TEACHER SELF-EFFICACY AND FORMATIVE ASSESSMENT FEEDBACK

A DISSERTATION
SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
DOCTOR OF EDUCATION
BY
COREY WILLIAM HARTLEY
DR. MARILYNN QUICK-ADVISOR

BALL STATE UNIVERSITY
MUNCIE, INDIANA
DECEMBER 2016
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DISSERTATION ADVISOR: DR. MARILYNN QUICK-ADVISOR

APPROVED BY:

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BALL STATE UNIVERSITY
MUNCIE, INDIANA
December 2016
ABSTRACT

DISSERTATION PROJECT: Teacher Self-efficacy and Formative assessment Feedback

STUDENT: Corey William Hartley

DEGREE: Doctor of Educational Leadership

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DATE: December 2016

PAGES: 107

The purpose of this study was to understand the relationship between teachers’ self-efficacy and the instructional use of formative assessments in the classroom. Teachers’ efficacy beliefs about their abilities to teach students have an influence on their instructional decisions. Furthermore, effective teaching strategies will help shape the students’ mastery experiences and thus influence the students’ own efficacy beliefs. Teachers were asked to self-rate their own use of formative assessments with students by completing a rubric, which included the following categories: formative assessment frequency, frequency of conferences with small student groups, frequency of student goal setting meetings, and frequency of the teacher requiring students to self-reflect and adjust learning goals. Furthermore, principals rated each responding teacher, using the same criteria as the teachers’ self-rating. Finally, the teachers were asked to complete the Teachers’ Sense of Efficacy Scale (TSES). The TSES provided an overall efficacy rating comprised of three sub-constructs: management, engagement, and instruction. In comparing the teacher and principal TSES responses, there was found to be a strong positive correlation between teachers’ efficacy beliefs and their use of formative assessments. Additionally, my results demonstrated that professional development and building assignment were connected to teachers’ efficacy
beliefs. Further exploring these results could have the potential to help teachers and principals become more effective in their practices.
DEDICATION

In all thy ways acknowledge Him, and He shall direct thy paths.

Proverbs 3:6

For my Mom and all single parents like her that never gave up.

To every kid who grows up on the poor side of town—you can do it.
ACKNOWLEDGMENTS

Dr. Pearson, Dr. Ellis, and Dr. Salloum I would like to thank each for your time, effort, and patience with me. A special thank you for taking on the additional responsibility of helping me complete this dissertation when circumstances required my initial committee members to recuse themselves. Your input and guidance in this journey has been invaluable and I would not have been able to finish without you.

A special thank you to my committee chair Dr. Quick. In this process you have shown me extreme patience with my repeated and annoying use of “such as” and my extreme inattention to the proper use of a comma in my writing. You have been a mentor and friend offering advice or just listening during troubled times. It did not matter if it was listening to me whine about my writing, giving advice about how to handle the frustrations of a new leadership position, or listening to memories of the loved ones who had passed on to heaven. You were there. The world has become so busy that most people don’t want to give that kind of time…but you always did. I was a student in the very first class you taught at Ball State and from that point on I knew I wanted to learn everything I could from you and I wanted to teach like you. I am forever grateful.

John Clark without you I would have dropped out of school in the eleventh grade and who knows what path I would have stumbled down. You showed a bunch of us poor kids that we could do better than what was expected of “at risk” kids. You are forever in my heart and forever in my prayers. Thank you for not giving up on me.
Chuck Reynolds you are my partner in crime. You are more than a friend—you are my brother. I'd go to the ends of the Earth for you.

To Cohen, Miles, and Laken-Mae. This journey might have taken me longer than most but I made a promise to not be an absent dad. I kept my promise. Set your goals in life but don't lose sight of what really matters. Remember to always pray, rock out, and always “be awesome to someone today.”

Melissa Hartley—not many people get to spin through this universe together with the kind of love we have. Someday in heaven I will thank God personally for allowing you and I to tackle life together. I could not do any of “this” without you. I've been asked why I still believe in God...and I point to us.
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CHAPTER 1
INTRODUCTION

There are few things sadder to a teacher or parent than being faced with capable young people who, as a result of previous demoralizing experiences, self-imposed mindsets, or mind-sets imposed before birth, have come to believe that they cannot succeed at a task or activity when all objective indicators show that they can. (Usher & Pajares, 2009, p. 790)

When students do not believe in their capability to complete a task, it can have life-long implications for goal attainment. Consider for a moment the student who chooses not to take particular courses in high school because of previous experiences or lack of experiences in early grade levels even though the student’s performance provides evidence that the student could successfully complete the course. In addition, consider the student who chooses not to complete high school or the graduate student who chooses not to finish dissertation work. Each of these students has effectively eliminated an array of career opportunities, potentially closed access to college courses, and limited an unknown number of academic contributions. Furthermore, it is not necessarily because students are incapable, but because they believed that they were incapable of goal attainment or did not persist in light of challenges.

It is important to recognize that a student who chooses one course option over another option in and of itself eliminates opportunities. In the context of student decision making, it is logistically impossible for a student to experience every course offering; however, it is important that students have the ability to make those choices based on a more actualized perception of their abilities, not a skewed perception of their abilities (Steyn, 2013). Therefore, understanding
how students' experiences in the classroom contribute to their self-perceptions and decision making in schools could have implications for how teachers deliver instruction.

Teachers' self-efficacy beliefs about their abilities to teach students will influence their decisions on what type of experiences they create for students. These educational experiences influence students' academic decision making or persistence towards a goal. Furthermore, students' academic decision making is based in part on their self-efficacy beliefs (Usher & Pajares, 2006). If teachers can orchestrate their classroom practices to be more conducive to helping students develop more positive self-efficacy beliefs, then it is likely that students will not place false limits on themselves or stop working towards a goal because of a skewed self-efficacy.

But the question remains, what if the teachers do not believe in their ability to teach all students? Understanding the sources of a teacher's efficacy beliefs could have the potential to contribute to students' development of self-efficacy because educators have the potential to construct classroom feedback systems. These systems and how they could be corrective in nature and simultaneously promote positive efficacy formation for students and for teachers is further explored in Chapter 2.

Statement of the Problem

Factors that contribute to human behavior are complex and interwoven in such a way that it is impossible to isolate one over the other as the sole determination for behavior and choice; however, researchers still strive to explore those influences in the context of the classroom. Understanding the relationship between instructional practices and how to help teachers and students develop a more accurate perception of their abilities might increase opportunities for both. In other words, it becomes relevant for educators to understand how the use of assessment
and feedback contribute to their own and students' cognitive processes, especially self-efficacy, in order for teachers to make instructional decisions and for students to make decisions about their academic careers.

It is my supposition that teachers who have a high self-efficacy about their abilities to help all students learn use teaching methods that provide more substantive and frequent formative feedback to their students. Furthermore, I suggest that the same formative feedback teachers give to students also helps build a teacher's sense of self-efficacy to teach all students. Therefore, because of their teachers' efficacy beliefs the students potentially could reach achievement goals and ultimately develop a more accurate sense of their ability to initiate academic tasks and persevere until completion of those tasks.

Purpose of the Study

The purpose of this study was to understand the relationship between teachers' self-efficacy and their use of formative assessments in the classroom. In addition, I wanted to see if there were significant differences in teachers self-efficacy based on gender, degree earned, elementary grade level taught, building assignment, hours of professional development in formative assessments, and years of teaching experience. In more detail, teachers were asked to self-rate their use of formative assessments with students. The rubric teachers used to rate themselves included the following categories: formative assessment frequency, frequency of conferences with small student groups, frequency of student goal setting meetings, and frequency of the teacher requiring students to self-reflect and adjust learning goals. Furthermore, principals rated each responding teacher, using the same criteria as the teachers' self-rating on their own use of formative assessment. Finally, the teachers were asked to complete the Teachers Sense of
Efficacy Scale, and it was compared to both the teachers’ ratings and the principals’ ratings of formative assessment use.

**Research Questions**

One central research question guided this study: What is the relationship between teacher self-efficacy, as measured by the Teachers’ Sense of Efficacy Scale and teachers’ use of formative assessments, as rated by their principal, in the classroom?

Ancillary research questions were:

1. What is the relationship between teacher self-efficacy in student engagement, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

2. What is the relationship between teacher self-efficacy in instructional practices, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

3. What is the relationship between teacher self-efficacy in student management, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

**Definitions**

The following concepts and terms are defined according to the context of this study:

*Formative assessment* is an assessment that gives both teacher and student performance feedback that is used to direct the course of further classroom instruction. For the purpose of this study, formative assessment is a teacher created assessment in math and reading that assesses essential grade level skills but does not provide students with a letter grade (Boston, 2012).
Malleability is when one is able to adjust to changing circumstances (Shunk & Pajares, 2001).

Performance feedback is information communicated to the learner that is intended to modify the learner's thinking or behavior for the purpose of improving learning (Shute, 2007).

Self-efficacy is the combination of self and efficacy that implies a conscious awareness of one's ability to be effective and to control actions. For the purpose of this study, student self-efficacy impacts their his or her choices and increases or impedes motivation (Bandura, 1977).

Teacher self-efficacy is the teacher's belief that he or she has the ability to help students learn. For the purpose of this study, self-effacacious teachers plan appropriate teaching activities and overcome challenging situations (Tschenenne-Moran, Hoy and Hoy, 1998).

Delimitations

1. The study was limited to six suburban elementary schools. These six schools incorporate Grades K-6. Because of the small sample, generalizations were limited.

2. The scope and complexity of what constitutes a formative assessment and performance feedback were narrowed to a general definition for this exploratory study. Therefore, generalization of results were limited and more refined definitions of each could be considered for future studies.

3. Principals reported their teaching staff members' use of formative assessments and performance feedback. Even though the research study provided training and field testing to ensure inter-rater reliability, only their perspectives were compared to the teachers' self-assessment.
Summary

Chapter 2 provides a literature review on the topic of self-efficacy in the context of the classroom for both teacher and student. It is important to note that self-efficacy for both teacher and student are discussed in this chapter because of the inseparable relationship between the two. However, the focus of the study will be in the area of teacher efficacy. The justification for further exploring this relationship and also a theoretical foundation for both teacher and student self-efficacy is offered through the perspectives of Social Cognitive Theory. The theoretical concepts provide the background for my study. Next, an explanation of formative assessments and the importance of feedback in the classroom is reviewed. Finally, the implications and potential applications are discussed.
CHAPTER 2

LITERATURE REVIEW

The collective experiences students have in school toward academic goals or experiences completing tasks impact their perceived self-efficacy. Self-efficacy influences student behavior, choices about courses of study, and the student’s ability to not give up when presented with a difficult task in a particular area of study (Pajares, 2003). Bandura (1997) explained self-efficacy in the following terms:

To realize their aims, people try to exercise control over the events that affect their lives. They have a stronger incentive to act if they believe that control is possible—that their actions will be effective. Perceived self-efficacy, or a belief in one’s personal capabilities, regulates human functioning. (p. 4)

Understanding sources of self-efficacy in the classroom is important because students make choices based on their self-efficacy, not necessarily their ability. Teachers are a primary source for constructing classroom experiences that influence classroom level-social process (Brown, Jones, LaRusso, & Aber, 2010). Therefore, it stands to reason that teachers’ efficacy beliefs influence classroom experiences for students and is worthwhile to explore potential influences on teacher efficacy.

RAND Study & Teacher Efficacy

In 1976 Armor presented the results of a study titled Analysis of the School Preferred Reading Programs in Selected Los Angeles Minority Schools. The Los Angeles School District wanted to study the effectiveness of reading programs in the school system and, thus, commissioned this study to be conducted. Although the focus of the study was on reading,
Armor included two questions that would be the start of studying teacher self-efficacy. Table 1 is a recreation of the two questions.

Table 1

*Armor's Questions That Was the Beginning of the Study of Teacher Self-Efficacy*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>When it comes right down to it, a teacher really can't do much-most of a student's motivation and performance depends on his or her home environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>If I try really hard, I can get through to even the most difficult or unmotivated students</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Adapted from *Analysis of the School Preferred Reading Programs in Selected Los Angeles Minority Schools* by D. Armor, 2003, p. 73. Copyright 1976 by the Rand Corporation.

The results of the study showed that factors such as socioeconomic status, attendance, past reading scores, and ethnicity accounted for differences in test scores. The results for African American and Mexican American students showed that there were other influential factors such as the school they attended and classroom experiences. When the researchers further examined influences on the students' gains in reading, they found for African American students that teacher training in the use of materials specific to student needs, orderly classrooms, and teachers who felt efficacious were significant.

**Theoretical Frameworks**

Theoretical frameworks provide a perspective for examining phenomenon. Social Cognitive Theory (SCT) and Goal Setting Theory (GST) help to understand some underlying
assumptions about student self-efficacy and self-efficacy sources. Understanding the sources of self-efficacy for students and teachers might have the potential to increase motivation and persistence at tasks for both.

**Social Cognitive Theory.** SCT establishes a theoretical model to understand human behavior, to predict actions or inactions of a person, and to provide options about how to alter a person's behavior. Bandura (1977) showed that the behavior humans exhibit are a result of the interaction between the environment, personal characteristics, and their previous behaviors. Furthermore, it is important to understand that the environment, personal characteristics, and actual behavior are never at a point of equilibrium; nor is one of the three characteristics more dominant than the other. Simply put, the three factors are constantly influencing each other. There is no one factor that is an absolute result of the interaction between the other two. Glanz, Rimer, and Lewis (2002) illustrated this important dynamic of SCT when they proposed their supposition that behavior is not a result of just a person in a particular environment. Conversely, the environment is not a result of the person and the behavior.

