The Effects of Reflection and Feedback

on Student Self-Efficacy and Achievement

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ABSTRACT

This study was designed to determine whether written feedback and self-reflection impacted a student's perception of his or her efficacy in mathematics and whether there exists a relationship between self-efficacy and mathematics achievement. In the treatment group, students were assigned homework to reflect on feedback written on exit tickets from the previous class period; students were given pretests and posttests in class to quantify their self-efficacy and mathematics understanding. The results of the study indicate that there was no significant change in students' perception of efficacy as a result of reflection on their own work. Moreover, there was no significant correlation between students' self-efficacy and mathematics achievement.

CHAPTER I

Overview

Middle school mathematics has gotten a negative reputation recently. With the introduction of Common Core and the Maryland College and Career Readiness Standards (MCCRS), teachers, parents and students alike have struggled to make sense of what they call "new mathematics." Focus on deep understanding of concepts rather than rote memorization and algorithms has people thinking that math has been made unnecessarily more challenging for students today. In addition, many people ask questions about whether all learners can achieve the high expectations set by MCCRS. As teachers work to determine how to help students be successful in math today, many variables come into play. One variable that has recently gained significance in middle and high school is students' perception of their own ability in various contexts, their *self-efficacy*.

Researchers and educators have worked to determine what impacts students' ideas about themselves and how to increase efficacy in children. Also, there is interest in the relationship between students' high perceptions of themselves and academic achievement when compared to their peers. It is believed that the most powerful learners are ones that are reflective, think about what they understand and take control of their own learning (White & Fredericksen, as cited in Boaler, 2016). This action research specifically focuses on the roles that student self-reflection and feedback have on students' self-efficacy.

Statement of Problem

This study examines the impact of student reflection with written teacher feedback on sixth grade students' perceived self-efficacy and achievement in mathematics classes.

Hypothesis

Student reflection and teacher feedback will have no impact on students' perceived efficacy. Students' perceived efficacy has no correlation with their Student Learning Objective (SLO) growth.

Operational Definitions

In this study, one dependent variable, students' perceived self-efficacy, is defined as students' self-assessment score on a Likert scale questionnaire. The other dependent variable, students' mathematics achievement, will be determined using a SLO assessment on algebraic expressions and equations. The independent variable, student reflection, is defined using student responses to reflection questions in a homework journal. For incorrect answers, students identify a mistake and attempt correcting it. If responses are correct, students identify strategies that helped them be successful. Teacher feedback, also an independent variable, refers to specific, written critique during the learning process on student exit tickets.

CHAPTER II

REVIEW OF THE LITERATURE

Middle school is a time when many adolescents begin to appear apathetic about their education and their learning. In fact, it common to hear middle school teachers say that students "do not care" about their work or that they "are not trying" to be successful. These problems are only magnified when one looks specifically at mathematics classes. This literature review seeks to explore literature about promoting positive beliefs about self—*self-efficacy*—in middle school mathematics students. Readers will explore why self-efficacy is important for students, how to develop self-efficacy, the usage of metacognitive strategies to raise students' self-efficacy and the critical roles that homework and teacher feedback plays.

The Importance of Self-Efficacy for Students

One prominent concern in educational psychology is attempting to understand why some students refuse to try when faced with academic difficulty while others rise to the challenge with strategies and perseverance (Mega, Ronconi & DeBeni, 2014). In addition to having the skills deemed necessary for the task, a student's perceived efficacy plays a "critical role" in these differences (Hinton, 2017). In 1977, the psychologist, Albert Bandura defined self-efficacy as a person's perceived capabilities for learning or performing actions at designated levels, and since, researchers have studied self-efficacy's role in human performance. It has since been determined that self-efficacy influences self-regulated learning, motivation and achievement and for students.

According to Boaler (2016), "the perceptions that students develop about their own potential affect their learning" (p. 146). Not only does self-efficacy have a strong impact on self-regulated behaviors in students, self-regulated behaviors impact a student's perceived self-

efficacy. An increase in students' perceived learning capability leaves them better equipped to set goals, use effective reading, writing and mathematics strategies and monitor their own comprehension. Self-efficacious students that are dissatisfied with their academic performance are more likely to change their strategy to one that is more effective (Mega, Ronconi & DeBeni, 2014). These students are more able to create effective learning environments for themselves that have minimal distractions and effective study partners (Schunk & DiBenedetto, 2016).

