Data: teachers' websites, one-on-one interviews, scale ratings of barriers, triangulation of student-centeredness, alignments between espoused beliefs and practices.	Twelve K-12 teachers who had been recognized for technology practices by the International Society for Technology in Education.	Teachers were able to enact technology integration practices that aligned with their beliefs (i.e., student collaboration, student choice).	First-order barriers or external factors: Internet, device availability, other resources greatly reduced, can still impose difficulties. Second-order barriers or internal-teacher beliefs was not a factor	Teachers not strong in beliefs about tech use; professional development is needed; teachers need evidence that students can perform on standardized tests; PD for teachers should include technology students will use.

						for the award winning tech teachers.	
T. Kopcha (2012)	Teachers' perceptions-barriers to technology integration and practices with technology under situated professional development	Examine common barriers to technology integrations in a sustained and situated professional development in an elementary school.	Longitudinal single case study over two years with surveys, observations, interviews with coded answers; researcher-participant observer-professional development provided.	18 teachers in an upper middle class Southwestern elementary school.	Ratings by barrier decreased from year 1 to 2: time, beliefs, vision and access, professional development, teachers acknowledged that workshops, follow-up, and mentoring promoted positive changes in beliefs, skills, and instructional practices.	Situated learning activities enacted from effective professional development provides teachers with knowledge and support to integrate technology into instructional practices.	Technology integration in K-16 should include in-class training and follow up; effective PD is needed; mentors for teachers play important role for tech integration.

B. Sheppard, & J. Brown (2013)	Leadership for a new vision of public school classrooms: Technology-smart and learner-centered.	Understand how leaders transform schools from teacher directed to student-centered technology enhanced.	All school districts in one Canadian province.	Qualitative-interviews, focus group sessions, semi-structured observations.	Teachers used diverse technology tools; different schools employed a variety of uses; lack of infrastructure-problematic; school leadership promoting student-centered learning helped; student use of devices driving force for tech in classroom.	Importance of school principal in school improvement; formal and informal leaders key stakeholders; multiple forms of tech being utilized yet still challenging for many.	Appropriate tools and PD needed for teachers; process of leading and implementing complex innovation has been ignored.

As indicated from the literature review, student-centered learning with technology is necessary for improving education in the United States by meeting the needs of the students in preparation for 21st century learning. Society demands it; students and parents expect it. Problem solving and critical thinking skills necessary for college and career success require more learner-centered teaching and learning with modern technology tools. Higher teacher self-efficacy achievement required for pedagogical change results from mastery experiences, vicarious experiences, and social persuasion. Leaders in schools have the potential to guide teachers through this evolutionary change. The gap that this study addresses is how to effectively change teachers' pedagogical beliefs and practices to student-centered learning, and meet the demands of rapid technological growth with expectations for device use in a culture resistant to change from traditional teacher-directed instruction methods.

CHAPTER III

METHODOLOGY

This chapter articulates how research conducted via an instrumental qualitative case study employing action research processes attempted to increase teacher self-efficacy for a 21st century instructional strategy. This study is considered instrumental in that research questions explore a general understanding of teachers' practices within the school, and recognizes that similarities are potentially common in other institutions (Simons, 2009; Stake, 1995). Qualitative research explores and inquires into phenomena or situations of a person or group (Creswell, 2014). Grounded in the epistemology of constructivism, the "belief that knowledge is made up largely of social interpretations rather than awareness of an external reality" (Stake, 1995, p. 170), qualitative research often is practiced because of strong feelings a researcher may have regarding a particular topic. As such, the topic of student-centered learning, which is grounded in constructivism, mirrors the foundation of qualitative research. Knowledge gained through personal experiences and research provide for deeper, more meaningful understandings both in qualitative research and student-centered learning enhanced with technology.

John W. Creswell (2014) discussed one qualitative research approach as relying on the premise regarding the value of methodology of the research. He provided six assumptions about qualitative research from Sharan B. Merriam's (1988) *Case Study Research in Education.* The ideals provide insight for qualitative researchers new to the field:

1. Qualitative researchers are concerned primarily with the **process**, rather than outcomes or products.

2. Qualitative researchers are interested in **meaning—**how people make sense of their lives, experiences, and their structures of the world.
3. The qualitative researcher is the **primary instrument** for data collection and analysis. Data are mediated through this human instrument, rather than inventories, questionnaires, or machines.
4. Qualitative research involves **fieldwork**. The researcher physically goes to the people, setting, site, or institution to observe or record behavior in its natural setting.
5. Qualitative research is **descriptive** in that the researcher is interested in process, meaning, and understanding gained through words or pictures.
6. The process of qualitative research is **inductive** in that the researcher builds abstractions, concepts, hypothesis, and theories from details (pp.19-20).

Employing Merriam's assumptions provided a foundation for the researcher throughout the facilitation process of guiding a team of educators through a process of inquiry among their colleagues and peers. As a doctoral student with minimal research experience, Merriam's quintessential list served as a valuable guide for this study.

Furthermore, a case being studied in education usually involves an individual, a group of people, or a particular program. Both uncommon or rare attributes and universal traits of the person, people, or program being studied prove interesting to the researcher (Stake, 1995). As a classroom teacher and leader in training, I was intrigued with the idea of preparing teachers for instructing students with technology embedded in their lives. Case studies attempt to answer questions of concern with rich, in-depth explanations and meaning in a reasonable or relatively short amount of time, from a few weeks to a year (Hays, 2004).

Action Research Approach

Action research (AR) entails utilizing a series of steps for a group or team to research solutions to solve problems and to develop organizational improvements. Action research exercises one or more continuous cycles of "look, think, and act" tasks to bring about organizational change (Stringer, 2014). The AR team within this study sought to explore and understand initial beliefs or pedagogies of teachers within the school, to think through and plan interventions, then, to guide participants through the implementation of the interventions.

As such, the action research team collaboratively developed a plan for implementation of interventions to aid teacher participants in increasing self-efficacy to use student-centered learning with technology as an instructional method. Qualitative data collected included a pre- and post-intervention questionnaire. The survey (Appendix A) was created by Lucy Ferreira as a Masters Thesis at Royal Roads University in Victoria, BC, Canada. With technology pervasive in the lives of young people throughout the world, Ms. Ferreira's goal was to develop a valid instrument specifically for measuring teachers' self-efficacy for instruction using student-centered learning enhanced with technology (Ferreira, 2013).

Moreover, Ms. Ferreira's work is framed in Bandura's Social Cognitive Theory and Organizational Change. Within the survey, "two separate scales were created for this study to represent the separate efficacy belief constructs of efficacy expectations and outcome expectations" (p. 39). Experts in the research department at the International Society for Technology in Education (ISTE) reviewed the instrument. Their expertise in questionnaire design and in the National Education Technology Standards (NETS) contributed to revisions and validation for measuring self-efficacy of educators (Ferreira, 2013).

Conducting the Survey

Seventy (70) content area teachers (Math, English Language Arts, Social Studies, and Science) at Hilltop Middle School self-reported as being fairly efficacious in using instructional methods of student-centered learning enhanced with technology. However, as previously described, both the school principal and the local school technology coordinator indicated that teachers were not observed teaching this way. Self-reporting survey data is used quite often to gather details regarding teacher practices in using technology in the classroom (Bielefeldt, 2002). Yet, Bielefeldt (2002) asserts that self-reported responses to survey questions may be considered less than accurate, valid, or reliable. In other words, teachers may not fully comprehend the meaning of a survey question; teachers may attempt to present themselves positively under pressure; or due to the intricacies of teaching and learning within individuals, simple survey questions may not convey the entire context of the situation (Mullens & Kasprzyk, 1999). Nevertheless, in an analysis of survey development work regarding instructional processes, Mullens and Kasprzyk (1999) found that teachers generally reported their practices accurately as compared to the observers' evaluations.

Data Collection

Data gathered included audio recordings and transcriptions from interviews of action research team members and intervention participants, the researcher's reflective journal notes, a plethora of document data (Simons, 2009) such as Teacher Keys Effectiveness System, the school district's Bring Your Own Device information pages, other district initiative texts regarding 21st century learners' needs (student-centered learning with technology), email communications, meeting agendas and minutes, member check notations (Creswell, 2014), and any related references and materials. Notes taken and audio-recorded reflections throughout

every aspect of this research project contributed to the awareness of the researcher's own thoughts, feelings, reactions, and biases experienced (Hein, 1991).

A timeline to implement action research team meetings, data collection, and one cycle of analyzing data (look), developing interventions (think), and implementing interventions (act) afforded opportunities to collect a wealth of data. Semi-structured conversational interviews conducted by AR team members provided rich valuable data from the heart and lived experiences of the participants. An effort to maintain interviewer reliability commands the use of starter questions, yet the conversational aspect stems from Simons' (2009) assertion that conversations: "…establish a more equitable relationship between interviewer and interviewee and create opportunity for active dialogue, co-constructed meanings and collaborative learning" (p. 44). Additionally, the teacher intervention participant interviews inquire to understand their thoughts on pedagogy and classroom practices and to incorporate Critical Incident (CI) interview (Flanagan, 1954) type questions. Critical incident interview questioning before interventions aided in understanding the impact of negative issues related to teacher attempts at student-centered learning lessons and use of technology. Analysis of this data investigated the extent of the problem of teacher hesitation to use student-centered learning enhanced with technology practices in the classroom.

Action research team members' interview questions included the following:

- What are your interests for participating on the action research team?
- In what ways do you think you will benefit, or learn from participating in action research?
- Do you have professional or personal goals for participating in this project?
- Do you think you can contribute to improving instruction for teachers?

- What are your thoughts on improving instructional practices to benefit students?

For initial interviews, an interview protocol (Spaulding & Falco, 2013) was developed in an effort to standardize questions. Interview questions were reviewed and discussed among the AR team members. Interview starter questions included:

- How would you define student-centered learning?
- What are your beliefs regarding student-centered learning enhanced with technology as an instructional strategy?
- Are there barriers you have faced implementing teaching student-centered learning enhanced with technology?
- Can you tell me about a time when you tried using this instructional strategy or technology in general and you became frustrated?
- Is there a way to teach current standards with project based learning, inquiry, or other student choice type lessons incorporating technology?
- Have you experienced success with student-centered learning enhanced with technology?
- What are your thoughts regarding student engagement when teaching with this strategy?
- How often do you use student-centered learning with technology strategies?
- How often do you/your students use technology?

Researcher's Role

As an insider, a colleague with respectful, healthy working relationships in this investigation, I attempted to interpret the self-efficacy of teachers and to assist in the transformation for educators to include student-centered learning in their instructional practices. Corrine Glessne (2011) discusses action research as an interpretive cycle of observing, reflecting, and acting. Glessne points out that, "Insiders who couple research theories and techniques with an action-oriented mode can develop collaborative, reflective data collecting and analysis

procedures for their own practices and thereby contribute to the sociopolitical context in which they dwell" (p. 23). Thus, the dual role as a researcher and group facilitator allowed me a unique opportunity to deeply understand this phenomenon.

Moreover, understanding the issues of positionality, power, knowledge construction and representation in qualitative research was important to this study (Merriam, Johnson-Bailey, Lee, Kee, Ntseane, & Muhamad, 2010). Merriam et al. (2010) posit a common and somewhat simplistic paradox in the insider/outsider relationship within a study. Insiders typically ease into the position with a comfort level within the culture, which allows for in-depth investigations. Yet, often it is thought that insider researchers are biased and too close to the situation to explore controversial or problematic issues. Outsiders' questioning have the potential to be proactive but inappropriate for a particular group in which the researcher is unfamiliar of norms and mores. Positionality references the insider/outsider phenomenom in relation to a cultural setting and is set on where a person stands in relation to others. Positionality can change. For example, over time, an outsider (researcher) may adopt cultural practices of a group and switch to more of an insider position. My position within this study shifted between insider and outsider. Educator commonalities contributed to my gaining entry (Creswell, 2014) for conducting research; however, as a newly hired teacher to HMS, the comfort level of relationships with many participants was diminutive.