Glanz et al. (2002) maintained that SCT provides models for behaviors and a platform for a person to practice or act out behaviors. Jones (1989) further explained the structural lattice of SCT:

The fact that behavior varies from situation to situation may not necessarily mean that behavior is controlled by situations but rather that the person is construing the situations differently and thus the same set of stimuli may provoke different responses from different people or from the same person at different times. (p 23)

In SCT, this is known as reciprocal determinism and it is a person’s perceived self-efficacy, within the environment, that influences these dynamic sequences of interactions.
In public schools, students spend 13 years in classrooms internalizing and regulating dynamic learning experiences. All of these experiences fit under the umbrella of Jones’ (1989) explanation of reciprocal determinism. Jones’ explanation denoted that a person’s choices are influenced by his or her cognitive abilities and the person’s environment. At the same time the environment is influenced by a person’s choices, and a person’s choices are influenced by the environment. An example of reciprocal determinism in education is that a student is learning math concepts at an accelerated rate. The student begins to display unwanted behaviors because the mathematic tasks are completed and there is additional time. The teacher restructures the student’s environment so that the student has more appropriate mathematic tasks to complete. The teacher is not able to make the student’s choices, but the teacher can make a choice to alter the learning environment to influence the student choices. It is important to note that the teacher will make a decision for the student based on his or her own efficacy beliefs about his or her ability to teach the student and help the student meet the learning objective.

In my study, it is the teachers who control the students’ school environment and adjust the learning environment (teaching practices) based on student behavior (learning). Furthermore, these learning opportunities can be classified into three broad and generic categories—positive, neutral, and negative occurrences. The sheer volume and type of experiences are incalculable; however, it is important to understand the relationship between the positive, neutral, and negative and how collectively all three types accumulate over time. There is a cycle of events and interactions between personal traits, behavior, and the environment (reciprocal determinism). Within this cycle the students make decisions based on their perceived self-efficacy, and teachers make decisions for their students based on their own efficacy beliefs.
Armor’s (1976) study of reading achievement in Los Angeles public schools and Bandura’s (1977) research are foundational studies in the area of self-efficacy. A search in academic databases show that these two foundational studies have been replicated in part and the ideas presented in both have been used to support research in many different academic areas. To illustrate the acceptance and diverse use of his work, the following is a brief list of research areas that have relied heavily on his concept of self-efficacy and behavior change: smoking cessation, sports medicine, athletic performance, dietary behavior change, and phobic behavior change.

If SCT and its underlying concept of perceived self-efficacy have been used in many different fields and many different areas of research, including education, then why continue in this field of research? First, self-efficacy, by its proliferation shows its depth and foundational importance. Second, there is an importance for educators to develop a deeper understanding of sources of self-efficacy for themselves and for the students in the classroom.

As children strive to exercise control over their surroundings, their first transactions are mediated by adults who can either empower them with self-assurance or diminish their fledgling self-beliefs. Young children are not proficient at making accurate self-appraisals, and so they must rely on the judgments of others to create their own judgments of confidence and of self-worth. (Pajeres, 2003, p. 153)

Bandura’s theoretical framework and Armor’s research are an appropriate foundation for the purpose and scope of this study.

Unpacking SCT in terms of self-efficacy is necessary to build a further understanding of the theoretical framework and its relevance for my research study. This framework allows for an observer to understand the impact of experiences in individuals’ lives and their subsequent behavior in terms of cognitive processes. Bandura (1977) stated, “Cognitive events are induced
and altered most readily by experience of mastery arising from effective performance” (p. 191). Bandura went on to divide these cognitive events into four sources of self-efficacy that have multiple modes of induction. Induction is simply how the efficacy source is relayed to the person from an external source. The efficacy source and the induction are referred to as *efficacy expectations* (Table 2). SCT shows that none of these sources of self-efficacy or the way in which a person “acquires” them operates independently of the others; however, it is performance accomplishment (mastery experience) and verbal persuasion (feedback) as sources of self-efficacy with the induction modes of performance exposure (formative assessments) and suggestion (teacher/student feedback) that are integral for my study. Table 2 is offered to show the complexity of self-efficacy and to help further understand how students’ efficacy functions in a classroom.

Table 2

*Efficacy Expectations*

<table>
<thead>
<tr>
<th>Efficacy Expectations</th>
<th>Induction Mode</th>
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<tr>
<td>Performance accomplishments</td>
<td>Participant modeling</td>
</tr>
<tr>
<td>Vicarious experience</td>
<td>Live modeling</td>
</tr>
<tr>
<td>Verbal persuasion</td>
<td>Suggestion</td>
</tr>
<tr>
<td>Emotion arousal</td>
<td>Attribution relaxation</td>
</tr>
</tbody>
</table>
One of the key ideas to take from Table 2 is the source of self-efficacy and the understanding that these four sources are cognitive functions. Young students are engaged in cognitive functions in the classroom that include one or all four of the sources of self-efficacy. However, the degree to which the sources of self-efficacy are positive, negative, or neutral are certainly constructed and cultivated by the classroom teacher. In addition, the teacher has the opportunity to control the induction of each experience in terms of frequency, duration, and quality. Based on SCT, then the teachers' decisions to construct classroom events would be filtered through their own efficacy beliefs. This creates cycles of efficacy induction for themselves and their students.

Usher and Pajares' (2009) critical review of the literature in this area supported the concept of multiple sources of self-efficacy in the classroom. They show at varying levels of student education (including higher education) a current classroom task might include the sources of self-efficacy of "vicarious experience" and "emotional arousal" simultaneously or a task might just be singular in nature in regards to sources of self-efficacy. However, it can be inferred from the research of others that the sources of self-efficacy are rarely isolated and in different degrees operate in concert with each other (Bouffard-Bouchard, Parent, & Larivee, 1991; Fernandez-Ballesteros, Diez-Nicolás, Caprara, Barbaranelli, & Bandura, 2002). These conclusions are in accordance with SCT and reciprocal determinism. The possibility of the classroom as a petri dish that offers all four sources of self-efficacy and cultivates a student's positive, neutral, or negative perceived self-efficacy is substantiated. Therefore, it is important to explore teachers' efficacy, as per SCT they would not be immune to the influences of the social interactions that impact them.
In very broad terms, just being in the classroom contributes to self-efficacy and the sources of self-efficacy are broad and varied (Usher & Pajares, 2009). The practical application to the classroom and the justification for my research lies in the different modes of self-efficacy induction. In a review of 27 self-efficacy studies, Usher and Pajares (2009) found that performance accomplishments have a profound influence on self-efficacy. Subsequently, the corresponding induction modes, especially those that involve mastery experiences for students, have the greatest influence on students' perceived self-efficacy. When a student successfully accomplishes a task, it helps build his self-efficacy toward similar tasks. A mastery experience for students is a key concept in the use of formative assessments in the classroom. It is my belief that mastery experiences created through formative assessments for students create mastery experiences for teachers. Thus, self-efficacy is increased for both student and teacher.

**Goal Setting Theory.** As previously stated, the sources of self-efficacy and students' development of perceived self-efficacy are not isolated phenomenon. Although SCT is an overarching theoretical framework, it does not function independently of other theoretical frameworks. Research on GST supports this interaction between the two theories in terms of mastery experiences inducing efficacy beliefs for students and teachers. More specifically how formative assessment mastery experiences (SCT) and goal setting experiences (GST) are firmly rooted in the concept of reciprocal determinism for both teachers and students. Bell and Kowzlowski (2002) wrote, “This research has established that goal orientation has a consistent direct relationship with a number of outcomes, including self-efficacy, feedback seeking, learning, and performance” (p. 3). Furthermore, goal setting has been shown to be an effective, formative instructional practice for teachers to engage in with their students as it provides performance feedback to students (Hattie, 2009). Consequently, students are able to internalize
the feedback and make either positive or negative assessments of their ability to successfully perform an academic task and take formative steps to reach a goal (Church, Elliot, & Gable, 2001).

Through the lens of GST, students' motivation behavior and achievement behavior can be placed in one of four categories: mastery approach, mastery avoidance, performance approach, and performance avoidance (Kaplan, & Maehr, 2007). These categories run parallel with Bandura's SCT concepts of efficacy sources most notably are goals rooted in task mastery. Kaplan and Maehr (2007) pointed out several longitudinal studies that focused on the changes in a person's goal orientation schema and their behaviors in terms of academic achievement. They duly note that a person's behavior towards achievement and mastery is a function of a person's ability to manipulate their situation and thus approach future contextual situations based upon their perception of past events. Furthermore, people over time develop these orientations or schemas as an internal mechanism for motivation to learn or complete an academic task. It is at this point that self-efficacy traits (cognitive ability, general efficacy, goal orientation) or state-like self-efficacy (a person's ability to overcome the state of fear, state of anxiety) moderate a person's decision on how she attends to a set goal (Fan, Meng, Billings, Litchfield, & Kaplan, 2008).

Wolters (2004) gave clear and concise explanations of each of the goal orientation categories. It is important to have an understanding of these categories because GST categories contain an element of mastery learning. The key difference between a mastery approach to learning and mastery avoidance is a subtle but key difference. The difference between the two types of student goal orientation lies in the student's motivation for task start up and task completion. Mastery oriented students see the content as engaging, challenging, and want to
master the content for the sake of learning. Avoidance oriented students want to learn so as to avoid a state of failure. Similar to the previous two modes of mastery oriented students, the performance approach and the performance avoidance oriented students demonstrate subtle but distinct differences. The performance approach oriented student is motivated by peers seeing his success in a public arena, while the performance avoidance oriented student seeks to avoid the appearance of performing less capable than his peers (Wolters, 2004).

As with efficacy expectations constructs, students can exhibit a combination of mastery and performance orientations (Kaplan, & Maehr, 2007). Wolters et al. (1996) reinforced this idea, but also identified research that shows “the” sources of a person’s goal orientation are malleable, just as self-efficacy is, and indicated time and contextual experience as a key function for a person to change. To that end student goal orientations are not static but can fluctuate based on a given task or assignment. I believe this is an important point of convergence among self-efficacy and goal setting. Both are malleable and are not static for the life of a person. This would include both teachers and students. Furthermore, I propose that the performance feedback teachers give to students or neglect to give to students is a powerful influence on students’ self-efficacy and to the students’ mode of goal orientation.

The multi-dimensional intersection of SCT and GST has been widely studied in terms of subjects and but less has been done in terms of instructional practices. Anderman, Andrezejewksi, and Allen (2011) gave a rationale for examining teacher created classroom structures and instructional practices. Their work showed that GST is connected to student motivation and thus the connection to self-efficacy. In addition, the researchers’ work suggested that students in classrooms with teachers who created mastery approach policies and practices reported high levels of motivation in terms of meeting academic goals. Anderman et al. (2011)
also cited the work of Meece (1991) as important to the connection between teacher-created classroom structures, policies, and practices. She found that students reported a high orientation level of mastery approach when the classroom teacher used instructional practices that focused on the intrinsic value of learning. Because grades are not a focus of formative assessments it is safe to infer that they might be more likely to focus on learning for the sake of learning. Furthermore, goal mastery oriented students communicated that their teachers helped them to build understanding of content, encouraged reflective practice that helped them to learn from mistakes, and encouraged dialogue between instructor and student. Usher and Pajares (2009) made the summation of these teacher characteristics, “Effective mentors encourage individuals to measure success in terms of personal growth” (p. 754). These ideas and characteristics are the bases for the rubric used in Chapter 3 to rate the use of formative assessment in the classroom.

Jernigan (2004) and Fan et al. (2008) highlighted the complexity of the decision making process involved in goal setting and a person’s subsequent reasoning for reaching the goal or not reaching the goal. This is a complex process for adults to navigate through, let alone adolescents. The research of many has suggested that adolescents should be guided in this process because students are not mature enough to process events (Pajares, & Miller 1997; Pajares, & Valiante, 1999; Ponton, 2002; Salanova, M., Llorens, & Schaufeli, 2011). Failing to guide students through appropriate and objective feedback has the potential, based on students’ goal orientation, to have a negative impact on self-efficacy beliefs.

The work of Shunk (1984) stated that student and teacher dialogue needs to be appropriately designed during the early development of self-efficacy beliefs. Therefore, those teachers who construct their classroom in such a way that students have mastery opportunities guided by reflective discourse (feedback) towards goal attainment have the potential to help
students develop positive general self-efficacy towards academic tasks. From this it is my supposition that using formative assessments with a teacher-student feedback cycle is a way to guide the development of students’ and teachers’ general self-efficacy. It is important to note that dependent upon a student’s goal orientation, the type of feedback the teacher gives to the students could be construed as either positive or negative. Therefore, it is important that teachers’ understand the type of feedback given and believe that the feedback they give to the student is able to impact student the student. Furthermore, the teacher feedback to students needs to be understood as the teacher being supportive so the student does not construe the feedback as negative nor a final summation of the student’s learning.

Formative Assessments & Feedback

The term formative assessment suggests that it is an assessment used to form or develop skills, dispositions, or beliefs. A literature review written by Black and William (1998) is many times credited with bringing formative assessment into the popular culture of education. Their subsequent work in educational research and formative assessments is also heavily referenced. The work these two researchers have conducted is considered foundational in the study of formative assessments.

In their initial literature review Black and William’s (2010) work sought to answer the following questions in terms of raising student achievement: “Is there evidence that improving formative assessment raises standards? Is there evidence that there is room for improvement? Is there evidence about how to improve formative assessment?” (p. 2). To answer these questions Black and William reviewed nine years of research that netted them 160 journals with 580 articles or chapters to use as sources to answer their questions. They concluded that there is
more than sufficient evidence to answer “yes” to their questions. As a result much research has been done in the area of formative assessment and how it impacts student achievement.

The importance of formative assessments and the applications to education have been noted and supported by a plethora of current research. (Boston 2002; Clark 2010, 2012; Cokely, McClain, Jones, & Johnson, 2011; Croussouard & Pryor, 2012; Eva et al., 2010; Lipnevich & Smith, 2009; McLaren, 2012; Salanova et al., 2010; Torrance & Pryor, 2001). Even with a rich body of knowledge in the area of formative assessments, it has become a challenge to define “formative assessment”. There is confusion among practitioners as to the application of formative assessments. Black and William (1998) defined the general term of assessment as “all those activities undertaken by teachers and by their students in assessing themselves that provide information to be used as feedback to modify teaching and learning activities” (p. 2). They went on to explain that the formative assessment information should be used by the teacher to structure classroom activities and teaching goals to address the needs of the students. Crossouard and Pyor (2012) expounded on the purpose of formative assessment as a way “to support learning” (p. 251). Furthermore, the operative word that helps clarify the concept of formative assessment is not “what” formative assessment is but rather “when” is assessment formative? (Clark, 2010).