When students lack the belief that they can learn and be successful, their motivation and effort are negatively impacted. Several studies report similar findings, that self-efficacy is the source of students' positive attitudes and is an important predictor of academic achievement (Schunk, Usher & Pajares, as cited in Kaya, 2016). People with a higher sense of efficacy approach challenging tasks as something that can be mastered with enough effort. They set goals and, even when challenged, remain committed to their goals. High efficacy individuals sustain or heighten their effort when experiencing failure and can recover more quickly when there are setbacks (Schunk, as cited by Schunk & DiBenedetto, 2016).

How Self-Efficacy is Developed

Many researchers have worked to determine how self-efficacy is developed. According to Bandura (as cited in Kaya, 2016), there are four sources to develop self-efficacy for people: mastery experiences, indirect experience, social persuasions and psychological states. The roles that families, peer groups and educators play are explored further.

Mastery experiences--the most effective, powerful and permanent--are gained from an individual's success and failure. Every time a person learns because of his own success or failure, their perceived self-efficacy increases. During adolescence, the potential to develop one's belief in capability exists in every facet of life. It is true that a person can believe he is highly

capable at home while holding a low academic self-efficacy. Parents that arrange opportunities for their children to experience various forms of mastery are more likely to develop efficacious young people (Schunk & DiBenedetto, 2016).

When individuals are unsure of their own skill, they may also develop self-efficacy by observing the successes and failures of people around them. Parents that model ways to cope with failures and setbacks can increase the ability to persevere in their own children. However, as the efficacy is not based on one's own success, the impact will likely be weaker than those gained through mastery experience. Peer groups also become increasingly influential during the adolescent years. When children see similar peers succeed, they are more likely to develop their own efficacy and become more motivated to try the task themselves. Adolescents that are in the same group over time are more likely to become like one another in academic self-efficacy (Schunk & DiBenedetto, 2016).

Social persuasion refers to the ability of individuals to maintain success based on "persuading words coming from the environment (family, friends, teachers)" (Kaya, 2016, p.3). The words that students hear hold power in developing or destroying their self-efficacy. This is especially true for people that are willing to put forth effort to achieve success. Teachers with high self-efficacy are more likely to use praise and give individualized attention to students, attributes that also contribute to increased student achievement. A person's psychological state, the mood that he or she develops based on their own perception, impacts efficacy. Low performing individuals tend to have increased stress and anxiety, often resulting in hesitation about their ability to fulfil a task. Conversely, individuals with high achievement tend to believe that their increased effort is a driving force and therefore develop a higher self-perception (Kaya, 2016).

A person's peer group also has a predictable influence on his or her socialization and efficacy. Children that are surrounded by highly motivated groups change positively, whereas less motivated groups make it more likely that a child will change negatively. For this reason, ability groupings in school can have positive or negative impacts on students' perceived self-efficacy. Classrooms that allow for competitive and comparison learning tasks tend to lower self-efficacy for students who believe themselves to perform beneath their peers (Schunk & DiBenedetto, 2016).

Using Metacognition for Self-Efficacy with Adolescents

Adolescence, a pivotal time of transition, is where cognitive, emotional and psychosocial changes are all taking place (Sanders, 2013). According to the Swiss psychologist, Jean Piaget, adolescents move into a new developmental stage, the formal operational stage of cognitive development. Moving beyond concrete thinking between the ages of 11 and 12, adolescents develop abstract thought, advanced reasoning skills and logical thought progressions. During the formal operational stage, adolescents newly develop the ability to think metacognitively, about their own thinking (Armstrong, 2016). Research in cognitive psychology (Weil et al., as cited by Armstrong, 2016) supports Piaget's perspective and finds that adolescence is a time of "substantial increase in the capacity to think metacognitively" (p. 108). For this reason, middle school educators can help students think about their own thinking, monitor and change their thinking, manage their work, control their behavior and improve their own lives (Armstrong, 2016). Middle School students can begin to take control of and improve their own self-efficacy.