Power plays a role in the relationship between the researcher and the researched. Action research allows for a sense of collegiality or equal footing in the research process (Merriam et al., 2010). "Particiatory action research also focuses on the political empowerment of people through particiaption in knowledge construction" (p. 413). Each member of the action research team at HMS moved into higher level teacher-leader roles upon completion of this study.

The AR team met six times guided by an agenda, which included the date, title of the study, purpose of the study, and the guiding research questions or themes. Several thoughts, ideas, questions, and suggestions were discussed when team members saw each other in the hall, or at other meetings. This was exciting yet difficult to write notes or to audio record the discussion as soon as practicably possible. Hallway conservation topics were added to the agenda to ensure that a formal discussion would be held with regard to the area of interest.

Data Analysis

Recorded data (words I wrote on transcripts while reading and listening to audio recordings) was placed on oversized post-it notes that were placed on the wall for a type of dancing with the data to organize categories, relate themes, and to look for issues like "cherry-picking" (Hays, 2004; Simons, 2009) or other flaws and mistakes to ensure validity and trustworthiness as well. Word-grouping software was utilized whereas a collage of words from transcripts was generated to make the most used words more prominent. Repetition of outstanding words compared amongst participants afforded the ability to recognize common threads of beliefs and attitudes from the participants. To ensure that understanding or interpretation of the data was accurate, processes described by both Simons (2009) and Stake (2006) were used. Simons' descriptions are clear and rich as in her illustration of "dancing with the data" (Simons, 2009, p. 121) as a way to grasp the mass of data collected. Essentially, the process included reading and re-reading texts and documents, and listening to recordings numerous times to identify themes, to code, analyze notes throughout the project, make assertions, and write the report (dissertation) (Stake, 2006).

Throughout the study, notes were made regarding "…emotional reactions and the way in which they connect to who [I am], [my] history, and experiences [which are] important"

(Glessne, 2011, p. 156), as an aid in addressing my reflexivity. The researcher worked through numerous data sources, completed in-depth concentrated and repetitive engagement, as well as thinking critically and carefully for the duration of the study which contributed to triangulation as explained "to assure that we have the picture as clear and suitably meaningful as we can get it, relatively free of our own biases, and not likely to mislead the reader greatly" (Stake, 2006, p. 77).

First, data collected was sorted and reviewed. Transcriptions and written reflections were coded and categorized according to research questions. All field notes from observations, transcriptions of interviews, and written reflections for a teacher were coded with names that were randomly coded to ensure anonymity (Simons, 2009). A table of contents contained the matching identity list and was locked away to maintain confidentiality and privacy.

To further analyze data, relevant findings and categories for themes were ranked by levels of prevalence. To rank findings, I listened to audio recordings of interviews and meetings while reading and re-reading transcriptions, read written reflection notes, wrote analytic memos or (summarizations) of interviews and penned reflections, and wrote notes in margins, highlighting, and underlining foundational aspects of the case (Simons, 2009). Findings were ranked high, middle, or low importance as related to understanding each theme. Next, identifying mistakes, outlier or unexpected findings (perhaps a barrier or success for teaching SCL with technology was related to an underlying less evident problem), and deciding how to address them within the study was instrumental in finding results and implications for further studies.

Early Assertions

As data was collected, tentative assertions or statements of the findings based on evidence of regularities or discrepancies related to each of the three themes (research questions) were made (Stake, 2006) on the completion of each intervention. Assertions were worded to reflect the evidence of support or lack thereof, indicative of the research questions or themes (Stake, 2006). In an effort to truly understand the data, I immersed myself in searching for vital information. Seeking advice and support from the AR team for clarification of assertions from their perspective proved beneficial, as shown below.

- An early assertion regarding: What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology? Teachers have mixed beliefs. Several teachers expressed they believe that this constructivist type teaching method is meaningful and using technology was "where our students are", or that it is a part of their world. Teachers Ms. Chambler and Mr. Hill adamantly opposed the use of technology at school. Therefore, I asserted that a change in pedagogy for them requires time or perhaps a crisis requiring their personal practices to change.
- Assertions regarding barriers and successes that teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom definitely include access to devices and the Internet as well as quality time needed for planning lessons.
- Finally, an early assertion regarding increasing teacher self-efficacy in order to transform traditional instruction methods to student-centered learning enhanced

with technology includes engaged leaders, a concerted school wide effort, and time greater than one semester.

Action Research Team

Leading and facilitating an action research group to gather and analyze data, design a plan for interventions, and complete the numerous meetings and tasks necessary was challenging to say the least. Teachers' demanding workloads, numerous meetings, conferences, professional learning, planning, analyzing student data, mentoring students, teaching, and an intense accountability measure increasing self imposed pressure to perform made it difficult to schedule meetings. Oftentimes, we scheduled and rescheduled to meet numerous times before all team members were available to meet.

Research sample. Action Research (AR) team participants consisted of faculty members at the school who were identified as key people (Stringer, 2014) based on social conversations in which an interest in the project was expressed. After the initial AR team members were chosen, one changed her mind and two were transferred to other area schools. A PowerPoint presentation was given regarding the action research process. Teachers who agreed to participate were given an Informed Consent form to complete and sign. Each of the AR team members had previously completed mini action research projects in graduate school so their familiarity with the process contributed to their enthusiasm to participate.

The team of four was comprised of three 7th grade teachers and myself. We were able to meet during our common planning. Teachers' schedules before and after school hours were filled with commitments to other school activities (coaching intramurals) and personal obligations (two teachers had young children). The AR team worked well together in search of deeper

understandings of the study's topic. One of the teachers added Action Research Team Member to her resume as a leadership position to highlight her group participation.

Participant selection for the implementation of interventions was voluntary. Based on suggestions from the AR team and school administration, potential participants were approached face-to-face for a general explanation of the study. Afterwards, they received an invitation to participate via email. Ideally, we hoped to identify participants representing a broad spectrum of pedagogical backgrounds from those interested in teaching strategies that are student-centered supplemented with technology to those less interested in the teaching strategy, yet simply wished to participate in the study. Stake (2006) suggests that participants should not be chosen by specific attributes. He states, "Balance and variety are important; relevance to the quintain and opportunity to learn are usually of greater importance" (p. 26). All of the AR team members were eager to learn and grow from the research content and from participating in the action research process.

An initial electronic survey was sent to potential teacher participants who consented to participate by reading the directions and indicating that by clicking next, they agreed to participate in the survey. After reading the consent form, asking questions, and receiving clarification, twelve teachers who agreed to participate in interventions during the school year signed Informed Consent forms. After initial interviews were completed, four of the original teachers who consented to participate did not conduct any of the interventions and expressed "lack of time" as the reason for their decision to decline from participation.

Trustworthiness and Validation

To ensure trustworthiness and validation within this study, I inquired into a variety of perspectives and their relationship to the context with cross checking, otherwise known as

triangulation (Simons, 2009). "Data source triangulation is an effort to see if what we are observing and reporting carries the same meaning when found under different circumstances" (Stake, 1995, p. 113). Striving for trustworthiness throughout this study, a commitment to monitor myself regarding potential personal biases was a major goal. As Simons stated in regard to staying open, " ...we have to balance foreshadowed issues with staying open to the unexpected. This is sometimes difficult as we are not always aware how our previous knowledge can get in the way" (Simons, 2009, p. 57). Thus, keeping a ruminative demeanor, I strove to remain open and be able to recognize the not so obvious components.

The action research team and intervention participants completed member checks throughout the course of this study. The AR team contributed to analyzing the plethora of data collected. Additionally, discerning negative or unexpected outcomes irrelevant to the study was beneficial in validating the research.

Limitations

As indicated earlier, Hilltop Middle School's system has high expectations for teachers to implement student-centered learning enhanced with technology. Because of that, school and system professional learning also provided opportunities for teachers to learn how to use technology more effectively. Thus far, learning to use the system-wide eClass program and Google tools more effectively was the focus of numerous optional professional learning opportunities, but not so much for the student-centered learning component. This is a possible limitation regarding the value of the study interventions in which teachers participated. Additional knowledge gained on the use of technology itself may have contributed to increased self-efficacy for this instructional method.

Timing: Key Milestones and Timeline

Presented next is the research plan (Table 2) and action research timeline (Table 3).

Table 2

The Research Plan

Research Questions	Data to be Collected	Sample	Analysis Approach	Proposed Timeline
What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology?	Teachers self reported in a pre-survey and interviews - positive values and support for teaching student-centered learning with technology. Interviews revealed some do not believe in using student-centered learning, technology, or both.	70 academic teachers (Math, English Language Arts, Social Studies, and Science) from grades 6, 7, and 8 completed the initial survey; 12 teachers participating in interventions were interviewed.	Pre-survey used for a general idea of teachers' beliefs. Initial interviews were coded using Process Coding, then categorized (Saldana, YEAR). Second cycle coding identified initial themes for early assertions for guiding the ART in planning interventions. AR team meetings throughout.	Collection of this data began in September of 2015 and continued through March 2016.
What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom?	Teacher interviews revealed lack of time to teach using student-centered learning with technology. Several teachers reported lack of self-confidence in using technology in their personal lives. When used successfully, student engagement increased.	12 teachers from grade 6,7, and 8 participated in interventions; four teachers were on the AR team as well as participants.	Teachers provided feedback through written reflections and end of study interviews (document data), which were coded for themes, categories. AR team meetings-agendas, recordings, transcriptions, and field notes.	Data was gathered from September 2015 through March of 2016.
How can an action research team guide teachers to	The AR team planned three interventions grounded in Bandura's Social	All 12 participants signed informed consent forms; however, all	Post-intervention documents and final interviews were coded, categorized, and	Data was collected from September 2015 through March 2016.

increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology?	Cognitive Theory framework using vicarious experience, mastery experience, and social persuasion. Document data-reflections and post-intervention interviews. The AR process methodology implementation and analysis were derived from this question.	participants did not complete all three interventions. Teacher participants and AR team were post intervention interviewed.	themes identified. AR team meetings and interviews, along with my recorded reflections and notes recorded and transcriptions, which were coded, categorized and themes developed. AR team meetings throughout.	

Table 3

Action Research Timeline

Action Research Timeline	
Phase I (August 2014—May 2015)	
Action	*Timeline*
Submit IRB	December 2014
Form Action Research Team	August 2015
GCPS Approval	September 2015
Initial Action Research Team Meeting	August 2015
Collect data re: Student-centered learning with technology	August 2014-April 2016
Phase II (May 2015—March 2016)	
Action	*Timeline*
Submit Revised IRB (If needed)	May 2015
Interview action research team members	August 2015
Meet with action research team re: Survey	August 2015
Survey re: Self-efficacy for teaching SCL with Tech	September 2015
Action research team to discuss survey results	September 2015
Initial interviews of intervention participants	October 2015
Develop and implement interventions to increase teacher self-efficacy.	October 2015-March 2016
Phase III (January 2016—March 2016)	
Action	*Timeline*
Evaluate effectiveness of methodology and interventions	October 2015-April 2016
Determine future of project	April 2016
Write up results	April 2016-June 2016
DATA	

Phase I (August 2014—October 2015)	
Action	*Timeline*
Document Analysis	August-September 2015
Observations of action research team	Duration of Project
Initial data collection for intervention	August 2014-September 2015
Phase II (October 2015—April 2016)	
Action	*Timeline*
Observations of action research team	Duration of Project
Implementation of intervention/data collection	Duration of Phase II
Intervene with intervention and document performance	Duration of Phase II
Analysis of interventions	Duration of Phase II
Phase III (March 2016—April2016)	
Action	*Timeline*
Observations of action research team	Duration of Project
Analysis of Interventions	Duration of Phase III
Final data collection and analysis	April 2016

Subjectivity Statement

Within the context of this Action Research project, in which a challenge of practice was identified, researched, and a plan then created attempting to make a change, a certain amount of subjectivity or personal involvement of the researcher was unavoidable. Amidst the notion of avoiding biases, incessantly bias checking, and endlessly seeking a degree of objectivity, I studied.