Brookhart (2007) noted that positive formative assessment processes inform teacher practices, instructional decisions are made as a result of the assessment information, and students receive support on how to improve their work. Roskos and Neuman (2012) put forth additional clarification as to when assessment is informative as they highlighted the importance of feedback loops.
In short, both teacher and student have to have a clear concept of the goal, compare what is with what should be, and engage in productive action to narrow the gap between actual and desired performance. Put simply, the teacher creates a feedback loop that models, instructs, and pulls the learning forward to achieving a specific goal. Formative assessment is the mechanism that facilitates this process. (p. 535)

Roskos and Neuman (2012) illustrated that performance feedback loops that involving the teacher and student interaction over time and in small incremental steps help students attain achievement goals and consequently master subject matter.

Thinking of formative assessments as a mechanism or process helps one to understand the connection it has to students' perceived self-efficacy beliefs and students' goal-orientation category. Butler and Winne (1995) synthesized the current beliefs about formative assessments from key researchers and developed a model of formative assessment and performance feedback (Figure 1).

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**Figure 1.** A Model of Formative Assessment and Feedback.
Nicol and MacFarlene-Dick (2010) made a specific distinction that separates this model of formative assessment and performance feedback from other models. They stated,

A key feature in the model that differentiates it from commonplace understandings of feedback is that the student is assumed to occupy a central and active role in all feedback processes. They are always actively involved in monitoring and regulating their own performance both in terms of their goals and in terms of the strategies being used to reach those goals . . . this self-generated feedback information might lead to reinterpretation of a task or to the adjustment of internal goals or of tactics and strategies. Students might even revise their domain knowledge or beliefs, which in turn, would influence subsequent processes of self-regulation. (pp. 2-3)

Nicol and MacFarlene-Dick (2010) pointed out the importance of external feedback based on monitoring student performance. They believed that the teacher’s response should help a student internalize and interpret the work so that she can take appropriate action steps to move forward in future situations. This model gives both the student and the teacher to the opportunity to internalize progress towards a mastery experience.

Nicol and MacFarlene-Dick (2010) offered points that add to and build upon the work of other researchers in terms of formative assessment and feedback:

2. Encourages teacher and peer dialogue around learning.
3. Helps clarify what good performance are (goals, criteria, and expected standards).
4. Provides information to teachers that can be used to help shape the teaching.

The work of other researchers supported one or more of these points of defining formative assessments and performance feedback. Some of these characteristics are highlighted in the
Elements of Effective Formative Feedback (Table 3). These four elements were highlighted because of their particular connection to formative assessments. Because these elements in Table 3 were noted the most in the literature, these particular qualities were used to create my study's Formative Assessment Rubric.

Table 3

*Elements of Effective Formative Feedback*

<table>
<thead>
<tr>
<th></th>
<th>Student Reflection</th>
<th>Teacher Student Dialogue</th>
<th>Frequency of Dialogue</th>
<th>Provides Information to Guide Instruction</th>
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<td>Black &amp; William (1998)</td>
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<td>Gully (2012)</td>
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<td>Nicol (2010)</td>
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</table>
Additional research further expanded on the importance of a systemic approach to formative assessment with feedback and the connection it has to students' perceived general self-efficacy (Clark 2012). Keeping in mind that both SCT and GST have highlighted the malleability of self-efficacy, the importance and use of formative assessments as an instructional practice should not be overlooked. The performance feedback from teachers and the classroom environment help regulate student academic choices and motivation. The social message students receive from teacher feedback has the potential to have an impact on academic achievement and growth. Clark (2012) stated, “If the social message is internalized, transformed, and integrated it penetrates the personal core of the self and becomes an authentic interest” (p. 232). Using the work of Zimmerman and Pons (1986), Clark illustrated that students very rarely seek out feedback from adults. In this research, it was shown that high achieving students asked for feedback from adults only 35% of the time and low achieving students sought feedback from adults only 8% of the time. This is further justification for the study of the importance of formative assessments in the classroom for two reasons. As previously discussed elementary aged students depend on adults to develop their self-efficacy beliefs and students, by their own volition, seek out feedback from teachers.

In addition, Anderman et al. (2011), Meece (1991), and Jemigan (2004) reported that reflective feedback between teacher and student is paramount to goal mastery. Thus, feedback is powerful but practitioners cannot assume that young students will actively seek out it or interpret it correctly without their guidance. Hattie & Timperley (2007) stated, “The ways and manner in which individuals interpret feedback information is the key to developing positive and valuable concepts of self-efficacy about learning, which in turn leads to further learning” (p. 101).
Therefore, it takes purposeful action on the part of the teacher to provide feedback to students on their efforts towards goal mastery. Otherwise students are not seeking feedback from adults and are left to their own cognitive devices to internalize their level of success towards the completion of a goal. Much of the research on perceived self-efficacy or general self-efficacy supports the idea that school aged children have not developed the appropriate cognitive devices to develop a more accurate sense of perceived self-efficacy and often depend on external sources, especially adults, to help them construct these domains (Clark, 2012).

Considering what has been previously stated about adolescents’ abilities to regulate self-efficacy and their dependence on adults for that regulation, the feedback students receive from teachers will be influenced by the teacher’s efficacy beliefs and becomes crucial to students’ mastery experiences. Therefore, rethinking or expanding the model presented in Figure 2 can illustrate how teacher efficacy and student efficacy interact and influence the other. In an expanded model the student remains the central figure in regulating his performance and reaching goal attainment; however performance and external feedback could be expanded to show the function of teacher self-efficacy as it relates to mastery experiences for students. This exchange between teacher and student is where a teacher’s efficacy beliefs become operational, not just for the student, but also for the teacher’s self-efficacy beliefs about their ability help all students move towards academic success. The feedback exchange becomes formative for the teacher’s self-efficacy and the feedback to the student becomes formative for the student. I believe that dependent upon the final mastery experience or goal setting outcome, these feedback exchanges between student and teacher have the potential to have a positive, neutral, or negative influence on the development of self-efficacy for both individuals. At each of these feedback points, there is an opportunity for the teacher to also receive feedback about his or her own
ability to help the student make progress toward a mastery goal or in more simple terms when
the student's mastery experiences influences the teacher's efficacy beliefs.

Convergence of Theory

I propose that structured formative assessments that highlight feedback loops have an
application for teachers and students in terms of developing students' and teachers' perceived
self-efficacy. The connection between the performance induction modes that involve mastery
experience is a key concept to understand. Students use many meta-cognitive strategies in order
to make sense of and maneuver through the course of a school day Lavery (2008) studied impact
of student meta-cognition strategies as compared to student success. Lavery found goal
setting/planning had a $d = 0.49$ effect on achievement. Hattie and Timperley (2007) noted, “At
the self-regulation level, the commitment to goals is a major mediator of the effectiveness of
feedback” (p. 99). They went on to describe how feedback influences the self-efficacy of people
Highly self-efficacious people make more optimistic predictions about their performance
after initial failure than after initial success, and they seek specifically unfavorable
feedback to excel at tasks. For the low self-efficacious students, positive feedback about
initial success may confirm that they have deficiencies that need to be remedied, which
can lead to a variety of actions. One reaction may be further engagement to remedy
“deficiencies.” Alternately, these students may avoid tasks and feedback following initial
success, because such success signifies that they have already reached an adequate level
of performance. (Hattie & Timperley, 2007, p. 99)

With each attempt at a task in the learning process the student moves towards or away
from mastery of classroom concepts (Boston, 2002). With each student advancement or retreat,
the teacher also experiences a mastery experience. Bandura (1986, 1997) hypothesized that self-
efficacy beliefs are created and developed as students interpret information from four sources, the most powerful of which is the interpreted result of their own previous attainments..." (as cited in Usher & Pajares, 2009, p. 752). GST proposes the initial motivation for a student in task completion. It is the teacher’s role to set these goals and the teacher will set goals for students based on his perceived ability to teach effectively. SCT, specifically, the sub-concept of self-efficacy, provides the internal regulatory mechanism for students to persist at the task. Teachers help students move towards goal mastery through the use of formative assessments (Black, 1998). It is the feedback from assessments that students need to make sense of their learning and thus reach mastery (Hattie & Timperely, 2007). At the many points throughout the feedback loop the teacher interjects to guide students’ regulatory mechanisms with the goal of student mastery. Then the cycle starts over again.

However, based on the concepts discussed in SCT and GST, I am of the opinion that teachers who have low teaching self-efficacy are less likely to engage students in a goal setting cycle, less likely to set appropriate goals for students, and/or give feedback that helps the students become more self-efficacious. Furthermore, I argue that leaving elementary students to their own cognitive faculties without teacher guidance to develop their self-efficacy is haphazard. Consider the consequences in terms of students’ self-efficacy, achievement, and growth of a teacher with low self-efficacy who fails to set goals or lowers goals regardless of students’ ability (that is a teacher who does not believe his students are capable of learning and that regardless of their actions students will not learn). At the very least, I believe students would not grow academically as much as they could and at the worst, students would come to realize their teacher’s lack of belief in their abilities. This lack of teacher belief would logically have a negative influence on their self-efficacy.
I propose that formative assessments with feedback loops have an additional benefit for both teachers and students in terms of developing self-efficacy. It is my belief that there is a relationship between the points of student and teacher dialogue that a formative assessment process provides. This formative assessment process then contributes to the development of teacher efficacy and student self-efficacy. As there are multiple opportunities for feedback from teachers, and since students do not actively seek out feedback nor are they always able to internalize the feedback in a meaningful way, it is important to understand how formative assessments relate to the formative development of student self-efficacy and teacher self-efficacy.

It is the convergence of positive teacher self-efficacy and teacher constructed mastery experiences that incorporate incremental steps (formative assessment) towards mastery, coupled with feedback for students that I wish to study. For the purpose of discussion and explanation, the formative assessment starting point in Figure 2 is the goal circle and moves in a clockwise rotation to the next circle and ultimately ends back up at the goal circle. Teacher self-efficacy is operational at each of the four outer circles: goal, instruction/feedback, practice/feedback, and performance/feedback. Each of the points after the goal circle leads to goal accomplishment for the student. The smaller circles represent structured feedback loops and how students' self-efficacy acts are operationally based on performance feedback. In addition, the feedback loops function in a formative manner not only in terms of goal mastery, but also in terms of the development of a student's self-efficacy. I believe that just as a formative assessment feedback loop has the potential to lead to a mastery experience, it also has the potential to develop a students' positive self-efficacy. However, the type of mastery experience and the
positive/negative development of self-efficacy for elementary aged students are dependent on teacher self-efficacy.

![Diagram](image1)

*Figure 2. A Model of Initial Student Efficacy Through Mastery Experiences*

![Diagram](image2)

*Figure 3. A Model of Student Efficacy Growth Through Matery Experiences*
For illustrative purposes, imagine the center circle of Figure 2 and Figure 3 to be a student’s general self-efficacy at a set point in time. These both represent what I believe to be before and after outcomes of effective formative assessment feedback on a student’s self-efficacy. The change in efficacy belief, using this model, would be because of efficacy beliefs. It is possible that the other three modes of efficacy induction could be a factor. (A third possibility would be no change in self-efficacy or the student matured to the point of no longer being primarily dependent on adults for the positive development of self-efficacy).

Both figures are included as a graphical representation of how self-efficacy is malleable. The figures show that self-efficacy is fluid, and it develops in either direction based on mastery experiences directed by teacher feedback over time. The figures are also included as a way to visualize the relationship the feedback has on a teacher’s self-efficacy. Replacing student efficacy with teacher efficacy in Figures 2 and 3, while maintaining the same formative assessment feedback cycle, also illustrates how a teacher’s mastery experience with students may change their efficacy beliefs about their ability to teach students.

Herein lays the core area of my study. It is at the point of teacher-student interaction that a teacher’s self-efficacy is going to influence the performance feedback, thus influencing a student’s goal mastery disposition and ultimately influencing the student’s persistence/motivation towards academic achievement and growth. Since self-efficacy is malleable and elementary students are dependent on teachers for their development of it, one could argue that a more self-efficacious teacher would likely have the ability to help students be more self-efficacious. Furthermore, teachers come to the classroom with their own perceptions about their abilities to teach children. It stands to reason, giving purposeful performance feedback that is part of a structured formative assessment model is a worthwhile classroom
system to investigate. There is reason to explore the connection between formative assessments with feedback and teacher self-efficacy as a contributing factor to teachers’ self-efficacy.
CHAPTER 3

RESEARCH METHODS

Social constructs in the elementary classroom are complex and diverse. Social cognitive theory states that elementary age students are dependent on the adult models in their world to help them rationalize and process the complex experiences in their lives. The students build their efficacy beliefs based on these experiences. In particular, SCT shows that individual mastery experiences significantly influence individual efficacy beliefs. Teachers come to the classroom with their own self-efficacy beliefs about their abilities to teach particular subjects and their ability to meet the needs of all learners. The teachers’ efficacy beliefs influence how they interact and guide the students’ experiences. It stands to reason that a teacher with high efficacy beliefs will manipulate classroom experiences so that students are led to positive mastery experiences. The converse stands true for a teacher with low efficacy beliefs. The impact on student achievement and growth could be profoundly positive, neutral, or negative.

Research has shown that teachers are reluctant to change teaching methods and efficacy beliefs (Hatte & Hoy, 2007). In part, I attribute this reluctance to the teachers’ experiences and the malleability of their efficacy beliefs. Through the lens of SCT this could be attributed to the fact that the teacher is lacking in mastery experiences in a particular subject, with different student populations, or a combination of both. However, if a classroom system could be put in place that created incremental mastery experiences for students and teachers, I believe that both teacher and students will form more positive efficacy beliefs.