One strategy that educators can use to help adolescents think about their thinking is to analyze their own errors. This practice is becoming increasingly more common in mathematics classes in middle schools. According to Heemsoth and Heinze (2016), error reflection supports

knowledge acquisition because it allows students to restructure their own thinking. Reflecting on errors gives students the opportunity to test and extend their own cognitive models and think differently when necessary. Furthermore, error analysis helps students distinguish between effective and ineffective learning strategies. This process extends students' learning beyond correcting an incorrect answer. Analyzing and explaining why an answer is incorrect allows students to reflect on the correct solution and its application, supporting learning from mistakes and increasing self-efficacy.

Educators that provide opportunities for their students to set goals improve their students' academic self-concept. Research (Turkay, as cited in Armstrong, 2016) suggests that students who set and commit to goals have increased motivation and academic achievement when compared to students who do not. Although Katz (2015) suggests that students that already believe they have high capability set more challenging goals and maintain a strong commitment to them, teachers, must instruct and provide practice for all students on setting goals and monitoring progress. Teachers should instruct their students on how to set and monitor their academic goals. Research finds (Ramdass & Zimmerman, 2008) that goal-setting instruction results in students that more accurately predict their own performance and perform higher than students without goal-setting instruction.

To build self-efficacy in adolescents, research (Katz, 2015) suggests beginning with short term goals, like a daily goal, and using teacher consultation to monitor whether the goal is accomplished. Students that meet their goals should develop additional goals, progressing from daily goals to weekly and monthly goals. Teachers' conversations with students should include student reflection time on accomplishments and setbacks as well as time to self-evaluate

successes. Goal setting consultation between teachers and students allows for mastery experiences that increase a student's self-efficacy.

Mathematics Homework and Self-Efficacy

Currently, the role of homework in building or breaking students' understanding, effort and efficacy is in question. According to Spadano (1996), the traditional state of homework, drill-and-practice questions, decreases students' efficacy, resulting in increased teacher dependence on mathematics, rather than student self-sufficiency and responsibility. Because many teachers review homework answers aloud in class, students learn that their effort is not valued, minimizing the ability for teachers to use homework so that students learn to self-regulate their behavior and take ownership of their understanding.

Research studies (Challenge Success, as cited in Boaler, 2016) show that "the presence or absence of homework has minimal or no effect on [student] achievement" (p. 46). However, in mathematics classes, many teachers continue to assign practice problems for students to complete at home daily. If students feel successful, homework is an opportunity to develop mastery experience, as it is the time where the learner is most autonomous (Spadano, 1996). However, teachers that provide homework to inform instruction so that they may adjust to better meet their students' needs, may cause harm to some students' self-concept (Riggan & Olah, 2011). Because the homework completion takes place before mastery, students that are unsure may experience a decrease in their perceived self-efficacy around these concepts. It is crucial for teachers to use homework in such a way that it results in increased efficacy and achievement.

Providing homework options, rather than assigning the same task for every child is one way that teachers can help students build up positive self-efficacy. Former middle school teacher, Amanda Ronan (as cited by Armstrong, 2016), recommends that teachers give students

the choice of which problems to solve as homework. Armstrong (2016) further suggests that teachers provide homework options so that students can think about and decide where their focus is most needed or give an assigned amount of time and allowing the students to choose how to use it to master the material. Studies (Patall, Cooper & Wynn, as cited by Armstrong, 2016) suggest that homework options give students higher self-efficacy resulting in increased motivation to do their work, increased feelings of competency and perform better on tests based on the homework.

Teachers that use homework specifically for student reflection on learning also help increase students' self-efficacy. Two teachers, after using reflection questions along with one to five mathematics questions, report positive impacts on their students, including asking more questions in class (Boaler, 2016). Boaler (2016) suggests providing questions that ask students to think about their own errors, confusion or misconceptions as they often "result in the students' understanding [of] the mathematics for the first time" (p. 47). Once students understand that mistakes are expected in learning, they do not see errors as an indication that they are not capable.

When teachers assign homework that allows students to practice metacognitive strategies, such as problem-solving skills, students increase their self-efficacy. Spadano (1996) studied using homework to develop metacognitive skills to determine the effect on the ownership of learning. Specifically, students communicated their own points of confusion and work autonomously, accepting their responsibility in solving the problem. This study finds that providing homework that is student-centered, extending learning through problem solving skills, develops self-efficacy and therefore independence in students.