CHAPTER IV

CASE STUDY

I have a well-trodden answer to the question, "What is the purpose of educational research?" My answer is this: "Educational research is critical and systemic enquiry aimed at informing educational judgment and decisions in order to improve educational action. The focus is on what happens in learning situations—that is, educational action—and on value—orientation towards improvement of that action" (Bassey, 2003, p. 111).

Michael Bassey (2003) eloquently expresses his philosophy behind case study research in the institution of schooling in the quote above. This quote encapsulates the desired goal of not only understanding what needs improvement in education, but that change requires work. Case study "is used in many situations to contribute to our knowledge of individual, group, organizational, social, political, and related phenomena" (Yin, 2014, p. 4). Case study is needed to understand unique social situations, experiences, and circumstances (Simons, 2009; Yin, 2014).

This is an intrinsic case of "where a case is studied for the intrinsic interest in the case itself" (Simons, 2009, p. 21). While there may be similar studies published, this case study is unique in that it attempts to understand a deep meaning of teachers' beliefs and how a positive change can be accomplished within a particular setting (Simons, 2009). Thus, a rich description will provide the reader (committee) with a greater understanding of the events and the uniqueness of this case (Hays, 2004).

In telling my story, I find Simons' (2009) writings valuable when she expressed her ideals regarding generalization.

> "In many contexts where we conduct case study research we have an obligation not necessarily to generalize but to demonstrate how and in what ways our findings may be transferrable to other contexts or used by others…not so much a generalization—moving out from the specifics of the case to other cases—but more universal understanding or insight arrived at through intense, in-depth particularization" (p.164).

Children are the same and children are different. Understanding the dynamics of educators' working practices embedded in their own pedagogy and efficacy for teaching and building relationships with students are unique in one setting, yet could be transferred and repeated in a similar environment.

Context of the Study

The setting for this qualitative case study took place in a quite massive, demographically diverse middle school located in a southern urban city. As a teacher at HMS, this unique case study landscape was used to wholeheartedly grasp the day-to-day experiences while trying to set aside ingrained presumptions while acquiring knowledge (Stake, 1995). Upon entering the front door of Hilltop Middle School, sounds of a waterfall emptying into a pool surrounded by stones and plants provide a warm, inviting welcome. Visitors find themselves feeling right at home as they are greeted and helped by friendly, caring front office staff. The environment has the feel of a small, hometown community.

Continuing to the main hall, the grandeur of the building is amazing. An immense hall is decorated with flags from all over the world. The vibrant pennants are suspended neatly on either side of the clean, impressive hallway, just below vast rows of skylights. Boasting approximately 275,000 square feet, one of the largest schools in the state, to visit each hall, level,

and office can be quite time consuming. From time to time, teachers are found walking through the long hallways before or after school for exercise.

In virtually every room and throughout hallways, wireless (Internet) access points are visible on the ceilings. The media center and each of six academic wings house a large, clean computer lab with approximately 30 desktop computers and an LCD (liquid crystal display) projector and screen. In the media center, there is a newsroom equipped with state-of-the-art technology equipment and a green screen for producing the morning news.

Within the school's (system) online communication program, educators may reserve devices on a shared database calendar for classroom use. Options available for check out include two laptop carts with 16 laptops per cart, seven carts each holding 10 iPads, 10 Nexus tablets, 10 Samsung tablets, and two carts each housing a set of 20 Chromebooks. Cameras and student response systems are available for classroom use. Technology support includes a Local School Technology Coordinator (LSTC) and a Technology Support Technician (LST). Teachers and administrators may request help by filling out and submitting an electronic "ticket". This process also contributed data to this study regarding the need for technology help within the school.

While meandering on through the building, quickly you notice a quite diverse student population. The student population's racial and ethnic make-up is categorized as "majority minority" in that students identified as Caucasian make up 35%. African American young people make up 26%, Hispanic 22%, and Asian students consist of 12%. Students participate in a variety of before and after school clubs, sports, tutoring, and other activities. The faculty consists of a unique blend of hometown folks, predominately white, with a small portion of faculty and staff of diverse racial and ethnic backgrounds from various states and countries.

Hilltop Middle School has gone through interesting changes over the past 10 years. The neighborhood, in the heart of a fairly small city, previously touted a population of middle to upper middle class status. The percentage of students living in poverty has increased during this time. Historically, students at Hilltop have scored extremely well on standardized assessments. Long time Hilltop Middle School teachers are experiencing difficulties adjusting to this changing population. For example, one significant change perceived is a decrease in student support at home.

Middle school students exist as creatures of their own type. Early adolescence situates learners to carry out each school day—designed for teaching and learning—with excessive drama, mood swings, and physical and physiological changes in their bodies, not to mention quite often, an abundance of familial baggage and heartbreaking events in their home lives. Hilltop Middle School educators diligently demonstrate patience, concern, and discipline while attempting to fill adolescent aged students' brains with knowledge.

Generally speaking, the culture and climate of the school is positive and caring. The notorious issue of "teacher morale" often a conundrum, is for the most part healthy and pleasant at Hilltop Middle School. Distributed leadership is prolific throughout the building with a variety of teachers leading professional development, piloting projects for school improvement, and sponsoring clubs. Teacher-leaders attend workshops then redeliver information to other faculty and staff members. Many are involved in planning or are committed to numerous obligations associated with typical school organization management.

The Action Research Team

Working with outstanding teachers who were inquisitive about my doctoral program led to discussions about this research project. As a veteran teacher working with several less

experienced, yet dynamic teacher leaders, their curiosity kept an air of excitement throughout this project. We found ourselves engaged in many discussions regarding education and if the long held institutional practices would fit into our changing world. The teachers with whom I worked had young children or had not started a family at that time.

Not only did conversations with the school principal spark my interest into the topic, but also observing my granddaughter, Tessa and her use of technology as a toddler. I found myself curious while trying to envision her future life in school. Would technology in our society change the conventions of schooling as it currently operates today? My colleagues and I discussed how students today wake up and power up with their smart phones, iPods, iPads, laptops, or other tablets with Internet access. On any given day, when a student walks through the school doors, they "power down" by silencing or turning off their personal technological devices. Students proceed moving from class to class with teachers talking through PowerPoint slide after slide disseminating information, as students passively endure the lectures. Students eagerly anticipate powering up their personal devices they have longed to use as soon as they exit the school building. Our modern day young people, from newborn to approximately age 27, have grown up with computers, cell phones and other technological devices. Technology ridden people drive societal decisions being made politically, socially, economically, and certainly educationally.

AR Team Members

Becky was the youngest teacher in the group with three years teaching experience. She was energetic and comfortable with technology use herself and with student use of technology. She taught 7th grade language arts and had the opportunity to implement writing and reading using a variety of methods. She volunteered for things above and beyond the regular classroom

such as coordinating the school Relay for Life team, sponsored the 8th grade dance, participated in trainings as a Lead Innovator for technology, and served on the school Positive Behavior Interventions and Supports (PBIS) team who planned school wide advisement for students with teachers. She completed her Master's degree while participating on the AR team. Becky was well liked by peers and students. Being a new mother, she was also eager to pursue this project. Her energetic and innovative thinking contributed to our team moving forward in a timely manner.

Laura taught 7th grade Special Education language arts. She had six years experience and was a wonderful resource for all teachers with students with special needs. Laura thrives on organization and details. She was the one we could count on to be inquisitive about every aspect of the AR team's work. She had a knack for remembering facts and for getting people to open up and pour out their thoughts and feelings. Laura is known for adding a creative flair to celebrations and faculty events. She was recognized by the school system for a lesson she created utilizing technology through the system eClass online program. Laura's passion for working with children and visionary ideas inspired the team to muse on creative ideas.

Linda, another 7th grade language arts teacher, had previously investigated technology use in the classroom and its effect on student achievement for her Masters Thesis. Inquisitive about this action research project, she was anxious to participate. Her six years experience in the classroom and as a basketball coach, she was dedicated to make a difference in the lives of students. Linda's calm curiosity kept the AR team grounded in that if some of the ideas were too aggressive or unrealistic, she spoke up and provided ideas to balance the plan of action.

AR Team Meetings

Each of the action research team meetings was held before school or during a common planning time. A hearty 45 minutes was allotted, and norms were adhered to consistently. However, simply due to the nature of completing action research by teachers within a school, interruptions were inevitable. From announcements over the loud speaker to other educators coming into the room—even with a "meeting and recording in progress, please do not disturb" sign on the door—flexibility and quick redirection became part of this team's process.

Meeting # 1, August 6, 2015. Serving in education for 20 years provided me with many opportunities to lead my peers through a variety of challenges, both positive and negative. As an optimist, endlessly hopeful, and always seeing the bright side to situations, leading through adversity often compels my attention. However, preparing for the first AR team meeting prompted a bit of anxiousness within. Since this project was part of an ever so high level of importance, a culmination of learning through coursework and preparing for doctoral research, it was both exhilarating and overwhelming at the same time.

I knew the team members well, and recognized that, in a sense, they were drawn to me as an energetic veteran teacher. They often came to me with questions regarding students or furthering their own education. They expressed that were eager to learn and anxious to navigate through the AR journey that was about to begin. The desire to facilitate this group was to complete research effectively and create a change within the school, and also to guide each person to realize and grow their individual leadership skills.

To begin the meeting, a PowerPoint presentation was given to explain the process of action research, the purpose of the study, research questions, theoretical framework, and a practical timeline (current school year) to complete the project. The team spent time discussing

the consent form ensuring understanding of the terminology, expectations, and investment they were making. The team member participants understood the information, agreed to engage in the project, and signed an informed consent (Appendix B). We then set norms to ensure productive meetings going forward. Beginning and ending on time, following the agenda, valuing each other's opinions, listening to each other respectfully, and meeting in a designated classroom were the essential criteria chosen to proceed forward.

Laura asked for clarification of one the research questions. She inquired, "*Are we looking at just the beliefs of how they [teachers] feel about instruction, or just if they implement that in instruction?*" Referring back to the research question: "What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology?" the goal was to understand teachers' beliefs, then we would move forward with planning interventions to increase the use of student-centered learning enhanced with technology. The team continued discussing teachers feeling confident with their use of technology even though their technology level may only include using PowerPoint, yet students were not actively using technology at all.

Next, the plan for sending the survey out to teachers to complete electronically was discussed. The principal had previously agreed to send the electronic link out to the faculty to be completed during curriculum team meetings during the third week of school. Support of the project from the principal clearly expressed in the survey invitation would encourage participation. The timing for completing the survey allowed teachers time to get into the routine of the new school year without being inundated with additional tasks during a hectic time.