Formative assessments with feedback is the classroom strategy that I believe impacts both teacher efficacy and student efficacy. Marzano (2014) ranked feedback as one of the top 10 factors that impact student achievement. The operative word is “formative.” The criteria I
presented for formative assessment in the literature review has the potential to create experiences necessary for teachers and students to develop positive efficacy beliefs. A deeper understanding about the relationship between teachers’ efficacy beliefs and how their own teaching strategies (in this study formative assessments) contribute to those beliefs has the potential to influence students’ efficacy beliefs, academic achievement, and growth.

Chapter 3 outlines how I plan to examine the relationship between teacher self-efficacy and formative assessments with feedback. The first section in this chapter is the research design. The second section describes the population used to gather data. Section 3 of this chapter describes the instrumentation used. Fourth, I describe the data collection procedures. The next section explains how the data were analyzed. Finally, I listed limitations of this study.

Purpose of the Study

The purpose of this study was to understand the relationship between teachers’ self-efficacy and their use of formative assessments in the classroom. In addition, I wanted to learn if there were significant differences in teachers self-efficacy based on gender, degree earned, elementary grade level taught, building assignment, hours of professional development in formative assessments, and years of teaching experience. In more detail, teachers were asked to self-rate their use of formative assessments with students. The rubric teachers used to rate themselves included the following categories: formative assessment frequency, frequency of conferences with small student groups, frequency of student goal setting meetings, and frequency of the teacher requiring students to self-reflect and adjust learning goals. Furthermore, principals rated each responding teacher, using the same criteria as the teachers’ self-rating on their own use of formative assessment. Finally, the teachers were asked to complete the TSES, and it was compared to both the teachers’ ratings and the principals’ ratings of formative assessment use.
Research Questions

One central research question guided this study: What is the relationship between teacher self-efficacy, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

Ancillary research questions were:

1. What is the relationship between teacher self-efficacy in student engagement, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

2. What is the relationship between teacher self-efficacy in instructional practices, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

3. What is the relationship between teacher self-efficacy in student management, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

Research Design

This study represented a quantitative research design. Teacher self-efficacy was correlated with formative assessment feedback (as measured by an observational rubric). Quantitative design allowed for some generalization of relationships from the sample to a similar population. As illustrated in Chapter 2, there are significant implications for students and teachers in being able to generalize the relationship between the variables. In addition, quantitative research design provides foundational support for further research to be done. Creswell (2009) explained that quantitative survey design is used when “examining the relationship between and among variables is essential to answering questions and hypothesis
through surveys and experiments” (p. 145). The research question examined the relationship between teachers’ perceived self-efficacy and the teachers’ use of formative assessment in the classroom.

Two types of quantitative research design were considered: longitudinal and cross-sectional. Because the scope of the research being conducted was limited (see delimitations), a cross-sectional analysis was selected. Cross-sectional analyses allow for the examination of a population at a fixed point in time and allow inferences to be made as to specific characteristics of the population and/or inferences about cause and effect. In addition, cross-sectional analysis was a suitable method of data collection for the following reasons:

- The research questions did not require a control sample or a treatment sample.
- Cross sectional survey research allows for two or more variables to be compared at the same time.
- Cross sectional design is an observational study whereas the researcher does not manipulate variables.

A cross sectional design is often used as a precursor for further research in which variables are manipulated based on inferences (Lavrakas, 2008).

In order to measure self-efficacy, past studies and guidelines were considered. Bandura (2005) provided a guide for the construction and use of self-efficacy survey scales. He noted that when a measurement attempts to generalize self-efficacy into a broad category approach, the information becomes of limited value to research in terms of the ability to make predictions or explanations. In addition, Bandura (2005) provided what he considered model self-efficacy scales that allow for comparative quantitative tools to be employed. Previous research has been conducted that was in alignment with Bandura’s recommendations on the sources of perceived
self-efficacy. These studies were not designed in terms of general self-efficacy because “sources of self-efficacy also function best at appropriate levels of specificity, and when they correspond with the self-efficacy outcome they are designed to predict” (Usher & Pajares, 2008, p. 763).

In contrast, there is a rich body of recent research that considers self-efficacy in more general terms (Scholz, Doña, Sud, & Schwarzer, 2002). These studies have used similar quantitative methods that incorporate Bandura’s recommendations to find relationships between perceived self-efficacy and one or more variables (Betz & Hackett, 1989; Pajares & Miller 1997; Schwarzer, 1993; Schwarzer & Jerusalem, 1995). In these studies, a participant self-rating scale was used to gather study participants’ measures of self-efficacy sources in mathematic, reading, teaching and self-regulated learning. The survey instruments used in the aforementioned studies were widely accepted as valid constructs even though Bandura created guidelines for more focused survey instruments. These studies provide support for my use of a generalized teacher self-efficacy survey instrument to examine the relationship between teacher self-efficacy and the feedback from formative assessments.

The Survey

Because of the complexity of classroom experiences it is more difficult to isolate causal factors. The Teachers’ Sense of Efficacy Scale was used for this study. The TSES used in this research was developed by Megan Tschanne-Moran and Anita Woolfolk Hoy (Tschanne-Moran & Woolfolk Hoy, 2001). Permission to use, reproduce, and add to the survey was granted (Appendix A).

This survey tool was developed to be general and flexible in terms of comparing teacher’s efficacy beliefs and other factors that might influence teachers’ efficacy beliefs. In addition, the developers of the TSES noted in their work that “there is a danger in developing
measures that are so specific that they lose predictive power beyond the specific skills and concepts being measured” (Tschanne-Moran & Woolfolk Hoy, 2001, p. 795). Therefore, this particular survey instrument becomes more useful in determining relationships between the factors of teacher-self efficacy and formative assessments.

The TSES was developed through three studies. Through these three studies, the original survey was changed from 54 questions to the current 24 question (long form) and the 12 question (short form) versions (Appendix B). The reliability and validity of the long form was examined in the development of the survey. The reliability was noted as 0.94. The validity of the survey was determined by correlating it with two other teacher efficacy belief surveys: The Rand items ($r = 0.18, p < 0.01$) and the Gibson Dembo measure ($r = 0.16, p < 0.01$). The developers noted the survey to be both reliable and valid to use for measuring teacher efficacy beliefs. The TSES (long form) is similar to a Likert scale format consisting of 24 questions with each question having a numeric response of 1 through 9. Response values of 1, 3, 5, 7, and 9 have descriptors of nothing, very little, some influence, quite a bit, and a great deal respectively. The TSES score is based on a normed group. This comparison of my sample to the normed group provided context about the sample in this study.

**Formative Assessment Rubric**

I designed a rubric for the elementary principals to rate the teachers’ use of formative assessment with feedback (Appendix B) in the classroom. The rubric was constructed based on elements of SCT: mastery approach, mastery avoidance, performance approach, and performance avoidance. In addition the rubric was designed based on frequency of references (Roberts, 2010) of formative assessment and feedback characteristics (Table 3).
The initial rubric was given to three experts and they observed three professional development videos of teachers in classrooms. The videos are a part of the sample school district’s professional development training materials and were used with permission from the sample school district. The expert panel used the criteria in the rubric to rate the teachers in the videos as either emergent, developing, or full implementation. These experts provided information to me for changing and clarifying the rubric. Through their input consensus as to what determined each of the teacher ratings was reached. The expert panel consisted of a Director of Student Services; A school human resources director; and an experienced high school principal.

Sample and Description of Population

The sample group was from a suburban school district located in the suburbs of a large mid-western city. A present picture of the county and school corporation demonstrated a high degree of population growth. The county had the highest growth in the state in terms of intrastate migration. The county demonstrated the state’s highest percentage of adults with a high school diplomas or higher (94%) and adults with bachelor degrees at 49%.

The kindergarten through sixth grade student population consisted of 3,485 students of rural and suburban settings. On state standardized tests 87.7% of the students received passing scores in both mathematic and reading in grades 3& 4. The student body was reported as 15% minority students and 24% of the overall student body was reported as receiving free or reduced lunch. This information was taken from the State’s Department of Education’s (IDOE) website (www.in.gov). The teaching staff was comprised of novice through experienced teachers.

This sample was chosen for the following reasons. First, the sample was chosen because the teachers were categorized as teachers of elementary aged students (see the discussion in
Chapter 2 about the importance of adult models to this age group). Second, teachers in this school district had variable teaching experience. Third, the teacher population had various degrees of professional development in the area of formative assessments. Finally, this study provides a benefit to the district and building leadership as to the level of fidelity of implementation of their formative assessment program and possible direction for future professional development.

Data Collection

Prior to the commencement of this study, an application for research approval was submitted to the Institution Review Board. In addition, prior to the collection of the data, permission was obtained from district administration, and the teacher’s union was consulted prior to the distribution of the survey. A Qualtrics link to the teacher self-efficacy scale was sent via email to potential participants. Qualtrics was used to collect and organize data from the teacher self-efficacy scale. In addition, it was used to assist with the output of data for the study.

All participants (teachers and principals) signed the informed consent letter (Appendix C). All direct response information was collected from individuals 18 years of age or older. Participants were all volunteers and their identity remained confidential in the study. The respondents in the study did not have their names or work assignments included in the study. Based on the following coding system, respondents were referred to as principal, developing teacher, emergent teacher, or fully implemented teacher.

In order to match teacher responses with principal ratings, a coding scale was developed to maintain confidentiality. Each potential respondent teacher was assigned a number from a random number table. The number table was generated using a free web-based program from www.stattrek.com. The table consisted of 500 random numbers. I chose 500 numbers because
that allowed for at least 100 numbers greater than the number of potential survey responses if 100% of the potential respondents participated. The following specifications were given to generate the numbers: numbers were selected with the range of 1 to 500, and duplicate numbers were not allowed. This allowed me to keep the participants confidential and at the same time allowed me to match the principal’s rating to the appropriate teacher survey responses.

Principals were given a list of all eligible participants (regardless if they took the survey or not) and asked to rate them as an emergent, developing, or implemented per the researcher-developed feedback rubric. The coded teacher response list remained confidential. The teacher response list was combined with the list principals used to rate their teachers. Once the two lists were combined, column 1 (teacher name) was permanently deleted. I was the only person who had access to both lists prior to combining and coding them. All data, except the teachers’ names and principals’ ratings, were retained on a password-protected and encrypted flash drive, which was stored in a locked filing cabinet in a secure office. All data will be erased or destroyed after three years. The following coding format was used:

- Grade level was coded as K, 1, 2, 3, 4;
- A random number was assigned to each teacher participant; and
- Principal rating was coded as E-Emerging, D-Developing, or I-Implemented and a corresponding numeric code.

The six principals who participated in the study viewed the same professional development videos of classroom teachers using formative assessments. They practiced rating the teachers as emergent, developing, or full implementation. The school district selected for this study had implemented the use of formative assessments as an initiative. As part of their regular duties, the principals were required to make multiple classroom observations so the
teacher ratings of the use of feedback was done regardless of the study. Further instruction was given to the principals as to what constituted the three categories of feedback. The principals received via Qualtrics a list of their teaching staff members and based on their observations and the rubric, rated the teachers in one of the three categories. I collected ratings on all teachers so that principals would not know which of their teachers did or did not complete the survey. Once principal ratings were matched with teacher responses, 100% of the principals’ ratings of their teachers were permanently deleted. Approximate time for administrative participants from initial direction to completion of the rubric was estimated at 90 minutes.

Information that was collected from teachers included the teachers’ responses to TSES.

In order to collect information from the teachers, I attended one of their predetermined staff meetings. I explained in detail the informed consent letter and gave them verbal instructions on how to complete the TSES. In addition, teachers were offered written forms of the informed consent letter. The teachers were sent an electronic link that contained two items: informed consent letter, and the TSES. In addition, teachers were given a note card with a unique random number to input as part of their survey. Teachers were offered coffee and doughnuts regardless of their choice to participate or not participate in the survey. The teachers were given two weeks to participate in the study. The teachers were sent four participation reminders and the link to the survey. One reminder was sent at the beginning and middle of each week. The approximate time for teacher participants to read the informed consent letter and complete the survey was estimated at 10 minutes.

Qualtrics is an electronic survey and data collection tool licensed for use through Ball State University. The TSES was sent to participants via email. Emails were gathered from the school district’s database. As suggested in Creswell (2009), standard directions were given in
survey instruments. Therefore, each participant was given standard instructions when participating (Appendix A). Teachers and principals gave their consent via online signature prior to completing the survey.

**Data Analysis**

Qualtrics provided the tool to collect and organize the data collected and organized and statistical computation was conducted with SPSS. The source of data for this study was a 24-item survey (TSES), building principals’ teacher rating scores, and teacher reported descriptive information collected as part of the electronic survey.

**Descriptive statistics.** Participants \((N = 108)\) were asked to provide the following information: gender, years of teaching experience, highest degree earned, and hours of professional development in the area of formative assessments. A univariate analysis (distribution of each variable and the range of the data set) was conducted to describe and represent each of the descriptive variables. This allowed for the data to be examined in terms of the frequency of distribution, mean, median, and mode.

**Inferential statistics.** The principal feedback rubric ratings were matched with participants self-efficacy score on the TSES. The relationship between teacher self-efficacy and feedback given to students was examined through correlation analysis and ANOVA. Data that were examined included the overall score from the TSES and the three sub-categories of engagement, instructional strategies, and classroom management. This allowed for inferences to be made about the relationship between teacher self-efficacy and feedback from formative assessments.
Limitations

The survey was dependent on the voluntary participation of teachers to complete the survey. There was a small sample size of principals used in the study and the variation between their observations may have been greater even with training using the feedback rubric. The variation was limited as much as possible because of the previous district training.