The Critical Role of Teacher Feedback

The teachers' role in students' development of academic self-efficacy is critical. Not only must teachers provide opportunities in the classroom and at home for students to develop self-efficacy, they must also provide students with meaningful feedback. Various studies examine feedback in the form of grades versus diagnostic and constructive feedback and their impacts on students' self-efficacy, motivation and achievement.

Teacher's understanding of the multiple impacts of grades as feedback is vital to the development of a student's self-efficacy. According to Boaler (2016), the communication of grades to students is negative because it causes students to compare themselves to others, with at least half of students deciding that they are not as good as their peers, lowering their perception of self. Students that receive grades frequently are likely to see themselves as a score or grade rather than focusing on learning. In a less enlightened age, (Kohn, as cited in Boaler, 2016), teachers believed that grades and scores would motivate students, but now more recent findings indicate that grades and scores demotivate students and communicate messages that are damaging to students' perception (Boaler, 2016).

Diagnostic feedback specifically identifies strengths and weaknesses in a student's knowledge, providing information to help reflection and action (Jang & Wagner, 2013). Teachers that give their students diagnostic feedback provide students with mastery experiences to learn from their successes and failures. As diagnostic feedback is "grounded in a knowledge base about how learning takes place," it is credited as being an effective form of feedback (Jang & Wagner, 2013, p. 2-3). When compared to students who only received feedback in the form of grades, students that received diagnostic comments on their work were able to learn two times more quickly and improve their self-perceptions (Boaler, 2016).

Constructive feedback, that which identifies ways for students to improve and promotes further development, is additionally an effective means of providing feedback to students. A study on feedback that results in increased learning and efficacy finds that teachers can be trained to give specific, written feedback that results in an improvement in students' attitudes and achievement. Feedback to students should provide constructive criticism, giving specific comments on errors and faulty strategies applied. When giving feedback, teachers should also give one suggestion on how to improve on the work being reviewed and make at least one positive remark. To ensure feedback is constructive, math teachers should focus on addressing content, singling out key errors and providing corrective guidance to students (Elawar & Corno, 1985).

One final aspect of teacher feedback is ensuring that students use feedback from teachers in a way that is meaningful and promotes positive self-efficacy. According to Sadler (as cited by Landers & Reinholz, 2015), information about student work is only considered "feedback" if students use it for improvement. To use teacher feedback, students must understand the criteria under which they are being assessed and be given regular opportunities to self-evaluate (Landers & Reinholz, 2015). Research finds that explicit protocol, such as a reflection form, is more beneficial for students than merely asking them to read their teacher's feedback. Providing effective feedback, which is constructive or diagnostic, along with reflection and student self-evaluation are ways that teachers can help students develop self-efficacy.

Summary

Self-efficacy can be a deciding factor that separates successful middle school students from ones that are less successful. Students that realize their high capacity are highly motivated to take on challenges, able to set and commit to goals and ultimately learn and achieve at higher

rates than their peers without these traits. Although there are some practices in schools that hinder the growth of efficacy in students, there are several strategies within teachers' control that can grow self-efficacy in students. Students that learn to self-evaluate using good teacher feedback, as well as develop self-regulatory skills and use metacognitive strategies to think about their own thinking and learning can increase their self-efficacy and move toward higher achievement.

CHAPTER III

METHODS

Design

This study consists of two designs. The first, determining the impact of reflection and feedback on self-efficacy, uses a nonequivalent control group design using a convenience sample. The independent variable is student reflection with teacher feedback. Students in the treatment group reflect on their work and teacher critique as homework while students in the control group's homework consists of practice problems. The dependent variable is students' score assessing their efficacy. Students in both groups were given the same efficacy pretest and posttest. The second design, determining the relationship between students' self-efficacy and their mathematics achievement, is a correlational study. The correlational coefficient between students' self-efficacy score change and growth on a mathematics SLO assessment is being used to determine whether a relationship exists. All students were given the same efficacy and SLO pretest and posttest. A convenience sample is being used because all participants are current students of one teacher.

Participants

The participants for this study are seventy-three (73) sixth grade students at a public middle school in Maryland. The sixth graders are currently enrolled in one of three on grade-level mathematics courses in the school. Eleven boys and thirteen girls, ages 11 – 12 are included in the treatment group for the study. Fifteen of these students (62.5%) receive free and reduced meals (FARMS). The control group is made up of twenty-seven boys and twenty-two girls. Thirty-six of these students (73%) are classified as FARMS.