Upon reflection on the first meeting, the importance of the research project purpose and questions were always at the top of the agenda to guide the team's focus. Primarily a content facilitator at this time, I discerned the need to move more toward a process leader to draw out

ideas from the team, and was invigorated and confident with facilitating meetings and encouraging the AR team members to continue learning and growing as teacher leaders. The team dynamics included attributes of intelligence, strong work ethics, children centered, inquisitive, and passion for the venture.

Meeting # 2 September 4, 2015. Anxious to learn from the survey, the second AR team meeting entailed analyzing results in which 70 academic teachers responded. The school principal had emailed the link to the online survey (via Qualtrics through The University of Georgia) to the content area faculty—those who taught the academic subjects of Math, English Language Arts, Science, and Social Studies. The goal was to gather data from teachers in general regarding their self-efficacy for teaching student-centered learning enhanced with technology.

The AR team found that results of the survey questions in this study for the most part showed little to no significant correlations of efficacy for student-centered learning with technology when compared to age, gender, or number of years of classroom experience. One common factor outstanding among teachers was the unreliability of Internet access. The majority of teachers responded Agree to Strongly Agree to the statement, "Technology is unreliable." This outcome was expected since during the spring of the previous school year the school and district experienced many days of interruptions of Internet access.

During the AR team meeting, the issue of teachers rating themselves highly self-efficacious led the discussion. One AR team member referenced the survey results with, "It didn't surprise me that our teachers would rate themselves fairly high (self-efficacious for using student-centered learning enhanced with technology), but they really don't use it." The team

considered the importance of interviewing teachers thoroughly in an effort to uncover their true beliefs regarding student-centered lessons and actual technology use in the classroom.

Next, the team discussed potential participants or teachers for interviewing, to implement interventions, reflect on their interventions, and to complete end of study interviews and a post survey. Each team member was willing, even exuberant regarding the task of having candid conversations (semi-structured interviews) with their peers. After an extensive dialogue regarding characteristics of teachers to ask to participate, the team came up with teachers from a variety of grade levels, years of experience, and differing abilities of technology practices. A list was compiled along with a plan to contact teachers individually face-to-face and to follow-up with an email.

The team began generating ideas for interventions. The AR team's plan to guide teachers to increase self-efficacy for student-centered learning with technology included providing encounters for teachers framed on Bandura's Social Cognitive Learning Theory. Therefore, the notion of presenting opportunities for vicarious experiences—observations of model teachers, mastery experiences, implementing a model lesson, social persuasion-leadership support, and encouragement (Bandura, 1977)—guided the decision-making process.

The team believed that trying to improve emotional and physical health, Bandura's fourth experience for increasing self-efficacy was out of the scope of doable tasks within the working timeframe; therefore, interventions from this physiological perspective were not chosen. There was an air of excitement in the room. At this point, exhilarated with the progress the team had made, a reflection was noted in my journal for the appreciation of the team's energy and enthusiasm to participate in this study.

Meeting # 3 October 12, 2015. Before the third meeting, 13 participants were contacted face-to-face by one of the AR team members regarding the project and what their role would be in it. Twelve participants agreed to be a part of the study and signed an informed consent form (Appendix C). All of the AR team members were vitalized to conduct interviews. The participants were divided among the AR team, and all agreed to complete initial interviews within two weeks. While each of the team members had previous experience in research interviews, it was prudent to provide interview tips or reminders. Helen Simons' (2009) *Case Study Research in Practice* provided valuable information for this purpose.

- Establish Rapport: (in a short amount of time) create a setting where interviewees feel at ease to express innermost thoughts and feelings; brief explanation of study—attempting to understand teacher beliefs and self-efficacy for student-centered learning enhanced with technology.
- Active Listening: listen actively *to hear what is being said;* practice patience and restraint; try not to rush or to intervene too soon with more questions; try not to answer questions; listen carefully and learn; however, do not allow interviewee to dominate—redirect to topic.
- Audio-recording: this research is approved by the UGA Institutional Review Board (IRB) and all participants are kept confidential/anonymous.
- Notes are good to take while listening and recording.

The team then agreed on the question starters for the semi-structured interview questions as listed in Chapter III. The team understood the desire to connect with the teachers to understand their true beliefs; yet, keeping the focus on the topic was imperative for gathering data. An interview outline document was provided with the interview tips, purpose of the study, and the

semi-structured interview questions to each of the team members for guidance through the interviews to be completed. The meeting ended with a fervent air and determined goal to finish interviews in a timely manner.

Initial interviews. Each AR team member worked vehemently toward the goal of completing audio-recorded interviews. Recordings were uploaded to an online transcription service, and returned for analysis within a few days. Completing interviews proved a more arduous task than originally thought. Teachers—both participants and AR team members—in the school were incredibly busy. Nevertheless, they were eager to participate when their schedule allowed. Many scheduled interviews were cancelled due to parent conferences, required professional development, Individual Education Plan (IEP) re-evaluations and meetings, and illnesses. Total time to conclude all of the interviews took twice as long as planned. One teacher participant was unable to find sufficient time, and ended up declining from participation due to her busy schedule. Each of the AR team members shared that they had a positive experience in conducting interviews. They were able to articulate the topic and made interviewees comfortable enough to open up and share from the heart. However, one interview conducted by Ms. Becky caused concern and strong feelings to emerge.

Vignette: Keep Calm and Carry On

Ms. Becky hurriedly entered my room during planning saying, "Do you have just a minute? I need to tell you what happened when I interviewed Mr. Hill!" Ms. Becky had volunteered to interview Mr. Hill since they had previously worked together sharing a common student supervisory duty. Ms. Becky believed their relationship was professional, yet comfortable enough that Mr. Hill would respond openly and honestly. Ms. Becky, 25 years old, was in her third year of teaching while Mr. Hill, 40 years old, had nine years of experience. Ms.

Becky began talking quickly and hardly paused for a breath. "I know I am not supposed to show bias in interviews, and that I am inquiring to deeply understand the other person's beliefs, but I was so shocked at the responses I received to the questions that I had to take deep breaths and not blurt out my personal feelings on the topic. My heart was pounding. Much effort from within helped me maintain a smile and nod like I was calm and cool."

Intrigued, I posed, "Tell me what in the world happened?" Ms. Becky proceeded to explain that Mr. Hill believed technology should not be in school at all. He exclaimed, "Technology makes us lazy" and that we (as in society) have become dependent upon it. She wondered aloud to Mr. Hill that it seems as if technology cannot be stopped since it has become a part of every day society. He retorted, "this is not society, this is school!" He also explained that students should not be treated as if they are in the real world because school is not like the real world at all. Ms. Becky was somewhat exasperated in this divergent point of view that she uncovered during the interview. She took a few deep, calming breaths. I encouraged her that I was sure the interview went fine, the data would be valuable, and requested that she write down her thoughts and feelings regarding the interview. With the time for students to return to class quickly approaching, she sighed and returned to her room to record her story.

Contemplation regarding Ms. Becky's interview lasted throughout the day. Later in the day at bus duty, Mr. Hill approached me and shared his satisfaction (almost joy) in how well he thought the interview went. From this conversation, I discerned that Ms. Becky maintained a pleasant demeanor and refrained from expressing personal bias regarding student-centered learning with technology. Mr. Hill's stance is further addressed in the findings chapter.

Meeting # 4, November 6, 2015—Interventions and implementation plans

initial interview data. Upon receipt of each interview audio-recording and transcribed texts, the process of listening while reading along began. Categories were coded for common beliefs of teachers. Furthermore, the transcriptions were entered into a software program in which "word clouds" are created for the text provided. The more a word appears in the text, the greater the size in the image or cloud. This tool allowed for an additional insight and reiterated teachers' voices as spoken in the interviews. In regard to teaching student-centered learning enhanced with technology as an instructional strategy, the following common words emerged in the cloud:

- Kids definitely use
- Access
- Accelerated students
- Students use information
- Kids learning
- Scores
- Not enough time
- Kids know
- Difficult
- Not comfortable

Generally speaking, teachers expressed that they realize students' use of technology is a major component in their lives. Teachers indicated that time learning and planning for student-centered learning with technology was difficult. Several teachers expressed being uncomfortable with technology themselves. Moreover, an issue that arose from the interviews addressed students who were high achieving or in accelerated classes doing well with student-centered learning with technology, yet lower achieving students were incapable of learning from this type of instruction.

The AR team believed that through interventions put into practice, teachers would generally increase their self-efficacy for using student centered-learning enhanced with technology.

Intervention design. The AR team's emphasis in designing interventions remained embedded in this research study's purpose. The purpose of this qualitative action research case study was to investigate, develop, and implement effective instructional practices to increase teacher self-efficacy for using student-centered technology enhanced learning. The research questions for this study contributed to intervention creation: What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology? What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom? How can an action research team guide teachers to increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology? Moreover, the overarching theoretical framework, Social Cognitive Theory engendered organizational and systemic ideals for effective self-efficacious change.

In planning interventions, intellectual discussions evolved regarding the use of traditional professional development, also known as "sit and get" lecture type settings. The team discounted this method as an intervention in hopes of a more meaningful training. Initial interview responses contributed to the first intervention grounded in providing a vicarious experience. Several teachers explicitly expressed the desire to observe student-centered learning with technology in actual practice. Ms. Becky explained, "*I just see a need for teachers to receive assistance, I feel that there is a constant push for teachers need to use technology. But there is not really … other than lecture type professional development, which often times they don't provide enough time for teachers to have … play around with it. That causes teachers to have stress when they are given a program with steps on how to do it. They need to find time*

for using it, practicing, figuring it out. I feel like we always just get that instruction, and there is no one to really help so I feel like actually, this research team is going to help others and myself to learn new strategies and things. "

Next, the team discussed and planned for teachers to implement a lesson similar to what they had observed, or to attempt another student-centered lesson with technology they found interesting and doable. The intent being that teachers would feel more efficacious for this instructional method after making observations; therefore, teachers would be better prepared for the second intervention, the opportunity for a mastery experience.

Lastly, ideas for the social persuasion intervention were discussed. The AR team planned to put together national, state, local, and school documentation supporting the desire for teachers to embed more student-centered learning enhanced with technology into their teaching strategies. As teacher-leaders, the AR team was available to answer questions and offer leadership support and encouragement for the project interventions.

Discussing our plan of intervention further, the AR team members considered designing a mentoring plan for working with our teachers. Mentoring provides a beneficial approach to typical barriers associated with technology integration (Bullock, 2004; Franklin et al., 2001). The AR team was hesitant to use this method of professional development. The team realistically and somewhat disheartedly believed that the time necessary to carry out a mentoring plan with teachers in the building would not work.

Vicarious experience. Two technology savvy teachers offered to lead a student-centered learning lesson with technology in which participants could observe. Intervention participants were given a schedule of model classes that were available to be observed. A variety of classes and times were offered to avail educators with hectic schedules. They were asked to complete a

15-20 minute observation and respond with a written reflection form answering questions similar to the interview questions. Due to time constraints of the AR team members and intervention participants, interviews were not feasible; hence written reflections were completed and given to the AR team.

Intervention participants had the opportunity to observe a teacher using a "Menu" or Choice Board which included both technology and non-technology activities. Students chose activities of their personal interest to complete. Students accessed the Internet using iPads the teacher had reserved from the technology lab or their own personal electronic devices. Interestingly, the teacher being observed was one of the AR team members who spent a great deal of time planning the lesson. Student-centered learning was not a method she had previously employed in her classroom. She reflected, *"The first day, I was uncomfortable with the noise level and that I was more of a facilitator. It was not easy changing the dynamics of [my] control, but my students were so engaged and completed the tasks. By the third day, I was excited about all that was going on in my room."* The increased level of student engagement positively impacted the teacher.