Summary

The purpose of this chapter was to detail the rationale for a quantitative method design for this study to analyze results of elementary teacher self-efficacy and formative assessments. In addition, the descriptive characteristics of the school district were provided as a context for the overall study. Furthermore, it provided details on how the data were collected, stored, and analyzed.
CHAPTER 4

RESULTS

Chapter 4 details the results of my research study. The chapter begins with a review of the purpose and the research questions. Next, the descriptive statistics are presented, which is followed by the inferential statistics. Finally, a brief summary of the chapter results is provided.

Purpose of the Study

The purpose of this study was to understand the relationship between teachers’ self-efficacy and their use of formative assessments in the classroom. In addition, I wanted to see if there were significant differences in teachers self-efficacy based on gender, degree earned, elementary grade level taught, building assignment, hours of professional development in formative assessments, and years of teaching experience. In more detail, teachers were asked to self-rate their use of formative assessments with students. The rubric teachers used to rate themselves included the following categories: formative assessment frequency, frequency of conferences with small student groups, frequency of student goal setting meetings, and frequency of the teacher requiring students to self-reflect and adjust learning goals. Furthermore, principals rated each responding teacher, using the same criteria as the teachers’ self-rating on their own use of formative assessment. Finally, the teachers were asked to complete the TSES, and it was compared to both the teachers’ ratings and the principals’ ratings of formative assessment use.

Research Questions

One central research question guided this study: What is the relationship between teacher self-efficacy, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?
Ancillary research questions were:

1. What is the relationship between teacher self-efficacy in student engagement, as measured by the TSES, and teachers' use of formative assessments, as rated by their principal, in the classroom?

2. What is the relationship between teacher self-efficacy in instructional practices, as measured by the TSES, and teachers' use of formative assessments, as rated by their principal, in the classroom?

3. What is the relationship between teacher self-efficacy in student management, as measured by the TSES, and teachers' use of formative assessments, as rated by their principal, in the classroom?

Factors that contribute to human behavior are complex and interwoven in such a way that it is impossible to isolate one over the other as the sole determination for behavior and choice; however, researchers still strive to explore those influences in the context of the classroom. Understanding the relationship between instructional practices and how to help teachers and students develop a more accurate perception of their abilities might help to increase opportunities for both. In other words, it becomes relevant for educators to understand how the use of assessment and feedback contribute to their own and students' cognitive processes, especially self-efficacy, in order for teachers to make instructional decisions and for students to make decision about their academic careers.

**Descriptive Statistics.**

The teaching population of the sample group consisted of a total of 207 potential respondents. Of the 207 surveys distributed, 108 teachers completed the survey ($N = 108$) for a response rate of 52%. Principals were instructed to remove any teacher respondent from the
study who was not rated as effective or higher on the state-approved teacher rubric. This was done as a protection for any teacher who might be in jeopardy of having their contract non-renewed. Therefore, all teacher respondents were rated effective or highly-effective. From the 108 teacher responses, the principals did not need to remove any teachers. In the sample, 98% of the teachers were reported as White, 1% reported as Asian, and 1% reported as Black.

Additional descriptive data for the teacher respondents are represented in Table 4 and includes gender, years of experience as an educator, highest degree earned, hours of professional development in formative assessments, and grade level taught. Of specific note concerning the teacher respondents, only 9% were in their first to fifth year of teaching and could be considered novice teachers. The remaining respondents were experienced teachers and the average years of teaching experience was 11 years. This is relatively small proportion of new teachers. The sample population had an average teacher attrition rate less than 2%. In addition, 85% of the respondents reported that their highest level of education at the masters level or higher. In the area of formative assessment training, 87% of the respondents reported having six or more hours of professional development. This indicated that the school district had committed some time and resources to the development and implementation of formative assessments.

Table 5 offers demographic information regarding the principals who completed the teacher formative assessment rating for the teachers they directly supervise and evaluate. Of the six potential schools invited to participate, all six principals participated. All participating principals were considered experienced. A group of five principals had 16 years of experience or more and one principal had six to 10 years of experience. Thus, these principals had experience in evaluating and rating teachers. In addition, all of the principals had completed advanced graduate level work.
Construct Analysis. The relationship between teachers’ self-efficacy and their use of formative assessments with feedback was the principle area of exploration for this study. The TSES (long form) was used to measure the teachers’ self-efficacy. The teachers completed a 24-item survey, which gave a rating in in the following constructs: efficacy in student engagement, efficacy in instructional strategies, efficacy in classroom management, and combined scores. These constructs were used to determine an overall teacher self-efficacy rating. Table 6 shows the standardized TSES scores for the sub-constructs, the composite scores for teacher efficacy, and the mean responses from the completed surveys.

The standard score was useful to note so that a comparison between the distribution of TSES teacher responses and a normalized distribution could be ascertained. As explained in Chapter 3, these TSES scores were based on a normed group. This comparison of my sample to
## Table 4

### Teacher Demographics

<table>
<thead>
<tr>
<th>Item</th>
<th>School A</th>
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<th>School C</th>
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Table 5
Principal Demographics

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<th>Item</th>
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<tr>
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<tr>
<td>Doctorate/Ed.S</td>
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</table>

the normed group provided context about the sample in this study. Efficacy in engagement and instructional practices of the sample showed no significant differences compared to the national standard of TSES scores.

When examining the overall teacher efficacy score, I expected to find the TSES overall score to not be significantly different from the standardized score; however, this sample scored significantly higher ($p = .01$) than the normed TSES group. These higher overall TSES scores indicated that the study sample believes it has more control and influence in their ability to teach all students regardless of extraneous factors that influence students. In addition, the sample population proved to have higher scores on the TSES in the sub-construct of management, which was significant at the .001 level. This score indicated that the responding teachers believed that
they were able to better handle situations, such as disruptive student behavior or motivating reluctant learners. These figures are reflected in Table 6.

Table 6

*Congruency Between Overall Sample TSES Scores and the Standardized Scores*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardized</th>
<th></th>
<th>Sample</th>
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</thead>
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<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>alpha</td>
<td>M</td>
</tr>
<tr>
<td>Efficacy in Engagement</td>
<td>7.3</td>
<td>1.10</td>
<td>.87</td>
<td>7.2*</td>
</tr>
<tr>
<td>Efficacy in Instructional Practices</td>
<td>7.3</td>
<td>1.10</td>
<td>.91</td>
<td>7.5*</td>
</tr>
<tr>
<td>Efficacy in Management</td>
<td>6.7</td>
<td>1.10</td>
<td>.90</td>
<td>7.6*</td>
</tr>
<tr>
<td>Overall T.S.E.S</td>
<td>7.1</td>
<td>.94</td>
<td>.94</td>
<td>7.4*</td>
</tr>
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</table>

Source. Adapted from “Teacher Sense of Efficacy Scale” by M. Tschannen-Moran & A. Woolfolk Hoy, 2001, Teaching and Teacher Education, 17, pp. 783-805. Copyright 2001 by The Ohio State University. *(p<.01)*

Table 7 represents the means and standard deviations of the teachers' responses to the TSES by each school. The normalized data were provided by the creators of the TSES and was used as a point of reference for this study. Schools A, B, C, and F reported comparable or slightly higher means. School D mean results are lower than the norm group in 2 sub-constructs thus, lower on overall efficacy rating. School D reported slightly lower overall efficacy and I believe it is related to building leadership and professional development. This point is discussed in more depth in Chapter 5. Finally, classroom management, which is the teachers’ beliefs in their ability to handle situations such as disruptive student behavior or motivate reluctant learners, was significant across all 6 schools with similar to the normed scores or higher than expected results.
Table 7

*TSES Mean and Standard Deviation by School*

<table>
<thead>
<tr>
<th>Sub-Construct</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>School F</th>
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<tbody>
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<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
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<td>7.2</td>
<td>1.10</td>
<td>7.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Instructional Practice</td>
<td>8.0</td>
<td>.74</td>
<td>7.9</td>
<td>.91</td>
<td>7.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Classroom Management</td>
<td>7.9</td>
<td>.52</td>
<td>7.9</td>
<td>.89</td>
<td>7.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Total Efficacy</td>
<td>7.8</td>
<td>.56</td>
<td>7.7</td>
<td>.92</td>
<td>7.3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Teachers were asked to complete a rating scale about their use of formative assessments in the classroom. In addition, the principals were asked to rate teachers using the same rating scale about each responding teacher. Table 8 indicates the principals’ mean rating in each category and the overall rating of the teacher. Also in Table 8, the teachers’ self-ratings scores are separated by category and overall rating. Overall principals tended to rate the teachers lower in their use of formative assessment in each of the four rating categories and the overall rating score, and teachers rated their use of formative assessments higher. Comparing the ratings of the same instructional practice between the two groups revealed that some teachers believed that they had implemented formative assessments beyond what would be considered the emerging level.
Table 8

*Overall Formative Assessment Rating Scores*

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>Principal</th>
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<th>Teacher</th>
<th></th>
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</thead>
<tbody>
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<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Frequency of Using Formative Assessments</td>
<td>2.5</td>
<td>1</td>
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<tr>
<td>Frequency of Teacher-Student Conference</td>
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<td>.9</td>
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<td>Frequency of Student Reviewing Goal</td>
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<td>1</td>
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<tr>
<td>Frequency of Student Revising Goal</td>
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<td>1</td>
<td>2.6</td>
<td>.9</td>
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</table>

Note. $n = 108$

Tables 9 and 10 reflect the breakdown of how the principal rated the teachers’ use of formative assessment and how the teacher’s rated their own use of formative assessments. The rating scale used Likert ranges. When the data were examined by building, it accounted for some of the differences between the teacher and principal ratings of formative assessment implementation. In both tables the frequency of using formative assessments was rated high or higher than the other rating categories. This illustrated that both teachers and principals identified that formative assessments were being used on a regular basis in the classroom. However, teachers reported the frequency of student goal review as higher than the principals’ ratings of the teachers in the same category. Teachers believed that they met with students individually or in small groups to review academic goals more often than what the principals rated the teachers as doing.
Table 9

*Principals Rating of Teachers’ Use of Formative Assessment*

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>School F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Using Formative Assessments</td>
<td>2.7</td>
<td>2.8</td>
<td>2.3</td>
<td>2.2</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Frequency of Teacher-Student Conference</td>
<td>2.7</td>
<td>2.6</td>
<td>2.3</td>
<td>2.2</td>
<td>2.6</td>
<td>2.1</td>
</tr>
<tr>
<td>Frequency of Student Reviewing Goal</td>
<td>2.2</td>
<td>2.1</td>
<td>2.1</td>
<td>2.2</td>
<td>2.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Frequency of Student Revising Goal</td>
<td>2.1</td>
<td>1.8</td>
<td>1.9</td>
<td>1.2</td>
<td>2.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Overall Rating</td>
<td>9.8</td>
<td>3</td>
<td>9.4</td>
<td>3</td>
<td>8.6</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 10

*Teachers’ Formative Assessment Self-Rating*

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>School F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Using Formative Assessments</td>
<td>2.9</td>
<td>.94</td>
<td>2.9</td>
<td>.9</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Frequency of Teacher-Student Conference</td>
<td>2.8</td>
<td>1.1</td>
<td>2.9</td>
<td>.9</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Frequency of Student Reviewing Goal</td>
<td>2.1</td>
<td>1.3</td>
<td>2.6</td>
<td>1</td>
<td>3</td>
<td>.8</td>
</tr>
<tr>
<td>Frequency of Student Revising Goal</td>
<td>2.3</td>
<td>1</td>
<td>2.2</td>
<td>.8</td>
<td>2.7</td>
<td>1</td>
</tr>
<tr>
<td>Overall Rating</td>
<td>10.3</td>
<td>2.1</td>
<td>10.7</td>
<td>2</td>
<td>11.7</td>
<td>2.9</td>
</tr>
</tbody>
</table>
The formative assessment rating scale was used to categorize the teachers into three groups—emerging, developing, and implemented. The score range for each category was 4 – 6 rated as emerging, 7 – 11 for developing, and 12 – 16 for implemented. Table 11 displays the categorical totals as rated by principals and teachers' self-rating. Principals tended to rate the teachers more evenly across the three categories, and the teachers self-ratings were higher. Of particular note the principals rated 35 (32%) of the respondents as emerging in their use of formative assessments compared to six (5%) respondents' self-rating of emergent. The category of developing also showed a notable difference with the principals rating 48 (44%) of the respondents as developing and 81 (75%) of the teachers reporting themselves as developing.

Tables 12 and 13 indicate the categorical ratings of formative assessment implementation by principal/school building and the teachers' categorical rating by school building. Of particular note is the principal of school F, who did not rate any of the teachers as emergent, but also had the lowest number of teachers rated as implemented (1%). In Schools D, E, and F, none of the teachers reported themselves as emergent, and Schools A, B, and C each self-reported two teachers each as emergent.

Table 11

Overall Formative Assessment Rating By Category

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>Principal Total</th>
<th>Principal %</th>
<th>Teacher Total</th>
<th>Teacher %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergent</td>
<td>35</td>
<td>32</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Developing</td>
<td>48</td>
<td>44</td>
<td>81</td>
<td>75</td>
</tr>
<tr>
<td>Implemented</td>
<td>25</td>
<td>24</td>
<td>21</td>
<td>20</td>
</tr>
</tbody>
</table>

Note. n = 108
The majority of teachers (95%) rated themselves as being developing or higher in using formative assessments. This meant that the teacher believed that they were using formative assessments in the classroom at a level greater than a novice. When comparing the differences between how the principals rated the teachers and the teachers’ self-ratings, there was a significant difference ($p < .000$). Therefore, I wanted to examine to what extent they agreed or disagreed.