Instruments

The first instrument used in this study is a survey. Students in both the control and treatment groups took the same self-efficacy survey as pre and posttests. The survey is made up of thirteen questions on a scale ranging between 1 (*not very like me)* and 5 (*very like me)*. The second instrument used in this study is the Student Learning Objective (SLO) assessment. This assessment is made up of multiple-choice single response, multiple-choice, multiple response and short answer questions, where students must show their work as well as answer the question. In total, there are eight questions. The instruments can be respectively found in Appendices A and B.

Procedure

The researcher administered self-efficacy survey and SLO assessment pre-tests to all students in the study. The students completed both assessments during mathematics instructional periods. Approximately two or three times weekly, students completed an exit ticket as formative assessment at the end of mathematics class. At this time, the treatment condition for students in the treatment group began. The researcher wrote individual diagnostic and constructive feedback on students in the treatment group's exit tickets. The following day, students in the treatment group received the following homework assignment: If you can see a mistake on your exit ticket, (1) Identify the mistake that you made on the page. (2) Read the feedback associated with the mistake. (3) Use the feedback to help you fix the mistake. If you cannot see a mistake on your exit ticket, (1) Identify what strategies you used to help you be successful on this exit ticket. The treatment took place for six weeks. The researcher administered self-efficacy survey and SLO assessment post-tests to all students to conclude the study.

CHAPTER IV

RESULTS

This study examines whether reflection on written teacher feedback affects the perception of self-efficacy and mathematics achievement on sixth grade students. With tests to determine normality, it was determined that both the control and treatment groups have normal distributions for the changes in their Student Learning Objective (SLO) assessments. However, only the treatment group has a normal distribution for the changes in efficacy perceptions. Therefore, a t test was used for SLO change and a median test was used for efficacy.

The analysis of efficacy in table 1 determined that the median change for students in both the control and treatment groups was about zero. Because $p = 0.453 > 0.05$, there is no statistically significant difference on self-efficacy score change between the control and treatment groups. Therefore, the first null hypothesis is supported.

Table 1: Median Pre and Post Efficacy Scores

Group	PRETEST EFFICACY	Median POSTTEST EFFICACY	Efficacy Change	Student Count
Control	3.96	4.08	0.00	48
Treatment	4.19	4.15	0.00	24

Figure 1. Pre and Post Efficacy Scores

Pre and Post Efficacy Scores
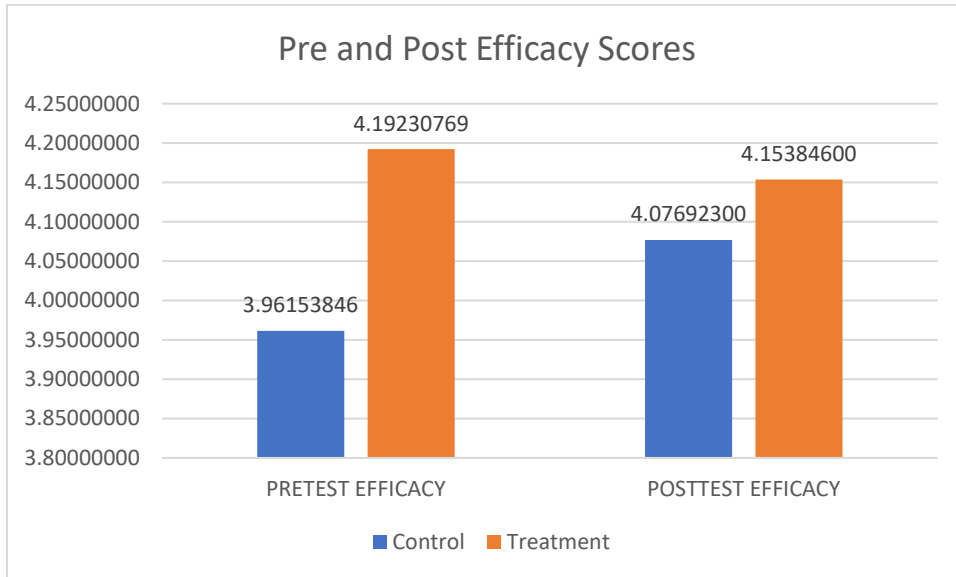
To determine whether a correlation exists between student efficacy and achievement, the following correlation coefficients (Table 2) were calculated: efficacy change vs. SLO score for the control and treatment groups and posttest efficacy score vs. SLO score change for the control and treatment groups. All correlations were determined to be insignificant, so the second null hypothesis was also confirmed.

Table 2: Correlation Coefficients

		Correlation Coefficient	Sig. (2-tailed)	N
Control	Efficacy Change vs. SLO Score change	0.01	0.94	48
	Posttest Efficacy Score vs. SLO Score change	0.04	0.79	47
Treatment	Efficacy Change vs. SLO Score change	-0.14	0.52	24
	Posttest Efficacy Score vs. SLO Score change	-0.13	0.56	24

Researchers may find it interesting in table 3 to note that the treatment group had higher average score change on their SLO when compared to the control group, although neither change was statistically significant.

Table 3: SLO Score Changes

Control or treatment group	N	Mean	Std. Deviation
Treatment	24	43.23	26.58
Control	48	35.68	20.79

CHAPTER V

DISCUSSION

This study determined the relationship between student reflection, teacher feedback, students' belief in themselves and student achievement. Analysis of the data indicated no significant differences between the treatment and control groups' efficacy or Student Learning Objective (SLO) assessment growth. The null hypotheses that reflection on written feedback would not impact the perception of self-efficacy and that there was no correlation between self-efficacy and achievement were therefore both accepted.

Implications of Results

The results of this study imply that students that are given explicit time to reflect on their mistakes and successes do not necessarily perceive these instances as opportunities that make them more efficient in the classroom. Although the students that reflected on their feedback experienced more growth in their math scores, they did not feel more capable in the subject of mathematics. This finding suggests that there is potentially a relationship between feedback and achievement. The study results also imply that students may not accurately articulate their mathematics success without guidance and explicit instruction. Further, the results of this study imply that students do not have to believe that they are being successful in order to be successful. This means that teachers should not feel compelled to give students less rigorous work to "build them up" before providing challenging tasks.

Threats to Validity

There are several potential threats to validity for a nonequivalent control group designed research study. However, no serious threats exist for this study. As students were selected as intact classes, rather than because of scores, statistical regression is not a likely factor. Selection-

maturation interaction is also not a serious threat, as the instructor in this study was present or absent for the entire study, for all class periods. Testing, also called *pretest sensitization*, is a potential threat to validity because of the timeframe of this study. There is a possibility that some students were able to score better on the posttest because they were given a pretest. However, because the information on the SLO assessment was not factually based and could not be easily memorized, this is not likely.

Connections to Previous Studies/Existing Literature

In 2016, Kaya and Bozdag conducted a study to determine whether mathematics and science self-efficacy could predict achievement in their respective courses for students in sixth, seventh and eighth grades. Self-efficacy surveys and report cards were used to collect data on about 700 students. After analysis, the researchers determined a significant correlation between efficacy and academic achievement, stating that belief in learning ability, skills, mastery experiences, social persuasions, and psychological states accounted for approximately 48% of the variance in achievement among the students in the study.

In 2017, Patricia Chen, a researcher at Stanford University, found that college students that were prompted to reflect about their usage of resources in the classroom earned higher grades than their peers (Chen, Chavez, Ong & Gunderson, 2017). Students in the treatment group of this study were given reflection time for seven to ten days before taking an exam. They were given a survey, asking them to write down the grade that they wanted to earn on the upcoming exam, how important the grade was and how confident they were that they would earn their goal. Students were then asked what kinds of questions they thought the exam would include and which resources they would use to effectively study. At the end of the semester, students in the treatment group outperformed their classmates by about one-third of a letter grade in the course.

Elawar and Corno (1985) conducted a survey to determine the impacts of teacher feedback on Venezuelan elementary students' self-esteem, attitude towards school/teachers, attitude toward mathematics, school anxiety and mathematics achievement. Teachers were trained to give feedback to students by responding to the following questions: What is the key error? What is the probable reason students made this error? How can I guide the student to avoid this error in the future? What did the student do well that could be noted? The results of the study indicated the effectiveness of teacher training in giving feedback and that all student learning benefitted from teacher feedback.

Implications for Further Research

Although this study did not yield significant differences between the treatment and control groups, several questions arose that researchers may choose to study in the future. Further research on how to raise students' belief in themselves would benefit classrooms at all levels. Specifically, self-efficacy in mathematics is important as early as middle school so that young people pursue higher education and careers in the mathematics field. Student reflection on mistakes as well as successes may have had an impact on students' perception of self; students likely do not see mistakes as an integral part of the learning process, having them rate themselves more poorly on the efficacy assessment. In the future, researchers may choose to give feedback and reflection time primarily to correct strategies and models to determine whether students perceive themselves as more successful.

As students in middle school are newly developing the ability to think metacognitively about their own thinking and learning, it is possible that self-assessment was not the optimal means to obtain efficacy scores for students. Future researchers may use a performance-based tool, over time to gain insight about efficacy. For example, researchers may determine whether

students start work without teacher dependence or engage in student discourse rather than solely using a survey.

Conclusion

This study confirmed the null hypothesis. Using the teacher's feedback to reflect on mistakes and successes did not prove to have a significant impact on students' perceptions about their mathematics ability. Moreover, students that had high perceptions of themselves did not, on average, score higher than students with lower self-perceptions.

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APPENDIX A

Directions: Please show your work on this paper.

1. After a hike, a group of students shares 5 boxes of granola bars equally. Each box has 8 granola bars. Which algebraic expression represents this situation?

   a. $(5 \times 8) \div s$

   b. $5 \times (8 \div s)$

   c. $s \times (5 + 8)$

   d. $(s + 5) \times 8$

2. What is the solution of $56 = k - 42$?

   a. $k = 88$

   b. $k = 98$

   c. $k = 2$

   d. $k = 14$

3. Solve the equation.

   $x - 15 = 67$

4. Solve. $42 = y + 15$.

5. A club orders magazine subscriptions for new members. Last year, it had 32 new members and spent \$624 on subscriptions. Use the equation $32m = 624$ to find the cost of each subscription.

6. A dance group ordered 36 jackets. The total price of the order was $1116. Select **all** the equations that can be used to find the cost, *c*, of each jacket.

  a. $1116c = 36$

  b. $c = 1116 \times 36$

  c. $36c = 1116$

  d. $1116 \div 36 = c$

  e. $1116 \div c = 36$

7. Which algebraic expressions could represent the phrase **"nine more than the product of five times the number of tires, *t*"?**

Select **all** that apply.

  a. $9 + 5t$

  b. $5 \cdot t + 9$

  c. $(9 + 5)t$

  d. $(5 \times t) + 9$

  e. $5 + 9t$

8. Select **all** the equations that have $m = 5$ as the solution.

  a. $m - 1 = 4$

  b. $m + 4 = 20$

  c. $m - 3 = 8$

  d. $22 + m = 25$

  e. $12 = m + 7$

	Not very like me				Very like me
	1	2	3	4	5
1. I can learn what is being taught in class this year.	☐	☐	☐	☐	☐
2. I can figure out anything if I try hard enough.	☐	☐	☐	☐	☐
3. If I practiced every day, I could develop just about any skill.	☐	☐	☐	☐	☐
4. Once I've decided to accomplish something that's important to me, I keep trying to accomplish it, even if it is harder than I thought.	☐	☐	☐	☐	☐
5. I am confident that I will achieve the goals that I set for myself.	☐	☐	☐	☐	☐
6. When I'm struggling to accomplish something difficult, I focus on my progress instead of feeling discouraged.	☐	☐	☐	☐	☐
7. I will succeed in whatever career path I choose.	☐	☐	☐	☐	☐
8. I will succeed in whatever college major I choose.	☐	☐	☐	☐	☐
9. I believe hard work pays off.	☐	☐	☐	☐	☐
10. My ability grows with effort.	☐	☐	☐	☐	☐
11. I believe that the brain can be developed like a muscle.	☐	☐	☐	☐	☐
12. I think that no matter who you are, you can significantly change your level of talent.	☐	☐	☐	☐	☐
13. I can change my basic level of ability considerably.	☐	☐	☐	☐	☐

Gaumer Erickson, A.S. & Noonan, P.M. (2018). Self-efficacy formative questionnaire. In *The skills that matter: Teaching interpersonal and intrapersonal competencies in any classroom* (pp. 175-176). Thousand Oaks, CA: Corwin.