The second teacher volunteer prepared a web quest with students completing the tasks in a computer lab working at their own pace. All information was available to the students via the school district's online program in which each teacher has their own site. The teacher expressed that this was an outstanding lesson added to her repertoire.

Mastery experience. Planning of the second intervention was grounded in the themes or research questions from the perspective of a mastery experience. Teacher participants were asked to implement a lesson similar to the one previously observed, or to attempt a student-centered learning lesson of their preference. Teachers taught a student-centered learning with

technology lesson, and completed written reflections. A variety of lessons were completed with different uses of technology. Ms. Laurie created a lesson in which, *"Students were simply typing essays and comparing the punctuation with dialogue to ensure that it was done correctly. Students were responsible and engaged while attempting to self check their own writing."* Ms. Laurie however, felt like the lesson had no effect on her self-efficacy for using this instructional strategy.

In Mrs. Becky's classroom, students completed a menu/choice type project. Mrs. Becky explained, *"Students were much more creative than I expected. For the most part, all projects achieved the anticipated learning target."* She also shared that she felt more confident about implementing lessons like this for her students and that students were truly engaged.

Social persuasion. The AR team discussed thoughts and ideas regarding an intervention for the social persuasion component for increasing teacher self-efficacy. A conclusion was not reached in our meeting, so we continued discussions during breaks and via emails. Finally, the team agreed that sharing document data or evidence of the expectations for teachers in our school, district, and society in general would impress upon teachers the need for rethinking their pedagogical beliefs and increasing their self-efficacy regarding this instructional approach to student learning.

Next, the team created a booklet of documents from the school district, the State Department of Education, and an article written by Marc Prensky (2013), "Our Brains", which was given to the participant teachers to read and reflect upon. Prensky's article predicts 21st century learning as diametrically different from traditional schooling most commonly seen in United States classrooms today. This social persuasion intervention communicated current

expectations for teachers, and described an idea of what schooling in the 21st century might be envisioned. Participants mused the writings in the booklet and responded in written reflections.

Participant Meeting—December 2, 2015

At this point in the study, teacher participants had conducted their first intervention—observing another teacher modeling a student-centered lesson with technology. The AR team opted to lead a group meeting with all participants. The team was curious to hear from participants in a collective format and wondered if their experience reflections might encourage or discourage dialogue. The agenda included the research purpose and research questions along with the three framework building blocks of vicarious experience, mastery experience, and social persuasion.

Five out of nine teacher participants attended the meeting, and they seized upon the opportunity to voice personal opinions regarding the dynamics of the instructional method they had observed. The lively discussion remained on topic; yet, when the meeting ended, my initial thoughts were that the meeting resembled a "gripe session". Nevertheless, I followed through with listening to the audio recording and reading the transcribed texts. In retrospect, teachers' passion for excellence in teaching and learning through loving and supporting children proliferated throughout their voices. What was gleaned from this re-examination? Change is difficult. Technology changes so rapidly; it is difficult to make a plan and carry out how to incorporate the use of technology by students and it causes stress for many. Through teachers' voices, their desire to guide and facilitate student-centered learning was mired in systemic tasks requiring strict schedules, overwhelming amounts of curriculum, and little classroom autonomy.

Notwithstanding, a recurrent and somewhat concerning matter brought forth the notion that only higher level, already well-behaved children are capable of success with student-

centered learning enhanced with technology, which resounded throughout the group. Classroom management/student behavior, time to prepare, freedom to implement, and lack of personal use of devices were barriers that several teachers perceived. One teacher actively involved in attempting interventions who did not use technology readily in her personal life expressed, *"Because I'm very against any of those, I don't think those belong in school"* when the discussion centered around students using devices such as smart phones, tablets, or personal computers.

Subsequently, interventions continued through the spring. Time to implement interventions varied among participants as anticipation for state testing in the spring consumed most educator's time. Media attention to recurring changes from the State Department of Education led to uneasiness and frustration among the faculty. Teacher evaluations tied to student achievement seemed to overwhelm participants. They were eager to implement the interventions, but were inclined to persist with more traditional methods of instruction in order to meet state mandates. The AR team remained positive, and encouraged teacher participants to complete their interventions as practicably as they could.

Critical Incident Technique Interview

Finally, interventions were completed. End of study interviews were conducted seeking to discern if indeed an increase in personal self-efficacy, or not, for student-centered learning enhanced with technology had occurred. Ms. Williams had much to say speaking frankly during her post-study interview in which Critical Incident Technique (CIT) questions were incorporated. She was not particularly fond of student-centered learning enhanced with technology since she was a "memorizer" in school and had some difficult experiences several times in the past with technology in student-centered lessons. Her desire to participate in the study was to gain

knowledge and comfort to incorporate this teaching strategy into her classroom instruction. The CIT interview progressed as Ms. Williams openly voiced her dismay regarding student-centered learning with technology as can be seen in the following excerpt.

Researcher: *"Ms. Williams, will you please tell me about a specific situation that occurred during an attempt to use student-centered learning enhanced with technology…maybe when something went really bad or really well? As you tell me your story, please include details describing the setting, the situation, the characters, and the crises. Kind of narrate what happened, what you did, and how things turned out."*

Ms. W.: *"Yes, I had attended a training on using iPads and decided to incorporate that into my 2nd intervention…the one where you wanted us to try a technology and student-centered lesson. I had observed Ms. Becky using iPads as well, so that is what I wanted to do. It was just a review for a test. We were using a little app and it wasn't working right, the kids couldn't get a signal and it was frustrating for them and it was frustrating for me so both of those are negative experiences for me where I can work... I can have a more productive classroom without depending on... and reliable technology so it just made me a little bit shy about using it. I know it has a place and I know technology is great but I haven't... I've had more negative experiences than positive ones in my limited scope."*

Researcher: *"So you had your lesson ready and your students have this iPad in front of them and you instruct them to go to a particular site or app?"*

Ms W.: *"Actually they were... no, they were working on something else before the lesson... I can't remember, it was couple months ago, they were working on something they had to do first and then that was their go to after. And so my first*

couple of students grab the iPads and I'm like 'Okay, guys. You're going to be my guinea pig because I haven't actually run this with students yet' and they were like 'It's not there, it's not there, and it's not there' and so that's when the email went out. It's not there, the app isn't there and then I have the kids to Show ME because Show ME was there so just sat right here in a little booth, it was about four kids that were finished with the assignment they were all working on and we sat in here and we did Show ME. Sorry, we use the stupid little white board app which I have white board so it was fun for them. I will say they were... they had fun writing with their finger on it but it wasn't really what I had in mind, you know we were able to recover but that's also my accelerated class, those kids are so malleable, they're going to be able to go with the flow. If that would happen in a regular education class, it could have been bad news."

Researcher: *"So what about that? Are you more comfortable with your accelerated students versus your standard class or your co-taught (students with special needs) class?"*

Ms. W.: *"No, and that's probably another fear. I try to go to all of the trainings where I get to play and see all these different things that are available. It's exciting and then to bring it into my classroom…there is a little wall there for me…I think it's a huge wall but it was a little wall for me like 'What happens if it works, what if we have a cancel connection, what if it flops, what if it...' and then that keeps me from trying... because it happened last year. I used the new program that Ms. Doright taught us and it was so exciting and I didn't really get what it looked like as a student. So I played at night on my phone and my computer as a teacher so*

then I could see what the kids would see and I could see what the teacher would see and it completely bombed on me too. None of this... it was one of those programs where you push stuff out to them and they would do something with it and then I could see all what they're working on my screen…and nothing was pushing out to them and I was just like 'I don't get what I'm doing, I guess.' I thought I did at home, it worked for me but once I was in the classroom, and I was trying to push information out to them and have them work on... it was a cell there... they were naming like cell and organelle and all of that."

Researcher: *"You were frustrated?"*

Ms. W.: *"It was very... it didn't go well so I think I haven't had a real successful lesson that went with the iPads and that's what I'm trying to do is putting more iPad, app, technology into my student-centered learning."*

Researcher: *"Do you have an iPad?"*

Ms. W.: *"I do. I bought one for teaching. My first... I bought it with my personal money for teaching and it's in my dresser at home because I'm... and there is a fear factor there for me for sure but it doesn't seem that they work in time and developing a time in playing with it, getting to be an expert at it, it takes time, you know."*

Researcher: *"Do you think, because of your experiences…even the not so great ones…do you feel more confident at this point in time than you did in the past as far as...?"*

Ms. W.: *"No, I do not feel more confident now. I feel like there are some really cool resources out there, and I feel like I should not quit and I need to keep trying."*

Researcher: *"So, what would make that happen for you?"*

Ms. W.: *"Just to do it, just do it…like this week I want to do quizzes…we learned that at the last one [training] and so I'm not going to quit, I'm not going to stop trying, I just... you know what I mean, I need a successful one."*

Along with interviews, teacher participants completed a post/end of study survey to determine if their pedagogical beliefs changed (or were changing) and if instructional practices or self-efficacy had increased. Data analysis throughout the study contributed to knowledge gained in our school.

Conclusion

The action research team and the intervention participants all expressed unique thoughts and ideas regarding student-centered technology enhanced learning. Self-efficacy was increased for some teachers while it decreased for others. Time was problematic for most of the teachers attempting to increase the use of student-centered learning with technology. Time also affected the overall processes of the action research team, which led to flexible scheduling and intervention design. Overall, the study benefitted all participants if not through an increase in self-efficacy, a self-awareness to consider their pedagogical beliefs and attitudes and their current teaching practices.

CHAPTER V

FINDINGS

The purpose of this qualitative action research case study was to investigate, develop, and implement effective instructional practices to increase teacher self-efficacy for using student-centered technology enhanced learning. The central research questions guiding this study include:

- What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology?
- What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom?
- How can an action research team guide teachers to increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology?

This chapter presents findings from interviews, written reflections, and pre- and post-study surveys of teachers who participated in the action research project at Hilltop Middle School. The information is organized by research question or theme detailing expected and emergent understandings in categorical form revealed during data analysis. Table 4 below illustrates the main characteristics of each theme, category and sub-category.

Table 4

Research Findings

Research Question	Findings from Data
What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology?	Participants' beliefs and attitudes for SCLw/ T were positive.
	Interviews uncovered an emergent theme in participants' pedagogical beliefs and attitudes toward SCLw/T.
	Teachers' beliefs and attitudes recognized the integral piece that technology plays in students' lives.
What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom?	Interventions confirmed time as major barrier for implementing SCLw/T.
	Interventions led to the emergent barrier of fear of teachers' loss of control.
	Interventions indicated technology issues persist as barriers for SCLw/T.
	Interventions led to successes for SCLw/T.
How can an action research team guide teachers to increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology?	The team understood the challenge to increase teacher self-efficacy for the instructional practice of SCLw/T.
	The team worked together to plan, implement, and evaluate interventions.
	The individual members of the Action Research Team were personally impacted.

Research Question 1:

Teachers' Pedagogical Beliefs and Attitudes Toward Student-Centered Learning Enhanced with Technology

The focus of this study was to mobilize teachers through a series of interventions and reflections in an attempt to increase their self-efficacy for using student-centered learning enhanced with technology as an instructional method. In order to understand teachers' levels of self-efficacy, pedagogical beliefs and attitudes were explored through pre- and post-study semi-structured interviews of nine participants. Three themes identified in the participants' interview discussions include: 1) participants' beliefs and attitudes for student-centered learning with technology positively increased, 2) an emergent, unexpected belief/attitude regarding student ability levels surfaced, and 3) ideas and outlooks regarding technology is an integral part of students' lives. Table 5 shows the findings.