Table 12

*Principals’ Rating of Teachers’ Use of Formative Assessment By Category*

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>School F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N = 18$</td>
<td>$N = 21$</td>
<td>$N = 18$</td>
<td>$N = 23$</td>
<td>$N = 12$</td>
<td>$N = 16$</td>
</tr>
<tr>
<td>Emergent</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Developing</td>
<td>9</td>
<td>8</td>
<td>12</td>
<td>11</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Implemented</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note. $n = 108$*

Table 13

*Teacher Formative Assessment Self-Rating By Category*

<table>
<thead>
<tr>
<th>Rating Category</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>School F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N = 18$</td>
<td>$N = 21$</td>
<td>$N = 18$</td>
<td>$N = 23$</td>
<td>$N = 12$</td>
<td>$N = 16$</td>
</tr>
<tr>
<td>Emergent</td>
<td>2</td>
<td>1.67</td>
<td>2</td>
<td>1.67</td>
<td>2</td>
<td>1.56</td>
</tr>
<tr>
<td>Developing</td>
<td>14</td>
<td>12.00</td>
<td>17</td>
<td>15.00</td>
<td>8</td>
<td>7.00</td>
</tr>
<tr>
<td>Implemented</td>
<td>2</td>
<td>1.00</td>
<td>2</td>
<td>1.00</td>
<td>8</td>
<td>7.00</td>
</tr>
</tbody>
</table>

*Note. $N = 108$*
When two or more raters examine the same variable or rate the same variable, Cohen’s kappa (κ) can determine inter-rater agreement. Cohen’s kappa can also be used to determine the difference between raters who are less experienced or raters who have similar but different job functions such as principal and teacher. Although there are other measures for agreement between raters, Cohen’s kappa was chosen because it considers chance agreement between the raters.

Table 14 presents the agreement between the principals and the teachers on the implementation of formative assessments. The category ratings range from poor to fair agreement with an overall agreement of slight (κ = .063). Because of the amount of professional development in the area of formative assessments I would have expected there to be a greater level of agreement between principals and teachers. In the category ratings, frequency of teacher-student conferences was rated as poor agreement, and the frequency of using formative assessments was shown to be fair.

Table 14

*Principal & Teacher Inter-Rater Agreement on Formative Assessment Use*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall Agreement</th>
<th>κ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Using Formative Assessments</td>
<td>Fair</td>
<td>.215</td>
</tr>
<tr>
<td>Frequency of Teacher-Student Conference</td>
<td>Poor</td>
<td>-.420</td>
</tr>
<tr>
<td>Frequency of Student Reviewing Goal</td>
<td>Slight</td>
<td>.098</td>
</tr>
<tr>
<td>Frequency of Student Revising Goal</td>
<td>Slight</td>
<td>.119</td>
</tr>
<tr>
<td>Overall Rater Agreement</td>
<td>Slight</td>
<td>.063</td>
</tr>
</tbody>
</table>
Table 15 displays the agreement between the principals and teachers in the same school. Schools C and D had fair agreement in the frequency of formative assessment use, and School B had the lowest rating of poor in this category. Across buildings there was consistently slight agreement in the category student goal revision. In addition, all schools, with the exception of School B, had slight agreement overall between raters and school B had poor agreement. I would attribute these findings to the differences in professional development the principals provided.

Table 15

Principal & Teacher Inter-Rater Agreement on Formative Assessment Use

<table>
<thead>
<tr>
<th>Variable</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>School F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Using Formative Assessment</td>
<td>.077</td>
<td>-.077</td>
<td>.280</td>
<td>.295</td>
<td>.153</td>
<td>.371</td>
</tr>
<tr>
<td>Frequency of Teacher-Student Conference</td>
<td>-.312</td>
<td>-.170</td>
<td>.056</td>
<td>.076</td>
<td>.215</td>
<td>.030</td>
</tr>
<tr>
<td>Frequency of Student Reviewing Goal</td>
<td>.080</td>
<td>.282</td>
<td>.149</td>
<td>.000</td>
<td>.077</td>
<td>.107</td>
</tr>
<tr>
<td>Frequency of Student Revising Goal</td>
<td>.025</td>
<td>.077</td>
<td>.165</td>
<td>.053</td>
<td>.056</td>
<td>.054</td>
</tr>
<tr>
<td>Overall Rater Agreement</td>
<td>.030</td>
<td>-.005</td>
<td>.016</td>
<td>.080</td>
<td>.036</td>
<td>.103</td>
</tr>
</tbody>
</table>

Inferential Analysis

The principal feedback rubric ratings were matched with participants’ self-efficacy scores on the TSES. The relationship between teacher self-efficacy and feedback given to students was
examined through correlation analysis using SPSS. Data that were examined included the overall score from the TSES and the three sub-categories of engagement, instructional strategies, and classroom management. This allowed for inferences to be made about the relationship between teacher self-efficacy and the teacher’s use of formative assessments. In addition, data analysis was conducted using one-way ANOVA between self-efficacy and years of experience, number of professional development hours, education level, grade level taught, and building teaching assignment.

A Spearman's rank-order correlation was used to assess the relationship between the principal's ratings of teachers' use of formative assessments and the overall score on the TSES. In addition, a Spearman’s rank-order correlation was used to compare the TSES sub-constructs of classroom management, instructional practices, and student engagement. Preliminary analysis showed the overall relationship between the variables to be a positive linear relationship, which was determined by examining a scatterplot. Table 16 presents the Spearman correlation coefficient between the principal’s ratings and teacher efficacy ratings as .922, \( p < .005 \). The Spearman correlation coefficient shows a positive correlation between the principal’s ratings of the teachers’ formative assessment use and the teachers’ self-efficacy scores. Although a causal relationship was not suggested through the correlation analysis, it suggested that the relationship between the variables was positive and as one variable increased so did the other. Positive correlations between the efficacy in engagement, efficacy in instructional practices, and efficacy in management were also found.
Table 16

Correlations Between Principal’s Rating and the TSES

<table>
<thead>
<tr>
<th>Correlation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Principal’s Overall Rating</td>
<td>.896*</td>
<td>.898*</td>
<td>.889*</td>
<td>.922*</td>
<td></td>
</tr>
<tr>
<td>2. Efficacy in Engagement</td>
<td></td>
<td>.916*</td>
<td>.879*</td>
<td>.969*</td>
<td></td>
</tr>
<tr>
<td>3. Efficacy in Instructional Practices</td>
<td></td>
<td></td>
<td>.909*</td>
<td>.969*</td>
<td></td>
</tr>
<tr>
<td>4. Efficacy in Management</td>
<td></td>
<td></td>
<td></td>
<td>.950*</td>
<td></td>
</tr>
<tr>
<td>5. Total TSES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

One-Way ANOVA

Since there was a positive correlation between the teacher’s use of formative assessments and their scores on the TSES, I wanted to discern if there might be other significant factors between the two variables such as the building to which the teacher was assigned. Therefore, a one-way ANOVA was conducted between the collected independent variables. No significant relationship was found between years of teaching experience, gender, level of education, or grade level teaching assignment. However, there was a finding between TSES and two of the independent variables—hours of professional development and building assignment.

When analyzing the number of professional development hours for formative assessment that a teacher participated in and the TSES the teachers were considered as a collective sample and not by building. The hours of professional development were assigned to one of three groups—initial training (two to seven hours), practitioner training (eight to 18 hours), and expert training (20 to 30 hours). When grouped this way significant differences between groups resulted. Homogeneity of variances was violated, as assessed by Levene’s test of homogeneity of variance. However, the Brown-Forsythe robust equality of means showed the number of...
hours of professional development was statistically significantly different between groups, Brown-Forsythe $F(2,80.97) = 26.186, p < .000.$

One-way ANOVA results were significant between the TSES sub-constructs (classroom management, instructional practices, and student engagement) and the number of professional development hours. For each sub-construct on the TSES homogeneity of variances was violated, as assessed by Levene’s test. However, the Brown-Forsythe robust equality of means showed significant differences between groups (Table 17).

Table 17

<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total TSES</td>
<td>26.19</td>
<td>2</td>
<td>80.97</td>
<td>.000</td>
</tr>
<tr>
<td>Efficacy in Engagement</td>
<td>27.19</td>
<td>2</td>
<td>80.09</td>
<td>.000</td>
</tr>
<tr>
<td>Efficacy in Instructional Practices</td>
<td>24.69</td>
<td>2</td>
<td>80.34</td>
<td>.000</td>
</tr>
<tr>
<td>Efficacy in Management</td>
<td>21.46</td>
<td>2</td>
<td>81.39</td>
<td>.000</td>
</tr>
</tbody>
</table>

A one-way ANOVA was also used for the building assignment (Schools A, B, C, D, E, & F) analysis. Again, the TSES homogeneity of variances was violated, as assessed by Levene’s test of homogeneity of variance. The Brown-Forsythe robust equality of means found significant differences between groups, $p < .05.$ Results were varied in terms of significance between the TSES sub-constructs (classroom management, instructional practices, and student engagement) and building assignment. For each sub-construct on the TSES, Levene’s test indicated that homogeneity of variances was violated. However, the Welch robust equality of means provided significant differences between the buildings and the sub-construct of instructional practices and
classroom management. Table 18 presents the results of the one-way ANOVA between these groups. This means that teachers, based on building assignment, reported higher levels of self-efficacy. Therefore, the teachers’ beliefs in their ability to manage students and instruct students are significantly higher than their peers’ teaching beliefs in another building.

Table 18

TSES & Building Assignment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total TSES</td>
<td>2.78</td>
<td>5</td>
<td>78.89</td>
<td>.023</td>
</tr>
<tr>
<td>Efficacy in Engagement</td>
<td>1.77</td>
<td>5</td>
<td>85.88</td>
<td>.126</td>
</tr>
<tr>
<td>Efficacy in Instructional Practices</td>
<td>3.57</td>
<td>5</td>
<td>77.29</td>
<td>.006</td>
</tr>
<tr>
<td>Efficacy in Management</td>
<td>3.42</td>
<td>5</td>
<td>80.45</td>
<td>.007</td>
</tr>
</tbody>
</table>

Summary

Several significant findings were reported in this chapter. There was a significant correlation noted between the teacher’s use of formative assessment and his or her self-efficacy beliefs. In addition, the time spent in professional development for formative assessment was also significantly related to the self-efficacy scores for a teacher in this study. Building assignment was also related to higher efficacy scores on the TSES. Although not directly related to the research questions, it was important to discuss the results of the differences in principal and teacher rating of the level of formative assessment implementation because the difference raised questions for further exploration. These results and their implications are further discussed in Chapter 5.
CHAPTER 5

CONCLUSIONS

Chapter 5 presents a summation of my study of the relationship between teacher self-efficacy and teachers’ use of formative assessments in the classroom. The section begins with an overview of the entire study and is followed by a more in-depth discussion of the findings in Chapter 4. The discussion focuses on major findings and how those findings relate to the literature review. The last sections include implications for action and recommendations for continued research.

Overview

Elementary-aged students are dependent on adult role models to help them develop their efficacy beliefs (Bandura, 1986). Efficacy beliefs are developed and begin to take root as the result of small mastery experiences over time; however, adults who do not necessarily have strong efficacy beliefs about teaching students may not always be capable or willing to help guide young children through mastery experiences. The result is the children may develop skewed efficacy beliefs.

This is particularly true when it comes to the teacher-student dynamic that occurs in the elementary classroom. A teacher is responsible for guiding a student to and through these mastery experiences. When teachers do not believe that they are capable of addressing student needs, how then are they able to help the student develop strong academic efficacy beliefs?

As discussed in Chapter 2, self-efficacy is considered to be malleable and is able to be altered based primarily on mastery experiences. Therefore, examining teacher instructional practices not only for their effect in terms of students’ skill mastery, but also for the effect the instructional practices might have on teacher and student efficacy beliefs, is a worthwhile
endeavor so that both teachers and students are able to make decisions based on a more actualized sense of themselves.

**Purpose of the Study**

The purpose of this study was to understand the relationship between teachers' self-efficacy and their use of formative assessments in the classroom. In addition, I wanted to see if there were significant differences in teachers self-efficacy based on gender, degree earned, elementary grade level taught, building assignment, hours of professional development in formative assessments, and years of teaching experience. In more detail, teachers were asked to self-rate their use of formative assessments with students. The rubric teachers used to rate themselves included the following categories: formative assessment frequency, frequency of conferences with small student groups, frequency of student goal setting meetings, and frequency of the teacher requiring students to self-reflect and adjust learning goals. Furthermore, principals rated each responding teacher, using the same criteria as the teachers' self-rating on their own use of formative assessment. Finally, the teachers were asked to complete the TSES, and it was compared to both the teachers' ratings and the principals' ratings of formative assessment use.

**Research Questions**

One central research question guided this study: What is the relationship between teacher self-efficacy, as measured by the TSES, and teachers' use of formative assessments, as rated by their principal, in the classroom?

Ancillary research questions were:

1. What is the relationship between teacher self-efficacy in student engagement, as measured by the TSES, and teachers' use of formative assessments, as rated by their principal, in the classroom?
2. What is the relationship between teacher self-efficacy in instructional practices, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

3. What is the relationship between teacher self-efficacy in student management, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?

Review of Methods

This study represented a quantitative research design. Teacher self-efficacy was correlated with the teachers’ use of formative assessments (as measured by an observational rubric). Quantitative design allowed for some generalization of relationships from the sample to a similar sample. Because the study was exploratory in nature, the research design needed to allow for inferences to be made. Cross-sectional analysis was selected for this study because it was possible to examine the population at a fixed point in time and inferences could be made. However, a cross sectional design is often used as a precursor for further research in which variables are manipulated based on inferences (Lavrakas, 2008).