Table 5

Effect on Participants

Research Question	Findings from Data
What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology?	Participants' beliefs and attitudes for SCLw/ T were positive.
	Interviews uncovered an emergent theme in participants' pedagogical beliefs and attitudes toward SCLw/T.
	Teachers' beliefs and attitudes recognized the integral piece that technology plays in students' lives.

Positive Beliefs and Attitudes

The combination of interventions, reflections, and group discussions resulted in teacher participants' pedagogical beliefs and attitudes toward student-centered learning with technology becoming increasingly optimistic for some of the participants. Participants shared their delight in students' creative thinking, understanding at higher cognitive levels, and solving problems through peer interactions when involved in student-centered, project based learning using modern technology devices. Teacher participants provided examples of their thinking during instruction of student-centered learning with technology. Ms Cohan shared:

> *"I like it when they are huddled around helping each other. For some, it's a process to learn. I do think it [student-centered learning] promotes higher-level thinking. It gives them independence. If a student does not have the skills needed, I partner them up with someone who can do it and they learn from their partner. I do reassure them that they are not going to hurt something in the software, to go ahead and explore and try things out. Students are sometimes afraid they will do something wrong. They love to share things they find and learn when they are working on a project using technology!"*

Mr. Jones expressed sincere amazement when narrating a situation in his class:

> *"I placed a PowerPoint online for students to use if they wanted to, or they could do a Google search to find the information. In doing that, what I had to teach them was how to split the screen. One of my struggling students showed me how to do it. I was shocked this young man showed me how to do this. I thought, wow, this guy might be able to write programs in the future for all we know. He is not a really good student, but he understands technology."*

He continued on to explain: *"Traditional schooling is not for all students if you really put it in perspective. I believe it is important to teach students using their current mediums of communication and social interactions."* Mr. Jones exuded excitement as he spoke about students learning in non-traditional avenues such as PowerPoint and notes. Ms. Stokes provided additional evidence of positive pedagogical beliefs and attitudes when she stated: *"Learning should always be student-centered, and technology is one way to enhance and foster learning. Technology adds another level of engagement for students and makes learning more enjoyable!"* Finally, Ms. Chambler summed the overall message with this: *"I believe student-centered learning is the most effective way for students to gain knowledge and retain it. The use of technology can enhance the experience."* Participants in this study held positive pedagogical beliefs regarding instructional practices for student centered-learning enhanced with technology.

Unexpected Emergent Data

A most surprising aspect of the data in relation to teacher beliefs and attitudes regarding students, instruction, and learning was revealed during participant interviews. Overwhelmingly, six of the nine intervention participants expressed similar sentiments regarding student-centered learning enhanced with technology and students' ability. Data from this group of six participants showed that they view the instructional strategy as effective with students who function at higher levels or exhibit self-discipline. Specifically, students who have been identified as gifted or accelerated are believed to be capable of practicing this strategy in the classroom. However, participants believe that students who achieve at lower levels cannot function in the classroom with this learning modality. Teacher participant quotes are shown in Table 6.

Table 6

Quotations Regarding Students' Ability

Participant	Quote
Mr. Grimes	"I believe my higher level students could do it more so than my lower level students."
Ms. Williams	"I think my accelerated kids, and this may be true for all accelerated kids, they really want to learn, want to be challenged, and really want more. And my regular education classes, I feel like they really don't care if the technology works or not because they are going to misbehave."
Ms. Peletier	"I did a project the students liked. The technology was not real advanced. It was really basic. The kids weren't as excited about it not being so advanced, but they enjoyed it. I did that with my accelerated group."
Ms. Chambler	"I am finding that students come to me with very little prior knowledge so I spend a lot of my class time teaching things that they should already know. If they had…if they came to me at a level where I could just teach my grade level, I think it would be a lot easier for me to incorporate more project type learning than just here is a skill now repeat it for me."
Ms. Monroe	"The type of kids I have in my small group instruction, many of them have problems with staying on task, staying focused. I can see project-based student learning being utilized in situations where you've got your higher level, your higher critical thinking kids, I think that would be an awesome self-directed, self-motivated project. But for kids that just are...you know, it's difficult, it's too difficult and they've learned that."

Needless to say, most of the intervention participants implemented their interventions in regular education students' classes.

Technology Integral Part of Students' Lives

Participants asserted that technology is prevalent in the lives of their students and that many students have personal devices such as smart phones, tablets, iPods, laptops, or desktop computers at home. Participants believe the use of technology and student ownership of personal devices will continue to increase. Teacher participants, regardless of age, understand the impact that technology has on children in middle school. Ms. Williams, desiring to reach out to students on their level, shared:

> *"I like the idea of using technology, because this is where they are at; it's the way they think. It is kind of like meeting them in their kid of culture. They live in such a digital world. Put an app in front of them…they're going to pick it up the minute they do get the app in front of them from whomever else. I don't think I need it, but I think it's a way to break into their world and I think it's a way to get them excited."*

Several participants expressed the problem of students' misuse of technological gadgets, lack of self-discipline, and the need to teach students digital citizenship. Students seemingly lack appropriate behaviors for meaningful use of technological devices.

Summary. The findings associated with the first research question indicate that teachers understand the value of student-centered learning with technology as beneficial for students. They believe students will be better prepared for continuing their education and for the future workplace. The unforeseen notion regarding students of lower abilities brought awareness to the action research team. Student behaviors while using technology or exhibiting digital citizenship are a concern of teachers in the classroom.

Research Question 2:

Barriers and Successes Teachers Experience with Student-Centered Learning Enhanced with Technology

Understanding barriers and successes that participants face when implementing student-centered lessons with the use of technology was vital for moving forward with this action research project. Teachers were interviewed before and after interventions to gather data regarding personal classroom experiences while attempting this instructional practice. Critical incident questions were included in the interviews to investigate specifics of particular situations that teachers perceived as barriers or successes. Findings from the data collected indicated four major themes or barriers that were confirmed: 1) time, 2) loss of control, and 3) technology related issues as barriers, and 4) success in implementation occurred. Table 6 below provides an overview of the data related to barriers and successes when teaching student-centered learning enhanced with technology.

Table 6

Barriers and Successes

Research Question	Findings from Data
What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom?	Focused interventions confirmed time as a major barrier for implementing SCLw/T.
	Focused interventions led to the emergent barrier of fear of teachers' loss of control.
	Focused interventions indicated technology issues persist as barriers.
	Focused interventions identified student engagement as a success.

Time Crunch. Participants universally stated that time, or lack thereof, was a significant barrier for teaching student-centered lessons with the use of technology. Planning new lessons and restructuring effective traditional lessons demands too much time. Ms. Cohan, a participant quite comfortable with incorporating technology into the classroom agreed: *"It's a lot of set up…it's a long set up. In fact, one of the websites I had planned to use, that I've used in the past, I looked today and the whole company's no longer…it doesn't exist anymore."*

Ms. Peletier discussed the time needed not only for planning, but for teaching lessons that are student-centered and often project based:

> *"The struggle is…it's the timeframe. That's the huge issue. If I had the time to get that foundation down where they really understood it, and then could apply it and use the technology tool to show it, and be able to have the time to do a good job of it, no problem. That's where I struggle. It's that the timeframe to do what we need to have done. Because lots of time they are learning the technology the same time that they are trying to use the technology. Then they are slow and they don't have access to it at home. They only have it at school and so then we are limited on labs here and when they can have it. It's a time crunch."*

Likewise, curriculum or content quantity and accountability for student achievement played a major contributing factor of stress for many teachers. Pressure to perform weighed heavily on teachers. Stress to meet criteria of an effective teacher made them feel as if they had less autonomy in the classroom than ever before. Mr. Grimes clearly was anxious regarding the time barrier, as indicated in his statement:

> *"The dilemma with the student-centered learning concept and approach is the way the county structures our curriculum where there is the billion things you have to teach. You*

have to teach them all a mile wide and a foot deep and you have to get through it all by these dates because we are going to give you a big test on it. Then we are going to hold you accountable for how your students perform on that test and it's going to be full of ridiculously obtuse questions that make no sense even to you as a teacher let alone what the kids are going to do with it. The concept of letting kids pick things and go at their own pace just starts to scare me."

Loss of Control

Participants expressed both explicitly and implicitly that classroom management was a challenge or barrier. Mr. Jones summated with clarity: *"Classroom management and expectations will be your greatest challenges for implementing student-centered learning enhanced with technology. For example, I had to first review classroom management procedures so that students clearly understood my expectations when performing a group activity. To do this, I scaffolded my instruction by performing one task at a time culminating to the completion of the entire project."*

Student responsibility was deemed a barrier for several participants. For example, Ms. Chambler, who did not favor student-centered learning with technology, noted less than favorable student practices in her observation reflections: *"Students were typing, reading, watching videos, laughing about comments students had posted on the discussion board. One student was using her phone to text, and another student was on a website playing a game called 'Effing Machines'. Many of the students spent their time looking at each other and laughing. A few were just sitting and staring at the computer monitor. Students distracting each other was a barrier."* Ms. Chandler also stated that she could do the lesson; however, *"It would take time to set it up and find the resources for the lesson. I would probably prefer to send it home as an*

independent study lesson to reduce the classroom distractions." She had little desire to use student-centered learning with technology in the classroom at the time of this study.

In reality, classroom teachers have had little to no facilitator training. Terminology referencing control, management, difficulty monitoring, higher level students only, misbehaving, self-discipline, and fear factor all indicate teachers lack of tools necessary for facilitating student-centered learning with technology. Traditional methods whereas teachers lecture with PowerPoint slides and students sitting passively taking notes resonate throughout classrooms at Hilltop Middle School.

Technology

Teacher skill set. Every participant within the study owned his or her own cellular "smart" phone, otherwise known as a cell phone with Internet access. Varying degrees of comfort levels with technology arose. Ms. Chambler refused to own a smart phone until the year of this study, and she opted out of using it most of the time. She tried to buy-in to the student-centered learning with technology, but conveyed that it was not easy for her. She asserted, *"I haven't had an interest in technology, so I haven't pursued it outside classes and I haven't spent much time researching technology that I could be using…that students could be using in the classroom. So inexperience, or apathy, I guess lack of interest…I don't feel a need to learn technology."* Much of this could be attributed to fear of the unknown.

Technology unreliable. Technology—the mechanics of Internet access—was another barrier. Technology use has consistently been recognized as problematic for many years. All of the participants stated that Internet access and device issues were unreliable. Ms. Green, a tech savvy teacher explained: *"One thing that happens every once in awhile is when the network is down. If you have anything related to the lesson using the Internet, which kind of makes the*

lesson not work. So I think it is important to have a backup plan, and in those situations I have planned ahead to have something to fall back on in case that happens." Additional reflections pointed out teachers' paucity of software and technology information.

Student skill set. Many students at Hilltop Middle School own devices or have access to devices. Teachers recognized the abilities that students exhibited are limited to texting, gaming, and swiping. Students did not know how to use Microsoft Word, Excel, or other Microsoft tools for writing. Teachers also stated that students should have learned word processing skills in elementary school. Teacher participants again referenced lack of time as a reason for why word processing skills could not be taught in their classrooms.