The Teacher Self-efficacy Scale (TSES) was used for this study. This survey tool was developed to be general and flexible in terms of comparing teacher’s efficacy beliefs and other factors that might influence teachers’ efficacy beliefs. The TSES used in this research was developed by Tschannen-Moran and Woolfolk Hoy (2001). The TSES 24-question long form survey is a Likert scale. Each of the 24 questions provided a numeric response of one through nine. Response values had descriptors of 1 = nothing, 3 = very little, 5 = some influence, 7 = quite a bit, and 9 = a great deal respectively. The TSES score is based on a normed group.
I designed the rubric that principals and teachers used to rate formative assessment as an instructional practice in the classroom. The rubric was constructed based on these elements of Social Cognitive Theory (SCT): mastery approach, mastery avoidance, performance approach, and performance avoidance. In addition, the foundation for the constructs included in the rubric was informed by the frequency of references (Roberts, 2010) that comprised the major themes of formative assessment and feedback characteristics (See Chapter 2, p. )

The sample was chosen for the following reasons:

1. The teachers were categorized as teachers of elementary-aged students (see the discussion in Chapter 2 about the importance of adult models to this age group).
2. Teachers in this school district had variable teaching experience.
3. The teacher population had various degrees of professional development in the area of formative assessments.

This study provides a benefit to the district and building leadership as to the level of fidelity of implementation of their formative assessment program and possible direction for future professional development.

A Qualtrics link to the teacher self-efficacy scale was sent via email to potential participants. Qualtrics was used to collect and organize data from the TSES. Principals were given a list of all eligible participants (regardless if they took the survey or not) and asked to rate these teachers as emergent, developing, or implemented per the researcher-developed feedback rubric. The coded teacher response list remained confidential. The teacher response list was combined with the list principals used to rate their teachers.

Data were organized via Qualtrics and statistical computation was done with SPSS. The source of data for this study included the TSES survey, building principals’ teacher rating scores,
and teacher-reported descriptive information collected as part of the electronic survey. Descriptive and inferential analyses were conducted with the assistance of Dr. Eouanzou, a statistician at Ball State University.

The principals’ feedback rubric ratings for their participating teachers were matched with participants’ self-efficacy scores on the TSES. The relationship between teacher self-efficacy and feedback given to students was examined through correlation analysis and ANOVA. Data that were examined included the overall score from the TSES and the three sub-categories of engagement, instructional strategies, and classroom management. This allowed for inferences to be made about the relationship between teacher self-efficacy and feedback from formative assessments.

**Summation of Major Findings**

The results of my study found that there is a strong positive correlation between a teacher’s efficacy beliefs and his or her use of formative assessments in the classroom. In addition, there was a strong positive correlation between a teacher’s efficacy in engaging students, a teacher’s efficacy in instructional practices, and a teacher’s efficacy in engagement. Furthermore, significant differences were found among teachers who had more hours of professional development in the use of formative assessments and their overall self-efficacy, efficacy in engagement, efficacy in instruction, and efficacy in management. Similarly, significant differences were found between the building assignment of the teacher and their overall self-efficacy score, efficacy in instruction, and efficacy in management. Finally, it was found that principals and the teachers, at best had only slight agreement, when their ratings on the use of formative assessments in the classroom were compared. Each of these major findings will be discussed in more detail with connections made to other researchers in the literature.
**Research Question 1.** What is the relationship between teacher self-efficacy, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom? There are several connections between the results of my study and the literature review in Chapter 2. A major finding was the strong positive correlation between a teacher’s self-efficacy and his or her use of formative assessments ($r = .922, p < .05$). Although I am not suggesting that there is a causal relationship between the two variables, I do believe that the relationship is in alignment with and is supported by the concepts of SCT. Furthermore, this positive correlation is the justification for future studies that are outlined later in the chapter.

Mastery experiences or lack of experiences for people impact efficacy beliefs (Bandura, 1986). Furthermore, the correlation is supported by the concept of reciprocal determinism in the sense that it is too complex to say which variable affects the other first; however, they both interact with the other. It is quite possible teachers with stronger efficacy beliefs chose to use formative assessments or that using formative assessments positively change a teacher’s efficacy beliefs. My finding of a strong positive correlation between teacher self-efficacy and formative assessment was further supported by two important findings from Chapter 4. First, the amount of time a teacher has devoted to professional development in the area of formative assessments was significant ($p = 0.000$) when compared to the teacher’s self-efficacy rating. Second, the teacher’s use of formative assessment in the classroom, as rated by the principal, was significant ($p = 0.023$) when compared to the building in which the teacher was assigned to teach.

In the area of professional development, it is well documented that professional development for teachers impacts their instruction. Armor’s (1976) study supported this idea. In my study, there was a significant difference between teachers’ self-efficacy and the number of hours of professional development hours reported. My findings show that the teacher who
reported more hours of training in the use of formative assessments also had higher self-efficacy scores. By design, professional development offers teachers time to learn, reflect on practice, and then learn how to manage formative assessment use. I contend that the increased professional development hours for teachers act as a model of formative assessments. The training allowed some teachers more opportunities to learn about formative assessment and practice what they had learned in the training. Therefore, the additional opportunity to practice provided feedback to the teachers and allowed them to alter their practices. However, the participants were not asked about the design of the professional development or continued classroom support via other means, such as an instructional coach. They were only asked to indicate the number of hours of formative assessment training they had received. It is possible that the design and delivery of the professional development differed in quality.

Based on building assignment, teachers reported higher or lower levels of self-efficacy. Some teachers’ beliefs in their ability to manage students and instruct students were significantly higher than their peers’ teaching beliefs in another building. Once again, data does not suggest a causal relationship between the variables; however, even though individual self-efficacy scores were collected, the findings are consistent with collective efficacy studies. Previous research has shown that individual teacher efficacy is generally higher when the staff has a high collective efficacy and is impacted by building leadership (Derrington & Angelle, 2013). Because of the similarities in demographics between buildings, it is difficult to discern conclusions that are specific to individual efficacy at the building level. However, when I coupled the use of targeted professional development, in this instance formative assessments, and the corresponding teacher efficacy ratings, this question arose, “To what degree does sustained professional development have on the overall collective efficacy of a school?” It is important to note that collective
efficacy is not aggregated self-efficacy. However, knowing that collective efficacy influences individual efficacy one could come to the conclusion that if a group of teachers report high individual efficacy that the as a collective they might also report a high collective efficacy. Furthermore, the building principal was responsible for the design of the professional development and classroom monitoring of its implementation. Survey questions did not inquire as to the type of professional development, nor did it inquire as to principal’s leadership style; however, based on anecdotal knowledge, the leadership style at each building and the leadership buy in to the use of formative assessment could potentially explain the differences. Professional development and efficacy are discussed in the implications and recommendations sections.

**Research Question 2.** What is the relationship between teacher self-efficacy in student engagement, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom? Student engagement is a sub-construct of the teacher’s overall self-efficacy rating, and there was a high positive correlation ($r = .896, p < .05$) between it and the teacher’s use of formative assessments. In addition, similar to the results of the primary research question, there was a significant difference between teachers’ reported level of self-efficacy and their use of formative assessments. By design, formative assessments require the teacher to engage the student in dialogue about the student’s performance. As noted by Boston (2012), performance feedback is a crucial piece in the development of teacher and student efficacy beliefs.

The sample population used a prescribed method for using formative assessments, which included the essential elements of a formative assessment model as suggested by Butler and Winne (1995). Using this model, the teacher received feedback not only about the students’ performance, but also about her performance as a teacher. Because the teachers were required to use this model of formative assessment, it required them to reflect upon instructional practices
that they determined were or were not successful for students. If the students were not successful, then the teachers would need to find different ways to engage with them. If the students were successful at tasks, the teachers could continue the method of instruction. Either way, the teachers with high levels of efficacy in engagement had the opportunity to have mastery experiences in terms of student engagement. Understanding the relationship between successful student engagement and mastery experiences might be an area of focus for a building leader with his teachers and provide an opportunity to explore effective ways to engage students.

**Research Question 3.** *What is the relationship between teacher self-efficacy in instructional practices, as measured by the TSES, and teachers’ use of formative assessments, as rated by their principal, in the classroom?* Instructional practices was a sub-construct of the teacher’s overall self-efficacy rating. My findings showed a strong positive correlation ($r = .896$, $p < .05$) between the teacher’s use of formative assessment and the teacher’s efficacy belief in this sub-construct. This finding was not a surprise based on the nature of the feedback formative assessments give teachers. As suggested by Black (2005), formative assessments direct teachers not only the “what” to teach, but give insight prompts on the “how” to teach. It does, however, point back to the idea of efficacy induction for teachers and the concept of reciprocal determinism. That is, where does the teacher’s instructional efficacy belief begin and to what extent do previous experiences from teaching students sustain or edify those beliefs? For example, did the teacher choose to use manipulatives in mathematic instruction because that was the way he or she was taught or did he or she use these because in the past the teacher had success using manipulatives with students? An additional example might be that a teacher was directed to use mathematic manipulatives during his or her instruction and did not believe that the teacher or the students were successful. Thinking in terms of efficacy induction and
reciprocal determinism, I suggest, based on this connection, that a teacher has a range of efficacy in instruction in which there is a lower and upper limit that influences instructional choices and practice. It raises the question, "Would examining other external factors such as high stakes testing, proximity to and sustained professional development, access to and use of instructional coaches, provide evidence for upper and lower ranges of efficacy beliefs?"

Self-efficacy is not a constant fixed point with a person and it is considered to be malleable (Shunk & Pajares, 2001). Taking malleability into consideration a teacher might report high efficacy beliefs immediately before giving students a mandatory standardized test, but report lower efficacy beliefs after observing the students' performance on that test. Understanding how a teacher's efficacy beliefs fluctuate through the course of the school year could help building leadership design ways to support that teacher at times when efficacy beliefs might be lower.

**Research Question 4.** What is the relationship between teacher self-efficacy in student management, as measured by the TSES, and teachers' use of formative assessments, as rated by their principal, in the classroom? Student management is a sub-construct of a teacher's overall self-efficacy rating and there was a high positive correlation ($r = .896, p < .05$) between it and the teacher's use of formative assessments. The student management construct is concerned with how effective teachers believe their feedback affects student behavior towards academic success and their beliefs about their ability to handle difficult behavior situations. Some research noted that that personal teaching efficacy has an effect on the behaviors of students, as well as student beliefs and outcomes (Morris-Rothschild & Brassard, 2006). Teachers respond to students because of specific student positive or negative behaviors and the feedback occurs as a result of that behavior (Kerr & Nelson, 2006).

The formative assessment model used by the sample population focused on specific academic outcomes and processes to help guide both student and teacher. The model used gave
the teacher a framework for academic feedback. The process directed teachers to give specific feedback to the student rather than a general response. Kaplan & Maehr (2007) noted that a person's behavior is a function of a person's ability to manipulate the situation. As such, this purposeful approach of formative assessment feedback helps eliminate some of the chance for the teacher to provide feedback that contains elements of negative messages (Hattie & Timperley, 2007), and the formative assessment process provides feedback to the teacher to help manage students towards their goal attainment.

Recommendations

The results of this exploratory study have shown that there is a significant relationship between a teacher's self-efficacy beliefs and the use of formative assessment. When the results of this study are coupled with previous research, the connections raise some interesting questions and implications for future study.

Professional development was an element that was important in my study. Previous studies have focused on pre-service teachers, their training, and their efficacy beliefs. It would be my recommendation to conduct additional research that would focus on the relationship between in-service teachers' professional development and their efficacy beliefs. Furthermore, additional studies that focus not only on content taught, but on specific instructional practices or techniques as these relate to a teacher's efficacy beliefs, could prove to offer additional insight. Lastly, the design and quality of the professional development the teachers received was similar in content but not necessarily in quality. Increased hours in professional development might not necessarily mean that it was effective.

Based on previous research studies that focused on efficacy beliefs of content specific teachers and my own findings, I believe that it would be of particular interest to conduct future
studies that examine the efficacy beliefs of teachers who are generalists (elementary teachers trained to teach all subjects) compared to teachers who are specialists (teachers trained to teach content specific classes, such as only science or only mathematic). I would expect to find that a specialist would report a higher level of efficacy as compared to a generalist teacher the same content.

Exploring to what degree professional development acts on or influences a teacher’s efficacy would be another worthwhile endeavor. SCT states that efficacy beliefs for adults can be derived from several sources. Performance exposure and verbal persuasion (teachers talking to peers about formative assessments) could be the possible source for the differences the teachers reported in their efficacy beliefs. To further clarify, a teacher’s using formative assessments allows for other teachers to be exposed to the use of formative assessment. As a result, the teachers might have discussed their use of formative assessments (verbal persuasion) during staff meetings, professional development opportunities, or during informal conversations. Such verbal persuasion could have prompted teachers to respond differently on the survey than those teachers in other buildings where informal discussions about the use of formative assessments was not occurring as frequently or at all. However, the design of my study did not allow for further conclusions outside of noting the significance. To make more inferences about this relationship, I would suggest the use of mixed methods. Combining both quantitative and qualitative research techniques would allow for a richer understanding of a teacher’s efficacy beliefs.

Based on their efficacy beliefs, determining the degree that teachers interact with students would be a possible next step for a future study. Although this study focused on a broad range of students, it would be interesting to analyze how teachers report their engagement efficacy beliefs
as these relate to differing student populations while using formative assessments. Shakut (2015) noted in a teacher efficacy study that student age and teacher age were correlated in terms of level of engagement; however, I found no level of significance between teacher experience and efficacy engagement beliefs.

Another interesting point for discussion in terms of teacher efficacy and what role instructional strategies play in teacher-student engagement derived from a significant difference in my findings. Prensky (2001) stated “our Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language” (p. 2). Along with this same idea, to what degree do teachers’ efficacy beliefs influence their engagement and management of students who have disabilities, students living in poverty, or students who are English Language speakers? Could an instructional practice, such as formative assessments, which requires the teacher to manage and engage students in a deeper dialogue, help bridge generational differences in learning? Also, studying the impact or change in a teacher’s efficacy beliefs after engaging students in differing ways could provide insight into the rate and degree in which a teacher’s efficacy beliefs change (malleability).

The concept of a teacher’s efficacy beliefs not being static, but being malleable, was well supported in the literature review. In addition, the idea of efficacy being situation specific is also well supported. However, based on the previous discussion in my findings section, I suggest that an individual’s efficacy beliefs operate within a range with an upper and lower limit. Exploring my suggestion of efficacy ranges further adds to the understanding of how, and perhaps to what extent, efficacy beliefs are able to be changed. The idea of efficacy ranges for an individual raises the question if examining other external factors, such as high stakes testing, proximity to
and sustained professional development, and access to and use of instructional coaches, provide evidence for upper and lower ranges of efficacy beliefs.

Effect size of instructional practices on student achievement has been well documented through research (Hattie, 2008). It is my supposition that self-efficacy and instructional practices could also be examined and discussed relative to effect size. In terms of my study, what is the effect size of formative assessments on a teacher's efficacy beliefs? In more general terms, instructional practices or professional development could be examined to determine the effect sizes those have on efficacy beliefs or vice versa (reciprocal determinism). I also suggest that educational practices be examined in terms of self-efficacy. Considering the effect sizes of events such as formative assessments, high stakes testing, instructional coaches, team teaching, and professional development have on teacher (and students) efficacy beliefs would be another area for future research. Hattie (2011) compiled a list of instructional practices and the effect sizes these had on achievement. Being able to determine the effect sizes of instructional practices in terms of efficacy beliefs could be of particular interest in examining student achievement. An interesting question is related when considering “how well does a low/middle/high efficacious teacher evaluate and monitor student growth and progress?”

Although the discussion up to this point has focused on the singular efficacy of the teacher, my findings of the significant difference between levels of efficacy based on building assignment support future work in terms of collective efficacy, because it has the potential to significantly influence student achievement. The impact an individual teacher has on the collective efficacy of a school is clearly supported through research (Derrington & Angelle, 2013). Moreover, Hattie listed the effect size of collective efficacy on student achievement as 1.57. According to his meta-analysis, collective efficacy was identified as one of the most
influential factors on student achievement. Being able to build singular efficacy through professional development in instruction, engagement, and management could foster collective growth and change the direction of a school for the betterment of the students.

Limitations

In a quantitative study, it is important to identify limitations that were not anticipated or considered during the initial research design. Four important limitations should be considered when looking at the findings of the study. First, the amount of teachers who responded to the survey was smaller than anticipated. Although there was over a 50% response rate from the sample, it was not of sufficient size to make broader generalizations. However, because the study was exploratory in nature, this particular limitation did not negate the findings. The second limitation was that the impact of collective efficacy was not accounted for in the research design. Although collective efficacy was discussed in the literature review, I was not able to discern the impact collective efficacy might have had on individual teacher responses on the TSES because collective efficacy studies require a larger number of schools. Questions could have been added to the survey to examine the impact of collective efficacy on the sample. The third limitation of the study was that no qualitative information was collected. Collecting qualitative data through principal and teacher interviews could have potentially provided additional information or yielded evidence for additional implications. For example, asking teachers questions about the content of their professional development, how much instructional autonomy building leadership allowed when teachers used the results of the formative assessments as a guide, and questions that illicit information about collective efficacy. Last, observing the formative assessment cycle in action and the dialogue between teacher and students has the potential to provide further
insight on teacher and student efficacy and how to further structure and refine formative assessment professional development.

**Principals’ and Teachers’ Agreement**

The teachers rated themselves in their use of formative assessments using the same rubric that building principals rated the teacher’s use of formative assessments. Because all the teachers involved in this study had performance ratings as effective or highly effective and principals are considered adept at identifying the strengths of their teachers (Armor, 1976), I expected high levels of agreement in terms of formative assessment implementation. As noted in Chapter 4, there was a significant difference between the two groups in how principals and teachers rated the use of formative assessment. Using Cohen’s kappa, there was only a slight agreement between teacher and principals overall. Only six teachers rated themselves in the lowest category (emerging) of using formative assessments, and the principals rated 41 teachers in this category. This has at least one specific implication that I believe is worth further exploring. I suggest that this information points to a potential area of concern with building administrators when it comes to how to provide feedback to their staff members.

This study allowed for the principals to rate teachers on their performances anonymously. Therefore, the question is, “Does a principal give different feedback, more critical feedback, when it is anonymous?” Conversely, do principals provide more positive feedback to teachers when it is not anonymous? Does the feedback to the teacher differ based on if the principal believes the teacher to be mediocre as opposed to highly effective or needs improvement? This can be problematic in terms of helping teachers become better at their craft. If principals do not give useful feedback it has the potential to stifle teacher growth.
SCT shows that change in efficacy beliefs occur based on the feedback that a person receives. This presents a problem for teachers and their growth as a professional. If the feedback to them is not deemed useful or not completely accurate, then it does not help them grow. That also leads to the question, “Does a teacher give more appropriate feedback to a student if it is done in a formative way with no impact on the student’s grade?”

Implications

There are four main implications from the results of my study. The first is the significance of effective professional development and the relationship between it and teacher self-efficacy. District leaders and principals should note the importance of sustained and ongoing professional development and find a means to provide a sustainable professional development model. This formative approach to professional development could be done through instructional coaches instead of the principal. Instructional coaches have become more mainstream in education, yielded positive results, and can be a more frequent mode of professional development for teachers (Denton & Hasbrouck, 2009). Although it might seem simple, I suggest that professional development be structured to allow educators to dialogue about what efficacy is, how efficacy impacts them and students, and to find root causes for why their efficacy beliefs are the way that they are.

Second, the relationship between the building a teacher is assigned to and their efficacy beliefs showed significant results. This result speaks to the leadership of the school and the relationship to staff efficacy beliefs and is consistent with previous research (Calik, Sezgin, Kavachi, & Kiling, 2012). Additionally, the principal directs the professional development, has the ability to stymie or promote teacher empowerment, and impacts the school climate overall (Gülsen & Gülenay, 2014). Therefore, the implications for building leaders are similar as those
discussed in professional development. What types of support, coaching, and mentoring do superintendents or central office personnel provide for building principals? The support and professional development for principals should be directed in a way that helps the principal develop a strong sense of efficacy beliefs about his or her role as a principal. The support provided to a building principal should focus more on what the principal does over time as opposed to immediate outcomes. In turn, the principal should do the same with teachers. Although outcomes are important, the focus of the principal should be more about what the teacher does as opposed to an immediate one-time outcome. Bringing this full circle back to Bandura’s (1986) Social Cognitive Theory, people develop stronger efficacy beliefs by focusing on mastery experiences over time.

Next, although not directly connected to the research questions, there were differences in how teachers rated their use of formative assessments and how the principals rated the teachers’ use of formative assessments. I believe that the anonymity provided by the design of my study allowed the principal the freedom to rate teachers without any ramifications that are associated with a less-than-effective rating. Although suggestions for further study were previously discussed, the implication of these findings further supports the research that building leaders should focus on understanding curriculum and instruction and less on managerial duties (Boscardin, 2005). Building leaders also have a level of efficacy beliefs about their ability to lead and help teachers develop as professionals. I would suggest that the differences, in part, at the building level might be connected to the principal’s efficacy beliefs about his ability to provide support as an instructional leader. Furthermore, considering the previous discussion concerning professional development, the principal should consider the development of instructional leaders or pseudo-instructional coaches in the building, especially if the principal is not a strong
instructional leader. This could allow for the principal to give the teacher feedback and have built-in professional development opportunities for the teacher through an instructional coach.

Last, there was a correlation between a teacher’s efficacy beliefs and his or her use of formative assessments in the classroom. Although more research should be conducted to determine to what degree the two are related, my results suggest that instructional practices should also be examined not just in terms of academic achievement but also in terms of impact on efficacy beliefs. For example, what is the impact on efficacy beliefs when students are grouped in clusters? Although this idea was discussed earlier, it merits further emphasis here because self-efficacy is an operational factor in an educator’s decision making. Educators need to be made aware of what efficacy is, how it influences their day-to-day practices, and how their efficacy beliefs influence their peers and students. By understanding the connection between efficacy beliefs and instructional practices, educators can be more purposeful in their decision making and more purposeful in their instructional design or professional development activities. Coupling instructional practices that have high effect sizes, in terms of academic achievement and self-efficacy, could prove to have powerful results for students, teachers, and principals.

Conclusions

The study strived to explore the relationship between teachers’ self-efficacy and the use of formative assessments in the classroom. The results indicated that there is a strong correlation between the two. Additionally, my results demonstrated that professional development and building assignment were connected to teachers’ efficacy beliefs. Further exploring these results could have the potential to help teachers and principals become more effective in their practices.
References


Appendix A: Permission to Use Survey

Dear

You have my permission to use the Teachers’ Sense of Efficacy Scale in your research. A copy the scoring instructions can be found at:

http://osu.edu/hoy17/research/instruments/

Best wishes in your work,

Anita Woolfolk Hoy, Ph.D.
Professor Emeritus
# Appendix B: TSES Survey

Long Form

## Teachers' Sense of Efficacy Scale (long form)

<table>
<thead>
<tr>
<th>Teacher Beliefs</th>
<th>How much can you do?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Beliefs</strong></td>
<td><strong>How much can you do?</strong></td>
</tr>
<tr>
<td><strong>Directions:</strong> This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.</td>
<td><strong>Nothing</strong></td>
</tr>
<tr>
<td>1. How much can you do to get through to the most difficult students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
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<tr>
<td>2. How much can you do to help your students think critically?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
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<tr>
<td>3. How much can you do to control disruptive behavior in the classroom?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
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<tr>
<td>4. How much can you do to motivate students who show low interest in school work?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>5. To what extent can you make your expectations clear about student behavior?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>6. How much can you do to get students to believe they can do well in school work?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>7. How well can you respond to difficult questions from your students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>8. How well can you establish routines to keep activities running smoothly?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
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<tr>
<td>9. How much can you do to help your students value learning?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
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<tr>
<td>10. How much can you gauge student comprehension of what you have taught?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>11. To what extent can you craft good questions for your students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>12. How much can you do to foster student creativity?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>13. How much can you do to get children to follow classroom rules?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>14. How much can you do to improve the understanding of a student who is failing?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>15. How much can you do to calm a student who is disruptive or noisy?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>16. How well can you establish a classroom management system with each group of students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>17. How much can you do to adjust your lessons to the proper level for individual students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>18. How much can you use a variety of assessment strategies?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>19. How well can you keep a few problem students from ruining an entire lesson?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>20. To what extent can you provide an alternative explanation or example when students are confused?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>21. How well can you respond to distant students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>22. How much can you assist families in helping their children do well in school?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>23. How well can you implement alternative strategies in your classroom?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
<tr>
<td>24. How well can you provide appropriate challenges for very capable students?</td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
</tr>
</tbody>
</table>
Directions for Scoring the Teachers' Sense of Efficacy Scale

Developers: Megan Tschannen-Moran, College of William and Mary
Anita Woolfolk Hoy, the Ohio State University.

Construct Validity

For information the construct validity of the Teachers' Sense of Teacher efficacy Scale, see:


Factor Analysis

It is important to conduct a factor analysis to determine how your participants respond to the questions. We have consistently found three moderately correlated factors: Efficacy in Student Engagement, Efficacy in Instructional Practices, and Efficacy in Classroom Management, but at times the make up of the scales varies slightly. With preservice teachers we recommend that the full 24-item scale (or 12-item short form) be used, because the factor structure often is less distinct for these respondents.

Subscale Scores

To determine the Efficacy in Student Engagement, Efficacy in Instructional Practices, and Efficacy in Classroom Management subscale scores, we compute unweighted means of the items that load on each factor. Generally these groupings are:

Long Form
Efficacy in Student Engagement: Items 1, 2, 4, 6, 9, 12, 14, 22
Efficacy in Instructional Strategies: Items 7, 10, 11, 17, 18, 20, 23, 24
Efficacy in Classroom Management: Items 3, 5, 8, 13, 15, 16, 19, 21

Short Form
Efficacy in Student Engagement: Items 2, 3, 4, 11
Efficacy in Instructional Strategies: Items 5, 9, 10, 12
Efficacy in Classroom Management: Items 1, 6, 7, 8
Appendix C: Rubric for Evaluation

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>Emergent</th>
<th>Developing</th>
<th>Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides Information to guide instruction</td>
<td>Does not purposely use formative assessments to guide instruction. One time per month.</td>
<td>Rarely uses formative assessments to guide instruction.</td>
<td>Formative assessments are used bi-weekly to guide instruction.</td>
<td>Formative assessments are used weekly to guide instruction.</td>
</tr>
<tr>
<td>Frequency of dialogue.</td>
<td>Does not regularly conference with students</td>
<td>Conferences at least once a month with students</td>
<td>Conferences with students at least bi-weekly</td>
<td>Conferences with students weekly</td>
</tr>
<tr>
<td>Teacher/Student Dialogue</td>
<td>Does not regularly set goals with individual students</td>
<td>Goals are set on a monthly basis with individual students</td>
<td>Goals are set bi-weekly with individual students</td>
<td>Goals are set weekly with individual students</td>
</tr>
<tr>
<td>Student Reflection</td>
<td>Does not provide a means for student reflection</td>
<td>Students reflect monthly on their goals/progress</td>
<td>Students reflect bi-weekly on their goals/progress</td>
<td>Students reflect weekly on their goals/progress</td>
</tr>
</tbody>
</table>

<= 5 is emergent  
6-9 is developing  
10-12 is implemented

Feedback on rubric construction

The following information was feedback given from the three expert witnesses in response to helping develop the rubric.

- Evidence for the categories could be through noting classroom displays. Examples could be charts showing student progress; goal setting meeting schedule.

- To receive a higher rating at least two of the highest rating should be met and two of the next lower category should be met also.
• The panel did not believe that in terms of the district's formative assessment initiative that there would be incidents of extreme high implementation of criteria and low criteria.

• When giving instructions to principals, remind them that each of the criteria should be considered in the context of the formative assessment model.

• With the current level of implantation the panel did not believe that there would be many emergent teachers so a teacher should have at least 50% of the points to be considered developing. The panel suggested the not implemented category of 0 points.

• The panel also believed that fully implanted that at least 80% of the points should be attained.