Digital Citizenship

Mr. Jones voiced concerns that middle school students do not quite understand the ramifications of risky behavior with devices and Internet usage. He recounted an incident that occurred during spring break. A student, known to be a "good kid", claimed to be "only kidding" when he made an Instagram post stating that he planned an attack with a gun at the school on a specific date. Interestingly, two children from two different states saw the post and reported it to their school principals who, in turn, called the principal at Hilltop Middle School to let him know of the threat. Needless to say, an investigation ensued. The student was identified via technology tracking the device used, and he was expelled. In hopes of curtailing this type behavior, Mr. Jones elaborated:

> *"I think we have to set up good controls because of the maturity that exists within our students. Teachers need to be good digital citizens; I think we need to teach digital citizenship before we begin the process of engaging our students with technology. After the spring break incident, I told my students they have to be extremely careful…that once*

you put something out there on the Internet, it's out there. You can't take it back and say oops I'm sorry. I talked to them about taking and sending pictures of themselves. It's not just about being suspended from school; the consequences can be long term. What they are doing is writing their story…their life story. We all make mistakes but you don't want to do certain things that will limit your access to certain opportunities."

Mr. Jones heartfelt passion for helping students make good decisions was intense. Concern for students' awareness regarding the issue of risky (sex related) or bullying type posts was prolific throughout the study.

Successes

By the same token, participants did explain that peer interaction and student engagement allowed for students to help each other. When one student was unfamiliar with the workings of a computer or application (app), another student would teach him or her how to accomplish the task. Teacher participants did see some success when implementing interventions. For example, teacher Ms. Peletier shared, *"Students were actively engaged…the environment was positive and they [students] loved the games."* When responding to how she could implement this technique in her classroom, Ms. Peletier expressed, *"I could definitely do this with any unit I teach."* Ms. Stokes implemented a web quest and remarked: *"Students were engaged and focused on their work. Most worked well to complete the tasks. They worked at their own pace."* Ms. Greene added: *"Students were actively engaged. The environment was positive; they loved the games!" They were able to get necessary information from a 'unique' source other than a book, especially since their textbook has little to no current information about the topic."*

Research Question 3:

Action Research Team Guides Teachers to Increase Self-Efficacy and Transform Instruction

The action research team progressed through a series of meetings to design a plan for teacher interventions to increase their self-efficacy for student-centered learning enhanced with technology. To do this, the team: a) understood the challenges based on initial study interviews and a pre-study survey, b) brainstormed a plan, assisted in implementation, and evaluated interventions, and c) was personally impacted.

Table 7

Impact of Action Research Team

Research Question	Findings from Data
How can an action research team guide teachers to increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology?	A team of teachers can guide their peers in learning effective teaching practices.
	Communication within a team provides for building self-efficacy of teachers.
	Leadership skills were enhanced while providing opportunities for student-centered learning enhanced with technology.

Challenge of the Team

Productive meetings and communication. The action research team meetings were productive with open and honest communications. For example, in the initial meeting, one of the team members, Ms. Laura, expressed her concern regarding the time involved to meet and carry out the research project. A special education teacher with a schedule packed with meetings, incredible amounts of paper work, and dealing with unforeseen often-intense situations, desired

to be an equal contributing member. She did not want to miss one thing. The team agreed to be flexible with meeting times in the event rescheduling became necessary. Emails were often exchanged to clarify scheduled meetings and to reschedule meetings as needed.

The team collaborated in deciding whom to ask to participate in the study. The team then decided who would interview specific participants. Conversations were collegial and respectful. Thoughts and ideas were discussed openly. The team supported each other and agreed on decisions made.

Plan, implement, evaluate interventions. Each action research team meeting began with an agenda that included the purpose of the study, research questions, and the basis of the theoretical framework. The entire process was grounded in the ideology of increasing teachers' self-efficacy to teach using student-centered learning enhanced with technology. The team focused on planning interventions from the lens of Social Cognitive Theory (Bandura, 2001). The team began analyzing the information from the pre-study survey and the initial interviews.

With this intention, interventions for participants were grounded in providing vicarious experiences, mastery experience, and social persuasion. Dialogue regarding interventions led the team to decide on asking highly skilled teachers to model a student-centered learning lesson enhanced with technology. Ms. Becky volunteered to model a lesson, saying: *"I'm teaching a lesson in which my students will be using a 'menu' to decide how they want to learn the standards. They will all be using a variety of technology—class computer, school iPads, personal tablets, smart phones, or their iPods. They will be working at their own pace over a period of three days. I know the principal is completing one of my formal observations on one day, but the other two are completely open for the participants to make an observation."* Dates were confirmed and emails were sent to participants with the dates that Ms. Becky was available.

The email included another teacher's contact information who volunteered for observations. Teacher participants were asked to record a reflection in writing and place it in the researcher's school mail box.

Likewise, the team discussed the reflections and decided to ask the participants via email to implement a lesson similar to the one they observed, or to attempt a student-centered learning lesson with the use of technology that was appealing to them. In the action research team discussion, consideration was given to provide a video of an actual student-centered learning lesson. The team agreed that the time factor for participants was hectic and the idea was nixed. Participants wrote reflections after completing mastery experience interventions.

Next, the AR team decided to place a series of publications in a notebook for the social persuasion intervention. Participants were asked to read the documents and respond with their reflections in writing. The principal was asked to provide an incentive for teacher participants as well; he agreed but time did not allow for this to happen. The action research team provided encouragement all throughout the study to contribute positively to the social persuasion component. As simple as it was, kind words and smiles were given. As the study progressed, participants would often approach the AR team members with tidbits of information they had learned regarding the topic of the study. Oftentimes, it was difficult to record comments or stories as conversations took place in passing through the hallways.

Behavioral change. Teacher participants completed a post-study survey, which was the same as the pre-study survey. Table 8 below presents teachers, interventions completed, and a score representing an increase or decrease in self reported self-efficacy for student-centered learning enhanced with technology as an instructional method. The change in self-efficacy score resulted from comparing teachers' self-reporting prior to beginning the study to their self-

reporting after interventions were completed. The post-survey answers were marked with a plus or minus score based on the increase or decrease within the Likert scale. For example, if a teacher had a pre-survey answer of "some influence" and a post-survey answer of "quite a bit", the change was a +2 since the answer was two increasing levels of self-efficacy. Each teacher's measurement of change per question was recorded in a Microsoft Excel spread sheet and calculated for a total sum of change. Findings are listed in Table 8. Four teachers decreased their level of self-efficacy for student-centered learning with technology while four increased their self-efficacy. One teacher did not complete the post-survey, yet indicated through his post-study interview, that he felt more self-efficacious for teaching student-centered learning with technology after completing the interventions.

As stated initially teachers rated themselves fairly self-efficacious. With that in mind, the team understood that after implementing student-centered learning lessons with technology and interviewing teachers, teachers realized they were not as efficacious as originally presumed. The level of involvement with classroom management and self-knowledge of technology use indicated teachers' lack of understanding attributes needed for instruction. Therefore, the post intervention survey displays decreases in self-efficacy for some teachers.

Table 8 *Self-Efficacy Change Data*

Participant/ Teacher	**Intervention #1 Vicarious Experience**	**Intervention #2 Mastery Experience**	**Intervention #3 Social Persuasion**	**Change in Self-Efficacy for SCLw/T**
Mr. Jones	yes	yes	yes	Did not complete survey
Mr. Grimes	yes	yes	yes	-7
Ms. Cohan	yes	yes	yes	20
Ms. Williams	no	yes	yes	-28

Ms. Chambler	yes	yes	yes	-30
Ms. Monroe	yes	yes	yes	15
Ms. Peletier	yes	yes	yes	47
Ms. Stokes	yes	yes	yes	16
Ms. Greene	yes	yes	yes	-1
Overall Average Change in Self Efficacy				**4**

Null hypothesis educator. Mr. Hill agreed to participate in the study and signed an informed consent; however, during his initial interview when discussing student-centered learning, he explicitly stated, *"I don't like the word facilitator, using the term facilitator, it demeans us as educators to be called a facilitator." He continued to say that he did not believe that technology should be used in schools: "I really think it's a detriment to what we do in the classroom."*

Mr. Hill did not attempt any of the interventions. The action research team discussed the situation and decided that this teacher was highly self-efficacious for not using student-centered technology enhanced learning in the classroom.

Upon completion of the study, participants were given a fast-food gift card with a thank-you note for participation in the study. The action research team completed the study with a final meeting. The team discussed how difficult it is to bring about change in individuals. The facilitating researcher provided food treats, school supplies, and thank you cards to each of the action research team members.

Impact Upon Action Research Team Members

Action research team members were passionate about the study from beginning to end. They could relate to the participants. Ms. Becky, who was quite comfortable with student-

centered learning with technology spoke about teacher participants and classroom management while analyzing data—an intervention reflection—from Ms. Chambler: *"It's hard for teachers, you know, I kind of see where they are coming from and they're hesitant and they have those beliefs of not using technology because it's so hard to manage a classroom in the computer lab and making sure they're doing what they're supposed to do and stay on task."* The researcher agreed in understanding after hearing teachers: *"In post-interviews, several teachers did express that classroom management is a huge part of doing all of this. Keeping the students engaged, being able to see what they're doing…all of it is a difficult task."*

Leadership Capacity

Equally important, the action research team members remarked on their feelings regarding being a part of the action research team. They indicated ownership, empowerment, and learning more about Hilltop Middle School as an organization seeking change as meaningful aspects of the action research process. Ms. Becky explained: *"I like the idea of we have, you know, this purpose and a set plan with some interventions and as working together within our school, within our community and the doors are open to say, 'Come in, look at technology, look at what I'm doing.' I think that was a great piece of it."* Ms. Linda agreed and added: *"I think it was a great kind of door opener for conversations that we wouldn't normally have like I wouldn't walk up to somebody who hates technology and just say, 'Let's talk about your feelings for technology,' and think about what works for me and why you don't think it works for you. I think the study was helpful in that way. You could go in and you were objective in starting that conversation and had someone to hear your perspective."*

Likewise, Ms. Laura shared her thoughts regarding ownership and leadership: *"I think too because I'd done action research as well, to me it's always really... it's one thing to read it*

when it's, you know, taking place clear across the country…but to actually see it in action and see the results for yourself, I think that's really enlightening. And to sit down and talk about it, it's interesting like when we talk and then we interview and talk to other people…participants like a lot of what we say like…we're a good representation of our school…so just interesting." The team discussed the issue of creating a desire or catalyst for change in teachers as a difficult task to plan and complete within one school year. The action research team found value in the study, working as a team, and building relationships as teacher-leaders with participants.

As facilitator of the team, I found that when working with peers to reach a common goal, emphasizing the purpose, research questions, and theoretical framework (on the agenda) during meetings was highly beneficial. Keeping the primary focus alleviated potential problems such as getting off task and off topic. In sharing a common goal, this action research team carried out the process, or cycle quite well with no major disagreements. Varying degrees of self-efficacy for student-centered technology enhanced learning arose from this study. The action research team discussed the findings and contributed to the points made in the conclusions and implications that follow.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose of this qualitative action research case study was to investigate, develop, and implement effective instructional practices to increase teacher self-efficacy for using student-centered technology enhanced learning. The three research questions guiding this study were:

1) What are teachers' pedagogical beliefs and attitudes toward student-centered learning enhanced with technology?

2) What barriers and successes do teachers experience when trying to increase the use of student-centered learning enhanced with technology in the classroom?

3) How can an action research team guide teachers to increase self-efficacy in order to transform instruction to student-centered learning enhanced with technology?

This chapter provides a discussion of the study, summarizing the data from the previous chapter. Next, conclusions provide clarity of the research findings. This chapter also asserts implications as well as recommendations for future research.

Summary of Findings

This action research study took place in a large southeastern urban middle school. The action research team consisted of a group of faculty seeking to increase teachers' self-efficacy for student-centered learning enhanced with technology as an instructional practice for teaching pre-teens and early teenagers. The action research process led to the development of interventions grounded in the Social Cognitive Theory framework with a focus on providing vicarious experiences, mastery experiences, and social persuasion. Data was collected from nine participants and three action research team members through pre-and post-study surveys, pre-

and post-study interviews, and written reflections from intervention participants. Significant understandings were gained as a result of this study regarding the task of investigating, developing, and implementing effective instructional practices to increase teacher self-efficacy for using student-centered technology enhanced learning. Findings have been organized according to the three research questions guiding this study.

Participants' beliefs and attitudes towards student-centered learning with technology were generally positive; however, one emergent belief clearly surfaced citing that only accelerated and gifted students are capable of learning from this instructional practice. Technology was believed by all participants to be an integral part of students' lives. Participants conveyed that time is the greatest barrier for planning and implementing this instructional strategy along with classroom management or loss of control in the classroom, and lack of personal skills with technology devices and software.

The action research team worked well together to design interventions through a theoretical lens conducive for increasing self-efficacy for teachers to teach using student-centered technology enhanced learning. Discussions centered on previous experiences of professional development and the desire to provide non-conventional opportunities, which the framework afforded.

Action research team members were empowered in their individual leadership styles. The overall desire to continue to assist teachers with increasing their confidence for teaching in more student-centered conventions remains. One of the action research team members included leadership skills developed in interview discussions and is now employed at another facility. The team members developed a strong bond in pursuing improvements in education for middle school students. The school, as an organization, benefited from the efforts exhibited by the

action research team, collaborative dialogue increased, and professional relationships grew stronger.

Conclusions and Discussion

This action research study has provided a framework that can be replicated at similar schools. This study contributes to literature by providing a link between teacher pedagogical beliefs and attitudes in relation to student ability levels with the challenge of increasing teachers' self-efficacy for 21st century instructional practices—student-centered technology enhanced learning.

The belief that average students and with special needs are not capable of student-centered learning using technology instructional practices lies grounded in deficit thinking and is problematic. Drawing from Lisa Delpit's book, *Other People's Children: Cultural Conflict in the Classroom* (Delpit, 1995), deficit thinking for these groups of students are comparable to deficit thinking of marginalized children and teachers' misconceptions of their ability in the classroom based on behaviors.

For example, in a literacy based program analysis, Delpit (1995) brought to light how black children were fairly fluent in their writing ability, especially through an artistic lens, yet they lacked the skills and processes for academic writing found more inherently (taught at home) in their white counterparts. The literacy program failed to develop skills needed for black students to be successful at writing. Teachers often referenced the students' culture and family life as a contributing factor instead of figuring out a way to give the students the proper writing balance needed to ensure student success in writing.

Likewise, teachers in this study leaned toward dismissing regular education students of average and below average ability along with students with special needs as capable in place of

finding strategies to include students to embrace technology in practices that were student-centered. Struggling students and special education students need the skill set of responsibly using technology while taking ownership of their learning. Hence, the need exists for teachers to learn how to manage classrooms and provide the skill set necessary for students to participate in 21st century classrooms, colleges, and careers.

Another significant contribution of this research is the current pursuit of teacher accountability related to student achievement causing a decay in teacher autonomy, stress due to lack of time with demands of doing more, and the need for teacher training as a facilitator. Teacher participants remarkably expressed their lack of attempting new lessons that are more student-centered due to the pressure of accountability for student performance. Without the confidence to practice this instructional method, teachers are hindered from increasing their self-efficacy. Digital citizenship training for students using technology in school as well as outside of school is imperative for student safety and discernment for leaving appropriate and inappropriate electronic footprints.

Also, adopting action research team procedures to reach solutions to local school challenges provides an objective way to engage faculty members in problem solving and building teacher-leader capacity. Teachers provide a plethora of experiences and education backgrounds within a school. Encouraging teachers as leaders will contribute to strengthening day to day as well as long-term practices, culture and climate within the school.

Finally, providing vicarious experiences, mastery experiences, and social persuasion (leadership support) for teachers to increase teachers' self-efficacy regarding areas in need of improvement contributes to leading change within the school.

Limitations

While the action research team worked well together to bring about minimal change within teachers, limitations were present. One limitation was the lack of time and resources to provide only a few vicarious experiences (observations) for the intervention participants. Multiple opportunities for vicarious experiences, mastery experiences, and social persuasion are more likely to generate a change or increase in self-efficacy (Bandura, 1977). Participants would have benefitted from observing successful student-centered technology enhanced learning of teachers in similar school settings that were more proficient with this instructional strategy.

Lack of time for the action research team to collaborate and research together was a limitation. Full-time teachers in the classroom have little to no time for extra duties and projects. This team was dedicated to a degree that time afforded. Many brainstorm ideas were unfavorable simply due to the time to plan and prepare or gather resources. Each team member had duties and responsibilities beyond the classroom, which were required by the school.

Implications

There are five recommendations for future research. The first is to investigate correlations between teacher pedagogical beliefs and attitudes toward lower level students and classroom management. If teachers believe that students are not capable, do they change the way they teach? This study recognized teachers' tendency or desire to teach student-centered learning with technology to higher-level students only. Exploration of successful teachers of lower level students might provide insight and best practice examples for teachers to successfully teach using this instructional strategy.

The second recommendation is to conduct a study of pre-service educator programs in search of teachers being trained as facilitators and how they fare once in their own classroom. Are they implementing instructional methods like student-centered technology enhanced lessons

and acting as a facilitator, or do they succumb to traditional teaching methods of skill and drill or lecture and notes? Is there support in schools for teachers as facilitators? Training teachers in the dynamics of guiding students through a series of steps for learning might decrease the fear of losing control of the classroom.

A third recommendation is to conduct a longitudinal study beginning with elementary aged students who are taught digital citizenship and follow them through middle school to see if they are better stewards of their technological actions. If students were trained in appropriate digital behaviors at a younger age, would they be less likely to engage in adverse behaviors in middle school? Students would be more likely to concentrate on research and learning activities.

A fourth recommendation is to research schools that are successfully integrating student-centered learning enhanced with technology for all students. Recognizing best practices in successful schools might contribute to Hilltop Middle School making changes to include students of all abilities in student-centered learning with technology lessons. Understanding the physical set up of successful 21st century schools may contribute to positive changes. Noticing teacher-to-student ratios within the teacher as facilitator classrooms might contribute to planning for greater outcomes as well.

The final recommendation is to conduct a comprehensive study regarding the need for 21st century type schooling over age-old instruction methods. Society has become dependent on technology; does that make it necessary to incorporate technology inherently into the classroom? As our "null hypothesis" teacher believes that technology has no place in school, is there validity in operating a school with no technology in these modern times? Students' lives outside of school are embedded with technology and instant gratification. What does a school without technology in the 21st century look like?

Conclusion

An action research team, also known as a group of hard-working teacher-leaders, attempted to assist their peers to increase their self-efficacy for student-centered technology enhanced learning. The idea for this project stemmed from the school administration and from ever increasing school system, state, and national expectations for this instructional practice in classrooms. Teacher participants implemented three interventions grounded in the theoretical framework of Social Cognitive Learning (Bandura, 2001). Five out of nine teachers' self-efficacy for using student-centered learning with technology increased. This study brings to light ideas and practices on how to lead a transformation toward student-centered technology enhanced learning in any middle school environment.

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APPENDIX A: The Student-Centered Use of Technology Teacher Efficacy Scale

This questionnaire is designed to gain a better understanding of the kinds of things that create difficulties for teachers in using technology for student-centered learning. Please indicate your opinions about each of the statements below by circling the appropriate number. Your answers will be kept strictly confidential and will not be identified by name. The survey consists of 20 questions and should take approximately 5 minutes to complete. Your participation in this research is voluntary. You may choose not to participate or withdraw at any time during the study.

1. To what extent can you model innovative thinking to your students?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

2. How much can you do to develop personal responsibility for lifelong learning in your students?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

3. To what extent can you evaluate student work that is provided in a variety of media/formats?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

4. To what extent can you advocate for school policies to support implementation of a technology-infused curriculum?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

5. How well can you engage students in exploring real-world issues using digital tools and resources?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

6. To what extent can you encourage students to reflect on their learning using digital collaborative tools (e.g. blogs, wikis)?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

7. How well can you model responsible social interactions in online communities to your students?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

8. To what extent can you create learning tasks for your students that require them to collaborate with students in other schools?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

9. To what extent can you discuss the use of technology with teachers in your school?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

10. To what extent can you adapt your lesson plans to incorporate digital tools and resources?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

11. To what extent can you assume a leadership role in demonstrating a vision of technology integration?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

12. To what extent can you access technology systems to support teaching and learning? 1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

13. To what extent can you manage a class in which each student is pursuing their own personalized learning activities?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

14. How well can you assist students to plan strategies that will guide their own inquiry? 1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

15. How well can you use technology to analyze assessment data?

1 2 3 4 5 6 7 8 9

None Very Little Some Influence Quite a bit A Great Deal

16. To what extent can you access professional development opportunities focusing on continuous improvement of digital-age teaching skills?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

17. To what extent can you access role models for the effective use of technology?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

18. To what extent can you stay abreast with emerging trends regarding the effective use of technology?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

19. How well can you instruct students in the use of computers?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

20. How well can you troubleshoot technological systems and applications?

1	2	3	4	5	6	7	8	9
None		Very Little		Some Influence		Quite a bit		A Great Deal

Please provide us with a little more information about yourself. This information will be used for research purposes only and will be kept confidential.

1. Gender □ Male □ Female
2. Age

□ 20 years and under □ 21 – 30 years □ 31 – 40 years □ 41 – 50 years □ 51 – 60 years □ over 60 years

3. Years of Teaching Experience

□ less than 5 years □ 6 – 10 years □ 11 – 15 years □ 16 – 20 years □ over 20 years

4. What grade level do you currently teach? Please check all that apply.

□ Grade 6 □ Grade 7 □ Grade 8

5. What subject(s) do you currently instruct? Please check all that apply.

□ Art
□ Language Arts
□ Other (please specify):
□ Drama
□ Physical Education
□ Music
□ Social Studies
□ Science
□ Mathematics

THE STUDENT-CENTERED USE OF TECHNOLOGY TEACHER OUTCOME EXPECTANCY SCALE

This questionnaire is designed to gain a better understanding of the kinds of outcomes that teachers expect when using technology for Student-centered learning. Please indicate the extent to which you agree with each of the statements below by selecting the appropriate choice on the rating scale. Your answers will be kept strictly confidential and will not be identified by name. This section of the survey consists of 10 questions and should take approximately 5 minutes to complete. Your participation in this research is voluntary. You may choose not to participate or withdraw at any time during the study.

1. Technology allows students to develop interpersonal skills.

1	2	3	4	5	6	7	8	9
Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly Agree

2. Technology use for project-based learning requires more class time than direct instruction.

1	2	3	4	5	6	7	8	9
Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly Agree

3. Teachers must continue to update their technological skills in order to gain and keep employment.

1	2	3	4	5	6	7	8	9
Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly Agree

4. Technology use improves overall student achievement on standardized tests.

1	2	3	4	5	6	7	8	9
Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly Agree

5. Technology use encourages student participation in achieving learning goals.

1	2	3	4	5	6	7	8	9
Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly Agree

6. Technology use requires large amounts of preparation time.

1 2 3 4 5 6 7 8 9
Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree

7. Technology is unreliable.
1 2 3 4 5 6 7 8 9
Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree

8. Technology use improves the critical thinking abilities of students.
1 2 3 4 5 6 7 8 9
Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree

9. The use of technology in the classroom helps prepare students for the 21st century workplace.
1 2 3 4 5 6 7 8 9
Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree

10. Technology use for student-centered learning makes it difficult to focus on the learning objectives of the curriculum.
1 2 3 4 5 6 7 8 9
Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree