

More Than Math

An Online Community of Practice to Address the Social and Emotional Aspect
of Middle School Mathematics

by

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ABSTRACT

The pandemic has not only increased economic inequities within various communities, but it has also exacerbated the social, emotional, and math achievement inequities of middle school students, creating an environment that increases the potential for heightened anxiety and peer conflict. Now, more than ever, it is imperative that educators not only understand the existence and impact of these social and emotional inequities but have the knowledge and skills to effectively address them. Within this study, I facilitated a 10-week online community of practice with three middle school math teachers, entitled The More than Math Collective (MTMC), with the purpose of improving participant self-efficacy with SEL, developing their professional capital, discussing various strategies to address the social and emotional skill needs of students in their classrooms, and providing time for implementation of the discussed strategies. At the conclusion of the study, most participants reported an increase in self-efficacy, human capital, and decisional capital while only one out of three participants reported an increase in social capital. All participants described a positive impact on their students and their professional growth due to their participation in the MTMC and the various strategies that were learned and implemented in their classrooms. Given the small sample size, more research can be done to determine if the results of this study may be transferable to other educational settings.

DEDICATION

This study is dedicated to all of the hardworking middle school mathematics teachers who show up for their students every day despite the many challenges they face inside and outside of the classroom. Teachers like you are what draw out the best in your students socially, emotionally, and academically.

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Working through an online program may be more difficult to find support with other classmates, but I was lucky to have a strong support group with Nadine, Stephanie, and Matt in our Small Group 5 and my fellow LSC members. These groups were a key pillar of my support system as we navigated our classes, assignments, and dissertations together.

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CHAPTER 1

LEADERSHIP CONTEXT AND PURPOSE OF THE STUDY

By education I mean an all-around drawing out of the best in the child and man; body, mind and spirit.

—Mahatma Gandhi

Introduction

It's a sunny Monday morning and 11-year-old Sierra rushes to first period math class after making sure her two younger sisters are awake and fed breakfast so her mother can catch up on sleep. In class waiting for Sierra is Jada, eating her homemade muffin after she was dropped off by her dad on his way to his corporate job. Several minutes after the late bell rings, Sierra and Jada notice Mark walking in late with his hood up. He makes his way to his seat and puts his head down after another rough night of sleeping on a family friends' couch while his grandma continues to look for a permanent home for them. Their math teacher, Ms. Smith, announces that they will be taking a state test to measure their math performance. Mark complains loudly about taking another test after they already took one last week while Jada begins to fidget with her pencil and Sierra starts to shake her leg. Ms. Smith explains the importance of doing well because it will determine which math class they go into next year and the goal is to earn a score of a 225. As the students take the test, Jada cannot stop wondering how she will ever increase her 193 score to a 225, Sierra starts to anxiously tap her pencil on her desk as she struggles to read the complex word problem about transporting apples cross country, and Mark counts to five before clicking a random answer just to make it through.

The experiences and differing home lives of Sierra, Jada, and Mark, three composite students' stories based on experiences during my nine years of teaching, and the academic pressures placed on students like them are commonplace in mathematics classrooms and even more so since the start of the COVID-19 global pandemic. Not only are students processing through their unique trauma and isolation they have experienced as a result of the pandemic, but they are also pressured into catching up on missed learning as quickly as possible. The impact and trauma of the pandemic combined with the pressures and potential oppression of standardized testing and federal policies can create an educational environment that increases the potential for heightened math anxiety, peer conflicts, and mental health crises (Loades et al., 2020; Wang et al., 2021). The result is a large need for educators to be prepared to support students' needs in their classrooms (Furner & Higgins, 2019; Mustafa, 2020).

National Context

For decades, the United States has been looking to improve education, specifically in the subjects of reading and math, to compete with the higher achieving nations across the globe. A variety of different educational policies have been enacted over many years to address school achievement, accountability, and prepare students for college and career readiness. These policies focused on standardized testing to routinely collect data on student achievement and, more recently, wellbeing (Fránquiz & Ortiz, 2016; Jennings & Rentner, 2006; United States Department of Education, n.d.). Recent policies have allowed for more diverse data collection, such as student wellbeing, to provide a bigger picture of school achievement and accountability. Providing schools with the opportunity to collect data on student wellbeing allows them the additional

opportunity to address the social and emotional needs of their students alongside achievement needs (Jennings & Rentner, 2006). The Collaborative for Academic, Social, and Emotional Learning (CASEL) has been the driving force behind defining social and emotional learning and advocating for integration in schools and districts across the United States (Collaborative for Academic Social and Emotional Learning, 2018).

Addressing the social and emotional needs of students is especially important for schools and teachers to address following the high levels of isolation and anxiety experienced during the COVID-19 pandemic as well as the consistent pressures of achievement on standardized tests (Loades et al., 2020; Wang et al., 2021).

Accountability Policies Focused on Math

According to the 2018 Programme for International Student Assessment (PISA), a survey given to 15-year-old students across the globe every three years to assess skills in reading, math, and science, the United States earned 13th place in reading and 37th place in mathematics compared with other participating countries (Organisation for Economic Co-operation and Development, 2018). Not only has this survey consistently reported the United States as far behind similarly developed countries in reading and mathematics, but it also exposed the achievement gaps between the socioeconomically advantaged and disadvantaged with the advantaged outperforming the disadvantaged on all measures (Organisation for Economic Co-operation and Development, 2019).

In 2002, President George W. Bush signed the No Child Left Behind Act (NCLB) into law, which focused on revealing and remediating inequities and achievement gaps across the nation through mandated standardized tests in reading and math administered

in grades 3-8 and one year in high school (Jennings & Rentner, 2006). Thus, the federal role in education increased to hold schools accountable for student achievement. Data reported from these tests were the major focus of identifying low-achieving schools to support and often tied to teacher evaluations to ensure that schools obtained highly qualified teachers. Standardized testing now placed significant pressure on all sectors of the educational system to have students achieve by earning a score that landed within a specific achievement band to meet a proficient level (Simpson et al., 2004). This student progress was measured yearly, referred to as “adequate yearly progress” (AYP), and schools that did not meet AYP for two to three years in a row were told to allow students to transfer to better performing schools in the same district and offer free tutoring. If a school continued to not meet AYP, then the school risked state intervention and potential shutdown.

While the NCLB forced a focus on the achievement gaps and sought a solution to close it, the law also created a major focus on testing in math and reading, which led to other subject areas falling by the wayside, a narrowing view of curriculum, and mandated interventions without the federal funding to support it (Jennings & Rentner, 2006). Additionally, focusing extensively on high-stakes tests and data as the main form of accountability for school districts could lead to teachers’ purposefully teaching to the test or administrators’ directing falsification of data as in the Atlanta Public Schools cheating scandal of 2009 (Adler-Greene, 2019; Huffington Post, 2011).

The NCLB continued to be implemented for 13 more years with only minor statutory revisions and increasing controversy with educators and school systems, until 2015, when President Obama officially signed a bipartisan measure entitled Every

Student Succeeds Act (ESSA) into law. ESSA reauthorized the Elementary and Secondary Education Act (ESEA) and replaced the NCLB Act. This new educational law continued the prior focus on annual standardized testing in grades 3-8 and one year in high school to hold school systems accountable for low achieving schools while also supporting the implementation of interventions that address student wellbeing and academic skill development (United States Department of Education, n.d.). ESSA shifted the federal power over testing to state offices and required multiple measures of achievement to be collected and monitored instead of the single standardized test scores to assess school and student performance (Fránquiz & Ortiz, 2016).

To further prepare students for success in college and careers, as with earlier versions of the Elementary and Secondary Education Act, ESSA requires states to adopt challenging college and career standards in subjects like math and English within their schools' systems, such as the Common Core State Standards (CCSS). CCSS, which are highly controversial in some states, were created to align with the higher achieving nations across the world and uniformity within the United States to prepare students for after high school (Akkus, 2016; Common Core State Standards Initiative, 2021; McCallum, 2015; National Council of Teachers of Mathematics, 2013). Some states chose to never adopt CCSS: Minnesota, Nebraska, Virginia, Alaska, and Texas. Some other states that have previously adopted CCSS, such as Florida and Arizona, have chosen to replace them with standards that state politicians claim better suit their students' needs (Lee, 2021; Vasinda et al., 2013). The implementation of ESSA and its shift to measure student success with multiple measures instead of solely standardized

tests, opens schools to explore more avenues of the social and emotional focus such as school climate, academic development, and student well-being.

Social and Emotional Learning

The passing of ESSA and the opportunity for schools to incorporate measures of SEL makes it imperative to demonstrate how schools are developing the whole child, not just the academic child (Collaborative for Academic Social and Emotional Learning, 2018). The integration of SEL competency skills with academics in the classroom has multiple positive effects such as improved academic performance, social behavior, graduation rates, and self-efficacy (Ashdown & Bernard, 2012; Collaborative for Academic Social and Emotional Learning, 2021; Durlak et al., 2011; Yoder, 2014). Like its predecessor, ESSA pushes for the implementation of standards to increase academic rigor, ensure that students are college and career ready, and to hopefully improve international standing. With an emphasis on college and career readiness, there is an assumption that students will already have the necessary SEL skills to cope with the increased rigor and rise to these new standards (Dymnicki et al., 2013). Students may face difficulties and frustrations when asked to solve more challenging problems, and it is important for them to know strategies to regulate their emotions and persevere through such difficulties (Yoder, 2014).

Throughout ESSA, evidenced-based strategies, interventions, and instructional practices are mentioned to support a variety of aspects of student achievement and wellbeing. The Collaborative for Academic, Social, and Emotional Learning (CASEL), formed in 1994, defined social and emotional learning (SEL) as self-awareness, social

awareness, relationship skills, responsible decision making, and self-management necessary for academic success and an essential part of preschool through high school education. In collaboration with CASEL, many school districts have implemented high-quality SEL supports and instructional practices throughout their schools to support students' development and advance educational equity. Multiple indicators of SEL implementation include supportive and proactive discipline, explicit SEL skill instruction, SEL skill and academic integration, elevation of student voice, aligned community partnerships, and adult SEL focus (Schlund et al., 2020; Yoder, 2014). Specific instructional practices and strategies that are effective in the classroom include project-based learning, ensuring that "student talk" exceeds "teacher talk," providing opportunities for student leadership, critical student reflection on academics and SEL skills, allowing for student input on classroom norms and activities, cooperative learning, class discussions, goal-setting, and instructional breaks (Yoder, 2014). If school districts and teachers can consistently and explicitly integrate SEL strategies and supports like the ones stated above, then students may be more likely to success academically, socially, and emotionally.

In response to mandates by ESSA and increasing rigor through standards like CCSS, Collaborative for Academic Social and Emotional Learning (2018) recommends that states do not use student SEL competencies for accountability purposes, but instead use them at the local level to inform teaching and learning practices. Additionally, states should provide resources to schools as they hold schools accountable through multiple measures including school climate, SEL supports, suspension rates, and chronic absenteeism. Strategies such as the ones listed above should assist states in the creation of

their plans in accordance with ESSA law while also supporting the development of the whole child in their local schools (Yoder, 2014). The implementation of SEL supports should take place on all levels of the educational system, not just the state. Local districts should implement SEL programs and connect SEL support to educator evaluations, administrators should provide teachers with SEL professional development and connect it to school procedures, and teachers should utilize instructional strategies that promote and assess SEL competencies in their classrooms (Yoder, 2014). Given the national policy and body of literature that reports the importance of incorporating SEL practices into the classroom, it is imperative that educators find ways to purposefully select SEL instructional strategies to support the whole child in the classroom. This importance is supported by data from the most recent 2018 PISA, where students surveyed in the United States were more likely than peers in other countries to have reported competition with their classmates as a larger component of their classroom experiences than cooperation across all course subjects. Additionally, students within the United States reported more instances of bullying and feelings of loneliness than the OECD average (Organisation for Economic Co-operation and Development, 2018).

These feelings of loneliness, social isolation, and academic pressures have increased since the emergence of the COVID-19 pandemic in March 2020 (Loades et al., 2020; Wang et al., 2021). Increased feelings of loneliness due to extended periods of social isolation have been associated with future mental health issues for adolescents such as depression and social anxiety (Loades et al., 2020). When comparing these feelings between elementary and secondary students, secondary students reported lower and decreasing levels of personal and interpersonal well-being throughout a three-month

period during the 2020-2021 school year (Wang et al., 2021). Additionally, Wang et al. discovered that schools with students who reported higher levels of well-being were associated with higher levels of academic achievement. This connection places increased urgency on addressing the social and emotional well-being of students to support their academic development, especially in mathematics where anxiety can be heightened (Furner & Higgins, 2019; Lailiyah et al., 2021).

The 2021-2022 academic year was one of the hardest for educators across the country as schools entered back into schools at full capacity (Vaughn, 2022). Teachers anticipated readjustment challenges for students as they entered back into full-time in-person learning after a year and a half of learning in isolation, but the challenges they faced during the 2021-2022 school year were worse than originally imagined (Belsha, 2021). Teachers reported that students were much less advanced with social skills and emotional maturity than they were prior to the pandemic, one teacher even mentioning that her high school freshmen were behaving like incoming seventh graders (Blad, 2022). As a result of this, schools and teachers across the country reported seeing higher levels of fighting, disruptive classroom behaviors, destruction of school property, challenging authority, skipping classes, and mental health crisis referrals (Baker, 2022; Belsha, 2021; Blad, 2022; Lambert, 2022; Strauss, 2021; Vaughn, 2022). The extended period of social isolation combined with pandemic-related trauma has greatly impacted the ways in which children perceive themselves, interact with their peers, and handle stress (Blad, 2022). While students are going through one of the most developmentally challenging periods of their lives, teachers are expected to be the emotional support for all of their students

while also processing through their own pandemic-related trauma, though not all teachers may have the skillset to do so (Belsha, 2021; Lambert, 2022).

Situated Context

I am a member of six online educator support groups, two of which are dedicated specifically to middle school mathematics teachers, that have either been created or grown in membership because of the pandemic to create a larger support network for teachers in a time of increased isolation. The teachers who participate in these groups range from novice to veteran teachers who join to seek and share advice on teaching strategies, curriculum, classroom setup, behavior management, and workplace situations that they are unsure of how to navigate. Members from these groups were voluntary participants in my first two cycles of research, in which I sought to gain insight into their general perceptions of SEL, the current perceived state of middle school mathematics, how SEL may or may not be integrated into their classrooms, and the need for SEL integration.

In my first cycle of action research, after three interviews I found that (a) middle school math teachers feel as if the current curriculum is not relevant or effective in teaching students social and emotional skills without teacher modification, (b) students are the most successful when their social and emotional needs are met, and (c) there is a need for more integration of social and emotional learning in the current middle school mathematics curriculum. Given my findings, I sought to dive deeper within this community to discover levels of self-efficacy with integrating SEL into their classrooms, areas of need to support the social and emotional skills of their students, and characteristics of professional development sessions that they feel would be effective in

supporting their learning with SEL and math integration. After analyzing 70 survey responses and three individual interviews, I found that teachers within these online communities reported a) positive perceptions of SEL integration, but lower levels of self-efficacy when asked to integrate it into their own classrooms, b) supporting external emotional behaviors (e.g. lashing out at teachers, peers, and walking out of the classroom) and internal emotional behaviors (e.g. expressing feelings of frustration, stress, and anxiety) as the most beneficial reason for SEL integration in the math classroom, and c) for a training, new expectation, or new initiative to be effective for teachers, they need to feel as if there is continued collaborative support and relevance to their everyday practice or else it may just feel like another thing they have to do.

Approximately half (51.4%) of teachers who participated have been teaching for less than 10 years and 44.3% of teachers have been teaching at the middle school level for less than 5 years. This could explain the positive perceptions of SEL, but slightly lower levels of self-efficacy when asked to integrate SEL. These novice teachers require the knowledge to not only effectively teach the curriculum in their classrooms, but to also support their students socially and emotionally in the math classroom. Therefore, while these novice teachers may have a positive outlook on integrating SEL, they may not be as confident with their ability to effectively integrate it due to a lack of experience. If students appear to have social or emotional upheaval, it will make them less available to learn in the classroom regardless of how engaging the lesson is planned. Learning how to prepare or quickly respond to such situations effectively is a skill that may come with more classroom experience or training.

The teachers in these online support communities want to develop their SEL skills to support students with academic and social pressures that could be contributing to their emotional upheaval. This is especially true in math since there can already be such heightened anxiety when faced with difficult problems and curriculum expectations. Past experiences with previous math classrooms and teachers can play an important role in how students view themselves and behave in the math classroom. Teachers feel that there needs to be a greater emphasis on these skills, but also identify that they would like to improve in their capacity to support their students.

The teachers in my previous cycles of research emphasized the importance of being emotionally responsive to their students in the middle school mathematics classroom for them to be academically successful prior to the 2021-2022 school year. It can be assumed that teachers now view this as not just important, but a non-negotiable skill for all educators to have. The issues experienced this past academic year are not localized to one region. Students are in a social, emotional, and academic crisis across the country. Teachers are leaving the profession in droves, staffing shortages and instability are increasing stress levels in schools, and there are more novice teachers in the field than experienced teachers (Baker, 2022; Lambert, 2022; Vaughn, 2022). Teachers seek support, collaboration, and connectedness from other educators in these emotionally tumultuous times as is evident from previous cycle interviews and my observations in these various educator support groups. These consistent teacher needs are why it is imperative to create a space centered around supporting teachers' collaboration and connectedness as they navigate addressing the mountain of student social, emotional, and academic crises in their middle school mathematics classrooms.

Researcher Role

My current position is that of a middle school mathematics teacher in a large school district in a metropolitan area. I have held this position for eight years and have worked with varying levels of students ranging from students needing significant math intervention support to students with high levels of achievement. In addition to varying skill levels, the students I have taught have brought their own unique math stories into the classroom. Common themes woven throughout their stories tell the tales of teachers they did not feel supported by, frequent moments of confusion and anxiety, and expressions of learning that were not relevant to their outside of school experiences. I have had students with such high levels of anxiety surrounding learning math that one has hidden under my desk in the fetal position while another burst into tears when she got stuck on a problem and walked out of the classroom to the counseling office. These situations almost always occur, in my experience, when centered around testing because of the immense pressures placed on them to achieve and solve problems that are irrelevant to them or due to the pressure of an out-of-school situation that they feel they do not have control over.

Once the pandemic hit, I was isolated from my colleagues and seemingly had to fend for myself regarding learning new online educational technologies. I joined these online educator support groups during the height of the pandemic as a way for me to feel connected to other educators and to learn different online teaching strategies as I had to quickly learn an entirely new way to teach mathematics. While I have only participated by writing posts and providing feedback to others' posts, I have found support and connectedness within these groups. Therefore, I know online communities of practice can

continue to be supportive for others, especially if they are smaller and more personalized to educators' classrooms.

Problem of Practice

There is a large emphasis on increasing the rigor of mathematics standards and pushing students to achieve higher test scores, but there are not provided opportunities for students to explicitly learn and practice social and emotional learning (SEL) strategies (e.g. perseverance, problem-solving, emotional regulation, collaboration, etc.) to support them through this increase in rigor and during times of increased anxiety and trauma, exacerbated by the current pandemic (Dymnicki et al., 2013; Simorangkir et al., 2021). These skills and strategies are often embedded in the general school environment or in other content areas like health and English, but not specifically in mathematics classrooms. In addition to the lack of explicit SEL strategy embedded instruction for students, teachers often state that they are not provided with explicit direction on how to embed these strategies into their daily instruction. If middle school math teachers can be fully prepared and informed on how to explicitly equip their students with SEL skills and support them through times of math learning anxiety and increased rigor, it can be powerful. The problem arises when teachers do not know how to provide their students with these resources (Duncan-Andrade, 2009). The pandemic in combination with the already existing standardized testing, math curriculum, and policy mandates have increased the social, emotional, and academic inequities among students (Fairbairn et al., 2021; Lailiyah et al., 2021; Lewis et al., 2021). According to Fairbairn et al. (2021) and Furner and Higgins (2019), the way to address this is through collective action among

teachers to engage in discourse and critical reflection to decrease the inequities within their classrooms.

Purpose Statement

The pandemic has not only increased economic inequities within various communities, but it has also exacerbated the social, emotional, and math achievement inequities of middle school students, creating an environment that increases the potential for heightened anxiety and peer conflict (Fairbairn et al., 2021; Furner & Higgins, 2019; Lailiyah et al., 2021; Lewis et al., 2021; Mustafa, 2020). Now, more than ever, it is imperative that educators not only understand the existence and impact of these social and emotional inequities but have the knowledge and skills to effectively address them. In this project I facilitated an online community of practice with a small group of middle school math teachers with the purpose of discussing and implementing various strategies to address the social and emotional skill needs of students in their classrooms: the More Than Math Collective (MTMC). If middle school math teachers can fully be prepared and informed on how to explicitly equip their students with these skills and support them through times of math learning anxiety and increased rigor, it can be powerful. The problem arises when teachers do not know how to provide their students with these resources (Duncan-Andrade, 2009). To further examine the impact an online community of practice focused on SEL integration has on middle school math educators' self-efficacy and professional capital, the following research questions guided this dissertation:

RQ1. For middle school mathematics teachers who participate in the More Than Math Collective, to what extent and how does their teacher SEL self-efficacy change?

RQ2. How does the More Than Math Collective develop the professional capital of middle school mathematics teachers?

RQ3. To what extent do middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically after participation in the More Than Math Collective?

CHAPTER 2

THEORETICAL PERSPECTIVES AND GUIDING RESEARCH

There is a substantial amount of literature that speaks to the positive benefits of social and emotional learning (SEL) within education and the powerful effects that self-efficacy has on teaching and learning (Chang, 2015; Collie et al., 2012; Küçükaliöglu & Tuluk, 2020; McCormick et al., 2015; Wu et al., 2019; Zee & Koomen, 2016). However, researchers are beginning to recognize the need to connect SEL and self-efficacy within middle school mathematics, especially from the perspective of the teacher. The proposed research will address this gap by examining the impact that a community of practice has on middle school mathematics teachers' self-efficacy, along with integrating SEL instructional practices into their classrooms and the development of their professional capital.

Within this chapter, there are three areas of research that will frame this study to inform an innovation that will promote SEL integration within the mathematics classroom through a teacher online community of practice. Within the first section, I discuss Albert Bandura's Social Cognitive Theory, specifically within the context of teacher self-efficacy in K-12 education. The second section connects the development of educator professional capital to self-efficacy and secondary mathematics classrooms through various collaborative innovations with a specific focus on virtual and in-person communities of practice. The third section introduces the five key competencies of social and emotional learning, as defined by the Collaborative for Academic Social and Emotional Learning (CASEL), in connection with middle school mathematics classroom

outcomes. I then summarize the literature along with key findings from previous cycles of research and use these findings to inform the proposed innovation.

Social Cognitive Theory

Social Cognitive Theory (SCT), developed by Albert Bandura (1977), emphasizes learning through an agentic social lens meant to influence and be influenced by the environment in which an individual is situated. Those learning within the environment, as described by SCT, are self-reflective, self-regulated, organized, and proactive (Bandura, 2005). The majority of learning and self-development is done through observation and vicarious experiences in which the individual can set goals and assess themselves based on social and personal feedback (Ewen & Ewen, 2009; Green & Piel, 2015). A more complex and pervasive aspect of observational learning and human agency is a concept within the SCT entitled self-efficacy (Bandura, 1989, 2000, 2002).

Self-efficacy is a person's beliefs about his or her capabilities to complete a task successfully and influences a person's behavior, motivation, cognitive processes, and affective processes (Bandura, 1994). A person with a higher level of self-efficacy visualizes their success and is more likely to approach a task perceived as difficult, cope with the difficulties, and ultimately believe he or she can persevere through the challenges and be successful by committing to high goals of success (Bandura, 1977). Additionally, when failure is experienced by those with high self-efficacy, it is attributed to a lack of effort as opposed to a lack of skill (Bandura, 1994). If a person has a lower perceived self-efficacy, he or she is more likely to display avoidance and less effort toward the task that is perceived as intimidating or a threat to their current level of coping skills when faced with a challenge (Bandura, 1977, 1994). For a person to persevere

through current and future challenging situations and develop a sense of positive well-being, this effort requires an optimistic sense of self-efficacy (Bandura, 1994). According to Bandura (1977), sources of self-efficacy in an individual can be viewed through mastery experiences, vicarious learning, social persuasion, and emotional states.

Sources of Self-Efficacy

Mastery experiences have been stated to be the most effective way of developing a strong self-efficacy as experiences of success bolster self-efficacy while experiences of failure diminish self-efficacy (Bandura, 1977, 1994). While success experiences assist in the development of a positive self-efficacy, if those successes are easily acquired then this can lead to discouragement when experiencing failure instead of resilience. It is important for these mastery experiences to be challenging enough to develop resilience and perseverance along with self-efficacy for it to stick (Bandura, 1994).

While independent experience is highly influential, another aspect that can play a large role in the development of self-efficacy is through vicarious experiences, or observing others experience challenging situations and see how they manage (Bandura, 1977). By seeing these modeled behaviors, especially by those who are similar, during challenging activities, self-efficacy is supported and developed (Bandura, 1994). The individual thinks, “if that person, who is like me, can do it, then so can I.” If the observed individual does not pose much similarity, then the influence on self-efficacy is not as significant (Bandura, 1977).

Social persuasion can be thought of as positive or negative appraisals by others. It is easy to diminish self-efficacy through negative appraisals, but more difficult to increase self-efficacy through positive appraisals alone (Bandura, 1977, 1994). This can

also be viewed as verbal persuasion as others are the ones expressing these positive or negative appraisals to the person completing the task. When social persuasion is paired with other supports to aid in perseverance and support self-efficacy, it can be highly influential (Bandura, 1977).

The way in which a person reacts emotionally to a stressful situation can impact the perceived self-efficacy. Individuals who have a positive mood and do not stress in the presence of challenging tasks tend to view their self-efficacy as higher than those who respond with negative emotions (Bandura, 1994). The arousal of stress, fear, and anxiety can result in avoidant behavior when presented with a challenging task and therefore decrease the perceived self-efficacy (Bandura, 1977).

Related Studies Based on Self-Efficacy

The way in which a classroom is structured can affect the development of self-efficacy because of the large role that social comparisons and modeled behavior play in the classroom. The creation of a learning environment that is conducive to the development of cognitive skills rests heavily on the talents and self-efficacy of the teacher (Bandura, 1994). Teachers with high self-efficacy tend to motivate students, increase cognitive development, and positively impact student achievement (Bandura, 1994; Hines III, 2008; Mojavezi & Tamiz, 2012; Shahzad & Naureen, 2017). Teachers with a low level of self-efficacy tend to acquire a more custodial way of teaching in the sense that the teacher relies heavily on negative consequences to motivate students (Bandura, 1994).

When viewed specifically in 58 math classrooms in a study by Chang (2015), perceived math teacher self-efficacy significantly influenced student math self-efficacy

and achievement. This led to the conclusion that the more efficacious a teacher is in their ability to teach mathematics, the more likely their students will have a higher sense of self-efficacy in mathematics, which in turn will positively impact their academic achievement. This was supported by research conducted across 10 middle schools by Küçükalioglu and Tuluk (2020) in which teacher self-efficacy had a positive effect on student math achievement and attitude toward mathematics. Additionally, they found that teachers with a high level of self-efficacy for classroom management also impacted student mathematics achievement. The conclusion was then drawn that teachers with a high level of self-efficacy for teaching and behavior management in the mathematics classroom are more likely to create a positive classroom environment to support student emotions and achievement.

When comparing middle school and elementary school teacher self-efficacy, Zee and Koomen (2016) reported that both sets of teachers communicated the lowest levels of self-efficacy in the area of managing peer relations. Additionally, middle school teachers reported a lower level of self-efficacy than elementary school teachers. As suggested by Wu et al. (2019) and Zee and Koomen (2016), there is a connection between teacher well-being and their level of self-efficacy. Therefore, the best way to support and increase teacher self-efficacy is through the promotion of teacher well-being factors and emotional intelligence.

Professional Capital

Similar to the impact self-efficacy may have, Fullan and Hargreaves (2012) defined professional capital as a crucial way to enhance teacher job satisfaction and collective expertise. Professional capital in the educational setting is the investment in

educators to be committed, effective, and satisfied with their jobs (Fullan & Hargreaves, 2012; Fullan et al., 2015; Hargreaves & Fullan, 2013). This professional capital investment is a broad term that includes three main capital components: human, social, and decisional capital.

Human capital refers to the quality, talent, or skill of the individual, or in this case the teacher (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). Human capital is not as influential as social capital and, in fact, they are most influential when developed together. Social capital focuses on connections within groups committed to working together toward a common goal of improving their professional practice. This social learning can develop human capital faster because effective teachers are drawn to positive, trustworthy, and collaborative school communities (Fullan & Hargreaves, 2012; Fullan et al., 2015). The final component is decisional capital, which is the capacity to make professional judgements. This type of capital develops more effectively when talented teachers make these decisions together (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). By focusing on developing the professional capital of educators, districts can expect a highly collaborative, supportive, and committed educational system that leads teachers to be agents of change in the classroom which will in turn develop student human capital as well.

Teacher Efficacy and Professional Development

Several studies have examined how developing the professional capital of educators may improve various other teacher factors such as confidence, well-being, effectiveness, and in-the-moment decision-making (Chapman et al., 2016; Hargreaves & Fullan, 2020; Kim & Martin, 2020; Nolan & Molla, 2017). This was especially true

when focusing on the development of social capital with human and decisional capital as supporting aspects. Collaboration between teachers through communities of practice (CoP), professional learning networks (PLN), and professional learning communities (PLC) are among the most powerful tools for supporting the development of teachers' social capital and lead to further development of human capital through the acquisition of knowledge and skills and decisional capital through decision discussion and peer feedback (Sanders et al., 2018; Snow et al., 2015).

In a three-year study conducted by Chapman et al. (2016), a collaborative school improvement initiative entitled the School Improvement Partnerships Programme (SIPP) was implemented in 50 primary and secondary schools across 14 districts in Scotland to encourage collaborative inquiry and professional capacity building between schools, with the goal of closing student outcome gaps for those from disadvantaged backgrounds through the development of educator professional capital. Upon survey analysis, they found that over 90% of respondents reported an increase in their human capital through an increase in knowledge, skills, and confidence with addressing inequities in education, especially in mathematics. Many of the participants connected the increase in these human capital aspects to the development of their social capital through participation in collaborative inquiry. Participants' increase in social capital was not only described as an increase in collaboration with educators within their own and other schools, but also with parents and community workers, additional connections which gave teachers a broader understanding of the issues facing their students outside of the classroom. Though causality cannot be assumed, these teacher outcomes were also connected to an increase in student confidence, engagement, and motivation for learning.

To further explore the connection between teacher confidence and professional capital development, Nolan and Molla (2017) collected qualitative data from four cohorts of teacher mentors participating in a professional learning community (PLC). At the conclusion of the mentoring program, the participants reported that they had gained confidence in their teaching knowledge, skills, and judgements (human and decisional capital). This could be attributed to the reflective discussions, learning, and ongoing peer support taking place within these mentoring cohorts (social capital). Not only did the novice mentees report a growth in confidence, but the mentors did as well, reporting that participating in reflective discussions with their mentees provided them an opportunity to reflect on their own practices. Nolan and Molla (2017) demonstrated that teacher confidence can be supported through the ongoing development of human, social, and decisional capital within the larger construct of professional capital.

Communities of Practice and Secondary Mathematics

One of the processes proposed for building professional capital is the community of practice, embedded in a specific professional context. Here, the context is middle-school mathematics. The recent pandemic has not only created wider achievement gaps in highly tested subjects, like mathematics, but it has also brought those gaps to the attention of the mainstream public (Fairbairn et al., 2021; Lailiyah et al., 2021; Lewis et al., 2021). Communities are more aware of the current mathematical struggles of children in school, and they are also keenly aware of the social and emotional struggles children face daily (Baker, 2022; Belsha, 2021; Blad, 2022; Lambert, 2022; Strauss, 2021; Vaughn, 2022). But that also requires paying attention to professional capital. Before the pandemic, communities of practice were a recognized way to promote teacher

collaboration and professional development to address such struggles (Cajkler et al., 2014; Cwikla, 2007; Gonzalez, 2009; Little, 2020; Lotter et al., 2014). Similar findings have been reported when looking specifically within secondary (grades 6-12) mathematics teachers' participation in communities of practice. Within some of these collaborative communities, the focus was on improving student achievement in mathematics, embedding opportunities for teachers to incorporate aspects of inquiry instruction or social justice into their regular teaching practices (Cajkler et al., 2014; Cwikla, 2007; Gonzalez, 2009; Little, 2020; Lotter et al., 2014).

Cajkler et al. (2014), Cwikla (2007), and Little (2020) examined the impact a community of practice of secondary mathematics teachers would have on teacher efficacy and professional capital in the area of addressing student achievement. All three studies found that when teachers participated in a community where they feel trusted, supported, and have a common goal, they developed a more positive self-efficacy and individual expertise as educators (Cajkler et al., 2014; Cwikla, 2007; Little, 2020). Gonzalez (2009) and Lotter et al. (2014) facilitated communities of practice with secondary mathematics teachers that focused even more specifically on the implementation of new teaching practices that would embed inquiry instruction or social justice in their classrooms. Both studies found even deeper levels of teacher impact as they reported that after participation, teachers viewed themselves as agents of change and described higher levels of teacher critical reflection within their own classrooms (Gonzalez, 2009; Lotter et al., 2014).

Regardless of the specific goal of the communities of practice in studies mentioned above, they all shared similar aspects that supported positive outcomes. Every

community of practice emphasized the importance of a shared vision, trust, collaborative resources, and the opportunity to share individual experiences happening within their secondary mathematics classrooms (Cajkler et al., 2014; Cwikla, 2007; Gonzalez, 2009; Little, 2020; Lotter et al., 2014). In addition to these non-negotiable components, the burden of curriculum and standardized exams always lingered in the background. While teachers felt motivated to learn new teaching strategies and to embed them within their own classrooms, they also felt as if they may not have time to do so as there are so many standards to address and tests to take in the secondary math classroom (Cajkler et al., 2014; Cwikla, 2007; Gonzalez, 2009; Little, 2020; Lotter et al., 2014).

Online Communities of Practice and Secondary Mathematics

A particular use relevant to the proposed project is the creation of a community of practice in an online setting. As stated previously, the educational system has adapted to many changes created by the pandemic, especially with the ways in which teachers learn (Ahadi et al., 2021; Bergdahl, 2022). Online professional learning increased throughout the pandemic and it is essential to understand how that may impact the ways in which teachers collaborate and develop their professional capital (Ahadi et al., 2021; Bergdahl, 2022). Many studies that investigated the impact of online communities of practice, within the general and secondary mathematics education setting, have reported similar findings to in-person collaborative opportunities such as increased teacher efficacy, high levels of reflective practices, and motivation to implement new instructional strategies (Ghamrawi, 2022; Goos & Bennison, 2008; Moolenaar et al., 2016; Ulla & Perales, 2021; Vavasseur & MacGregor, 2008; Wu et al., 2012). While there were similar findings, the challenges faced were unique to the online setting.

The two main challenges faced and addressed by researchers were member attrition and building of trust between teachers within the community (Jakopovic et al., 2021). Jakopovic et al. (2021) reported a decline in participation within their early career secondary mathematics teacher community of practice. This community was created to form mentorship relationships as they begin their careers as educators and provided opportunities to share challenges faced in the classroom, but it lacked a consistent platform and participant expectations (Jakopovic et al., 2021). Other online communities that were able to overcome membership attrition stated that the community was most effective when it was focused on a shared need and provided well-structured activities, visible leadership, and ongoing communication through a consistent application (Ghamrawi, 2022; Goos & Bennison, 2008; Moolenaar et al., 2016; Ulla & Perales, 2021; Vavasour & MacGregor, 2008; Wu et al., 2012).

A final common theme that appeared as both a strength and challenge of facilitating an online community of practice was the development of trust between members in an online setting (Ghamrawi, 2022; Goos & Bennison, 2008; Moolenaar et al., 2016; Ulla & Perales, 2021; Vavasour & MacGregor, 2008; Wu et al., 2012). Trust was stated as one of the most essential building blocks of an online community of practice because, as stated by Wu et al. (2012), deception and false representation are easier to display in a virtual setting than in-person. Goos and Bennison (2008) found that a hybrid community of practice built trust quickly with secondary mathematics teachers due to familiarity, as they worked together in-person, but met online to collaborate and share resources. Ultimately, many studies investigating the impact of online communities of practice within the secondary education setting have found results similar to those that

operated in-person, but require more deliberate pre-planning to ensure that authentic trust can be established and maintained between members (Goos & Bennison, 2008; Ulla & Perales, 2021; Vavasseur & MacGregor, 2008; Wu et al., 2012). To build trust, there needs to be a consistent platform, strong leadership, and a focus on the shared needs between the members. When this process is effective, there can be high levels of reflection, resource sharing, support, self-efficacy, collaboration, and professional growth (Ghamrawi, 2022; Goos & Bennison, 2008; Jakopovic et al., 2021; Moolenaar et al., 2016; Ulla & Perales, 2021; Vavasseur & MacGregor, 2008; Wu et al., 2012).

As the studies discussed have found, the development of professional capital through various social interventions, such as a CoP, PLN, or PLC, has strong ties to the personal and professional development of educators (Chapman et al., 2016; Hargreaves & Fullan, 2020; Kim & Martin, 2020; Nolan & Molla, 2017). In line with the professional capital theory by Fullan and Hargreaves (2012), these studies demonstrate that social capital is the driving force behind teacher development, with human and decisional capital as secondary influences. When educators have the opportunity to engage in reflective discussions, sharing of ideas, collaborative decision-making, and ongoing peer support regardless of whether it takes place in-person or online, they will develop all aspects of their professional capital and most likely become more confident in their practices (Chapman et al., 2016; Hargreaves & Fullan, 2020; Kim & Martin, 2020; Nolan & Molla, 2017; Sanders et al., 2018; Snow et al., 2015).

Social and Emotional Learning and Mathematics Education

Social and emotional learning (SEL) can be broadly described as the processes in which skills and attitudes are developed to promote success in school, work, and life

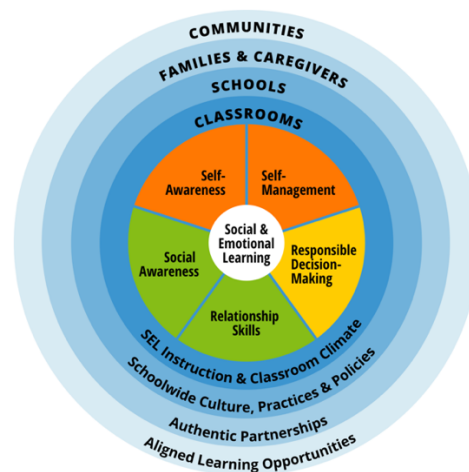
(Charles A Dana Center at the University of Texas at Austin & Collaborative for Academic Social and Emotional Learning, 2016). One of the more prominent advocates for the integration of SEL within educational systems is the Collaborative for Academic, Social, and Emotional Learning (CASEL). More specifically, CASEL (2021) defines SEL as:

...the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions.
(para. 1)

CASEL (2021) believes that SEL is an important part of not only human development, but also of education and has developed five areas of social and emotional competence that are intertwined: self-awareness, social awareness, responsible decision-making, self-management, and relationship skills (see Figure 1).

Figure 1.

CASEL’s Social and Emotional Learning Framework (CASEL, 2021)



Components of Social and Emotional Learning

As stated earlier, CASEL (2021) emphasizes the importance of teachers addressing five components of SEL in their classrooms: self-awareness, social awareness, responsible decision-making, self-management, and relationship skills. Students who have a developed self-awareness can recognize and understand their emotions as well as accurately assess their strengths and areas of growth, which relate to an accurate assessment of self-efficacy (CASEL, 2021; Domitrovich et al., 2017; Yoder, 2014). Within the classroom setting, self-awareness competency can be supported by teachers by providing feedback, opportunities for reflection after experiences of success and failure, and the modeling of emotion recognition (CASEL, 2017).

The development of social awareness results in the ability to understand the perspectives of others and empathize with people from different backgrounds (CASEL, 2021; Domitrovich et al., 2017; Yoder, 2014). This is especially helpful during class discussions and cooperative learning. This can be instructionally supported with modeling desired behaviors during discussions and cooperative learning, provide opportunities to reflect in groups after solving a challenging problem, and routinely provide feedback when students engage in peer interactions (CASEL, 2017).

Responsible decision-making refers to a student that can make appropriate decisions about social or academic problems while considering ethics, respect, and safety (CASEL, 2021; Domitrovich et al., 2017; Yoder, 2014). Support such as a decision-making step process, opportunities to reflect on classroom norms, rules, and consequences, and modeling good decision-making can be implemented in the classroom

to assist in the development of responsible decision-making competencies (CASEL 2017).

The ability to manage emotions to handle stress in difficult situations, set goals that are both personal and academic, and have the motivation to achieve is what defines the self-management competency (CASEL, 2021; Domitrovich et al., 2017; Yoder, 2014). Supporting the development of self-management could involve the implementation of mindfulness exercises, goal-setting activities, reflection activities and/or space, and teacher modeling of emotional control (CASEL, 2017).

When a student has developed relationship skills, they are able to establish and maintain healthy relationships, resist negative peer pressure, and navigate conflict, especially during collaborative learning during challenging tasks (CASEL, 2021; Domitrovich et al., 2017; Yoder, 2014). This can be supported with instructional strategies such as opportunities for collaborative learning, conflict resolution processes, lessons that teach effective communication and listening skills, providing feedback, and modeling desired behavior (CASEL, 2017).

With the increased emphasis on implementing rigorous mathematics instruction through standards that aim to promote college and career readiness for all, students are faced with more challenging problems to solve, but not necessarily supplied with strategies to conquer these challenges (Dymnicki et al., 2013). Supplying these strategies to students for them to learn how to manage their emotions and stress as well as work with their peers to solve problems is essential, especially at the middle school level during a crucial time in their development (Charles A Dana Center at the University of Texas at Austin & CASEL, 2016). Students who develop their various social and

emotional competencies (SEC) through social and emotional learning (SEL) integrated instruction are more likely to have better behavioral and academic outcomes (Babalis et al., 2013; Durlak et al., 2011; McCormick et al., 2015).

Mathematics Education, Anxiety, and SEL

Supporting the development of the five SEL competencies is important for students in school, but it is especially important in high-pressure subjects, like mathematics, due to the potential of producing feelings of anxiety. According to Lewis et al. (2021), math achievement was significantly impacted during the 2020-2021 school year as students began the year with lower achievement and made lower gains than in prior years. This was especially true for students of color and those in high-poverty areas as they were more likely to experience a sharp achievement decline in mathematics when compared to their White and more affluent peers. This is most likely due to the fact that these students have an increased likelihood of experiencing the educational and societal inequalities exacerbated by the pandemic such as access to instruction, community resources, parental support, and technology (Lewis et al., 2021; Wyse et al., 2020). This decline in mathematics achievement is compounded by the fact that this subject typically sparks feelings of anxiety among students, especially as they increase in grade level (Furner & Higgins, 2019; Lailiyah et al., 2021). Furner and Higgins (2019) have even argued that negative perceptions and anxiety toward mathematics instruction has become a crisis in and of itself. Students who experience anxiety when learning mathematics have been significantly associated with a negative influence on their academic performance (Lailiyah et al., 2021). Ways in which teachers and schools can support students' anxieties and well-being in mathematics, especially during pandemic times, include

incorporating affective and psychosocial strategies that provide opportunities for students to engage in cooperative learning, emotional regulation, healthy relationship building, and creative expression (Fairbairn et al., 2021; Furner & Higgins, 2019; Lailiyah et al., 2021; Mustafa, 2020; Vaillancourt et al., 2021). Fairbairn et al. (2021) refer to the incorporation of such strategies that allow students to bring their entire selves into the classroom as rehumanizing mathematics.

Fairbairn et al. (2021) emphasize the importance of rehumanizing math education by providing teachers opportunities to come together as a collective, learn from each other's experiences, and reflect on their own practices that may dehumanize their students by viewing their learning through deficits instead of achievements. Furner and Higgins (2019) expanded on this concept of building intellectual capital with teachers to address the social and emotional needs of students in their mathematics classroom, specifically focusing on math anxiety, just months before the COVID-19 pandemic. Humanistic mathematics is an approach to mathematics education that focuses not just on the '*what*' being taught, but on the '*who*' of learning and teaching (Apel, 1999). Both aspects hold equal importance in the preparation of a lesson and will present mathematics education as personally and historically relevant to students and teachers. By approaching teaching mathematics from a humanistic perspective that places emphasis on identity, creativity, relevance, relationships, and curiosity, it can make learning math more accessible to students and minimize negative feelings toward mathematics (Fairbairn et al., 2021; Fried, 2004; Haglund, 2004).

Related Studies on Math Education and Social and Emotional Learning

It is imperative to support not only the academic success of the students in the math classroom, but also their social and emotional wellbeing. When studying the link between the implementation of SEL programming and math achievement in the classroom, McCormick et al. (2015) found that there was an explicit link among the implementation of SEL programming, emotional support, and math achievement, though the authors did not measure the size of this effect. SEL programming has been shown to lead to higher achievement in core subjects, like English and Mathematics and is especially important for students in low-income areas to develop their math skills (Ashdown & Bernard, 2012; Babalis et al., 2013; Durlak et al., 2011; McCormick et al., 2015). According to Durlak et al. (2011), the implementation of SEL programming has also been shown to increase prosocial behaviors within the classroom setting while also improving academic performance. The current research all supports the statement by CASEL (2021) that the integration of SEL programming is imperative for the human and academic development of students and will be most effectively conducted in safe and caring classroom environments.

Interventions that target the social and emotional learning of students must take place in a specific classroom environment that communicates support explicitly (Babalis et al., 2013). Students who judge themselves as within a classroom environment that is supportive both academically and emotionally are students who are more likely to take risks when learning new math problems (Fast et al., 2010; McCormick et al., 2015). Few studies have examined the relationship between math self-efficacy and the classroom environment. The relationship has been shown to be indirect with math self-efficacy

being the mediating variable between classroom environment and math achievement (Fast et al., 2010; Tosto et al., 2016). Based on the published research, one can conclude that implementing a SEL program is important specifically in the development of student self-efficacy and achievement within the math classroom. For this to be effective, the classroom environments should align with the many of the values and core competencies of SEL programming (CASEL 2021).

Viewing SEL through student outcomes is important, but it is also important to view through the lens of teacher outcomes because when teachers are negatively impacted by the stress of their jobs, it can impact the stress of their students (Schonert-Reichl, 2017). Schonert-Reichl (2017) makes the case that the social and emotional competence of teachers plays a crucial role in the implementation of SEL and therefore, teachers don't need to just know the skills and how to teach SEL, but they also need to have the disposition to create a warm and supportive community. Additionally, a warm classroom environment that promotes resilience along with positive teacher and student relationships can improve academic learning as well as SEL (Sosa & Gomez, 2012). According to Collie et al. (2012), teacher comfort in implementing SEL has a powerful effect. Teacher comfort in SEL implementation was shown to have a negative association with stress and positive association with teacher efficacy and job satisfaction. This can suggest that teachers with high levels of implementation comfort also have high social and emotional competence. SEL has an important impact on students and teachers within the mathematics classroom and long term implementation of SEL leads to less stress, increased teacher efficacy, and increased job satisfaction (Collie et al., 2012). It is imperative to not only address student SEL, but teacher SEL as well. When teachers have

less feelings of stress and higher levels of efficacy and job satisfaction, they will be more likely to create a positive classroom environment in which students can build positive relationships with peers and teachers and build upon their own SEL skills (Collie et al., 2012; Schonert-Reichl, 2017; Sosa & Gomez, 2012).

Prior Cycles of Action Research

The study was a practical action research design in which the goal was to improve a problem or need in an educational setting related to my own professional practice as a middle school mathematics teacher (Mertler, 2017; Nolen & Putten, 2007). This type of design allows teachers to investigate their own classrooms to promote growth in student learning and teacher practices as well as find strategies to immediately implement in their own classrooms (Mertler, 2017). The process is cyclical in nature with four steps: planning, acting, developing, and reflecting. Upon completion of the final data reflection step, the process starts over again to create a new plan and further investigate newly found needs or areas of improvement.

Since the nature of action research is cyclical, I had conducted a first cycle of research to gain preliminary background information prior to the proposed study. In my preliminary research, I met with three middle school mathematics teachers virtually to discuss their views of middle school mathematics, influences of student success, and social and emotional learning integration. The results from this cycle informed my line of inquiry for my next cycle of research, in which I assessed the self-efficacy and general perceptions of SEL instruction integration of middle school mathematics teachers who are members of an online support community. These findings combined inform the proposed study of facilitating a community of practice to impact teacher self-efficacy

with integrating SEL into their instruction to positively affect student well-being and academic success.

Identifying a Need for Social and Emotional Learning

The purpose of this initial investigation was to determine if teachers believe there is a need for more social and emotional integration in the math classroom and if they believe it to be an influence on student success in middle school mathematics. When examining the middle school mathematics teacher responses in regard to influences on student success, the major concepts discussed were not curriculum-based, but mindset, emotion, and relationship-based. Students are more likely to be successful when they have a willingness to learn and students that exhibit this willingness and effort to learn are typically students who have positive relationships with their teachers. These positive relationships are built through explicit teacher behaviors that demonstrate care and support to create a positive classroom environment. Teachers with positive relationships with their students provide consistent praise and feedback to help their students develop confidence while also enhancing the teacher-student relationship through behaviors that exhibit care and support.

When the three participants specifically reflected on the curriculum, more weaknesses were identified than strengths and these weaknesses focused immensely on pressure and the lack of relevancy. The curriculum seems to apply a substantial amount of pressure on teachers to cover a significant number of topics and on students to perform to higher expectations. An important aspect of participant responses consistently returned to how the curriculum does not relate to students personally to generate interest and engagement. The participants also suggested that this lack of relevant curriculum leads to

a lack of interest and therefore a lack of willingness to try, which can in turn inhibit student success.

The last area of focus for this study was on whether teachers believed that social and emotional learning was currently integrated in middle school mathematics. Based on the three interviews, teachers consistently mentioned that the integration of social and emotional skills into instruction was specifically the responsibility of the teachers. If teachers did not choose to or know how to develop relationships with their students, create a positive classroom environment, or teach students how to persevere with difficult problems, then it would not be supported by the current curriculum. Lastly, it is important to note that one participant mentioned current initiatives from the local county on integrating social and emotional learning into a non-instructional period. This participant stated that the current integration initiative felt forced and non-authentic, expressing the need for more development in the area of effectively integrating social and emotional learning into classes.

Based on this study's research questions, I concluded that (a) middle school math teachers feel as if the current curriculum is not relevant or effective in teaching students social and emotional skills without teacher modification, (b) there is a need for more integration of social and emotional learning in the current middle school mathematics curriculum, and (c) students who have a positive relationship with their teachers are more likely to be open to learning and problem-solving through difficult problems.

Examining Teacher Self-Efficacy Beliefs

A second preliminary study examined current middle school mathematics teacher perception and self-efficacy of SEL and areas of need. There was a total of 70 survey

participants and three interview participants. All participants in this study were members of an online educator support group and taught in different communities across the United States and ranged in teaching experience from one year to more than 20 years. The survey data was collected via a Google Form survey to measure middle school mathematics teachers' experience, perception, and self-efficacy with supporting social and emotional learning in their classrooms. All responses were anonymous. Within the survey, demographic data (gender, race, age, years of experience teaching, and experience with SEL professional development) was collected as well as 16 questions adapted from *Teacher SEL Beliefs Scale* developed by Brackett et al. (2012). All questions were on a four-point Likert-scale to measure the following constructs: perceptions of SEL, self-efficacy with SEL implementation, commitment with SEL implementation, and school culture. The final question was an open-ended item in which the participants were asked to describe a time in which one of their students could have benefitted from social and/or emotional support. At the end of the survey there was an optional question that asked if any participants were interested in participating in an interview to further expand on their responses, to record their email. A total of 17 emails were collected and three of those participants agreed to participate in an interview.

The interviews, that were conducted virtually, took place with three teachers with between 5 and 10 years of middle school math teaching experience. A key finding was that teachers want to grow and develop their SEL skills to support students with academic and social pressures that could be contributing to their emotional baggage. The three math teachers who participated in the interviews stated that they feel generally confident in their ability to support their students socially and emotionally, but also feel that there is

room for growth and that they should be doing more. This perception could potentially explain why the questions relating to self-efficacy with integration ($M = 2.8$) decrease slightly than when asked about general perceptions ($M = 3.5$). Teachers may feel content with where they are now and what they are currently implementing in their classrooms but feel as if there is more that they could be doing to improve in their capacity to support their students socially and emotionally in math class.

Similarly, the teachers who participated in the survey and interviews stated an interest in more professional learning opportunities to support students socially and emotionally. This is especially important in math, since there can already be such heightened anxiety when faced with difficult problems, curriculum expectations, and how past experiences play an important role in how students view themselves in the math classroom. Teachers in the study felt that there needs to be a greater emphasis on these skills, but also that they would like to improve in their capacity to support their students in this way. Approximately half (51.4%) of teachers who participated in the survey have been teaching for less than 10 years, and 44.3% of teachers have been teaching at the middle school level for less than 5 years. Novice teachers may report positive perceptions of SEL integration, but lower levels of self-efficacy due to lack of mastery experiences. These novice teachers require the knowledge to not only effectively teach the curriculum in their classrooms, but to also support their students socially and emotionally in the math classroom. If students appear to have social or emotional conflict or upheaval, it will make them less available to learn in the classroom regardless of how engaging the lesson is planned. Learning how to prepare or quickly respond to such situations effectively is a skill that may come with more classroom experience or training.

Another key finding was that while participating teachers may have had negative experiences with professional development in the past, they were still able to describe explicit instances of positive training that included collaboration and relevance to their teaching practice while also expressing a desire for further development of their SEL integration skills. Teachers expressed their interest in professional development sessions that were both collaborative and relevant for them to feel as if the training was worth their time. This could potentially further relate to the imbalance in school expectations ($M=3.5$) and school support ($M=2.9$). Teachers may feel as if they are being held to high expectations to support SEL but are lacking that follow through and collaborative support from their school administrators. For a training, new expectation, or new initiative to be effective for teachers, they need to feel as if there is continued collaborative support and relevance to their everyday practice or else it may just feel like another thing they are being asked to do.

Synthesis

Not only are students and teachers processing through their own unique trauma and isolation they have experienced in the pandemic, but they are also pressured into catching up on missed learning as quickly as possible (Belsha, 2021; Lambert, 2022). The impact and trauma of the pandemic combined with the pressures of standardized testing and federal policies can create an educational environment that increases the potential for heightened math anxiety, peer conflicts, and mental health crises (Baker, 2022; Belsha, 2021; Blad, 2022; Lambert, 2022; Strauss, 2021; Vaughn, 2022). This results in a large need for middle school math educators, especially novice ones, to be prepared to support students' social, emotional, and academic needs in their classrooms. If middle school

math teachers can be fully prepared and informed on how to explicitly equip their students with SEL skills and support them through times of math learning anxiety and increased rigor, it can be powerful. The problem arises when teachers do not know how to provide their students with these resources (Duncan-Andrade, 2009).

Based on the key areas of research discussed, several implications for innovation are addressed. The literature on self-efficacy and SEL professional development clearly emphasizes the importance of not only focusing on student outcomes, but also including teacher outcomes and classroom settings as a whole (McCormick et al., 2015). With the introduction of new curriculum frameworks such as CCSS to prepare students for college and career readiness, students cannot meet this readiness without social and emotional skills and teachers play a crucial role in this skill development (Charles A Dana Center at the University of Texas at Austin & CASEL, 2016; Schonert-Reichl, 2017). Due to the critical role of teachers in the development of student SEC, future research needs to examine professional development that focuses on teacher SEL, efficacy in SEL implementation, and teacher implementation reflection (Holder, 2020; Küçükalioglu & Tuluk, 2020; Schonert-Reichl, 2017; Stephanou et al., 2013; Wu et al., 2019). As suggested by the research on developing the professional capital of educators and results from previous cycles of research, when designing a professional development, it is essential to focus on developing the social capital of the participants through a collaborative innovation such as a CoP, PLN, or PLC (Chapman et al., 2016; Hargreaves & Fullan, 2020; Kim & Martin, 2020; Sanders et al., 2018). By developing this social capital, teachers should feel an increased sense of confidence or self-efficacy with their knowledge (human capital) and decision-making (decisional capital) (Nolan & Molla,

2017; Snow et al., 2015). When examining the effect of teacher professional development and the integration of SEL into academic content such as mathematics, it has been suggested that a mixed methods research design would be the most ideal route to take for participants to talk their way through their responses and describe how teacher beliefs and experiences with SEL impact students (Collie et al., 2012). When looking at SEL professional development with teacher and student outcomes, studies should be conducted within a collaborative environment that promotes self-reflection and decision-making, provide support for teacher SEC and self-efficacy, and focus on the “how” and “why” of achievement outcomes to determine effectiveness of specific instructional strategies (Chapman et al., 2016; Cristóvão et al., 2017; Domitrovich et al., 2017; Hargreaves & Fullan, 2013, 2020; Holder, 2020). Therefore, the proposed intervention was a 10-week online community of practice of approximately 7-10 members from a middle school math teacher online support group. This group met live bi-weekly through Zoom for 1.5 hours each session to engage in discourse around SEL practices, current experiences and challenges they are facing in their classrooms, and create a shared online toolbox of resources, materials, and strategies.

CHAPTER 3

METHOD

In Chapter 2, I discussed Albert Bandura's (1977) Social Cognitive Theory, Fullan and Hargreaves's (2012) Professional Capital Theory, and Collaborative for Academic Social and Emotional Learning's (2021) SEL Framework in connection with the proposed study. In this chapter I discuss the method I utilized to implement and assess the impact of an online community of practice for middle school mathematics teachers on teacher self-efficacy and professional capital development. The intervention was a community of practice entitled More Than Math Collective: Addressing the Emotional Aspect of Middle School Mathematics (MTMC). A brief overview of action research, specifically mixed methods action research (MMAR) and how it applies to the research questions will begin the discussion followed by the introduction of the setting, participants, and the role of the researcher. A detailed description of the online community of practice entitled More Than Math Collective (MTMC) will follow along with the data sources, analysis, and their connection to the research questions. Finally, I will address limitations within the present MMAR study, and include a detailed timeline of procedures.

This study is a mixed methods action research design in which the goal was to improve a problem or need in an educational setting related to the specific professional practice as a middle school mathematics teacher (Mertler, 2017; Nolen & Putten, 2007). Action research has become more popular in recent years because of its relevance to professional practice and the direct impact it can have on student learning and teaching practices (Nolen & Putten, 2007). This type of design allows teachers to investigate their

own classrooms to promote growth in student learning and teacher practices as well as find strategies to immediately implement in their own classrooms (Mertler, 2017). The process is cyclical in nature with four steps: planning, acting, developing, and reflecting. Practitioners follow these four steps to create a plan, act on the plan, develop data, and reflect on the data. Upon completion of the final data reflection step, the process restarts to further investigate newly found needs or areas of improvement. When examining the effect of teacher professional learning and the integration of SEL into academic content such as mathematics, Collie et al. (2012) has suggested that a mixed methods research design would be the most ideal route to take for participants to talk their way through their responses and describe how teacher beliefs and experiences with SEL impact students.

As discussed in the previous chapter, I conducted a first cycle of research to gain preliminary background information prior to the proposed study. In my first cycle of research, I interviewed three middle school mathematics teachers to gather information on general perceptions, areas of need, the extent to which social and emotional learning (SEL) is integrated, and important influences of student success in middle school mathematics education. After conducting these three interviews, common themes emerged including the large importance of teacher-student relationships, relevant math topics, and the lack of authentic SEL integration in mathematics curriculum without it being a responsibility of the teacher. Upon reflecting on the themes from my first cycle of research, it continued to show the importance of further investigation. Specifically, on the importance of authentic integration of SEL in middle school mathematics and the impact it may have on teaching and learning. In my next cycle of research, I examined current

middle school mathematics teacher perception and self-efficacy of SEL and areas of need. Common themes to arise from this cycle included positive perceptions of SEL, a need to learn more about SEL integration to support students emotionally in a collaborative professional learning environment, and previous negative professional development experiences. These themes emphasize that while teachers have positive perceptions of SEL, they have a desire to learn more to better support their students emotionally in the middle school mathematics classroom. These previous cycles of action research informed the development of the MTMC, and I answer the following research questions:

- 1) For middle school mathematics teachers who participate in the More Than Math Collective, to what extent and how does their teacher SEL self-efficacy change?
- 2) How does the More Than Math Collective develop the professional capital of middle school mathematics teachers?
- 3) To what extent do middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically after participation in the More Than Math Collective?

Setting and Participants

I am a member of six Facebook educator support groups that have either been created or grown in membership as a result of the pandemic to create a larger support network for teachers in a time of increased isolation. These groups span a total of approximately 315,000 educators across all groups combined. The following study recruited participants through these support groups, which are private and require prospective members to answer several questions and agree to group terms before being

accepted to the group. Out of the six educator support groups, two of them are dedicated specifically to middle school mathematics teachers which make up approximately 45,000 of the 315,000 educators. The teachers who participate in these groups range from novice to veteran teachers who join to seek and share advice on teaching strategies, curriculum, classroom setup, behavior management, and workplace situations that they are unsure of how to navigate. Additionally, there are members of the groups who are finishing up their undergraduate degree in teaching and join to seek advice for their future classrooms. All groups are joined on a voluntary basis.

Recruitment

Recruitment materials consisted of a course overview, recruitment poster, and screening survey (see Appendix A). The purpose of the screening survey was to ensure that all interested participants are certified middle school math educators with a degree in education, in good standing with their district, currently teach at least one math class, and have common availability to assist with scheduling a recurring meeting time. All recruitment materials focused on and made clear that the MTMC is for middle school mathematics teachers. Due to the nature of the recruitment method, I assumed that the participants would be teachers that actively seek an online community of support to grow personally and professionally. Additionally, these participants have the knowledge and skills to participate in and navigate an online support community.

Innovation

The More Than Math Collective (MTMC) was planned to be a small group of between 7 and 10 middle school mathematics teachers but ended up being between 3 and 5 teachers who met via Zoom in a live online meeting bi-weekly to discuss current

experiences within their classrooms, areas of need, and helpful resources. The first- and fifth-week live meetings had five participants attend while the third-, seventh-, and ninth-week live meetings had three participants attend. The same three participants consistently attended all five live meetings. The audience of this intervention comprised of middle school mathematics teachers to develop their professional capital and self-efficacy with implementing SEL in their classrooms, which in turn impacted their students emotionally and academically. The MTMC met bi-weekly for 10 weeks in a series of five cycles (1 week with one live meeting followed by 1 week of implementation and reflection by each participant) to discuss integrating SEL strategies in their middle school mathematics classrooms. The major components of MTMC were as follows: live meeting weeks, implementation weeks, implementation reflections, and a shared SEL toolbox (see Figure 2). Within Figure 2, there is also the stated connection between each element of the MTMC and its connection to the three professional capital components. When participants are discussing their challenges, adding helpful strategies to the SEL Toolbox, and reflecting on their implemented strategies, these all develop their human capital as they are learning new knowledge and skills. When participants are discussing these challenges and communicating with each other through the online platform and on Zoom, this process is developing their social capital and collaboration skills. Lastly, When participants are selecting a strategy to implement, implementing, and reflecting on the chosen strategy, that selection is developing their decisional capital as they are improving in their ability in understanding which strategies their students need and how they may be able to improve the next time. All resources, meeting materials, recordings, surveys, and any additional intervention work were housed in a Google Classroom for participants to

access and mark assignments completed. This served as the main hub of work for participants to complete pre-work assignments which assisted in tracking participation and accountability.

Figure 2
More Than Math Collective Schedule

| Week 1 LIVE (3/6) | Week 2 OFFLINE | Week 3 LIVE (3/20) | Week 4 OFFLINE | Week 5 LIVE (4/3) | Week 6 OFFLINE | Week 7 LIVE (4/17) | Week 8 OFFLINE | Week 9 LIVE (5/1) | Week 10 OFFLINE |
|---|-------------------|--------------------------|-------------------|-------------------------|--|--------------------------|-------------------|-------------------------|--------------------|
| Weekly Activities | | | | | | | | | |
| Live Weeks on Zoom (1,3,5,7,9*) | | | | | Offline Weeks in Classrooms (2,4,6,8,10*) | | | | |
| <p>Discuss personal math journeys, resources, strategies, positive impacts, and current challenges. <i>(Human & Social Capital)</i></p> <p>Select a strategy to implement within classrooms the following week. <i>(Decisional Capital)</i></p> <p>Add helpful resources and strategies to a Shared SEL Toolbox or Suggestion Bank. <i>(Human Capital)</i></p> <p>*Final live week with a focus on group reflections</p> | | | | | <p>Implement the chosen strategy in math classrooms. <i>(Decisional Capital)</i></p> <p>Reflect on strategy impact by completing an online strategy reflection. <i>(Human & Decisional Capital)</i></p> <p>Communicate by sending messages via online discussion group for support as needed. <i>(Social Capital)</i></p> <p>*Interview week and final data collection.</p> | | | | |

Live Meeting Weeks

In each cycle, participating teachers attended a 1-hour live meeting via Zoom on every other Monday at 7:00pm EST to engage in discourse around SEL practices, current experiences and challenges they were facing in their classrooms, and created a shared online toolbox of resources, materials, and strategies. Each session opened with a review of updates from the SEL toolbox, ground rules, and framing the session agenda items. The ground rules for each meeting were as follows: be on time, come prepared, share time, be honest and supportive, be open to new ideas, perspectives, and strategies, and actively participate.

After the review of updates and session framing, the MTMC discussed one research-based resource, strategy, or material that participants had reviewed ahead of

time and provided time to discuss and/or practice how it might work or impact students in their classrooms. All resources and strategies shared were primarily pulled from the CASEL District Resource Center and Edutopia, but other supplemental resources were shared from participants based on their past experiences. I assigned pre-work assignments with the opportunity for participants to share additional resources in the Google Classroom. The first meeting included time for introductions, intervention expectations and format, social and emotional responsive practices, and how these concepts are currently addressed in participants' respective classrooms and schools. The second meeting focused on supporting group problem-solving skills. The third meeting focused on student perspective-taking in a group setting when working on a task or assignment. The fourth meeting focused on addressing student anxiety and negative emotions. The fifth and final meeting focused on student perseverance through a perceived problem and reflections of participant experiences.

After the review of a resource, strategy, or other material, each participant shared the strategy they implemented, one way in which they feel they positively impacted their students, and one challenge they were currently facing. Throughout these discussions, participants were encouraged to be specific with classroom structure, school expectations, and other additional contextual information to help others understand the context of the strategy implementation. Time was provided for others to supply feedback to each other and engage in discourse around various areas of strength and growth. I added any strategy or resources discussed to the online SEL toolbox. To conclude the meeting, I reviewed expectations for the upcoming implementation week and participants stated one strategy they were going to implement in their classrooms the following week. I recorded

each MTMC meeting posted the link in our Google Classroom at the end for participants to reference if they would like a reminder of what was discussed or for participants to view who could not attend the meeting. A sample agenda for a meeting can be viewed in Figure 3, a calendar of topics and SEL connections can be viewed in Figure 4, and detailed lesson plans can be viewed in Appendix B.

Figure 3

Sample Meeting Agenda

| Time | Topic | Description |
|-------------|---|---|
| 7:00 — 7:05 | MTMC Updates | Frame the session and provide updates on shared resources. |
| 7:05 — 7:30 | Resource Discussion | <ul style="list-style-type: none"> ● Discussion of the Resource Video ● Discussion of responses to the pre-work assignment. |
| 7:30 — 7:50 | 1:1-One Impact & One Challenge | <ul style="list-style-type: none"> ● Each participant will share updates on their experience with implementing a strategy in their classrooms. ● Participants will share advice, strategies, and practices on how to address challenges. SEL Toolbox will be updated. |
| 7:50 — 8:00 | Choosing a Strategy for Implementation Week | Each participant will choose a strategy or tool to implement in the upcoming week. |

Figure 4

Calendar of Topics and SEL Connections

CALENDAR

| | Topic | SEL Connection | Pre-Work Videos and Tasks | Agenda |
|----------------|--------------------------------------|--|---|----------------------|
| Week 1 | Introductions & SEL Toolbox | Responsible Decision-Making | Pre-work Video: What is Social and Emotional Learning? Pre-work Task: Pre-Intervention Survey | Link |
| Week 2 | Implementation Week | | | |
| Week 3 | Group Work/ Problem-Solving | Relationship Skills/ Responsible Decision-Making | Pre-work Video & Strategy: The Math Interview (Edutopia) Pre-work Strategy: Decision-Making Tool/Checklists | Link |
| Week 4 | Implementation Week | | | |
| Week 5 | Group Work/ Perspective-Taking | Relationship Skills/ Social Awareness | Pre-work Video & Strategy: Building Argumentation Skills Pre-work Task: Nice is Not Enough | Link |
| Week 6 | Implementation Week | | | |
| Week 7 | Anxiety & Negative Emotions | Self-Management/ Self-Awareness | Pre-work Video: Why Do People Get So Anxious About Math? (TedEd) Pre-work Task: Emotional Action and Reaction Support Document | Link |
| Week 8 | Implementation Week | | | |
| Week 9 | Closing, Reflections, & Perseverance | Self-Management/ Self-Awareness | Pre-work Video: Learning to Measure the Size of a Problem Pre-work Task: More Than Math Collective Reflection | Link |
| Week 10 | Implementation/Reflection Week | | | |

*All strategies and resources are from [CASEL District Resource Center](#), [CASEL SEL Practices Playbook](#), [CASEL SEL in Elementary Math](#), and [Participant Experiences](#).

Implementation Weeks

During the weeks in which MTMC did not meet live via Zoom, participants implemented the strategy they selected at the end of the last meeting within their classrooms. Throughout the week, I was available via email, WhatsApp, and Facebook Messenger for participants to ask questions and submit topics or resources to discuss next week. In addition to serving as a time for implementation, this week was a time for reflection.

Implementation Reflection

Over the course of the 10 weeks, teachers completed a virtual reflection weekly posted in Google Classroom via a Qualtrics link to record SEL strategies used, their

experiences that week, how they impacted student behavior/achievement, and areas of need (see Appendix C). I sent teachers a weekly reminder five business days after the live meeting through email and WhatsApp to fill out the reflection form prior to our next live meeting. The online reflection form developed teacher SEC through self-awareness and self-management because of its connection to self-reflection on teaching practices and student outcomes.

Shared SEL Toolbox

Throughout the MTMC sessions, I continued to add any resources, strategies, or materials discussed or requested to an online document entitled “Shared SEL Toolbox” (see Appendix D). This online document served as a working document for participants to refer to strategies and resources that they have found helpful or would like to try in their own classrooms. By the end of the MTMC, teachers were able to walk away with a tangible and comprehensive resource of SEL strategies and resources at their disposal. The goal was for teachers to continue to use this toolbox and find purpose in it even after the MTMC has ended. The shared SEL toolbox developed teacher SEC through responsible decision-making and student SEC through the variety of strategies that teachers had the ability to implement.

Data Collection

To address the research questions, I collected both quantitative and qualitative data to measure teacher sense of self-efficacy with SEL, development of professional capital, and student impact. These data sources consisted of Likert scale surveys, weekly reflections, meeting materials, and semi-structured interviews. I administered Likert scale surveys to participants before and after the MTMC. These surveys included qualitative

data in the form of an open-ended question at the end of the survey. I sent out weekly reflection reminders to participants every other week after the live meeting by posting the link in our Google Classroom and participants will be expected to be complete the reflections prior to the next live meeting. I collected meeting materials, which consisted of pre-work assignments, meeting recordings, and the SEL toolbox, throughout the MTMC. I conducted individual semi-structured interviews after the final MTMC meeting to expand on survey data responses, weekly reflections, and meeting materials. I collected all data electronically through Qualtrics, Google Classroom, and Zoom.

Quantitative

I collected quantitative data via a Qualtrics survey (see Appendices E and F) to measure middle school mathematics teachers' self-efficacy with supporting their student social and emotional learning skills in their classrooms as well as their own social and emotional skills. In addition to these constructs, the survey also collected information to measure participants' development of professional capital. To measure the development of participants' professional capital, the survey further partitioned this construct into the three major areas of professional capital: human, social, and decisional. This separation detailed which aspects of professional capital developed for participants after their participation in the MTMC. I administered these surveys pre-intervention and post-intervention to assist with answering the three research questions.

The survey collected demographic data (gender, race, age, location, years of experience teaching, and experience with SEL professional development) as well as 10 questions adapted from *Teacher SEL Beliefs Scale* developed by Brackett et al. (2012) and 11 questions adapted from the *Professional Capital Survey for Teachers* developed

by Fullan and Hargreaves (2012). All questions were on a four-point Likert-scale to measure the following constructs: *teacher SEL self-efficacy* (e.g., ‘I feel confident in my ability to regulate my emotions when disciplining students.’), *student SEL skill self-efficacy* (‘I feel confident in my ability to support my students when they feel stressed or anxious during math instruction.’), *human capital* (‘I have the skills and knowledge to integrate social and emotional learning into my math curriculum.’), *social capital* (‘I regularly collaborate with other teachers in order to share new strategies to enhance teaching and learning in my math classroom.’), and *decisional capital* (‘I can quickly and easily adapt my math instruction to meet the needs of my students without straying from the objective or standards.’). The final two questions on the pre-intervention survey are open-ended items that asks the participants to describe a student they have that is currently struggling academically and a student that is struggling with something that is not academic. These same two questions appeared on the post-intervention survey as well (see Appendix F). Participants were able to see their pre-intervention survey response to the open-ended questions and were asked to describe how those two students they described at the beginning have been impacted by the strategies they implemented in their classrooms. The final section on the post-intervention survey included five additional questions that asked participants to rate effectiveness, usefulness, and level of professional growth on a 4-point Likert scale, as well as state an area of success and growth of the MTMC.

The survey form contained five constructs under two major sections of self-efficacy and professional capital: (a) *teacher SEL self-efficacy* (b) *self-efficacy with supporting student SEL* (c) *human capital* (d) *social capital* and (e) *decisional capital*. To

ensure reliability within each set of items in each of the constructs and as a full survey, for each construct I calculated coefficient alpha, or Cronbach’s alpha (α), using 20 survey responses that I gathered through a pilot administration. Typically, when Cronbach’s alpha (α) value is greater than or equal to 0.70, internal reliability of the survey is established (Salkind & Frey, 2019). Essentially, the higher the coefficient value, the greater reliability that the items similarly measure the same concept within each construct. The Cronbach’s alpha (α) for the survey can be seen in Table 1.

Table 1.
Cronbach’s Alpha (α) Reliability

| Construct | (α) |
|---------------------------------------|--------------|
| Teacher Social and Emotional Learning | .88 |
| Student Social and Emotional Learning | .89 |
| Human Capital | .75 |
| Social Capital | .81 |
| Decisional Capital | .72 |
| Total Survey | .89 |

Qualitative

To further explain the results from the quantitative data sources and answers my research questions, I collected three sources of qualitative data. The first data source I collected was the weekly reflections that participants completed to reflect on how their SEL strategy implementation went that week. The second data source I collected was all meeting materials from the MTMC live meetings. These meeting materials will include

pre-work assignments, meeting recordings, and the shared SEL toolbox. The third data source I collected were the semi-structured interviews that I conducted at the conclusion of the MTMC to expand on participant experiences, self-efficacy, and professional capital development.

Weekly Reflections

According to Dewey (1910), reflection is an important aspect of adult learning and is an ongoing process in which a person reflects and creates meaning from experiences to move forward and continue to build on this meaning. This way the experiences are connected through various reflections to provide a clear continuity of learning for the individual. Reflections, specifically through journal entries, is one of the most effective tools to collect data that reports on personal experiences and emotions after any given experience (Given, 2008). In addition to reflections functioning as an effective tool for data collection, critical reflection is a key aspect of the SEL competency of self-awareness and therefore further developed teacher SEL as they participated in the MTMC. Completing reflections after an action is linked to the ability to critically reflect, which creates a deeper understanding of the personal impact of a specific action (Coghlan & Brydon-Miller, 2014). To promote this critical reflection throughout the intervention, I assigned participants a weekly online reflection in the Google Classroom in which they recorded a strategy implemented that week and answered three questions to discuss the *observed classroom impact on students* (e.g., ‘Describe any observations in regard to student behavior, achievement, or classroom environment related to the strategy or instructional practice you implemented.’), *areas of success* (‘Describe an instance of success you experienced this week.’), and *areas of need or improvement* (‘Describe any

current areas of need or improvement with SEL integration in your math classroom.’). At the conclusion of the reflection, I asked participants to list any topics of interest they wanted to discuss in the next meeting. Therefore, the discussion topics could be addressed to meet the needs of the participants each session.

Meeting Materials

Throughout the MTMC, I consistently collected three types of meeting materials: pre-work assignments, meeting recordings, and the shared SEL toolbox. Prior to each meeting, I assigned participants a short strategy video to watch and a small assignment to complete related to the upcoming topic. The video and assignment were the points of discussion during the resource discussion, and both were added to the SEL Toolbox. The pre-work assignments served as participant accountability, discussion points, and data to assist in analysis of participant experiences and impact. At the end of each meeting, I posted the meeting recording link and the weekly reflection link in our Google Classroom. The third type of material from each meeting that I collected for analysis was the shared SEL toolbox. I collected this toolbox at the conclusion of MTMC, so that it was a complete and comprehensive resource bank of strategies connected to specific SEL competencies. Throughout the live meetings, participants requested three additional categories to be added to the SEL toolbox: Resources from Google Classroom, SEL Reference Books, and Math Hook Videos. Participants suggested that at the conclusion of the intervention, any general resources related to SEL, but not tied to a specific competency that I posted in Google Classroom be included in the toolbox. This would make it easier for them in the future to reference if all resources were in one location. During the meetings a few participants expressed interested in learning more about SEL

and engaging in some independent study after the intervention. Therefore, I posted several SEL reference books in the toolbox under its own category for participants who would like to dive deeper into schoolwide SEL. Finally, during a particular meeting in which we discussed student motivation, a participant suggested adding a separate category for hook videos to engage students in the lesson for the day. This material provided more understanding of where the focus of resources was for participants and what was found to be the most helpful.

Semi-Structured Interviews

At the conclusion of the intervention, I conducted semi-structured interviews with the participants to obtain an overall description of how the implementation of these strategies impact their students behaviorally and academically (see Appendix G). Additionally, these interviews focused on gaining more insight into the teacher efficacy scores and professional capital constructs. This focus provided more understanding about how teachers feel about their effectiveness in implementing SEL strategies in the mathematics classroom, commitment to the continuation of implementation of these strategies, and the level to which participation in the MTMC has impacted the development of their professional capital.

Data Analysis

To answer the research questions stated earlier, I conducted quantitative and qualitative analysis on the following four sources of data: pre- and post-intervention surveys, weekly reflections, meeting materials, and semi-structured interviews. Mean and standard deviations helped determine if there were any change in participant responses regarding self-efficacy and professional capital from before and after the MTMC.

Qualitative analysis included thematic coding and a priori codebook to further expand on the survey results and allow participants to describe how they feel their experience with the MTMC has impacted and will continue to impact their students emotionally and academically. Following quantitative and qualitative analysis, I conducted a data presentation for participants to view to provide them with the opportunity to confirm or disagree with my findings. This member checking process allowed my results to be validated by participants.

Quantitative

The use of quantitative data in action research not only saves time for the researcher with data collection, but it also allows for objective generalizations of the relationships and interactions between various variables due to the exclusive use of numeric calculations (Eyisi, 2016). I administered two iterations of the survey, pre- and post-intervention, to determine if there is a change in teacher SEL self-efficacy and the extent to which teacher professional capital develops. With two administrations, I was able to calculate means and standard deviations for both pre- and post-intervention scores. Because the study had a small number of teacher participants (3-5). I limited quantitative data analysis to descriptive statistics. These comparisons showed if there was any change in participant scores prior to and after participation in the MTMC.

Qualitative

The use of qualitative data in research provides a wider understanding of participant thoughts and behavior as this type of collection is done within a social context, making it easier for participants to assist in shaping the research (Eyisi, 2016). Interview recordings were transcribed using a transcription service, and I cross-checked

all transcripts for accuracy using the original recordings. Qualitative analysis included provisional coding using an a priori codebook and axial coding to further expand on the survey results and allow participants to describe how they experienced the MTMC and its perceived impact on their students emotionally and academically. Provisional coding began by creating the three major codes that attach directly to each of the three research questions: 'teacher self-efficacy', 'professional capital', and 'student impact'. I added common concepts discussed under each major code that connected to the research questions to create a substantial list of codes. When coding the material for concepts related to teacher self-efficacy, I sorted the concepts based on whether it was a perceived challenge or a positive experience. For professional capital, I sorted all of the codes by one of the three professional capital components: human, social, or decisional. The student impact codes were sorted by academic, emotional, influences, and social. Once I generally coded all qualitative material into these major codes and subcodes, I looked within each sub code to identify patterns or common concepts that may assist me in developing an axial code. I used axial coding to summarize all the codes created under each provisional code into a general phrase to assist in structuring the results and discussion around each of the three research questions. I used this coding process as well with the open-ended survey responses, live meeting recordings, pre-work assignments, and the weekly implementation reflections. Lastly, once all axial codes were created and organized, I looked within and across the categories to identify any commonalities that could be identified to create meaningful conclusions.

The final step of data analysis was a synthesis of the quantitative and qualitative data. Using the descriptive statistics and content analysis, I compared the findings to if

and how the qualitative data further expanded on or differed from the survey response data. After this process, general findings, conclusions, implications, and future research recommendations were drawn and communicated. Alignment between the research questions, data sources, and data analysis can be seen in Table 2.

By collecting and analyzing various types of qualitative data in conjunction with quantitative data, I maximized the trustworthiness of the data and analysis through triangulation as different views, experiences, and sources can be compared to each other (Ivankova, 2015). In addition to the triangulation of qualitative and quantitative data, I conducted the member checking process by presenting all findings to participants and asked for accuracy and opinions on how well the analysis resonated with the experiences of the participants. This further verified the trustworthiness of the data collection and analysis processes (Ivankova, 2015).

Table 2.

Research Question and Data Alignment Table

| Research Question | Data Source | Data Analysis |
|---|--|---|
| RQ1: For middle school mathematics teachers who participate in the More Than Math Collective, to what extent and how does their teacher SEL self-efficacy change? | <ul style="list-style-type: none">● Pre & Post Teacher SEL Beliefs Survey with open ended prompt● Semi-Structured Interviews● Meeting Materials | <ul style="list-style-type: none">● Descriptive Statistics Comparison● Thematic Analysis |
| RQ2: How does the More Than Math Collective develop the professional capital of middle school mathematics teachers? | <ul style="list-style-type: none">● Pre & Post Teacher Professional Capital Survey with open ended prompt● Semi-Structured Interviews● Meeting Materials | <ul style="list-style-type: none">● Descriptive Statistics Comparison● Thematic Analysis |
| RQ3: To what extent do middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically after participation in the More Than Math Collective? | <ul style="list-style-type: none">● Pre & Post Teacher SEL Beliefs Survey with open ended prompt● Reflection Forms● Semi-Structured Interviews● Meeting Materials | <ul style="list-style-type: none">● Descriptive Statistics Comparison● Thematic Analysis |

Role of the Researcher

Within this study, my role as the researcher was viewed as a middle school math teacher and the researcher of the intervention and data collection. As a facilitator I led the MTMC as a fellow online group member and shared resources. This placed me as an insider within the research setting while simultaneously an outsider to the specific district contexts of the other teachers who participated. As the researcher, which placed me in an additional outsider role, I recruited participants, led meetings, collected and analyzed

data, and provided virtual support to participants. Prior to the intervention, I created the promotional materials for participant recruitment, screening survey, agendas for each time the MTMC met, and the Google Classroom in which many resources and assignments were assigned for participants. During the MTMC, I initiated the topics of discussion as listed on the agenda and moderated as the participants engage in conversation with each other. Between synchronous Zoom meeting sessions, I was available to answer questions, updated the shared resource document, and collected future topics of conversations that participants requested to be discussed. As the action researcher, I also collected surveys, demographics, reflections, meeting materials, and interview data before, during, and after the intervention as well as analyzed all data utilizing various analytic methods.

When engaging in or facilitating a community of practice, Roberts (2006) mentions several aspects to address: power dynamics, trust, and predispositions. The power dynamics do not only emphasize the importance of including myself as both a facilitator (insider) and the researcher (outsider), but address the potential dynamics at play between novice and veteran teachers. While facilitating the MTMC, I ensured that all participants, regardless of level of teaching experiences, felt as though they all had unique knowledge and expertise they could bring to the discussions. The second aspect that Roberts (2006) states as important to be addressed to ensure a productive community of practice is trust. For participants to be open to sharing personal experiences and knowledge, there needs to be a certain level of trust with the other participants and facilitator. Within my role as a facilitator, I also shared my own experiences and resources at the beginning of the meetings to create a sense of openness with myself and

others. The final aspect that was considered is that of participant predispositions. Given the fact that participants came from various contexts, they also be entered with different beliefs and goals for professional growth. Roberts (2006) asserts that to address this limitation, the creation of shared knowledge should align with the identity and goals of participants instead of challenging their beliefs. Within my role as the facilitator, I ensured participants felt as though they had a choice in what is discussed, shared, and implemented. By providing participants with increased agency, they were more likely to develop new relationships, practices, and beliefs (Saavedra , 1996).

Limitations

As stated previously, the nature of conducting research in an online environment with participants who do not share the same work setting pose unique challenges and limitations. The two main challenges faced and addressed by researchers who conducted online communities of practice were member attrition and building of trust between teachers within the community (Jakopovic et al., 2021). To address the potential for member attrition, all participants were compensated with a \$50 gift card at the conclusion of the study. Participants earned \$5 for each week they participated in live meetings and completed assignments in the Google Classroom. The three participants who completed all aspects of the intervention and attended all meetings were compensated with an additional \$50 at the end of their individual interviews. The purpose of spreading out the compensation was to further limit the chance for member attrition. Other online communities that were able to overcome membership attrition stated that the community was most effective when it was focused on a shared need and provided well-structured activities, visible leadership, and ongoing communication through a consistent

application (Ghamrawi, 2022; Goos & Bennison, 2008; Moolenaar et al., 2016; Ulla & Perales, 2021; Vavasseur & MacGregor, 2008; Wu et al., 2012). Therefore, all session topics for the live sessions were agreed upon by participants and there were opportunities for participants to suggest topics and activities to address specific areas of shared need. Additionally, there were many opportunities for active communication and support between participants and the researcher via online communication throughout the study to build trust between all participants and the researcher. Lastly, since the implementation weeks and reflections were not directly observed by the researcher, it may have created room for exaggeration of experiences since the researcher could not verify what was occurring in the classrooms through observations. This emphasized the importance of building trust and motivation in addition to addressing the shared needs of all participants.

Timeline and Procedure

I conducted this study from February 2023 to August 2023. The study followed a concurrent mixed methods action research design (Ivankova, 2015). Participants were recruited through an online support group after obtaining permission from the group administrator. Recruitment materials were posted in February 2023 in the Middle School Mathematics Teachers Facebook group to recruit participants for the intervention. Once participants were selected, the consent form was sent in February 2023. Upon completing the consent form, participants were then sent the pre-intervention survey to collect data on self-efficacy with SEL implementation in their classrooms and their professional capital. This initial data collection was analyzed in February 2023. Participants met bi-weekly through Zoom every other Monday at 7:00pm EST for 10 weeks from March

2023 to May 2023 to discuss specific SEL topics and strategies centered around middle school mathematics. When participants were not meeting, they were implementing a specific SEL strategy they selected in their mathematics classrooms. At the end of the implementation week, participants completed an online reflection consisting of closed and open-ended questions to collect data on their self-efficacy progression, professional capital, and classroom experiences. At the conclusion of the MTMC in May 2023, all participants completed a post-intervention survey to collect data on self-efficacy with SEL implementation, their professional capital development, and experiences with their participation in the MTMC. Participants were invited to participate in a semi-structured interview in May 2023 to expand on their survey responses and experiences with the MTMC. Data analysis of quantitative and qualitative data was conducted from June 2023 to July 2023. Study findings were presented to participants in August 2023 as member checking.

Approval for the study was obtained from the Institutional Review Board (IRB) of Arizona State University prior to participant recruitment. A detailed overview of the study procedures can be seen in Table 3.

Table 3.*Timeline and Procedures of the Study*

| Timeframe | Actions | Procedures |
|-----------------|---|---|
| February 2023 | Post recruiting materials in the online support group | <ul style="list-style-type: none"> ● Post recruiting materials in online support group ● Collect participant registration information and availability. |
| February 2023 | Collect participant demographics and pre-intervention survey. | <ul style="list-style-type: none"> ● Email a consent form and pre-intervention survey to participants and provide one week to complete. |
| March- May 2023 | Meet bi-weekly with MTMC | <ul style="list-style-type: none"> ● Facilitate MTMC. ● Collect meeting materials ● Support via email |
| May 2023 | Collect post-intervention survey | <ul style="list-style-type: none"> ● Participants complete post-innovation survey during final meeting. |
| May 2023 | Conduct individual semi-structured interviews | <ul style="list-style-type: none"> ● Invite participants to participate in semi-structured interviews |
| June-July 2023 | Analyze data | <ul style="list-style-type: none"> ● Transcribe audio interviews ● Conduct qualitative analysis ● Conduct quantitative analysis |
| August 2023 | Present findings | <ul style="list-style-type: none"> ● Invite participants to presentation. |

CHAPTER 4

RESULTS

In this research, I implemented an online community of practice entitled the More Than Math Collective (MTMC) over the span of 10 weeks. The MTMC focused on supporting the development of middle school mathematics teachers' self-efficacy and professional capital with implementing social and emotional learning (SEL) practices into their classroom with the goal of positively impacting students emotionally and academically. In this chapter, I first review data collection and analysis procedures. Then, I discuss both quantitative and qualitative findings as they relate directly to each research question. Additionally, I will present quantitative and qualitative results that communicate how participants felt they are impacted by the MTMC. The quantitative data includes pre-intervention and post-intervention surveys. The qualitative data includes open-ended survey responses, three live meeting transcripts, two live meeting audio recordings, three individual participant interviews, and twelve strategy reflections. The research questions are as follows:

- 1) For middle school mathematics teachers who participate in the More Than Math Collective, to what extent and how does their teacher SEL self-efficacy change?
- 2) How does the More Than Math Collective develop the professional capital of middle school mathematics teachers?
- 3) To what extent do middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically after participation in the More Than Math Collective?

Overview of Quantitative Data

To answer the first two research questions, I administered two iterations of a 4-point Likert scale survey, pre-intervention in February 2023 and post-intervention in May 2023, to determine if there is a change in teacher SEL self-efficacy and the extent to which teacher professional capital develops. The survey form contained five constructs under two major sections of self-efficacy and professional capital: (a) *teacher SEL self-efficacy* (b) *self-efficacy with supporting student SEL* (c) *human capital* (d) *social capital* and (e) *decisional capital*. With two administrations, I calculated means for both pre- and post-intervention scores within each construct to determine if there is any change in individual participant scores when comparing their responses from before and after participation in the MTMC. In addition to these constructs, the final section on the post-intervention survey included three additional questions that asked participants to rate effectiveness, usefulness, and level of professional growth of the MTMC on a 4-point Likert scale. Survey responses measured level of agreement with the statements using a scale of 1 = *strongly disagree* to 4 = *strongly agree*. Quantitative data are reported based on the individual participant for each construct to determine to what extent participant self-efficacy and professional capital changes or develops.

Overview of Qualitative Data

To answer the three research questions and further expand upon the quantitative results, I collected open-ended survey responses, five live meeting recordings, three individual participant interviews, and four weeks of strategy reflections from each of the three participants. I administered the pre-intervention survey in February 2023 and the post-intervention 10 weeks later in May 2023. All five live meeting recordings and four

weeks of strategy reflections occurred over the span of the 10-week intervention. I conducted 3 individual interviews at the conclusion of the intervention in May 2023. Qualitative analysis included provisional coding using an a priori codebook and axial coding to further expand on the survey results and allow participants to describe how they experienced the MTMC and its perceived impact on their students emotionally and academically.

Provisional coding began by creating the three major codes that attach directly to each of the three research questions: ‘teacher self-efficacy’, ‘professional capital’, and ‘student impact’. I added common concepts discussed under each major code that connected to the research questions to create a substantial list of codes. I split the self-efficacy codes into two categories of challenges and positive. Anytime a participant referenced an area of challenge for themselves (e.g., ‘I think my challenge is just some of my kids who have no desire to try. Like, I’m trying to get past that.’), I coded the text according to the topic of the stated challenge and placed it within the challenges category. Anytime a participant referenced an area of strength (e.g., ‘it’s just enhancing the morale because they’re feeling like okay, I’m talking math and my teachers understand me even though a couple of months ago that was not the case.’), I coded it according to the topic of the stated strength and placed it within the positive category. In the end, there are 28 codes under teacher self-efficacy with 13 of those codes placed under challenges (e.g., colleagues) and 15 codes placed under positive (e.g., student relationships).

I split the professional capital codes into three categories of decisional, human, and social capital. Any time a participant referenced a decision they made for their classroom such as strategy implementations, reflections on those strategies, or an idea of

what they would like to implement in the future (e.g., ‘I changed it a little bit and put the whiteboards on the wall so they have to be standing up.’), I coded it according to the topic and placed it under decisional capital. Anytime a participant referenced trainings they attended or new information learned about skills or about their students (e.g., ‘I’ve learned a lot of strategies in terms of helping my students to be more accountable, but also to be willing to try.’), I coded it according to the topic and placed it under the human capital category. Anytime a participant referenced communicating with a colleague, parent, other participant, or student (e.g., ‘With two new teachers who came from different districts who are very, very, very opinionated, it’s been interesting just learning to find my voice.’), I coded it according to the topic and placed it under the social capital category. In total, there are 18 codes under professional capital with 7 codes placed under decisional (e.g., improvement reflection), 5 codes placed under human (e.g., teacher skills), and 6 codes placed under social (e.g., colleague communication).

I split the student impact codes into four categories: academic, emotional, influences, and social. Anytime a participant referenced an outcome that impacted a students’ academic effort, performance, or skills (e.g., ‘it helped improve their grades, it helped improve even their willingness to do homework.’), I coded it according to the academic aspect discussed and placed it under the academic category. Anytime a participant referenced an outcome that impacted a students’ mindset or emotions, whether that be positively or negatively, (e.g., ‘It has really been beneficial to their self-esteem and their confidence level and what they feel they can do.’), I coded it according to the topic and placed it under the emotional category. Anytime a participant suggested an influence for students socially, emotionally, or behaviorally (e.g., ‘My kids are like, well,

I don't know how to do this. I'm not good at math. If my parents aren't good at math, I'm not even going to try.'). I coded it according to the specific influence suggested and placed it under the influences category. Lastly, anytime a participant referenced an outcome that impacted students' behavior or discourse (e.g., 'It's nice watching her group try to help her and also watch her want to write something on the board.'). I coded it according to the topic and placed it under the social category. Altogether there are 14 codes under student impact with 3 codes placed under academic (e.g., effort), 4 codes placed under emotional (e.g., mindset), 5 codes placed under influences (e.g., home), and 2 codes placed under social (e.g., behavioral).

I used axial coding to summarize all the codes created under each theoretical code into a general phrase to assist in structuring the results and discussion around each of the three research questions. Appendix A displays the codebook along with all major codes, number of files referenced, and total number of references for each code. The overarching axial codes that I gleaned from each category of self-efficacy, professional capital, and student impact can be seen in bold at the top of each category.

To identify the axial code as it related to teacher self-efficacy and the way in which it changed for participants because of their participation in the MTMC, I first looked at the most frequently referenced codes that fell under the challenges category. The three codes that participants referenced the most are challenges with their colleagues, student behavior, and student motivation (e.g., 'My struggle is the teacher that I work with just wants to continue to push on push on, but we can't push on because they're legitimately a mess.'). I then looked at the codes placed under the positive category to identify which codes are referenced the most frequently and if there are any connections

to the challenges codes. While both colleagues and student behavior are also under the positive self-efficacy category, they are not the most referenced codes. The most referenced codes under the positive category are student relationships, strategy implementation, and general positive self-efficacy statements related to SEL (e.g., ‘I feel like I really know the kids, I go out of my way to know them. I know them by name. I know them in every grade level.’). I cross-examined all the references and excerpts within the most referenced codes in both the challenges and positive self-efficacy categories to identify any connections or overlaps to assist in developing an axial code to summarize the extent to which self-efficacy changed for participants. After I examined these codes, the commonly recurring topics across both categories centered around building positive relationships with their students and colleagues to improve their mindset toward SEL and their self-efficacy with SEL implementation. Therefore, the first axial code to summarize the teacher self-efficacy data is ‘*Mindset Improvement Through Relationships and Implementation*.’

To identify the axial code as it related to the development of teacher professional capital of the participants as a result of their participation in the MTMC. I followed a similar process to that of what I did when identifying the axial code for teacher self-efficacy which involved first identifying the most referenced codes within each category. The most referenced codes under the decisional category are implemented strategies and future strategy (e.g., ‘I gave them a certain amount of time and then I had them rotating around and looking at what each other did to figure out how to solve the problem.’). The most referenced codes under the human category are teacher skills and student information (e.g., ‘I discovered that a lot of my kids who don’t know how to use

strategies don't use them because they feel like they'll look stupid.'). The most referenced codes under the social category are colleague communication and validating participant ideas (e.g., 'My kids are low too and that might actually work. Alright, I will see what I can pull up tomorrow.'). I cross-examined the references and excerpts from these most frequent codes in each category to summarize how participant professional capital developed as a result of their participation in the MTMC. After analyzing the codes within professional capital, the most prominent stories shared, and concepts discussed centered around knowing their students and diverse colleagues to collaboratively make decisions on what strategies are effectively implemented in their classrooms and which strategies to implement in the future. Therefore, the second axial code to summarize the professional capital data is '*Collaborative Decision-Making Through Different Perspectives*'.

Lastly, to identify the axial code to summarize the extent to which teachers felt they have impacted and will continue to impact their students socially, emotionally, and academically, I identified the most frequently referenced codes as they connected to each aspect of student impact. Effort and performance are the most referenced codes under student academic impact (e.g., 'It was interesting to watch kid make connections that they hadn't previously made because all their little brains think differently.'), positive is the most referenced code under the student emotional impact (e.g., 'It was nice to watch some of my lower students become more confident when others found good about how they were performing. Some of them had a low self-esteem because they aren't praised often.'), home is the most referenced code under student influences (e.g., 'A student said I really like coming to school because it's my safe space, but my mom has fibromyalgia

and she can't get up on some days and I miss out on learning and I'm behind.'). and behavioral and verbal are equally referenced under the student social impact (e.g., 'I had some of my "jumpy students" calm down and get to task sooner than what has typically been the case.'). Out of all student impact categories, the emotional and social categories contain the most referenced codes with influences being referenced the least number of times. While analyzing all the excerpts and references under the most frequently used codes as they related to student impact, participants frequently discussed the extent to which praise and student reflection positively impacted their students socially, emotionally, and academically despite negative home environments. Therefore, the third and final axial code is '*Praising and Promoting Student Reflection to Impact the Whole-Child*'. These three major themes gleaned from the data will be discussed below as they relate to each research question.

Research Question 1: Examining Change in Teacher SEL Self-Efficacy

The first major research question centered around examining to what extent and how teacher SEL self-efficacy changes because of the participation in the MTMC. The areas explored are teacher self-efficacy in relation to their ability to integrate SEL into their middle school mathematics classrooms and their ability to support the development of their students' SEL skills. Within this section, I discuss both quantitative and qualitative results to answer the first research question and how these findings support the connection to the first major theme of '*Mindset Improvement Through Relationships and Implementation*'.

Quantitative Results

To answer Research Question 1, I administered a 4-point Likert scale pre-intervention survey in February 2023 and post-intervention survey in May 2023. All participants created a unique identifier that they would use on both surveys to match the pre-intervention with the post-intervention survey. The survey included a section of 10 questions designed to assess teacher self-efficacy with implementing social and emotional learning into their middle school mathematics classrooms. There are two constructs within the self-efficacy section, each with five items: (a) *teacher SEL self-efficacy* and (b) *self-efficacy with supporting student SEL*. Due to the small sample size, I only calculated means for all constructs within the survey. The results for the construct of teacher SEL self-efficacy from the pre-intervention and post-intervention surveys can be found in Table 2. At the conclusion of the MTMC, Participant A reported a 0.2-point increase, Participant B remained unchanged, and Participant C reported a 1.2-point increase in teacher SEL self-efficacy.

Table 4.

Descriptive Statistics for Teacher Social Emotional Learning Self-Efficacy Construct,

n = 3

| | Pre-Intervention Survey Mean | Post-Intervention Survey Mean |
|---------------|---------------------------------|----------------------------------|
| Participant A | 3.0 | 3.2 |
| Participant B | 3.0 | 3.0 |
| Participant C | 2.4 | 3.6 |

Means for the construct of self-efficacy with supporting student SEL on both the pre-intervention and post-intervention surveys can be found in Table 3. At the conclusion of the MTMC, Participant A reported a 0.6-point increase, Participant B reported a 0.2-point decrease, and Participant C reported a 0.6-point increase in self-efficacy with supporting student SEL.

Table 5.

Descriptive Statistics for Student Social Emotional Learning Self-Efficacy Construct, n = 3

| | Pre-Intervention Survey Mean | Post-Intervention Survey Mean |
|---------------|---------------------------------|----------------------------------|
| Participant A | 2.4 | 3.0 |
| Participant B | 3.2 | 3.0 |
| Participant C | 2.4 | 3.0 |

Results from both constructs display that two out of the three participants reported an increase in self-efficacy between 0.2—1.2 points. Additionally, one out of three participants reported a decrease or lack of change in self-efficacy with implementing SEL in their math classrooms.

Qualitative Results

I analyzed three participant interviews, three live meeting transcripts, two live meeting audio recordings, six open-ended survey responses, and 12 strategy reflections to expand upon the survey data and provide a deeper understanding of how participants' self-efficacy with SEL implementation developed at the conclusion of the MTMC. As stated earlier, I used an a priori codebook to sort all codes into the three major categories

of self-efficacy, professional capital, and student impact. Within the self-efficacy category, I created two additional subcategories of positive and challenges. I identified thirteen subcodes within the challenges category (e.g., student motivation) and fifteen subcodes within the positive category (e.g., student relationships) (see Appendix A). As stated earlier, after examining the various subcodes under the challenges category, the most frequent codes are student behavior, student motivation, and colleagues.

Participants often referenced that their biggest challenges lied with students wanting to put in productive effort toward their academic achievement and collaborating with colleagues within their respective schools. Within the positive category, the most frequent codes are student relationships, strategy implementation, and general positive self-efficacy statements related to SEL. Participants often referenced the importance of understanding the students within their classrooms and building positive relationships with not only the students but also the colleagues in their schools. By purposefully working toward these positive relationships, it helped them to understand what strategies need to be implemented in their classrooms to positively impact their students socially, emotionally, and academically. The examination of these references and excerpts within these frequent codes, displayed that commonly recurring topics across both categories centered around building positive relationships with their students and colleagues to improve their mindset toward SEL and their self-efficacy with SEL implementation. This supports the development of the first axial code entitled *Mindset Improvement Through Relationships and Implementation*.

As participants described their level of confidence with implementing SEL and whether they felt it had changed as a result of participation in the MTMC, all participants

reported an increase in their level of confidence with their mindset and ability with implementing SEL in their middle school mathematics classes. One participant reflected on their SEL mindset along with their collegial relationship with their school counselor at the beginning of the year and how it has improved due to their participation in the MTMC.

I feel a lot more confident. There was definitely an issue in the beginning of the school year, that I felt like I kept wanting to go to the counselor who was like 'You gotta do SEL yourself'. I was mad. I was like 'No, that's your job, honey, not mine.' But, the more that I embraced it and the more I learned, the more I tried, and the easier it became. I realized that it's not a counselor's job. It's everybody's job. Not just math, every teacher needs to be doing it. That is just being a good teacher. Now I feel pretty confident.

Another participant reflected on how their participation in the MTMC improved their motivation and confidence in modifying their daily lesson plans to include SEL in their middle school mathematics classroom.

I would do things, but I would do things as a standalone. I would do something because I have to do it. But now I have started feeling this is doable every day. It's doable for everyone. So I believe I've become more confident that I can do more.

The third participant reflected on their own math mindset, how that perception may have been impacting how their relationships with the students in their classroom, and their improved confidence in making changes for the upcoming school year.

At the beginning of this collaborative experience, I was a lot less sensitive to the needs of my students and the fact that they're all so different. Math has always been really easy and good for me, but it's hard sometimes when it's not easy for kids. So it's helped me to be a lot more sensitive to the kids' needs as well. It's helped me to think what are the things I can do that will help my students and so I'm already looking at stuff to do for next year.

While the quantitative findings indicate that one participant reported a lack of change or decrease in self-efficacy, all participants verbally reported an increase in confidence with

implementing SEL or supporting the SEL of their students at the end of the MTMC during their interviews. Not only did participants indicate they felt a growth in their confidence with implementing SEL in their classrooms, but a frequent area of confidence brought up throughout all the meetings and interviews is around building positive relationships with their students.

I've always been pretty okay with developing relationships, but now I see more of the importance of it with the teacher developing a relationship because I can see the difference between my relationships with the kids and my co-teacher. They will come to me for every little thing and as annoyed as I get, I know why they do it. I have a different relationship with them and they trust me. Even though I keep pointing over there and saying there's another teacher over there, they would prefer to go to me and it's all about the relationship.

The relationships that the participants talked about building are not just surface level. They discussed the importance of creating a classroom environment that would be conducive to opening those conversations, as long as the students are comfortable, to allow them to share deeper aspects of themselves, their lives, and their experiences.

So my kids talked about their life so far and they went to extents like when I lost my pet, when I saw my brother drown and you know, very sensitive things. I did not expect that. I thought they would say like when I won the math competition or something like that. So some of them really opened up. So that was one big thing for me. That helped kind of set the tone for the conversations I had for the rest of the week and I think going forward.

While the participants did state that student behavior and motivation is a frequent area of challenge, these statements are typically coupled with a potential out-of-school catalyst. The participants are aware of how out-of-school relationships such as home instability, family crises, and societal pressures may add to the emotional baggage students bring into class. This varied student by student which participants reported as a key reason why

addressing it individually with all their students can be a challenge no matter the quality of relationship they may have with their students.

I feel like when you've got so many different kids with so many different things going on, it's even harder to try to support like, if I had just the one, it'd be easier, right? But I don't. I've got a lot of kids with a lot of emotional baggage that are a lot of different situations. So it's harder to be able to support all of them. I've got two that have parents that have cancer. I've got one who's lived with grandma this school year, grandma passed away, and grandma was the breadwinner. So, they're not sure if they're gonna have a house. Then I've got one that's homeless right now. I've got three of them that have had their parents separate this school year and one of them his dad left the country and went to Mexico. So it's just a lot of different things in a lot of their lives and it's really hard to support all of them with their self-management because when you have one kid who's struggling, and even if you know what they're struggling with, it's hard.

Not only do the varying home lives of the students impact their behavior and motivation in the classroom, but another frequently discussed influencing factor affecting participants' self-efficacy with addressing this area is the pandemic. Participants often mentioned how the COVID-19 pandemic not only impacted the academic skills of their students, but heavily affected how their students perceive and approach the work they do in their mathematics classrooms. Addressing such a complicated and individualized issue for their students has proven to be a constantly evolving area of need in their classrooms.

I don't know how to do it, and it's trying to break those barriers of, you actually can do it, you just have to put forth some effort. And so it's been hard because at least in my school district when COVID happened, every kid, every kid passed. They didn't have to do any work. They didn't have to do anything. Every kid passed and they are still in that mentality. In fourth and fifth grade, their teachers would basically give them credit for turning everything in. So they've been getting credit and they've been passing and getting A's, because they turn everything in. Then I started looking at what they're turning in, and they're turning in papers with the answers 'idk', 'idc', and question marks, stuff like that. I'm like, that's not even trying. That's not putting forth any effort at all. So I understand they're scared to try. But I'm like, I can't help you if you're not willing to at least put forth a little effort to try.

The pandemic experience of students has made it a challenge for teachers to address student behavior and motivation, but participants also discussed how the behavior of their students' previous teachers and parents influence them as well.

I also have a big problem with that because from the pandemic, that's been a big issue. It's no longer about learning loss. Like I'm sure they learned something, there's no loss loss as such. They all got good at video games and YouTubing and whatever. So but setting the bar so low, I have a big problem with that when others do that and it affects us subsequently.

My kids are like, well, I don't know how to do this. I'm not good at math. If my parents aren't good at math, I'm not even gonna try.

Despite the challenges created by the pandemic and various out-of-school relationships, the participants continued to show resilience, improvement in their SEL implementation, and advocacy for the needs of their students. Discussions centered around a problem are always met with a potential solution or growth statement. Even one participant stated how student motivation began as a challenge at the beginning of the MTMC, but their self-efficacy with addressing it has improved as a result of their participation in the group.

I feel a lot more competent in it now. And it's been great, because I've learned a lot of strategies in terms of helping my students to be more accountable, but also to be willing to try. Because, for the longest time, I've had so many students who are afraid to even try. So now it's like, okay, let's look at your notes. You know, what strategies are you using? Before you say, I don't know how to do it? Have you read what the steps are in the notes? ...So, it's really helped me to be able to more effectively encourage my kids to use the resources that they have, which has been super, super good. It has really been beneficial to their self-esteem and their confidence level and what they feel they can do.

It is important to note, that while these various challenges of student motivation and behavior are still perceived as challenges by participants, they have stated that they are more confident in implementing strategies to address it since their participation in the

MTMC. Additionally, the third area of challenge as stated by the participants is in relation to collegial relationships and collaboration. This area will be discussed more in depth in the next section discussing the development of participants' professional capital, specifically social capital.

Research Question 2: Development of Professional Capital

The second major research question focused on analyzing how the professional capital of middle school mathematics teachers developed because of their participation in the MTMC. The results below discuss the three areas of professional capital: human, social, and decisional and how they developed since the beginning of the MTMC. Within this section, both quantitative and qualitative results are discussed to answer the second research question and how these findings support the connection to the second major theme of '*Collaborative Decision-Making Through Different Perspectives*'.

Quantitative Results

To answer Research Question 2, I administered a 4-point Likert scale pre-intervention survey in February 2023 and post-intervention survey in May 2023. The survey included a section of 11 questions designed to assess the development of professional capital of middle school mathematics teachers. There are three constructs assessed within the professional capital section: (a) *human capital*, (b) *social capital*, and (c) *decisional capital*. Descriptive statistics for the construct of human capital from the pre-intervention and post-intervention surveys can be found in Table 5. At the conclusion of the MTMC, Participant A reported a 0.7-point increase, Participant B reported a 0.5-point increase, and Participant C reported a 0.2-point increase in human capital.

Table 6.*Descriptive Statistics for Human Capital Construct, n = 3*

| | Pre-Intervention Survey Mean | Post-Intervention Survey Mean |
|---------------|---------------------------------|----------------------------------|
| Participant A | 2.3 | 3.0 |
| Participant B | 2.3 | 2.8 |
| Participant C | 3.3 | 3.5 |

Descriptive statistics for the construct of social capital from the pre-intervention and post-intervention surveys can be found in Table 6. At the conclusion of the MTMC, Participant A remained unchanged, Participant B remained unchanged, and Participant C reported a 1.0-point increase in social capital.

Table 7.*Descriptive Statistics for Social Capital Construct, n = 3*

| | Pre-Intervention Survey Mean | Post-Intervention Survey Mean |
|---------------|---------------------------------|----------------------------------|
| Participant A | 3.0 | 3.0 |
| Participant B | 2.7 | 2.7 |
| Participant C | 3.0 | 4.0 |

Descriptive statistics for the construct of decisional capital from the pre-intervention and post-intervention surveys can be found in Table 7. At the conclusion of the MTMC, Participant A reported a 0.2-point increase, Participant B reported a 0.7-point decrease, and Participant C reported a 1.0-point increase in social capital.

Table 8.*Descriptive Statistics for Decisional Capital Construct, n = 3*

| | Pre-Intervention Survey Mean | Post-Intervention Survey Mean |
|---------------|---------------------------------|----------------------------------|
| Participant A | 2.8 | 3.0 |
| Participant B | 3.5 | 2.8 |
| Participant C | 2.5 | 3.5 |

Qualitative Results

I analyzed three participant interviews, three live meeting transcripts, two live meeting audio recordings, six open-ended survey responses, and 12 strategy reflections to expand upon the survey data and provide a deeper understanding of how participants' professional capital developed since the beginning of the MTMC. I used an a priori codebook to sort all codes into the three major categories of self-efficacy, professional capital, and student impact. I created three additional subcategories of human capital, social capital, and decisional capital within the professional capital category. I identified five subcodes within the human capital category (e.g. teacher skills), six subcodes within the social capital category (e.g. colleague communication) and seven subcodes within the decisional capital category (e.g. implemented strategies) (see Appendix A). As stated earlier, after examining the various subcodes under the human capital category, the most frequent codes are student information and teacher skills. Participants often mentioned the variety of new SEL strategies and skills learned since they began participation and collaboration with others in the MTMC. Within the social capital category, the most frequent codes are colleague communication and validating participant ideas. Participants often discussed the challenges they faced with collaborating with other teachers in their

respective schools, but also discussed how much they have learned through their positive collaboration, idea exchange, and community building with other teachers from different environments in the MTMC. Finally, within the decisional capital category, the most frequent codes are implemented strategies and future strategy. Participants often discussed the various strategies they implemented, their effectiveness, and ideas for strategies they would like to try in the future or upcoming school year. As stated earlier, after analyzing the codes within professional capital, the most prominent stories shared, and concepts discussed centered around knowing their students and colleagues to collaboratively make decisions on effective strategies implemented in their classrooms and which strategies to implement in the future. This supports the development of the second axial code entitled *Collaborative Decision-Making Through Different Perspectives*.

Human Capital

Human capital refers to the quality, talent, or skill of the individual, or in this case the teacher (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). Both pre-and post-intervention surveys assessed the extent to which participants believed they had the skills, knowledge, and training to integrate social and emotional learning into their instruction to support their students socially and emotionally. In alignment with the quantitative results, participants described their acquisition of skills and knowledge as a result of their participation in the MTMC by stating that they felt they have acquired new knowledge and skills that they did not have prior to the intervention. One participant had a difficult time stating specific skills learned because there is an abundance, but specifically referenced the collaborative SEL toolbox created during each meeting.

I feel like I've acquired so much that it's hard to really point out any of it. Because there were so many strategies. I love having that toolbox. I mean, I think that the best part of all of this is that if you forget, go back to the toolbox.

Another participant also reflected on the abundance of strategies learned and how it impacted how they believe SEL connects to their future lessons.

Definitely all the strategies that everybody shared, I think they're all great wisdom, like, firstly, and even revisiting the CASEL framework and everything that you started us with. I think that was a much needed refresher throughout for all of us. So even though people talk about it, I think putting that connection with a little SEL, it's like the salt and pepper we add [to our lessons].

The third participant did not just reflect on the strategies that they learned and have been using in their classroom, but also how learning these strategies have impacted their mindset on how they approach students who are having difficulties in the classroom either socially, emotionally, or academically. This participant mentions that because they have learned an abundance of new knowledge and skills during their participation in the MTMC, they are more aware of what strategies their students may need to be successful at any given time.

It's just helping me to be more open and more sensitive to what my students are really going through. Because it's easy to get lost in the mindset of, you know, what, you have to get this done and have to do this, you have to do it, you know, whatever. But it's been good to realize that I want all my students to do their work, but also sometimes need that grace, because I needed it personally as well. So that's been a super beneficial thing. Just helping kids to focus more on the positive and to focus on what strategies they could do to solve the problem. Focus on how you can do it instead of what you can't do.

Throughout the meetings, participants continued to share and add strategies to the SEL toolbox and communicate the usefulness of such a resource. Additionally, all participants referenced learning they have sought out or would like to seek out to continue their skill and knowledge development with SEL because as one participant stated, "I like the

opportunity to challenge myself to think of something I could do to help the students' social and emotional aspects.”. Another participant mentioned not having enough time to try all the strategies discussed, but expressing interest in finding the time to explore and learn more by stating, “I plan to do all of them. I've not dived into all of them yet, but the hope is that I use summertime to look up more, and hopefully you will give us some follow up, PD.”.

Not only have the participants stated an increase in knowledge and skills as a result of their participation in the MTMC, but they also stated an interest in continuing the group so that they can continue to have social support and learning opportunities.

It was great learning. I mean, it was fantastic, especially because you had so much to share. So thank you, for all the research and the follow ups that you did, I appreciate that, especially that toolkit that you put together for us. Of course, it's everybody else's, too, but it's largely yours. You kind of categorized it beautifully, like I said last time, too. So, thank you. I look forward to keeping in touch and learning more from you.

Overall, the participants demonstrated an increase in human capital through the learning completed within the MTMC and stated an interest in continued learning through continued group support and future professional development opportunities.

Social Capital

Social capital focuses on connections within groups committed to working together toward a common goal of improving their professional practice (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). Both pre-and post- intervention surveys assessed the extent to which participants believe that they regularly collaborate with other teachers to share new strategies and identify ways to support their students socially, emotionally, or academically in their middle school mathematics classroom. Based on the

quantitative results, two out of three participants reported no change in their social capital since the beginning of the MTMC. Only one of those participants stated an increase of 1 point in their social capital. As stated earlier when discussing participant self-efficacy, collegial relationships and collaboration are frequently discussed as a challenge for participants. Throughout the MTMC and during individual interviews, the development of participants' social capital is consistently discussed in two separate contexts: within their respective schools and within the MTMC itself.

A commonality that all participants have stated either in various meetings or through their individual interviews is that the challenge with collegial relationships and collaboration is not the skill itself, but rather with the teachers in their respective school buildings. One participant stated an ongoing issue with collaborating with their co-teacher to try new strategies that support student social and emotional learning.

I just came back from a math conference and they were talking about how you should have kids collaborating and all that great stuff and I was like, oh I used to do that but my co-teacher loves it when it's quiet. I'm like I actually don't mind if they're talking as long as they're doing their work. So like I haven't figured out how to be like hey...can they talk today?

Another participant described the challenge of working with a new team of teachers that lack experience and lean into the negativity.

My team is crazy. I'm the only teacher who returned from last year. See, I've got two people on my team who have taught other grade levels, but not 6th, and not 6th math. Then I've got one who has taught a lot of grade levels, but not 6th either, and not 6th math. One of them, she's been in my school for a while. The other two have not been in our district even. So the other two like to complain about everything.

The third participant mentioned that they have no problem collaborating with other teachers, with the exception of the team of teachers within their school building.

I mean, I feel comfortable collaborating, it's just that when it comes to my own team, I don't have the best team. They're not very open. So strangers are always easier to collaborate with than people I know because there's no judgment. I do not think I can convince anybody at my site, because they're all veteran teachers. They have their own standpoint. I'm not here to make enemies. So, with strangers, yes, all the time, anytime. They're easier to handle.

I did not know this commonality between participants at the beginning of the MTMC, but it may be a large factor as to why these three participants continued to be dedicated to regularly attending the live meeting sessions. While participants may not believe that they have increased their social capital, this may be because of team dynamics taking place outside of the MTMC.

Two participants at the conclusion of the MTMC during their interviews, stated how their challenges with collaboration of communication with their colleagues improved as a result of the knowledge and skills they learned to share. One participant explained the improvement they noticed in collaboration with their co-teacher which led to more open communication with their students.

I think it was good, not just for my students, but also for my co teacher, because it forced me to talk to her about things we probably would not have spoken about and the kids heard us talking about it. So I think it opened up the lines of communication, not just between my team, the co- teacher and I, but with the children. We talked about a lot of different things and I definitely think it opened up further relationships.

The second participant described an increase in confidence with approaching colleagues that display a negative mindset toward teaching or trying new ideas and strategies.

I feel like it's helped me be more confident in approaching them because at the beginning, I just kind of sat in a corner and let them complain and let them do their thing. But doing this collaborative experience has really helped me to be more of an advocate for the students. It's helped me to even just look at it, and to be a voice for the kids, you know, because it's so easy to, to just sit and just let them complain and let them do their venting about how dumb the kids are, and how low kids are and all this other stuff.

While only one participant reported an increase in social capital since the beginning of the MTMC on the post-intervention survey, at least two participants verbally reported that the collaboration skills with their colleagues in their respective schools improved since the beginning of the MTMC.

While there are clear challenges and moments of growth that participants faced within their schools regarding collaborating with their colleagues, the other context that participants reported social capital growth in is within the context of the MTMC. A commonality that participants shared as the most impactful to them that is provided by the MTMC is the connection to other teachers outside of their school districts.

What I found really amazing was that this happens even in Florida, even in New York. It's that geographical perspective that helped me. I mean, they say misery likes company and I think that's what I needed, because I'm like, okay, it's not just a meeting. It's not just my friend. It's like, the third person whom I don't know, also struggling with the same thing. So I think the practices that were shared were very good. Especially the ones that they shared as a success was something I was more excited to try, like the 60 second, shout out. I did not even think of that. So I'm very grateful for all the resources that were shared.

Participants shared that by joining and participating in this group it provided them an outlet and sounding board for challenges, advice, and ideas to improve their practice as educators and their students' success in the classroom.

I really look forward to this and I'm sad that it's over because I feel like you guys can relate in ways that teachers in my school [can't]. It's just me and my co-teacher. There's one other math teacher, a sixth grade teacher, but she's not particularly helpful. So like there's no one to go to.

During live meetings, participants continuously shared resources, strategies, and praise between each other. Participants frequently made statements such as, “ I think I'm going to steal that and use that, so thank you.” or “I love those questions...Those are some questions I've never even thought to ask my kids.” or “If you have a collection of such

things, please dump it [in the chat] and let's all use each other's love and craziness.”.

Despite the negative spaces that the participants came from, they continued to be eager to learn, share, and collaborate with others in the group with the goal of improving themselves as educators.

I explained this group [to someone] and as I was explaining it, I was saying I work in kind of a negative space, not the teacher I work with, but just the school, like there's a lot of issues. Doing this makes you think about your teaching, and how to become a better teacher. Listening to what you guys do in your classrooms makes me feel better about what's going on in mine, and makes me want to strive to do better. I think that dissertation or not, this is a healthy thing for teachers to do.

While the MTMC is a small group of three educators, the participants connected on a deeper level and felt more comfortable sharing the challenges they faced in their classrooms with one participant referring to the group as ‘small but mighty’. This small and more intimate group setting allowed a strong sense of community to build and develop which participants requested to continue utilizing after the research has been completed.

I feel like you built a community that you shouldn't just let go. I feel like this is something we should revisit every few months or once a month, have a math zoom, because I really feel like we all connected, and we all supported each other in our different issues. I think that was really helpful. I really do because I am in a very negative, a lot of times, negative school situation. When you talk to some other people, you realize you're not the only one, but your ideas are different from the ones I'm going to get at school. You're going through the same exact stuff that I'm going through in my classroom.

Connecting middle school math teachers to others they felt did not hold a negative mindset toward SEL, remained supportive, and open-minded resonated with the participants to develop their knowledge, collaboration skills, and a strong sense of community.

Decisional Capital

Decisional capital is the capacity to make professional judgements and develops more effectively when talented teachers make these decisions together (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). Both pre-and post- intervention surveys assessed the extent to which participants believe they can plan instruction to meet the needs of their students, improve their practice through reflection, and respond to students in need of social, emotional, or academic support. Based on the quantitative results, two out of three participants reported an increase in their decisional capital since the beginning of the MTMC. One of those participants reported a decrease of 0.7 points in their decisional capital. A large aspect of the MTMC is for participants to continuously reflect on the practices they are implementing in their classrooms whether that be through weekly strategy reflections or during the live meetings. As participants discussed various strategies they implemented in their classrooms or challenges they faced, other participants would provide advice and other potential strategies. Throughout these discussions moments arose in which an implemented strategy did not go as planned or work well, but provided time for reflection on what to do better the next time.

There was only one thing I felt that I did not do right [during group presentations] because hindsight is 20/20. [I gave them] 2 minutes and one person could speak for the group. So maybe I will refine that next time, so that there are more voices because it ended up being a big group and obviously the Alpha personality ended up taking the mic. So...but it was good. I think the feedback I got after that was helpful.

One participant shared their struggle with getting students to create their own study sheet for upcoming tests and the emphasis on taking note of how to improve to be better the next time.

So, my first few times I struggled with [having them make their own cheat sheet], because they said “But what I need is not on it.” So then you need to plan smarter next time. So it's good to make a note for yourself.

Participants consistently reflected on their experience with strategy implementations during live meetings and by turning in their weekly reflection forms. They continued to take risks each week with implementing new strategies and reporting back to the group how it went to find ways to continue to improve their practice in supporting their middle school math students. Several strategies came from those that I provided to them from the CASEL District Resource Center, but they implemented several strategies because others had found success with them in their classrooms and suggested it.

I really love the concept of a hook like something to just capture their attention right away. That is really important and something that I really just forget the significance of doing. So, thank you for this escalator [video]. I'm looking forward to seeing it.

Another participant related to the challenge of developing a cohesive and collaborative co-teaching relationship which led to their suggestion on how to approach it.

I co-taught with a specialist for 5 years and we have similar issues. I realized it was because we were not talking to each other much and I ended up telling her that I like to make name tents. It ended up being just a kind of needed conversation, so I don't know if that's something you've already had. I would just start at that and say ‘Hey you know what? Let's just stop for 5 minutes. This is something I do and I would really appreciate it. If you don't let's meet halfway’ or something like that, but I mean that's hard to say anything.

Within the meetings a consistent and strong sense of collaborative decision-making existed. If one participant struggled with something, another participant became ready to provide advice or strategy to support. If one participant wanted to try a new strategy, they would report back in their strategy reflection and the live meeting to debrief on how it went and what could go better the next time around. Participants always held a positive

outlook on implementation, reflection, and collaboration. This outlook is what the participants focused on passing on to their students in their classrooms.

I know this course has been just that nice reminder through the whole thing of, okay, how can I focus on the positive? You know, what's the positive? How can I help my students focus on the positive? That's been a really important part of this experience. For me, it's just that reminder of how life can get crazy and life can get hard and stuff. But you have to focus on that positive because I think that's the big thing that helps my students as well, with their SEL experiences, seeing everybody give grades, but also focus on that. What can we do? What can we change? What can they improve on?

At the conclusion of the MTMC during individual interviews, participants described how they would respond to a student who is struggling socially or emotionally in their classroom. The first step for all three participants is to address it individually through a private conversation either in the hallway or within the classroom to support feelings of safety.

Helping the students to remember that everybody has different big problems and different little problems. Just helping the kids to understand that sometimes you may not feel safe here, you may not feel safe wherever. But, I want all the kids to know that my classroom is a safe place. My classroom is a place where I want them to learn and grow and to be comfortable in the process of learning and growing.

Another participant emphasized the importance of addressing the struggle using a variety of strategies prior to trying to present learning to the student.

They definitely don't learn anything when there's other things on their minds. So you first have to get rid of whatever, or at least address it to some extent, whatever the issue is, because once they have that wall up, because they're worried about, you know, the boy they like over there, nothing's gonna happen. It's a useless period of time. So I guess I would try some drawing or writing or talking it out to get at least a little pass with their thoughts on it so they don't miss an entire math class.

The third participant made it clear that to address any social or emotional struggle that a student may be facing, the teacher needs to first reflect on their own mindset.

I would want to take a moment to reflect myself and get myself regulated before I even address their needs at the most of the moment. The goal is to get out of that hole successfully from a mental standpoint both for that person and me. I'm not there to absorb their sorrow or emotions and then let me be the person who's dealing with it. But, the idea is to regulate both of us. But, I feel like the first thing I would do is to make sure that I check on myself whether I'm in a state of mind to help somebody.

Making decisions on how to support students socially, emotionally, and academically, in the middle school mathematics classroom is a highly collaborative process during the MTMC. Participants shared their experiences and challenges while others provided advice on how to address it whether that be using a strategy or providing support on how to have tough conversations with students and other colleagues. This collaborative decision-making process always focused on the shared goal of positively impacting their students socially, emotionally, and academically in their middle school mathematics classrooms.

Research Question 3: Examining Student Social, Emotional, and Academic Impact

The third major research question examined the extent to which middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically. The results below initially present the participants' observations of how specific students they shared at the beginning of the MTMC are impacted by the end of the MTMC and then lead into a discussion of the specific impact on students' socially, emotionally, and academically. Within this section, only qualitative results are discussed to answer the third research question and how these findings support the connection to the third major theme of '*Praising and Promoting Student Reflection to Impact the Whole Child*'.

I did not collect quantitative data to measure the extent to which teachers feel that have impacted and will impact their students emotionally and academically. Though I did not collect quantitative data, I required participants to describe two students in their classrooms on two open-ended questions on the pre- and post-intervention surveys. In the pre-intervention survey, participants described a student struggling academically and a student struggling non-academically. In the post-intervention survey, I gave participants their previous descriptions from the beginning of the MTMC and asked them to describe how those students they initially described are impacted as a result of the strategies they implemented in their classrooms. Table 8 displays the responses by participants of the descriptions of students struggling academically in the classroom and how they feel they are impacted by the implemented strategies. All participants stated their students are impacted positively since their initial description. Participant A and Participant C are specific in their responses and stated there is an impact academically and with the motivation to learn. Participant B is general in their response and additionally stated there may have been areas in which this student may have been negatively impacted.

Table 9.

Open-Ended Survey Responses for Students Struggling Academically

| | Pre-Intervention Description | Post-Intervention Description |
|---------------|---|---|
| Participant A | A 6th grade girl who works super hard just can't seem to retain the lessons. | I think she has made some progress recalling information with some tricks we've introduced. |
| Participant B | This student of mine has been performing below grade level math standards in all summative assessments for the past few years. A vibrant personality in class, and someone who loves to be social in and outside the classroom. A keen participant, not ashamed to share out, even though they are mostly inaccurate in the answer, but the enthusiasm to participate in class (even though she is often incorrect in her mathematical response) is something I have never seen before. | Yes, in both positive and negative ways. |
| Participant C | I have a student in class who is very quiet. He does not try to do anything. Instead, he would rather copy whatever I write down. | He has become more involved in his learning. He still struggles, but I have definitely seen growth. |

Table 9 displays the responses by participants of the descriptions of students struggling non-academically in the classroom and how they feel they are impacted by the implemented strategies. All participants stated their students have been impacted positively since their initial description. Participant A and Participant B are general in

their responses but stated an improvement since the initial description. Both participants also stated that there is still growth to be seen for these students, but have generally been positively impacted more than negatively. Participant C has seen their student increase in confidence and leadership skills since their initial description.

Table 10.

Open-Ended Survey Responses for Students Struggling Non-Academically

| | Pre-Intervention Description | Post-Intervention Description |
|---------------|--|--|
| Participant A | A 6th grade boy has so many emotional issues mixed with anxiety that he doesn't have the capacity to do anything in math class. | He has improved overall but has his good days and bad days. |
| Participant B | This student of mine has just come to this country, and has limited English communication skills. Very fluent in their native language, this student loves math but has outside classroom struggles that inhibit them from thinking of schoolwork once they leave the classroom. | Yes, both positively and negatively. ...although more positively. |
| Participant C | I have a student in my class who works hard. She has had a lot going on. Her grandma died this week so she's trying to keep up, but sometimes struggles. | Yes. She has gotten so much more confident in her learning, and is becoming a leader in my classroom |

I analyzed three participant interviews, three live meeting transcripts, two live meeting audio recordings, six open-ended survey responses, and 12 strategy reflections to provide a deeper understanding of how participants' felt they have impacted and will

impact their students emotionally and academically as a result of their participation in the MTMC. As stated earlier, I used an a priori codebook to sort all codes into the three major categories of self-efficacy, professional capital, and student impact. Within the student impact category, I created four additional subcategories of academic, emotional, social, and influences. I identified three subcodes within the academic category (e.g., effort), four subcodes within the emotional category (e.g., positive), two subcodes within the social category (e.g., behavioral), and five subcodes within the influences category (e.g., home) (see Appendix A). As stated earlier, after examining the various subcodes under the academic category, the most frequent codes are effort and performance. Participants most often referenced how the various strategies that they implemented in their classrooms positively impacted student motivation to complete assignments and performance on assessments. Participants often connected this growth in motivation and performance to their implementation of student reflections before and after assessments. Within the emotional category, the most frequent code is positive. The most referenced area of positive emotional impact that participants discussed centered around student confidence within the middle school mathematics classroom. Additionally, participants connected this increase in confidence to strategies that involved students praising one another in addition to teacher praise. Within the social category there are only two subcodes of verbal and behavioral which appeared equally as often. Participants frequently referred to social impact through their implementation of structured group activities in which students clearly knew what role they had in group. Finally, within the influences category, the most frequent code is home. Often when participants stated the challenges faced with reaching and positively impacting their most high-need students, it

is often due to an out-of-school situation that is out of the teacher's control. These frequent areas of discussion support the development of the third axial code entitled *Praising and Promoting Student Reflection to Impact the Whole-Child*.

As stated earlier, there are several out-of-school influences that participants identified as barriers when implementing social and emotional learning into their classrooms. The largest barriers participants stated came from the varying home lives and self-perceptions of their students. While there are major life events that occur in their students' lives there is also the impact that parents have on their children which can often go unnoticed. Participants reported hearing statements such as, "I'm not good at math, but my mom wasn't either so it's not important" or "my parents aren't good at math so I'm not even going to try". Breaking through that cycle of negative self-perception and parent influence is something that participants perceived as a major barrier to supporting their students in their classrooms.

I think that if they don't feel confident in themselves, in general, they're not going to feel confident in their work either or making a decision about what to do. They also have to want to try taking that leap. It's hard to try.

Despite these barriers, participants are still able to positively impact their students socially, emotionally, and academically. To support students socially in the classroom, participants implemented strategies to improve social awareness and relationship skills. These strategies included group work that emphasizes listening and supporting each other.

I know this year I've really started having my kids working together at interactive whiteboards, so that they're working together and interacting. So I've really been working and pushing listening to other people and helping each other, especially my students who are struggling in math...It has really helped to encourage the kids to do a better job, as well as take accountability for what they do. It has been

nice to watch kids praise some of the work that is from students who don't get a lot of praise.

One strategy is the 60 second shout out which has students give specific compliments to each other at the end of a group work task.

It's been nice to have the compliments go from something as simple, she wrote a one and a four on the board to he helped me and told me what I'm supposed to write or he asked me these questions to help me know that I was subtracting wrong or that I was multiplying wrong or whatever. So that's been really fun.

Another strategy utilized the Frayer model to frame group work and assigned specific roles within that group to review for a test. Each group member is assigned a section of the model for a specific skill they learned in that unit and as a group they had to present their topic to the class.

I actually combined [another strategy] with the Frayer model, and made them review for the test. I gave them different topics, they had to look it up, they had to go back to their books. Then they met with the groups and they presented, and I went really well. We did it quickly. So they didn't have a lot of time to complain and they had to get it done. I think about wow, they were up and out of their seats and that's what we needed.

By implementing various structures around the group work and providing opportunities for students to give peer praise, it positively impacted the way their students approached their work and worked with each other. Giving praise to students from their own peers and from the teachers not only impacted how students interacted with each other and collaborated, but also their confidence and motivation to complete their work.

[The strategies] really helped me to be able to more effectively encourage my kids to use the resources that they have, which has been super, super good. It has really been beneficial to their self-esteem and their confidence level and what they feel they can do.

Not only did participants cite an increase in confidence with some of their students, but this improvement is also seen with some students and the level of effort they put into completing their work which is originally described as a challenge earlier in the MTMC.

I felt like they were impacted positively, it helped improve their grades, it helped improve even their willingness to do their homework. Because some of them would never do their homework because they didn't feel confident how to solve the problems and how to do the work. And so it really helped increase their willingness to even try. I feel like that's one of the big things.

Lastly, several participants implemented reflections before and after assessments for students to practice their self-awareness and even their relationships skills. One participant implemented a reflection strategy prior to an assessment in which they had their students discuss their feelings about the upcoming test.

Before even giving the quiz, I told them to come in, sit down and just talk about how they were feeling today about the test. It was the end of the unit tests. So we just talk to each other about it and then they just talk like 'I'm nervous'... 'I'm okay'... 'It's cool'... 'It doesn't matter', things like that. My eighth graders went rambunctious over that.

Providing time for students to discuss their feelings and how they relate to their academics supported student self-awareness and relationship skills. By having those conversations about their emotions, actively listening, and providing support, it helps to build a classroom environment in which students feel safe and confident to learn and take risks. One participant stated that the strategies and focus on building confidence positively impacted their students academically.

Focusing on strategies for the kids and focusing on helping build the students confidence and helping the students learn to be more proactive learners and stuff. It made such a difference that my numbers went up and this is just one class. My numbers doubled, in terms of how many kids were proficient. And I was like, That speaks volumes, in my opinion...At the beginning of the school year, I had three kids in my class who were proficient. For the rest of my class I had four of them who were on grade level and everybody else was below grade level. It's

been interesting, because by the middle of the year, I had seven kids who were proficient or seven kids who were on grade level or beyond. Then everybody else was still way low... This last time I did it, I had 16 kids in one class who are proficient and beyond! I'm like that's seven more than in just the amount of time that I've been collaborating, which was super exciting to me.

While only one participant stated clear observations of the strategies impacting student performance. The other two participants described more increase in student engagement and participation during class.

They were excited because I told them that I'm doing this course with a group of teachers and I will tell them that today we are going to try this... They were eager and okay to give it a try. So I think that speaks. They were thrilled, to say the very least like they were okay. They participated willingly. So that to me, is a big thing in middle school.

All participants observed a positive impact on their students as a result of the strategies they learned and implemented during their time within the MTMC. When asked at the end of the MTMC during their individual interviews about strategies they would like to continue to implement in the future, participants had several ideas on how they want to continue to integrate SEL into their classrooms to continue to impact their students.

I put a bunch of note cards in my Amazon wish list, because I'm like, [writing positive notes] might help to just to improve the social-emotional well-being of my students at school and at home and build those relationships.

[Something] I'm going to start doing next year at the end of each group session, is having them in or doing more of an interview or asking the whole class and just calling on people what strategies worked well.

I definitely want to do that jigsaw a little bit more. The different colors and groups worked really well. I want to continue to do that.

I think it's something we'd like to do as maybe a whole grade level or more even as a school. Like at the beginning of next year. I really liked the video. I sent it to numerous people.

I just literally forwarded it to my principal, especially the Making Sure Each Child is Known one. I'm like, we should all do this. Like we should do this every three months, like so that we see some growth on our side, too.

Participants did not view the MTMC and the strategies they learned during their participation as an end to their SEL learning and implementation within their middle school mathematics classrooms. Participants described their experience within the MTMC as beneficial to their self-efficacy, professional capital development, and to their students socially, emotionally, and academically. Therefore, they all have the desire to continue to learn and grow as middle school mathematics educators to continue to positively impact their students now and in the future.

Participant Reflection on the Impact of the More Than Math Collective

The results below present the participants' perception of the effectiveness, relevance, and impact of professional growth of the MTMC. Within this section, both quantitative and qualitative results are discussed as they relate to participant feedback on MTMC structure, areas of growth, and improvement for potential future iterations of the MTMC based on their experiences with the group.

Quantitative

To measure the effectiveness of the MTMC and the impact on teachers' ability to integrate SEL into their mathematics instruction, I added three additional questions to ask participants to rate effectiveness, usefulness, and level of professional growth of the MTMC on a 4-point Likert scale. Survey responses measured level of agreement with the statements using a scale of 1 = *strongly disagree* to 4 = *strongly agree* (see Appendix B). Scores close to or equal to 4 represent a high value of the MTMC and scores close to or

equal to 1 represent a low value of the MTMC. The results for these ratings can be found in Table 10.

Table 11.

Participant Responses on MTMC Effectiveness, Relevance, and Professional Growth, n = 3

| | Effectiveness | Relevance | Professional Growth |
|---------------|---------------|-----------|---------------------|
| Participant A | 3.0 | 3.0 | 3.0 |
| Participant B | 4.0 | 4.0 | 4.0 |
| Participant C | 4.0 | 4.0 | 4.0 |

Qualitative

Overall, in alignment with the quantitative results, the participants found the structure and impact of the MTMC is effective in supporting their skill development and improvement as an educator with implementing SEL into their middle school mathematics classrooms. The main areas of effectiveness as stated by the participants include: the SEL toolbox, consistent support from other educators outside of their state, and the ability to troubleshoot classroom issues. One participant in particular discussed how the events of their own life influenced the learning that occurred within the MTMC.

This group happened during a lot of hard real life situations in my own life-some health issues with my husband, a member of my team being out with a double mastectomy due to cancer, me getting a concussion, and my children losing their

grandfather. It seems to suck, but it helped me to realize that everyone needs some grace—even my students, and it is important to allow others to see that.

While there are many areas of effectiveness, there are still areas of growth for the MTMC that included decreasing the meeting time from 1.5 hours to 1 hour, providing time to examine their curriculums, and learning about ways to support out-of-school issues like parental conflicts and suicidal awareness. Additionally, two participants mentioned the attrition of participants since the beginning of the MTMC as an area of improvement. This area of improvement did not decrease the effectiveness of the group as one participant described the group of three as ‘small, but mighty’, but they would have enjoyed hearing more perspectives.

I think five would have been good. Maybe 10 would have been too big... I like a whole group setting...I think five or four is a good, sweet spot to have for discussions and you know, even controversies.

Another thing I have to say is like a couple of weeks ago, we had a couple of extra people who were supposed to be joining this and they backed out. I just felt like how sad for them because I know, at least myself, I've learned a lot through it.

In general, the MTMC is effective in improving middle school mathematics teachers' self-efficacy and professional capital with implementing SEL into their classrooms.

While the group may have been small and not able to address all areas of need, participants highly rated the intervention. To close out the results, one participant summarized the impact their participation in the MTMC had on themselves and their students.

I think I feel much better at [implementing SEL] now that we've had our thing because I was really doing it on my own in my own classroom prior to this. So that's actually why I joined. I saw you said something about like, I don't know what the thing said at the beginning, was SEL and math. I was like, oh, it's exactly what I need help on. I think people collaborating now that I've done it, done our

sessions and done it in the classroom, makes me more competent in talking about it with others, for sure. And knowing that it works, and that it's not just for the counselor, that every teacher has their own responsibility to do it.

Summary

Within this chapter I examined the quantitative and qualitative data. For quantitative analysis, I calculated the means for both pre- and post- intervention scores within each construct to determine if there is any change in participant scores since their participation in the MTMC. Additionally, I collected scores at the conclusion of the MTMC that communicated participant's perceptions of effectiveness, relevance, and level of professional growth of the MTMC. For qualitative analysis, all qualitative data underwent provisional coding using an a priori codebook and axial coding to develop broader themes as they connect to each research question.

For RQ1, when examining the extent to which participants' teacher SEL self-efficacy changed, two out of three participants reported an increase in teacher SEL self-efficacy and self-efficacy with supporting student SEL. One participant did not report any change in teacher SEL self-efficacy and reported a slight decrease in self-efficacy with supporting student SEL. Within the qualitative analysis, all participants reported an increase in self-efficacy with implementing SEL and supporting the SEL of their students. Participants specifically emphasized the importance of creating a positive classroom environment through building positive relationships with their students. Implementing strategies that focused on relationship building is identified as a major factor supporting the SEL of their students especially since out-of-school influences can weigh heavily on the students within their classrooms.

For RQ2, when examining the development of professional capital, all participants reported an increase in human capital. One out of three participants reported an increase in social capital with two out of those three participants reporting no change in social capital. Two out of three participants reported an increase in decisional capital with the other one participant reporting a decrease in decisional capital. Qualitative analysis shows that all participants reported an increase in knowledge and skills (human capital) as a result of their participation in the MTMC with specific reference to the SEL toolbox and strategies shared during each live meeting. Additionally, while all participants stated collaboration with colleagues in their individual school contexts is an area of challenge, two out of three participants stated they feel more comfortable advocating for the SEL needs of their students while in a collaborative setting since participating in the MTMC. Within the MTMC context itself, participants stated that having the opportunity to hear from other teachers outside of their context positively impacted how they view their own classrooms and built a strong sense of community within the group (social capital). Lastly, two out of three participants reported an increase in their capacity to make professional judgements (decisional capital) while one of those three participants reported a slight decrease in this area. Qualitative analysis revealed that participants relied on the collaborative environment to assist in their decision-making process as there are multiple opportunities for teachers to share their challenges and receive feedback during the live meetings. Participants agreed that to effectively make a decision regarding SEL and supporting their students, it is important to understand the unique student and situation occurring before making a decision.

For RQ3, when examining the extent to which teachers feel they have impacted and will impact their students emotionally and academically, there are not any quantitative results, but all participants stated that their students were positively impacted socially, emotionally, and academically as a result of the strategies they implemented in their classrooms. Specifically, participants reported that explicit praise and promotion of student reflection during their classes have positively impacted their students' confidence, self-awareness, and relationship skills. Additionally, all participants emphasized that their SEL learning, and strategy implementation does not end with the MTMC. All participants plan to continue implementing strategies in their classrooms during the upcoming school year to continue to improve as middle school mathematics educators and support their students socially, emotionally, and academically.

Finally, all participants stated that the MTMC is effective, relevant, and provided a high level of professional growth. While they felt the MTMC is effective, there are always areas of improvement such as shortening the time from 1.5 hours to 1 hour and working on improving member attrition so there are at least 4 or 5 members consistently attending live meetings. The MTMC has proven to be an effective method in improving teacher self-efficacy and professional capital of middle school mathematics educators while positively impacting students socially, emotionally, and academically.

CHAPTER 5

DISCUSSION

My problem of practice examined the extent to which middle school mathematics teacher self-efficacy with SEL implementation and professional capital changed as a result of their participation in a 10-week online community of practice entitled the More Than Math Collective (MTMC). Additionally, I examined the extent to which participants felt that they have impacted and will continue to impact their students socially, emotionally, and academically in their classrooms through the implementation of various SEL strategies. I have been a middle school mathematics teacher for the past 10 years and have noticed how students struggle with various social and emotional skills in the math classroom such as persevering through difficult problems and working collaboratively in a group. The recent pandemic has exacerbated this issue as students were isolated from their peers with minimal social interaction. Additionally, implementing social and emotional support in the classroom is not often a skill that teachers are taught in their educational program as all classrooms and students are unique, requiring different approaches to support them. Through this research, I was eager to examine if creating an online space for middle school mathematics teachers from across the country to discuss these unique circumstances, provide support, and suggest strategies would positively impact their self-efficacy with integrating SEL, their overall professional capital development, and the students in the classrooms.

To support teacher self-efficacy, professional capital, and student well-being, I designed an online community of practice with three middle school mathematics teachers that met bi-weekly for 10 weeks. During the intervention, participants met via Zoom bi-

weekly to discuss various topics related to SEL integration in the middle school mathematics classrooms. All participants completed pre-work assignments prior to each meeting in order to come prepared for the discussion. During the live meetings, we discussed the main resource, current areas of strength, and challenges that they are facing in their classrooms as they related to the topic of the meeting. Participants and I provided various strategies supported by research or by previous positive experiences that other participants could use to help address the challenges they experienced (housed in a SEL Toolbox document). The purpose of this document is to act as a one-stop resource for all strategies related to SEL in the middle school mathematics classroom. Additionally, I organized all strategies according to each of the five SEL competencies for easy access depending on the specific challenge. When participants did not meet live online, they implemented a chosen strategy in their classroom and completed an online reflection. We used these strategies and experiences as a point of discussion at the next live meeting. This process continued for 10 weeks until the online community of practice concluded.

The findings suggest three general themes as they relate to each of the three research questions and theoretical perspectives. First, participants sought *Mindset Improvement Through Relationships and Implementation*. Second, participants experienced *Collaborative Decision-Making Through Different Perspectives*. Third, participants practiced *Praising and Promoting Student Reflection to Impact the Whole-Child*. Within this chapter I discuss major findings by theme as they relate to middle school mathematics teacher SEL self-efficacy, professional capital, and student impact. Then, I discuss the limitations and transferability of this study. Finally, I will personally reflect on lessons learned throughout the action research dissertation process. The

following three research questions guided my study and align correspondingly with the three themes that I discuss within this chapter:

- 1) For middle school mathematics teachers who participate in the More Than Math Collective, to what extent and how does their teacher SEL self-efficacy change?
- 2) How does the More Than Math Collective develop the professional capital of middle school mathematics teachers?
- 3) To what extent do middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically after participation in the More Than Math Collective?

RQ 1: Mindset Improvement Through Relationships and Implementation

My first research question focused on examining to what extent and how teacher SEL self-efficacy changes for the middle school mathematics teachers who participated in the More Than Math Collective (MTMC). The first theme that I gleaned through qualitative analysis that connects to this research question is *Mindset Improvement Through Relationships and Implementation* due to frequent discussion centered around improvement in confidence as it relates to building positive relationships through SEL implementation. While quantitative data indicates that 2 out of 3 participants noted an increase in teacher SEL and student SEL self-efficacy with 1 out of 3 participants noted a slight decrease in student SEL self-efficacy, all participants verbally reported in their individual interviews that they experienced an increase in their confidence with integrating SEL into their middle school mathematics classrooms. Participants felt as if their confidence increased since the beginning of the MTMC because of the various

opportunities to try new strategies in their classrooms that would improve their relationships with their students. This increase in self-efficacy with integrating SEL into their classrooms could be due to the structure of the MTMC and how it addresses the major sources of self-efficacy from the Social Cognitive Theory (Bandura, 1977). The MTMC provided participants with opportunities to try new strategies in their classrooms and report on their successes (mastery experience), listen to the successes and challenges of others in the group along with ways in which they addressed it (vicarious experiences), provide positive and constructive feedback to other participants when sharing areas of challenge (social persuasion), and have a support group in which they know they can rely on (emotional states). The structure of the MTMC addressed all major sources of self-efficacy for participants and, in alignment with Bandura's Social Cognitive Theory, can potentially be a reason behind the increase in self-efficacy for two out of three participants. Additionally, teacher comfort with SEL implementation has a negative association with stress and a positive association with teacher self-efficacy (Collie et al., 2012). Teachers who are less stressed and more confident in their SEL integration skills are more likely to create a warm classroom environment that is conducive to building positive relationships which could furthermore positively impact students socially, emotionally, and academically (Collie et al., 2012; Schonert-Reichl, 2017; Sosa & Gomez, 2012). Therefore, it can be assumed that as participants continued their participation in the MTMC, implemented strategies, and received feedback from each other, their self-efficacy with integrating SEL continued to improve as did their relationships with their students. This, in turn, resulted in positive student outcomes

which further created mastery experiences and supported the development of their teacher and student SEL self-efficacy.

Two of the participants noted that prior to their participation in the MTMC, they viewed SEL as an isolated topic to be addressed in its own lesson or even by another adult in the school instead of integrated in the daily plans. Now, after providing multiple opportunities to integrate strategies into their instructional routines, this mindset has shifted and they feel more responsible and capable of integrating it into their lessons. This can be due to the aspect of the MTMC that required participants to implement strategies in their classrooms that were complementary to their instruction and not separate. This builds on the mastery experience source of self-efficacy because as participants are repeatedly implementing strategies and finding success, they will be more likely to build an optimistic sense of self-efficacy (Bandura, 1994). Additionally, because they are integrating SEL strategies and instructional routines more frequently, this has positively impacted their relationships with their students in their classrooms. Building positive relationships developed trust between the students and the teacher which built the teacher's knowledge of who their students are individually. When teachers know their students, they can have a better sense of how to support them in the classrooms socially, emotionally, and academically. Participants stated that by building these positive relationships through SEL integration, some students were more open to discussing their deeper selves and the participants were able to better understand which strategies would be beneficial to implement in their classrooms. Building positive relationships is a key aspect of the CASEL SEL framework and, as stated previously, when those relationships

are built in a positive classroom environment it can further develop the SEL skills of the students (Collie et al., 2012; Schonert-Reichl, 2017; Sosa & Gomez, 2012).

While participants experienced an increase in self-efficacy with SEL integration, there are still challenges that they faced as each participant, student, and classroom environment are unique and evolve daily. Participants consistently discussed student behavior and motivation as challenges during the MTMC and felt these two challenges changed student-to-student and even day-to-day. Many participants attribute these challenges to the various out-of-school influences, such as the pandemic and varying home lives, that impact their students in the classroom. At times, participants perceived it as increasingly difficult to select a singular strategy to support so many students with a variety of needs and emotional baggage. Participants discussed students who struggle with relationships because they come from a broken family, some struggle with a sense of control as their family members pass away and are diagnosed with cancer, while others struggle with positive self-perception of themselves in math class because all they hear from home is negative talk. One participant noted a slight decrease in self-efficacy as it relates to supporting student SEL in their classroom. While this decrease still reports a positive sense of self-efficacy, this slight decrease could potentially be attributed to the variety of out-of-school influences that affect students on a daily basis. Only one of the MTMC meetings discussed student negative emotions such as anxiety, anger, and depression. These negative emotions can originate from outside of the classroom. If more time were spent discussing this topic and strategies to support students in the classroom, it may have improved this area of self-efficacy for that one participant.

Despite the challenges created by various out-of-school influences, participants continued to participate in the MTMC with the goal of improving their practice and supporting their students socially, emotionally, and academically. Participants consistently provided each other with support, feedback, and advice on their unique circumstances and challenges. By participating in the MTMC, participants were continuously exposed to various sources of self-efficacy which may be a key factor in the increase in self-efficacy mindset for 2 out of 3 participants.

RQ2: Collaborative Decision-Making Through Different Perspectives

My second research question focused on analyzing how the professional capital of middle school mathematics educators developed because of their participation in the MTMC. The second theme that I identified through qualitative analysis that connects to this research question is *Collaborative Decision-Making Through Different Perspectives* due to consistent emphasis on collaborating with teachers from outside of their own schools to learn SEL strategies and further understand their students and colleagues in order to effectively make decisions in their middle school mathematics classrooms. To explain how the professional capital of the participants developed, I will discuss the results in connection with each of the three capital components: human (skills and knowledge), social (collaboration skills), and decisional (ability to make decisions).

Human Capital

Human capital refers to the specific knowledge and skills of an individual (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). At the conclusion of the MTMC, all three participants reported an increase in their human capital and further expanded on this improvement in their interviews by referencing the access to a plethora of strategies

related to SEL and middle school mathematics housed in the SEL toolbox. Participants stated that since they have now learned a variety of strategies to implement in their classrooms, they are more aware of the needs of their students. Additionally, participants expressed an interest in continuing the group and seeking out additional resources related to SEL and math that can further assist them in their learning journey. While this increase in human capital is wonderful, it could have been predicted as the MTMC focused on supplying novel strategies to the participants in order to meet their varying classroom needs. All of the strategies provided to the participants were supplied because a participant stated that they did not know of a strategy and needed one. Therefore, the increase in knowledge and skills could have been presumed because the very nature of the MTMC was to supply new strategies to participants based on their stated needs.

Social Capital

Social capital focuses on the connections and collaboration skills that take place within a group that is working toward a shared goal (Fullan & Hargreaves, 2012; Fullan et al., 2015). As stated in several studies, human capital is not as influential as social capital and is actually most influential when they are developed together (Sanders et al., 2018; Snow et al., 2015). Interestingly, while there was an increase in human capital across the board for participants, only 1 out of 3 participants reported an improvement in their social capital, while the other two participants did not report any change in social capital. This lack of change in social capital can be attributed to the fact that all participants, whether it was during a live meeting or individual interview, stated that collaborating with the colleagues in their own buildings was a challenge. Participants stated that they do not perceive any difficulty with collaborating with other educators

outside of their building and actually stated high confidence in this area, but when it came to other teachers in their respective schools, this is where the struggles lied. The goal of the MTMC did not focus specifically on improving collaborative skills with others outside of the group, but instead focused the collaboration with the other participants within the MTMC to improve their SEL implementation skills in their own classrooms. All information shared by the participants about their respective schools was self-reported. Therefore, it is important to keep in mind that all participants bring their own positionality and perspective to what their school environment and colleague collaboration is like whether they feel their experience is connected to their race, social class, professional status, or other element. Thus, the lack of change of social capital with two participants could be because the focus was not on the colleagues in their building and some participants already stated a comfortability with collaborating with other educators outside of their school.

One participant did state an increase in social capital within the quantitative data and during an individual interview they stated that the collaborative aspect and various learning that occurred during the MTMC helped them become more of an advocate for their students when working with other educators in their school. This might be due to the increase in human capital. Since this participant increased in human capital, they were more knowledgeable about how to support students in the classroom. Therefore, they felt more confident in approaching negative colleagues because they had more information to support their collaboration skills. Interestingly, at the beginning of the MTMC Participant C was the only participant to state an increase in social capital, reported the highest human capital score, but reported the lowest score for decisional capital. Participant C

may have had the knowledge of various strategies, but lacked the confidence in making decisions on how to utilize that knowledge. The ongoing collaboration with others who reported higher decisional capital scores may have assisted Participant C in their decision-making abilities as this participant ended up reporting the highest decisional capital score at the end of the MTMC.

Decisional Capital

Decisional capital refers to the ability to make judgements and this capital develops more effectively when teachers make decisions together (Fullan & Hargreaves, 2012; Hargreaves & Fullan, 2013). The quantitative data reports that 2 out of 3 participants reported an increase in decisional capital while one participant reported a decrease. At the beginning of the MTMC, Participant B reported an average score of 3.5 which indicates a high agreement with confidence level in making professional judgements. This average score dropped to a 2.8 at the end of the MTMC, which is substantial and indicates that Participant B decreased from a high agreement in confidence level to a disagreement in decisional capital confidence level statements. This could potentially be because this participant may have provided more feedback to other participants on their challenges than they received on their own challenges. Another reason may be because this participant may feel they need more practice with implementing the abundance of new strategies and knowing what strategy to use when. The number of strategies introduced to them may require additional time to sort through which ones worked and which ones did not as participants were only implementing one strategy biweekly in their classrooms.

Reflections were a major aspect of the MTMC as participants were required to complete a strategy reflection biweekly to report on which strategy they implemented and how it went within their classrooms. During the live meetings, participants continued to reflect on what went well and what could be improved along with feedback and advice from other participants. This provided participants with the opportunity to hear other's decision-making process as it relates to their own challenges. As stated in previous research reflective discussions and ongoing peer support within a collaborative environment can be connected to an increase in decisional capital (Nolan & Molla, 2017). These reflective discussions and hearing the various perspectives of other teachers from different schools were highly valued by all participants and could be related to the increase in decisional capital scores for two participants.

RQ3: Praising and Promoting Student Reflection to Impact the Whole-Child

My third research question focused on student impact and to what extent middle school mathematics teachers feel they have impacted and will impact their students emotionally and academically after their participation in the MTMC. The third theme that I identified through qualitative analysis that connects to this research question is *Praising and Promoting Student Reflection to Impact the Whole-Child* after examining patterns in what strategies participants consistently mentioned as the most impactful for their students and ones they would like to continue to implement in the future. All participants stated that the students they described in the beginning of the MTMC as struggling academically and non-academically improved. Though Participant B stated a general improvement in their student descriptions, the ending statements are vague and therefore no deeper conclusions can be made on student impact for Participant B. Participants A

and C both stated improvements academically and non-academically with recalling information, involvement in learning, leadership skills, and confidence. These improvements can potentially be due to the emphasis on student reflection, praise, and structured group work strategies that the participants continued to implement over the course of 10 weeks.

Integrating various reflection activities is a key strategy to support all five components of self-awareness, social awareness, responsible decision-making, self-management, and relationship skills within CASEL's SEL framework (CASEL, 2021). Participants specifically implemented assessment reflections which occurred before and after an assessment. These reflections were also implemented in written and verbal formats. This was most impactful for students' self-awareness and relationships skills because it not only had students reflect on their own feelings and academics, but also had them practice active listening as others verbally shared aloud how they felt about the current assessment. Another reason the implementation of reflections is highly impactful for students can be because mathematics is one of the subjects that students tend to have the most anxiety centered around and would benefit from expressing those negative feelings (Fairbairn et al., 2021; Fried, 2004; Haglund, 2004). By implementing reflections and other strategies in the classroom, it created a supportive classroom environment and may have led to participants observing positive emotional and academic student outcomes. One participant even stated that the number of students labeled as proficient in mathematics doubled since their integration of various SEL strategies in their classroom. One of the strategies this particular participant found to be extremely effective in

improving student confidence and willingness to try is providing opportunities for teacher and student praise.

Providing opportunities for teachers and students to praise each other during group work or whole-class activities is a strategy that participants have consistently mentioned as most impactful for their students, especially on their confidence and willingness to complete assignments. In previous studies it has shown that students who perceive their classroom environment to be warm, inviting, and supportive both academically and emotionally are more likely to take risks when learning new math problems (Fast et al., 2010; McCormick et al., 2015). Therefore, implementing strategies that have students and teachers give praise to others in the classroom, such as the 60-second shout out strategy, can further build that positive environment for students to feel comfortable taking risks and solving problems. One participant emphasized the importance of integrating praise strategies in class because of the potential negative out-of-school influences mentioned earlier. Once students leave the classroom, they may be met with significant negative talk both from friends, family, and society. Participants stated that by having peers provide positive praise to each other, it positively impacted student self-esteem, relationship skills, and motivation to complete the work. Throughout a vast number of studies that examine the impact on SEL on middle school students and throughout the CASEL SEL framework, there is a large emphasis on ensuring that the integration of SEL is occurring in a classroom that is supportive and positive (CASEL, 2021; Fast et al., 2010; McCormick et al., 2015; Sosa & Gomez, 2012; Tosto et al., 2016). By integrating multiple opportunities for praise during instruction and even after

group work activities, it can further build that positive environment and impact students emotionally and academically.

In addition to integrating student reflection and praise, participants mentioned the importance of structuring group work for students where each student had a specific role or job within the group. The two most common methods to do this involved giving each student their own color to use when solving a problem and utilizing the Frayer model in which a problem is separated into four distinct sections with the common agreement in the middle. Integrating opportunities for collaborative learning is a strategy that is referenced as ways to support student relationship skills and social awareness.

Additionally, teacher modeling of appropriate behaviors and emotional regulation is mentioned as a strategy to support all five SEL competencies. By having participants implement cooperative learning in their classrooms, but in a structured manner, it models for students what is expected of them as they work in a group. All participants mentioned that they gave clear directions and expectations for the groups, whether that be keeping track of the different colors the students are using or assignment specific sections of the Frayer model for students to work on. By giving students structure, it not only assists students with their self-management, but it can also improve social awareness and relationship skills as they work together because with clear roles and expectations it can hopefully minimize moments of group conflict.

Participants in the MTMC mentioned that they feel they have positively impacted their students both academically and emotionally. Specifically citing their implementation of reflections, praise, and structured group work as key reasons for this positive impact. While this positive impact is something to be celebrated, the other aspect

of this third research question focuses on how participants feel they will continue to impact their students after their participation in the MTMC. During their individual interviews, I asked participants about strategies they would like to continue to integrate in the future and how they see their SEL integration in the next school year. All participants had several ideas on what they would like to integrate in the future to continue positively impacting students in their mathematics classrooms. Some ideas are sending home positive notecards, having students reflect in groups and as a class on what strategies worked well, continuing with structured group work in other forms, and expanding a strategy from just their classroom to the whole school level. Participants frequently mentioned how often they shared what they learned with others and even their principals to advocate for future integration in their grade-level classrooms and at the school level to reach a wider range of students. Participants described their experience with the MTMC as impactful on their self-efficacy, professional capital, and to their students socially, emotionally, and academically. All participants stated their continued interest in meeting together as a group in the future, seeking additional SEL training, and implementing more SEL strategies in their classrooms with the goal of continuing the positive impact they have started. Overall, all participants stated within individual interviews and through quantitative data collection that our “small but mighty” MTMC was effective, relevant, and provided a high level of professional growth.

Limitations and Transferability

While there are a substantial number of positive outcomes from this study, it does not come without its limitations in design and transferability. The main limitations of this study consist of the small sample size due to high attrition, the lack of school or site-

specific data, and the voluntary participation. The goal number of participants for my study was between 5 and 7 participants. While I recruited participants from an online group for middle school mathematics teachers of 53,000 members, only 45 expressed interest in participating in the MTMC. Out of those 45 participants, 8 were selected to participate and completed the consent form. Out of those 8 participants who completed the consent form, 5 attended the first live meeting and 3 attended the second live meeting. After the second live meeting I conducted a second round of recruitment to increase the number of participants and I added only two more participants to the MTMC which led to 5 participants attending the third live meeting, despite reaching out to the other 45 members that had expressed interest in participating. After the third live meeting only three participants attended the fourth and fifth final meetings. There were three participants who completed all aspects of the MTMC and attended all live meetings. Therefore, only data for the three participants is utilized in this study, which further limited my quantitative analysis and limited the transferability of the middle school mathematics teacher experience with integrating SEL into their classrooms.

The second limitation of this study is the lack of school site specific data for each of the participants. All information about the schools in which the participants taught was learned from the participant perspective and can therefore be potentially viewed as bias. I did not have access to their school site data such as student demographics, achievement scores, climate surveys, school culture information etc. Additionally, due to the virtual nature of the group and wide geographic range of participants I was unable to conduct classroom observations on the strategy implementation. All strategy implementation and

reflections were self-reported by the participants and I could therefore not personally confirm that strategies were consistently implemented.

The third limitation is that all participants self-selected to participate and continue their participation throughout the 10 weeks of this study. This should be taken into account when reviewing the data because while all participants stated an increase in self-efficacy and human capital, this could be because they were self-aware of these areas of growth. By being self-aware of this area of growth, it could influence their motivation to improve their self-efficacy in this area and desire to learn new strategies. If participants were mandated to participate in the MTMC, the motivation to improve may be different and therefore may result in different outcomes related to self-efficacy.

While this study may have limited data and generalizability due to a small sample size, there are still an abundance of positive outcomes that indicate the MTMC could be effective in other contexts. The main aspect that needs to be taken into consideration when seeking to transfer this study to other contexts is the limited sample size due to the high attrition rate. The attrition rate for this study was quite high due to the online nature of the study which resulted in participants feeling like they could easily stop attending. Additionally, since I did not have any personal connection to any of the participants it made retaining participants more difficult even if I offered compensation for their full participation. In the future, it may be beneficial to work with an online training organization or school district that could provide academic credits for participation to increase incentive or by conducting it with teachers that the researcher is connected to. This may improve motivation for initial participation and continued participation. If this study were to be conducted in an in-person environment at a school site or a neutral

location within the community, it may also improve participation as the participants would feel more connected to their community.

While conducting this study with an in-person location may increase participation, an in-person community of practice could undermine the goal of the MTMC, of having teachers from various schools across the country come together to collaborate. For each participant, exposure to the varying perspectives of teachers from outside of their district was a key aspect of the MTMC that all participants greatly enjoyed. By having participants have the opportunity to hear from other teachers that were not just from outside of their district, but from outside of their state entirely, it supports participant self-efficacy through diverse vicarious experiences. An online community of practice allows for a broader audience and therefore a broader range of experiences that participants can learn from vicariously. Additionally, when deciding whether this intervention should take place in-person or online, it is important to keep in mind that the types of activities can differ between environments and there should be purposeful moments built in for participants and the facilitator, in an online setting, to develop a sense of trust with each other. For some participants, an online community of practice with others outside whom they do not know may open up more opportunities for them to openly share without fear of judgement because the other participants do not have any prior knowledge. This can also limit the potential for any power dynamic struggles since the online community of practice is non-evaluative. Finally, there are certain states within the United States that are creating limitations on what teachers can implement, discuss, and have access to. Unfortunately, recent politics have greatly impacted the education field and there may be teachers across the country that need a

virtual community for support because these opportunities are not provided to them within their own school districts or even statewide.

Overall, the main limitation of this study to take into consideration when interested in transferring it to other contexts is that of attrition. An online community can be and has proven to be effective in other studies (Goos & Bennison, 2008; Ulla & Perales, 2021; Vavasseur & MacGregor, 2008; Wu et al., 2012). These effective online communities may also be needed as certain teachers may feel isolated and restricted in their own district due to political strife or restrictions. Therefore, a strong structure for participant incentive should be established whether that be monetary or by offering academic credit. Additionally, more opportunities for participants to share school specific data, can improve the contextual understanding that the participants are coming from and therefore further understand the results regarding professional capital and student impact.

Personal Reflection

Throughout my career as a middle school mathematics educator, I was always a participant within professional development sessions and occasionally a guest presenter, but never the one in charge of course design. This action research process put me in the unique leadership position of designing and implementing an online community of practice to support other middle school mathematics teachers. As a researcher and online community facilitator, I have grown not only as a leader, but as an educator myself. The two leadership skills I feel have greatly improved as a result of my role within this action research study are problem-solving and team building.

Prior to facilitating this group, I felt as if I had quality problem-solving skills since my role as an educator is filled with daily challenges that require quick decisions to

be made. Upon reaching the recruitment phase of my action research process, I realized that the problems I would face were ones that I have yet to encounter as a classroom teacher. As the attrition of members continued to rise, I had to quickly problem solve and make decisions on how I could increase the membership. Maintaining membership is still an area of growth for me as a leader, but I understand that there are factors of attrition that are out of my control, especially within the online community setting. Additionally, as I facilitated the MTMC, participants consistently requested resources and strategies based on the unique problems they faced in their classrooms. I could not assume the challenges and therefore could not plan ahead of time for all strategy requests. Therefore, I needed to learn how to continuously adapt plans and strategies biweekly to meet the needs of all the participants.

The second leadership skill I felt that I have developed as a result of this action research study is that of team building. Within my own professional context, I am the leader of my professional learning community and am comfortable with creating a sense of community within a group. While this is an area of comfort with me currently, it has always been with others that I have known personally for several years. Facilitating a group and building a team with other teachers whom I have never met before was a unique experience for me and one in which I felt I have grown from. Especially with the high attrition rate of the group, the beginning started off on somewhat unstable grounds as members came and went. Once I was able to maintain a solid core group of three educators in the group, I felt the sense of community and belonging grow. I was happy to hear while conducting the individual interviews that these three participants reported a connection with the group and each other. They also stated that they would like for the

group to continue even after the study has officially ended. While the sense of community felt rocky in the beginning, once the membership stabilized, I feel that I was able to fully focus on building that sense of community and team.

In addition to the significant amount of learning I found as a leader, I learned an ample amount about what it means to be a middle school mathematics teacher from my interactions with the three participants. The challenges they faced in the classroom were similar to ones that I faced in my own classroom regarding student motivation and out-of-school influences. The relationships that the participants built with their students and the way in which they built those relationships always impressed me. At the end of each meeting, I always felt as if I walked away amazed by the quality and level of expertise of the participants. While my role was not as a participant of the group, I was still continuously learning through the experiences of the participants. Some of the strategies that they shared during the meetings were ones that I have never thought or heard of. Just listening to the pure optimism of the participants and their motivation to support their students in whatever way they could was an inspiring experience. While my goal was to support them in their integration of SEL, I also learned a lot from them and will be taking this learning into my own practice as I enter my tenth year of teaching.

This dissertation journey has been incredibly eye-opening for me as a student, educator, and researcher. I have grown as a leader and middle school mathematics teacher in ways that I could have never imagined at the beginning of this experience. I am optimistic about where this road will take me and how I can continue to positively impact other teachers and their students. My dissertation begins with a quote from Mahatma Gandhi stating “By education I mean an all-around drawing out of the best in the child

and man; body, mind and spirit.”. My work with this action research study and within the MTMC drew the best out of me as a leader and educator. I can only hope that as I continue with my advocacy for supporting the social and emotional needs of students and teachers within the middle school mathematics classrooms, that I will be able to draw the best out of them.

Conclusion

There is a large emphasis on increasing the rigor of mathematics standards and pushing students to achieve higher test scores, but there are not provided opportunities for students to explicitly learn and practice social and emotional learning (SEL) strategies (e.g. perseverance, problem-solving, emotional regulation, collaboration, etc.) to support them through this increase in rigor and during times of increased anxiety and trauma, exacerbated by the current pandemic (Dymnicki et al., 2013; Simorangkir et al., 2021). If middle school math teachers can be fully prepared and informed on how to explicitly equip their students with SEL skills and support them through times of math learning anxiety and increased rigor, it can be powerful. The problem arises when teachers do not know how to provide their students with these resources (Duncan-Andrade, 2009). According to Fairbairn et al. (2021) and Furner and Higgins (2019), the way to address this is through collective action among teachers to engage in discourse and critical reflection to decrease the inequities within their classrooms.

This action research study was designed to address this problem of practice through the implementation of an online community of practice entitled the More Than Math Collective (MTMC). Results of this study demonstrate that when middle school mathematics teachers participate in an online community of practice that focus on shared

decision-making, reflections, and time to implement newly learned strategies, they may (a) improve their self-efficacy with integrating SEL into their classrooms when the focus is on building positive relationships with their students, (b) improve their professional capital, specifically human and decisional capital, when consistently collaborating with other educators from different school districts, and (c) positively impact their students through the implementation of strategies that integrate reflections, praise, and structured group work.

These findings are important because of the connections between teacher self-efficacy, professional capital, and well-being. Teacher self-efficacy can be supported through the development of professional capital (Nolan & Molla, 2017). When teachers participated in a community where they feel trusted, supported, and have a common goal, they developed a more positive self-efficacy and individual expertise as educators (Cajkler et al., 2014; Cwikla, 2007; Little, 2020). Additionally, when teachers feel high levels of comfort with implementing SEL in their classrooms, they are more likely to report higher levels of self-efficacy, job satisfaction, and overall well-being (Collie et al., 2012). Furthermore, teachers who report higher levels of comfort with implementing SEL in their classrooms are more likely to report lower levels of stress and burnout which can lead to a warmer and more supportive classroom learning environment (Collie et al., 2012; Schonert-Reichl, 2017). When students learn within this type of classroom environment, students are more likely to build positive relationships, build their own SEL skills, take risks when learning new math problems, make improvements in their math self-efficacy and achievement, engage in prosocial behaviors, and minimize negative feelings toward mathematics (Fairbairn et al., 2021; Fast et al., 2010; Fried, 2004;

Haglund, 2004; McCormick et al., 2015). The findings from this study suggest that by providing an online space for middle school mathematics teachers to meet virtually to discuss SEL challenges, provide and receive feedback, and have time to implement newly learned strategies, it can positively impact their self-efficacy, professional capital, and their students both academically and emotionally.

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APPENDIX A
RECRUITMENT MATERIALS

Do your math students struggle socially and emotionally?

Join the conversation by attending **More Than Math!**

Earn up to

\$50

February 27 - May 6

- ✓ Online Collaboration
- ✓ Relevant Strategies
- ✓ Time to Implement
- ✓ Positive Student Impact

Five Online Sessions Addressing:

- + Group Problem-Solving
- + Perspective-Taking
- + Math Anxiety & Trauma
- + Perseverance

Register with QR code

or go to <http://bitly.ws/AtEf>



More Than Math Collective

Facilitator: Erica Norcini
Contact Information: enorcini@asu.edu
When: March 6 - May 12
Where: Zoom & Google Classroom

Objectives

- Discuss social and emotional needs of current math students
- Brainstorm and review instructional strategies and resources to support student social and emotional needs in math classes
- Share positive impacts and current challenges in math classrooms related to SEL
- Implement strategies in math classrooms
- Reflect on the impact of implemented strategies.
- Collaborate on a shared list of SEL strategies for middle school math classrooms

Description

This is a small group of middle school math teachers who meet via Zoom bi-weekly to discuss current experiences within their classrooms, areas of need, and helpful resources related to SEL. The collective will meet bi-weekly for 10 weeks (1 week with one live meeting → 1 week implementation and reflection) to discuss integrating SEL strategies in their middle school math classrooms. View a detailed calendar of topics below. This is a research study as part of a doctoral dissertation and all participation is voluntary. Members may receive up to a \$50 gift card pending completion of all weeks of the study. In order to receive full compensation, all members must attend at least four live meetings, complete all five pre-work activities, complete all four strategy reflections, and complete the post-intervention survey.

Study Format

| Week 1 LIVE (3/6) | Week 2 OFFLINE | Week 3 LIVE (3/20) | Week 4 OFFLINE | Week 5 LIVE (4/3) | Week 6 OFFLINE | Week 7 LIVE (4/17) | Week 8 OFFLINE | Week 9 LIVE (5/1) | Week 10 OFFLINE |
|---|-------------------|--------------------------|-------------------|-------------------------|---|--------------------------|-------------------|-------------------------|--------------------|
| Weekly Activities | | | | | | | | | |
| Live Weeks on Zoom (1,3,5,7,9*) | | | | | Offline Weeks in Classrooms (2,4,6,8,10*) | | | | |
| Discuss personal math journeys, resources, strategies, positive impacts, and current challenges. Select a strategy to implement within classrooms the following week. Add helpful resources and strategies to a Shared SEL Toolbox or Suggestion Bank. *Final live week with a focus on group reflections | | | | | Implement the chosen strategy in math classrooms. Reflect on strategy impact by completing an online strategy reflection. Communicate by sending messages via online discussion group for support as needed. *Interview week and final data collection. | | | | |

Calendar

*All topics may be subject for modification depending on participant interest and needs.

| Week | Topic & SEL Connection | Pre-Work | Tasks |
|-------------------|--|---|--|
| 1 LIVE 3/6 | Topic: Introductions & Classroom Portraits SEL: Responsible Decision-Making | <u>Video:</u> <input type="checkbox"/> What is SEL? <u>Task:</u> <input type="checkbox"/> Pre-Intervention Survey | <input type="checkbox"/> Attend Live Meeting on Zoom |
| 2 | Implementation Week | | <input type="checkbox"/> Implement Strategy in Classroom <input type="checkbox"/> Complete Reflection Form <input type="checkbox"/> Complete Pre-Work for Week 3 |
| 3 LIVE 3/20 | Topic: Group Work (Problem-Solving) SEL: Relationship Skills/ Responsible Decision-Making | <u>Video:</u> <input type="checkbox"/> The Math Interview <u>Task:</u> <input type="checkbox"/> Creating a Decision-Making Tool | <input type="checkbox"/> Attend Live Meeting on Zoom |
| 4 | Implementation Week | | <input type="checkbox"/> Implement Strategy in Classroom <input type="checkbox"/> Complete Reflection Form <input type="checkbox"/> Complete Pre-Work for Week 5 |
| 5 LIVE 4/3 | Topic: Group Work (Perspective-Taking) SEL: Social Awareness | <u>Video:</u> <input type="checkbox"/> Building Argumentation Skills <u>Task:</u> <input type="checkbox"/> Math and Morality Problem | <input type="checkbox"/> Attend Live Meeting on Zoom |
| 6 | Implementation Week | | <input type="checkbox"/> Implement Strategy in Classroom <input type="checkbox"/> Complete Reflection Form <input type="checkbox"/> Complete Pre-Work for Week 7 |

| Week | Topic & SEL Connection | Pre-Work | Actions |
|-------------------|--|--|--|
| 7 LIVE 4/17 | Topic: Anxiety & Negative Emotions SEL: Self-Management/ Self-Awareness | <u>Video:</u> <input type="checkbox"/> Why Do People Get So Anxious About Math? (TedEd) <u>Task:</u> <input type="checkbox"/> Student Portraits | <input type="checkbox"/> Attend Live Meeting on Zoom |
| 8 | Implementation Week | | <input type="checkbox"/> Implement Strategy in Classroom <input type="checkbox"/> Complete Reflection Form <input type="checkbox"/> Complete Pre-Work for Week 9 |
| 9 LIVE 5/1 | Topic: Reflections & Perseverance SEL: Self-Management/ Self-Awareness | <u>Video:</u> <input type="checkbox"/> Cultivating Growth Mindsets <u>Task:</u> <input type="checkbox"/> More Than Math Collective Reflection | <input type="checkbox"/> Attend Live Meeting on Zoom <input type="checkbox"/> Sign-Up for Interview |
| 10 | Post Intervention Interview Week | | <input type="checkbox"/> Complete Post-Intervention Survey <input type="checkbox"/> Participate in Interviews <input type="checkbox"/> Receive Compensation! |
| TBD | Data Presentation | | <input type="checkbox"/> Attend Presentation of Findings and Conclusions |

More Than Math: A Virtual Middle School Math Collective Screening Form

Are you a middle school math teacher? Are your students having difficulty interacting with each other and persevering through difficult problems? If you answered “yes” to both questions, you are invited to participate in a research study conducted by Arizona State University! We are looking for 6 to 7 participants to join the More Than Math Collective and have the chance to receive up to a \$50 gift card! The purpose of this collective of middle school math teachers is to come together to discuss the social and emotional needs of our students and how we can better support them by integrating social and emotional strategies into our instructional practices. This collective will meet biweekly across 10 weeks with 5 live meetings through Zoom, 4 implementation weeks, and 1 interview week. Participation is voluntary. If you are interested in participating please complete the screening form below. The data collected in this form is solely used for screening purposes and will not be used in the study itself. Only 6 to 7 form responses will be invited to participate in the study. All those selected to participate will be notified via email by **February 19th**. For more information, contact Erica Norcini at enorcini@asu.edu .

Click [here](#) to view a more detailed calendar of what to expect with this 10 week study.

First Name

Last Name

Email Address

Which U.S. state are you located in?

How many years have you been teaching?

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21+ years

Current grade level(s) you are teaching

- 6th grade
- 7th grade
- 8th grade

Do you have a degree in education?

- Yes
- No

Are you in good standing with your school district? (no disciplinary action, suspension, etc).

- Yes
- No

How many math classes do you currently teach?

- 1
- 2
- 3
- 4
- 5
- More than 5

Previous grade levels taught

- Pre-K
- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade
- 7th grade
- 8th grade
- 9th grade
- 10th grade
- 11th grade
- 12th grade
- Higher Education

Why are you interested in participating in this group?

Do you understand that this is a 10-week commitment with 5 live meetings that you are expected to attend and participate in?

- Yes, I understand and can commit to attending five live meetings.
- No, I cannot commit to attending five live meetings.

This group will meet one day every other week virtually for 1.5 hours over 10 weeks. The weeks for the live meetings are below. Please select the days and times you are available to meet every week. All times are reported in EST.

| | Live Meeting Dates |
|--|-----------------------|
| Week 1 | (February 26-March 4) |
| Week 3 | (March 12-March 18) |
| Week 5 | (March 26-April 1) |
| Week off for Spring Break (April 3-April 9) | |
| Week 7 | (April 16-April 22) |
| Week 9 | (April 30-May 6) |

Every Monday

- 5:00 pm - 6:30 pm EST
- 7:00 pm - 8:30 pm EST
- I am not available on Mondays

Every Saturday

- 10:00 am - 11:30 am EST
- 11:00 am - 12:30 pm EST
- I am not available on Saturdays

Every Wednesday

- 5:00 pm - 6:30 pm EST
- 7:00 pm - 8:30 pm EST
- I am not available on Wednesdays

Every Sunday

- 10:00 am - 11:30 am EST
- 11:00 am - 12:30 pm EST
- I am not available on Sundays

Every Thursday

- 5:00 pm - 6:30 pm EST
- 7:00 pm - 8:30 pm EST
- I am not available on Thursdays

Please include the dates of your district Spring Break this year.

State any specific days/times you are not available to meet.

All materials and tasks will be housed in Google Classroom. What additional way would you feel comfortable communicating with the group?

- Facebook Messenger
- Slack
- Discord
- WhatsApp
- Other: _____

What SEL topics would you be interested in learning more about to implement in your math classroom?

- Problem-Solving Skills
- Group Collaboration Skills
- Supporting Students with Anxiety and Trauma
- Perseverance Skills
- Other: _____

Any additional questions or comments?

Thank you for completing the screening form for the More Than Math Collective!

APPENDIX B
DETAILED LESSON PLANS

WEEK 1 AGENDA

| Skill Introductions and SEL Toolbox | | SEL Connection Responsible Decision-Making |
|--|---|---|
| <u>Slideshow Presentation</u> | | |
| Time | Topic | Description |
| Pre-Work | Watch Video: What is Social and Emotional Learning? Complete Task: Pre-Intervention Survey | |
| 7:00 — 7:15 | Introductions | Members will introduce themselves to each other. |
| 7:15 — 7:35 | Structure of the Group & My Math Story | My Math Story Speaker: Erica Share structure and group norms of MTMC. Share personal relationships with math as a student and a teacher. |
| 7:35 — 8:15 | 1:1-One Impact & One Challenge | Each participant will share one positive impact they have had on a student and one challenge they are currently facing in their classrooms. Participants will share advice, strategies, and practices on how to address challenges. |
| 8:15 — 8:20 | Choosing a Strategy for Implementation Week | Each participant will choose a strategy or tool to implement in the upcoming week. |
| 8:20 — 8:30 | Closing and Next Steps | Discuss next steps for upcoming implementation week and live meeting. |
| Notes: | | |

WEEK 3 AGENDA

| Skill Group Work/Problem Solving | | SEL Connection Relationship Skills & Responsible Decision-Making |
|-------------------------------------|--|---|
| Time | Topic | Description |
| Pre-Work | Watch Video: The Math Interview (Edutopia) Create or Find: A Decision-Making Tool/Checklist for Problem-Solving | |
| 7:00 — 7:05 | MTMC Updates | Erica will frame the session and provide updates on resources that have been posted in the Google Classroom. |
| 7:05 — 7:10 | My Math Story | Speaker: Jessica Share personal relationships with math as a student and a teacher. |
| 7:10 — 7:45 | Resource Discussion | <ul style="list-style-type: none"> ● Discussion of the Math Interview video and strategy. ● Share Decision-Making Tool for Problem-Solving and provide feedback. |
| 7:45 — 8:15 | 1:1-One Impact & One Challenge | <ul style="list-style-type: none"> ● Each participant will share updates on their experience with implementing a strategy in their classrooms. ● Participants will share advice, strategies, and practices on how to address challenges. SEL Toolbox will be updated. |
| 8:15 — 8:30 | Choosing a Strategy for Implementation Week | <ul style="list-style-type: none"> ● Erica will share current areas of needs expressed from the surveys and topics to be addressed in the next meeting as well as share the upcoming to-do list. ● Each participant will choose a strategy or tool to implement in the upcoming week. |
| Notes: | | |

WEEK 5 AGENDA

| Skill Group Work & Perspective-Taking | | SEL Connection Relationship Skills & Social Awareness |
|--|---|---|
| Time | Topic | Description |
| Pre-Work | <p><u>Watch Video:</u> Building Argumentation Skills</p> <p><u>Complete:</u> Nice is Not Enough Morality Task</p> | |
| 7:00 — 7:05 | MTMC Updates | Frame the session and provide updates on shared resources. |
| 7:05 — 7:10 | Introductions | New members will introduce themselves to the group. |
| 7:10 — 7:45 | Resource Discussion | <ul style="list-style-type: none"> ● Discussion of the Argumentation Skill video and strategy. ● Discussion of responses to the <i>Nice is Not Enough</i> Task. |
| 7:45 — 8:15 | 1:1-One Impact & One Challenge | <ul style="list-style-type: none"> ● Each participant will share updates on their experience with implementing a strategy in their classrooms. ● Participants will share advice, strategies, and practices on how to address challenges. SEL Toolbox will be updated. |
| 8:15 — 8:30 | Choosing a Strategy for Implementation Week | Each participant will choose a strategy or tool to implement in the upcoming week. |
| Notes: | | |

WEEK 7 AGENDA

| Skill Anxiety & Negative Emotions | | SEL Connection Self-Management & Self-Awareness |
|--------------------------------------|---|---|
| Time | Topic | Description |
| Pre-Work | <p>Watch Video: Why Do People Get So Anxious About Math? (TedEd)</p> <p>Watch Video: Making Sure Each Child is Known</p> <p>Task: Brainstorm Response Strategies to Different Negative Emotions</p> | |
| 7:00 — 7:05 | MTMC Updates | Frame the session and provide updates on shared resources. |
| 7:05 — 7:10 | Resource Discussion | <ul style="list-style-type: none"> ● Discussion of Math Anxiety video. ● Discussion of Making Sure Each Child is Known video. ● Discussion of response strategies for different emotions students display in class. ● Create a bank of calming strategies for students experiencing anxiety, frustration, anger, or other negative emotion to include in the SEL Toolbox. |
| 7:10 — 7:45 | 1:1-One Impact & One Challenge | <ul style="list-style-type: none"> ● Each participant will share updates on their experience with implementing a strategy in their classrooms. ● Participants will share advice, strategies, and practices on how to address challenges. SEL Toolbox will be updated. |
| 7:45 — 8:15 | Choosing a Strategy for Implementation Week | Each participant will choose a strategy or tool to implement in the upcoming week. |
| Notes: | | |

WEEK 9 AGENDA

| Skill Closing, Reflections, & Perseverance | | SEL Connection Self-Management & Self-Awareness |
|---|--|---|
| Time | Topic | Description |
| Pre-Work | <u>Watch Video:</u> Learning to Measure the Size of a Problem <u>Complete:</u> More Than Math Collective Reflection | |
| 7:00 — 7:05 | MTMC Updates | Frame the session and provide updates on shared resources. |
| 7:05 — 7:25 | Resource Discussion | <ul style="list-style-type: none"> ● Discussion of Learning to Measure the Size of a Problem ● Reflect on the More Than Math Collective Experiences |
| 7:25 — 7:45 | 1:1-One Impact & One Challenge | <ul style="list-style-type: none"> ● Each participant will share updates on their experience with implementing a strategy in their classrooms. ● Participants will share advice, strategies, and practices on how to address challenges. SEL Toolbox will be updated. |
| 7:45 — 7:50 | Sign-Up for Interview Slot | Participants will sign up for a time to participate in an interview. <ul style="list-style-type: none"> ● Post-Intervention Survey ● Interviews ● Member Checking |
| 7:50 — 8:00 | Upcoming Tasks | <ul style="list-style-type: none"> ● Optional Strategy Reflection (due by May 12th) ● Interviews (Week of May 8th) ● Post-Intervention Survey (due today May 1st) ● Receive Compensation! ● Member Checking (TBD) |
| 8:00 — 8:15 | Post-Intervention Survey | Participants will be provided time to complete the post-intervention survey. |
| Notes: | | |

APPENDIX C
IMPLEMENTATION REFLECTION

Weekly Strategy Reflection

To keep responses anonymous and connect your pre and post survey responses as well as your strategy reflection, please type your unique identifier below by typing your school mascot followed by the last four digits of your phone number. (ex. School Mascot: Ravens, Last Four Digits of Phone Number: 9876. Unique Identifier = Ravens9876)

1. What strategy or instructional practice did you implement this week?

2. Describe any observations in regard to student behavior, achievement, or classroom environment related to the strategy or instructional practice you implemented.


3. Describe an instance of success you experienced this week.



4. Describe any current areas of need or improvement with SEL integration in your math classroom.

5. Are there any topics of interest you would like to be discussed in a future meeting? If so, please write below.



APPENDIX D
SHARED SEL TOOLBOX

SHARED SEL TOOLBOX



|  Reference Materials From Google Classroom | |
|---|--|
| Resource Name with Link | Description |
| CASEL SEL Signature Practices Playbook | The SEL 3 Signature Practices are one tool for fostering a supportive environment and promoting SEL. They intentionally and explicitly help build a habit of practices through which students and adults enhance their SEL skills. While not an SEL curriculum, these practices are one concrete example of a way to help people understand and practice the goals of an overall systemic SEL implementation plan. |
| SEL in Elementary Math Examples | The purpose of this document is to draw on these previous reviews of evidence-based programs to identify and describe some of the most common strategies used to promote student SEL. |
| CASEL District Resource Center | CASEL is the leading organization for SEL and is the organization that formally defined SEL in 1994. They have created a district resource center that is free to sign up for and access a significant amount of SEL resources, activities, lessons, etc. I am including the link below for you to have the option to create a free account! |
| Math Teacher Lounge Podcast | Math Teacher Lounge is a biweekly podcast created specifically for K-12 math educators. In each episode, co-hosts Bethany Lockhart Johnson (@lockhartedu) and Dan Meyer (@ddmeyer) chat with expert guests, taking a deep dive into the math and educational topics you care about. <u>Season 5 is specifically focused on Math Anxiety!</u> |
| Budgeting Course: Show Me the Money! | A course that I designed for summer school on financial literacy. This will take you to the folder in my Google Drive that houses all of the materials. By the end of the course students will be able to understand financial vocabulary terms, develop a budget in order to organize your spending, and solve real-world financial decisions using percentages and decimals. |

|  Self-Management | |  Self-Awareness | |
|---|--|--|---|
| <i>The abilities to manage one's emotions, thoughts, and behaviors effectively in different situations and to achieve goals and aspirations</i> | | <i>The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts.</i> | |
| Resource Name with Link | Description | Resource Name with Link | Description |
| Utilizing Different Colors During Group Work | When students are working in groups on a combined problem, each student will have a different color to write with. This will display who contributed to what part of the problem. | Assessment Reflection After Testing | Students may complete a written reflection at the end of a test, or they can rate how they feel like they did at the end of the test on a scale of 1-4. |
| Utilizing the Frayer Model During Group Work | Students all solve a problem on one of four corner sections of the model. The middle will be where all members agree upon what the answer is and how to solve the problem. | 7 Defining Moments | Students complete a worksheet where they identify 7 defining moments in their life so far and turn it in. The moments may be positive or negative, but they must have been impactful to who they are today. |
| Building Argumentation Skills in Math | Instead of rushing to find a solution, this math activity forces students to slow down, consider evidence, and deepen their understanding of the concepts. | Boom Board | Have a space in your classroom where students can post anything good that has happened to them or something they want to celebrate. |
| 1, 2, 3, Then Me | Steps for students to follow and plan how to approach a task. Give students: One minute to go over the directions silently, Two minutes to discuss the directions with each other, Three minutes to plan their approach to the task. Only then can the students ask for assistance. | Stuck on an Escalator | This video can be played in class to spark discussion around how some problems can be easily solved with a simple solution. |

| | | | |
|---|--|---|---|
| Colored Cups | Serves as a communication method that students control to indicate when they need assistance, clarification, or further instruction. <ul style="list-style-type: none"> Green cup: I am/we are fine—no teacher help needed. Yellow cup: I/we need teacher help but can continue working while waiting for it. Red cup: I/we need teacher help immediately and have stopped working. | Assessment Reflection Before Testing | Have students complete a short reflection to say how they feel about the test coming up, how they plan on studying, and any support they need. Use this as a tool to inform upcoming review for class and for providing students information on where to find resources to help them study. |
| 4 Tips for Engaging Reluctant Math Learners | An article that explains four tips for approaching and engaging reluctant learners in the math classroom. | Negative Emotion Reaction and Response Support Document | Bank of various lived experiences with various negative emotions and teacher responses to those emotions. |
| Emotional Affect in Mathematics by Eric Marshall | This research study explored the impacts of an intervention that utilized discussing emotions tied to mathematics along with classroom best practices to reduce mathematics anxiety and promote positive student affect towards mathematics. | 100 Prompts for Getting to Know You | 100 prompts for students to reply to for getting to know you with students. |
| Every Young Person Needs to Hear this (Motivational Video) by Jeremy Anderson | Jeremy Anderson is one of the top School Motivational Speakers. He is also a Youth Expert that is a powerful and passionate speaker for Middle & High School Students. | Learning to Measure the Size of a Problem | Teachers at Lister Elementary School, in Tacoma, Washington, help students compare and contrast the sizes of problems by having them fill out a Big vs. Little Problems worksheet with examples. |
| Your Value (Motivational Video) by Jeremy Anderson | Jeremy Anderson uses the metaphor of a crumpled dollar to show students that if they feel like they are pushed aside, stomped on, or crumpled up, they still have value. | Quick Journal Before a Test | Right before students take a test, have them do a brain dump of all of their feelings about the test on a piece of paper. This will assist students in unloading the anxious and pervasive thoughts. |

| Various Motivational Videos for Test Preparation | This post shares some test prep videos that you can use for motivation and encouragement, ranging from songs to inspirational speeches and true-life stories. | Motivating the Unmotivated Handbook | This handbook focuses on various strategies for motivating students in your classroom that appear disinterested or disengaged from instruction. Your Handbook Password: seminars |
|---|---|---|--|
| Exam Motivation by Michelle Obama | Michelle Obama speaks about the power of success, education, and achieving. | | |
|  Social Awareness | |  Relationship Skills | |
| <i>The abilities to understand the perspectives of and empathize with others, including those from diverse backgrounds, cultures, & contexts.</i> | | <i>The abilities to establish and maintain healthy and supportive relationships and to effectively navigate settings with diverse individuals and groups.</i> | |
| Resource Name with Link | Description | Resource Name with Link | Description |
| Chatting During a Test | While taking a test, allow 30 seconds to talk every 5 minutes. They can talk about the test and ask any questions to their neighbor, but once the 30 seconds is over, they must return to silently completing the test. | The Math Interview | At Henderson Inclusion School, middle school teacher Connell Cloyd uses a math interview worksheet to give his students discussion prompts to help guide their conversation. |
| Nice is Not Enough: Facilitating Moral Development by Larry Nucci | Filled with examples of authentic lesson plans based on social studies, literacy, the sciences, art, and math for elementary, middle school and high school students, this unique and practical text conveys a more accurate account of moral development, especially in adolescence. | Simple SEL Practices to Start the Day | 15+ simple SEL practices to begin any class. |

| | | | |
|---|---|--|--|
| 60 Second Shout-Outs | A shout-out is a positive comment given from one peer to another. Shout-outs are an effective strategy for anyone, and you can throw them in anywhere. Ask each group to give a shout-out to someone that they noticed was doing a particularly good job, or doing something difficult for them. | Resources for Supporting SEL and Co-Teaching | Resource document that contains several resources and articles that cover best co-teaching practices, how to have critical conversations with your co-teacher, and generating buy-in for SEL among teachers. |
| Frayer Model for End of Year Testing Review | Form students into groups with a different topic/standard assigned to them. The group must then come up with as many things that they know about that topic and fill in the Frayer Model. Everything they record must be recorded into 5 different categories, but the group must decide what the main categories of the topics are. After each group believes they have fully completed their review model, they will have 5 minutes to present it to the class. | Making Sure Each Child is Known | A simple activity to do alone, with a grade-level team, or a whole school staff to identify how well you know your students. |
| Teaching Mathematics for Social Justice: Reflections on a Community of Practice for Urban High School Mathematics Teacher | Meeting regularly as a community of practice, the teachers and author/researcher discussed issues of teaching mathematics for social justice; explored activities and lessons around social justice; and created a unit of study that attempted to meet high school level mathematics standards, while addressing a social justice issue affecting the lives of urban students. | 100 Prompts for Students to Write About | 100 various prompts for students to write or discuss about as a getting to know you opener or independent discussion. |
| Social Justice Math Resources | A padlet that houses a variety of resources between that connect social justice and mathematics | Quick Response Journaling | Provide each student with a journal. In the beginning of the week, have students write a page about a given prompt. The teacher will respond to each journal entry |

| | | | by the time the students get the journal back at the beginning of the next week and the process starts over again. |
|---|--|--|--|
| Math That Matters | A teacher resource book linking math to social justice | | |
| Under the Surface (Video) | This video shows various members of a school building and the hidden struggles they face that others may not be aware of. | | |
|  Responsible Decision-Making | |  General SEL Reference Books | |
| <i>The abilities to make caring and constructive choices about personal behavior and social interactions across diverse situations.</i> | | <i>A list of general SEL reference books that contain a variety of strategies, resources, informational content, and lesson ideas.</i> | |
| Resource with Link/Strategy | Description | Book Title with Amazon Link | Summary |
| Math Checklist/ Decision-Making Tool | A compilation of various decision-making and problem solving checklists. | The SEL Solution by Jonathan C. Erwin | The SEL Solution provides everything teachers need to create a safe and positive learning environment. With dozens of fun and easy-to-do lessons and activities, educators have a clear path to integrate SEL lessons into social studies and language arts curriculum as well as throughout the school day. |
| Cheat Sheet for a Test | Tell students that they will be able to use a "cheat sheet" on the upcoming test. This "cheat sheet" can be the size of an index card or as large as a half sheet of paper. Students can write anything they want on it to help them with the upcoming test, but | Leading for Change: Through Whole-School Social-Emotional Learning by Jennifer E. Rogers | The real-world experiences and evidence-based strategies outlined in this book will guide implementation of a practical and sustainable social emotional learning program. In addition |

| | | | |
|---|--|---|---|
| | they have to decide what is important information to include. The card is then turned in for anywhere from 1-5 points on test day. This strategy gets students motivated to productively study for an upcoming test. | | to an integrated workbook you will find: 1. recommendations for steps with each strategy in an implementation rubric 2. reflection questions to promote deeper thinking on SEL 3. resources to explore at the end of each chapter |
| What Do Mathematicians Do When They Get Stuck on a Math Task? | Anchor chart to assist students with decision-making whenever they are stuck on a math problem. | All Learning is Social and Emotional by Nancy Frey, Douglas Fisher, and Dominique Smith | The authors offer a comprehensive, five-part model of SEL that's easy to integrate into everyday content instruction, no matter what subject or grade level you teach. Along with a toolbox of strategies for addressing 33 essential competencies, you'll find real-life examples highlighting the many opportunities for social and emotional learning within the K-12 academic curriculum. |
| | | SEL Every Day: Integrating Social and Emotional Learning with Instruction in Secondary Classrooms by Meena Srinivasan | This book draws on the latest research and resources to offer individual teachers and teacher teams an accessible guide to incorporating SEL into everyday teaching in middle- and high- school classrooms. |
| | | Everyday SEL in Middle School by Carla Tantillo Philibert | Perfect for middle school educators at any level of experience, the book will help you develop positive youth identity and promote connectedness so students can deal successfully with life's stressors beyond school doors. |

| U Math Hook Videos | |
|---|--|
| The Weird Number | An adventure story which introduces rational numbers. Tells about the visit of the first rational number to a community of natural numbers. |
| Line 'em Up | This fun song was made to remind everyone to "Line 'em Up" before solving an equation! Whether you're a high school student preparing for the SAT and ACT, this song will be that friendly reminder to get those decimals lined up before any mathematical processes take place! |
| Combining Like Terms with Fast Food | Video from MAD TV that shows students how combining like terms can make your life easier. Students can try to reword (or rewrite) this order to make it simpler. |

APPENDIX E
PRE-INTERVENTION SURVEY

Pre-Intervention Survey

The purpose of this survey is to measure middle school mathematics teachers' self-efficacy with implementing social and emotional learning instructional strategies in their classrooms and the development of their professional capital. The responses will remain anonymous by using a unique identifier to connect the pre- and post-survey responses. To keep responses anonymous and connect your pre and post survey responses as well as your strategy reflection, please type your unique identifier below by typing your school mascot followed by the last four digits of your phone number.

(ex. School Mascot: Ravens, Last Four Digits of Phone Number: 9876. Unique Identifier = Ravens9876)

| Self-Efficacy | Strongly Disagree | Disagree | Agree | Strongly Agree |
|--|----------------------|----------|-------|-------------------|
| Teacher Social Emotional Learning | | | | |
| 1. I feel confident in my ability to regulate my emotions when disciplining students. | 1 | 2 | 3 | 4 |
| 2. I feel confident in balancing both the emotional and academic needs of my students during instruction. | 1 | 2 | 3 | 4 |
| 3. I feel confident in my ability to understand the diverse experiences of my students and respond to their emotional cues during class. | 1 | 2 | 3 | 4 |
| 4. I feel confident in my ability to build positive relationships with all of my students. | 1 | 2 | 3 | 4 |
| 5. I feel confident in identifying areas of strength and growth in my teaching practices. | 1 | 2 | 3 | 4 |
| Student Social Emotional Learning | | | | |
| 6. I feel confident in my ability to foster a growth mindset with my students. | 1 | 2 | 3 | 4 |
| 7. I feel confident in my ability to support my students when they feel stressed or anxious during math instruction. | 1 | 2 | 3 | 4 |
| 8. I feel confident in my ability to provide students with various critical thinking strategies to approach difficult problems. | 1 | 2 | 3 | 4 |
| 9. I feel confident in my ability to help my students solve interpersonal conflicts while working in collaborative groups. | 1 | 2 | 3 | 4 |
| 10. I feel confident in my ability to instruct students on how to actively listen and respect different perspectives while working in a collaborative group. | 1 | 2 | 3 | 4 |

11. Please describe a current student in your classroom that is currently struggling academically. (do not use names)
12. Please describe a current student in your classroom that is currently struggling with something that is not academic. (do not use names)

| |
|--|
| |
| |

Professional Capital

Strongly Disagree Disagree Agree Strongly Agree

Human Capital

- | | | | | |
|--|---|---|---|---|
| 13. I have the skills and knowledge to integrate social and emotional learning into my math curriculum. | 1 | 2 | 3 | 4 |
| 14. I know I can teach social and emotional learning skills to my math students. | 1 | 2 | 3 | 4 |
| 15. I regularly search for learning opportunities about addressing social and emotional learning in math classrooms. | 1 | 2 | 3 | 4 |
| 16. I have the skills and knowledge to support students who struggle socially and emotionally in my math classroom. | 1 | 2 | 3 | 4 |

Social Capital

- | | | | | |
|---|---|---|---|---|
| 17. I regularly collaborate with other teachers in order to share new strategies to enhance teaching and learning in my math classroom. | 1 | 2 | 3 | 4 |
| 18. I regularly collaborate with other teachers to identify ways to support students socially and emotionally in my math classroom. | 1 | 2 | 3 | 4 |
| 19. If I am having difficulties with a students' academics or behavior, I collaborate with other teachers to find various ways to support the student in my math classroom. | 1 | 2 | 3 | 4 |

Decisional Capital

- | | | | | |
|--|---|---|---|---|
| 20. I can quickly and easily adapt my math instruction in order to meet the needs of my students without straying from the objective or standards. | 1 | 2 | 3 | 4 |
| 21. The decisions I make in my math classroom are based on research and experience. | 1 | 2 | 3 | 4 |
| 22. I regularly reflect on areas of strength and growth after a lesson in order to improve the lesson for future use. | 1 | 2 | 3 | 4 |
| 23. I am comfortable providing support and coaching to other teachers. | 1 | 2 | 3 | 4 |

Background Information

What is your gender?

- Male
- Female
- Nonbinary
- Prefer Not to Say

Which of the following best describes your race/ethnicity?

- White
- Black
- Hispanic
- Asian
- Mixed Race
- Other: _____

What is your age group?

- 21-29
- 30-39
- 40-49
- 50-59
- 60+

How many years have you been teaching?

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- Over 25 years

How many years have you been teaching at the middle school level?

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- Over 25 years

Have you ever attended a training in social and emotional learning?

- Never
- Yes, through my district
- Yes, through a degree program
- Yes, personally-sought professional development

APPENDIX F
POST-INTERVENTION SURVEY

Post-Intervention Survey

The purpose of this survey is to measure middle school mathematics teachers' self-efficacy with implementing social and emotional learning instructional strategies in their classrooms and the development of their professional capital. The responses will remain anonymous by using a unique identifier to connect the pre- and post-survey responses. To keep responses anonymous and connect your pre and post survey responses as well as your strategy reflection, please type your unique identifier below by typing your school mascot followed by the last four digits of your phone number.

(ex. School Mascot: Ravens, Last Four Digits of Phone Number: 9876. Unique Identifier = Ravens9876)

| Self-Efficacy | Strongly Disagree | Disagree | Agree | Strongly Agree |
|--|----------------------|----------|-------|-------------------|
| Teacher Social Emotional Learning | | | | |
| 1. I feel confident in my ability to regulate my emotions when disciplining students. | 1 | 2 | 3 | 4 |
| 2. I feel confident in balancing both the emotional and academic needs of my students during instruction. | 1 | 2 | 3 | 4 |
| 3. I feel confident in my ability to understand the diverse experiences of my students and respond to their emotional cues during class. | 1 | 2 | 3 | 4 |
| 4. I feel confident in my ability to build positive relationships with all of my students. | 1 | 2 | 3 | 4 |
| 5. I feel confident in identifying areas of strength and growth in my teaching practices. | 1 | 2 | 3 | 4 |
| Student Social Emotional Learning | | | | |
| 6. I feel confident in my ability to foster a growth mindset with my students. | 1 | 2 | 3 | 4 |
| 7. I feel confident in my ability to support my students when they feel stressed or anxious during math instruction. | 1 | 2 | 3 | 4 |
| 8. I feel confident in my ability to provide students with various critical thinking strategies to approach difficult problems. | 1 | 2 | 3 | 4 |
| 9. I feel confident in my ability to help my students solve interpersonal conflicts while working in collaborative groups. | 1 | 2 | 3 | 4 |
| 10. I feel confident in my ability to instruct students on how to actively listen and respect different perspectives while working in a collaborative group. | 1 | 2 | 3 | 4 |

For the next two questions, think about the students you described as struggling in the pre-intervention survey.

11. How has the student you described as academically struggling been impacted since your initial description?
12. How has the student you described as non-academically struggling been impacted since your initial description?

| |
|--|
| |
| |

| Professional Capital | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|-------------------|----------|-------|----------------|
| Human Capital | | | | |
| 13. I have the skills and knowledge to integrate social and emotional learning into my math curriculum. | 1 | 2 | 3 | 4 |
| 14. I know I can teach social and emotional learning skills to my math students. | 1 | 2 | 3 | 4 |
| 15. I regularly search for learning opportunities about addressing social and emotional learning in math classrooms. | 1 | 2 | 3 | 4 |
| 16. I have the skills and knowledge to support students who struggle socially and emotionally in my math classroom. | 1 | 2 | 3 | 4 |
| Social Capital | | | | |
| 17. I regularly collaborate with other teachers in order to share new strategies to enhance teaching and learning in my math classroom. | 1 | 2 | 3 | 4 |
| 18. I regularly collaborate with other teachers to identify ways to support students socially and emotionally in my math classroom. | 1 | 2 | 3 | 4 |
| 19. If I am having difficulties with a students' academics or behavior, I collaborate with other teachers to find various ways to support the student in my math classroom. | 1 | 2 | 3 | 4 |
| Decisional Capital | | | | |
| 20. I can quickly and easily adapt my math instruction in order to meet the needs of my students without straying from the objective or standards. | 1 | 2 | 3 | 4 |
| 21. The decisions I make in my math classroom are based on research and experience. | 1 | 2 | 3 | 4 |
| 22. I regularly reflect on areas of strength and growth after a lesson in order to improve the lesson for future use. | 1 | 2 | 3 | 4 |
| 23. I am comfortable providing support and coaching to other teachers. | 1 | 2 | 3 | 4 |

More Than Math Collective Feedback

| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|-------------------|----------|-------|----------------|
| 24. The MTMC was effective in developing my SEL support and integration skills in my math classroom. | 1 | 2 | 3 | 4 |
| 25. I feel that the topics, strategies, and resources discussed in the MTMC were useful and relevant to implement in my math classroom. | 1 | 2 | 3 | 4 |
| 26. I feel that I improved as a middle school mathematics educator as a result of participating in the MTMC. | 1 | 2 | 3 | 4 |
| 26. Please state an aspect of the MTMC that you felt was effective in developing yourself as a mathematics educator. | | | | |
| 27. Please state an aspect of the MTMC that you felt could be improved upon for future groups. | | | | |

APPENDIX G
SEMI-STRUCTURED INTERVIEWS

Initial Briefing

The purpose of this interview is to discuss your confidence level in integrating social-emotional learning in your math classes, the development of your professional capital, and your overall experiences with the More Than Math Collective. Please make sure when you are responding to questions to not use the names of any students. As a reminder, this interview will be audio recorded for data analysis purposes. Do you have any questions before we proceed?

Self-Efficacy

1. Describe your confidence level in supporting your students socially and emotionally in your mathematics classrooms.
2. Do you feel as if your confidence level in integrating social and emotional learning into your mathematics classes has changed because of your participation in the More Than Math Collective?
3. Which of the 5 core SEL competencies (social awareness, relationships, self-awareness, self-management, and responsible decision making) do you feel the most confident with supporting your students' math learning? Why?
4. Which of the 5 core SEL competencies (social awareness, relationships, self-awareness, self-management, and responsible decision making) do you feel the least confident with supporting your students' math learning? Why?

More Than Math Collective Experiences

1. What is something you found helpful, interesting, or motivating from the More Than Math Collective?
2. What is something you felt was missing, could be improved, or did not find necessary in the More Than Math Collective?
3. How do you feel your students were impacted by the strategies and instructional practices you implemented in your classrooms each week?
4. What are some strategies or instructional practices that you would like to continue or try to implement in your math classrooms in the future?

Professional Capital Development

1. What new skills or knowledge do you feel you have acquired as a result of your participation in the More Than Math Collective?
2. Describe your level of comfort with collaborating with other math teachers to discuss how to support the social and emotional skills of your students in your classroom.
3. During the More Than Math Collective, you stated that one of the challenges you were facing was _____. Is this still a challenge for you or were you able to address it? Please explain.
4. If a future social or emotional challenge with a student were to arise in your math classroom, what steps would you take to address it?

Debriefing

Thank you so much for your participation in this interview. Are there any final thoughts you would like to share regarding the questions we discussed or the interview process before we conclude? Thank you again for your time. I will be reaching out in the future to let you know of potential times for you to hear my data conclusions and provide insight. If you have any further questions for me, please let me know.

APPENDIX H
CODEBOOK

| Name | Files | References |
|--|-------|------------|
| Collaborative Decision-Making Through Different Perspectives | 20 | 316 |
| <i>Professional Capital</i> | 20 | 316 |
| Decisional | 20 | 132 |
| Classroom Setup | 3 | 4 |
| Future Strategy | 7 | 23 |
| Idea Resistance | 1 | 1 |
| Implemented Strategies | 20 | 67 |
| Improvement Reflection | 5 | 10 |
| Sparked Ideas | 6 | 14 |
| Teacher Response | 6 | 13 |
| Human | 8 | 67 |
| Independent Research | 2 | 4 |
| Job Responsibilities | 4 | 6 |
| Student Information | 8 | 16 |
| Teacher Skills | 8 | 31 |
| Trainings | 5 | 10 |
| Social | 8 | 117 |
| Colleague Communication | 8 | 54 |
| Parent Communication | 1 | 1 |
| Participant-Participant Suggestions | 2 | 7 |
| Sharing Resources | 4 | 12 |
| Student Communication | 3 | 4 |
| Validating Participant Ideas | 5 | 39 |
| Praising and Promoting Student Reflection to Impact the Whole Child | 15 | 235 |
| <i>Student Impact</i> | 15 | 235 |
| Academic | 9 | 55 |
| Effort | 9 | 27 |
| Performance | 8 | 22 |
| Skill | 5 | 6 |
| Emotional | 10 | 73 |
| Mindset | 4 | 10 |

| Name | Files | References |
|---|-------|------------|
| Negative | 8 | 25 |
| Past Experiences | 1 | 1 |
| Positive | 10 | 37 |
| Influences | 6 | 47 |
| Age Development | 4 | 5 |
| Home | 5 | 19 |
| School | 3 | 7 |
| Self-Perception | 6 | 9 |
| Society | 5 | 7 |
| Social | 10 | 60 |
| Behavioral | 10 | 31 |
| Verbal | 10 | 29 |
| MTMC Structure | 4 | 8 |
| Mindset Improvement Through Relationships and Implementation | 16 | 162 |
| <i>Teacher Self-Efficacy</i> | 16 | 162 |
| Challenges | 16 | 76 |
| Colleagues | 4 | 14 |
| ELL | 1 | 1 |
| Open-Ended Math Tasks | 1 | 1 |
| Organizing Student Tasks | 1 | 2 |
| Parents | 1 | 1 |
| Responsible Decision-Making | 2 | 3 |
| SEL Implementation | 1 | 1 |
| Self-Awareness | 2 | 5 |
| Self-Management | 1 | 3 |
| Student Academic Skills | 3 | 8 |
| Student Behavior | 7 | 14 |
| Student Motivation | 10 | 19 |
| Time | 5 | 7 |
| Positive | 10 | 86 |
| Classroom Culture | 1 | 1 |
| Colleagues | 4 | 8 |

| Name | Files | References |
|-------------------------|-------|------------|
| Effort | 1 | 1 |
| Future Implementation | 2 | 3 |
| General Statement | 6 | 10 |
| SEL | 5 | 8 |
| Self-Awareness | 2 | 2 |
| Strategy Implementation | 8 | 14 |
| Student Achievement | 1 | 1 |
| Student Behavior | 1 | 1 |
| Student Confidence | 4 | 7 |
| Student Discourse | 4 | 7 |
| Student Identity | 1 | 1 |
| Student Relationships | 8 | 19 |
| Teaching Skills | 1 | 4 |

APPENDIX I
IRB APPROVAL



EXEMPTION GRANTED

Sherman Dorn
 Division of Educational Leadership and Innovation - Tempe
 602/543-6379
 Sherman.Dorn@asu.edu

Dear [Sherman Dorn](#):

On 2/6/2023 the ASU IRB reviewed the following protocol:

| | |
|---------------------|---|
| Type of Review: | Initial Study |
| Title: | More Than Math: A Middle School Math Teacher Collective |
| Investigator: | Sherman Dorn |
| IRB ID: | STUDY00017392 |
| Funding: | None |
| Grant Title: | None |
| Grant ID: | None |
| Documents Reviewed: | <ul style="list-style-type: none"> • Data Collection.pdf, Category: Other; • Group Admin Permission.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • Norcini_IRB Social Behavioral Protocol.pdf, Category: IRB Protocol; • Norcini_Short Consent Form.pdf, Category: Consent Form; • Post-Intervention Survey (1).pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Pre-Intervention Survey (1).pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment Post Document, Category: Recruitment Materials; • Screening Form (1).pdf, Category: Recruitment Materials; • Semi-Structured Interviews.pdf, Category: Measures |

| | |
|--|--|
| | (Survey questions/Interview questions /interview guides/focus group questions); • Strategy Reflection (1).pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Study Overview Calendar.pdf, Category: Participant materials (specific directions for them); |
|--|--|

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2)(ii) Tests, surveys, interviews, or observation (low risk) on 2/6/2023.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrator

cc: Erica Norcini
Erica Norcini



APPROVAL: MODIFICATION

[Sherman Dorn](#)

Division of Educational Leadership and Innovation - Tempe
602/543-6379
Sherman.Dorn@asu.edu

Dear [Sherman Dorn](#):

On 6/6/2023 the ASU IRB reviewed the following protocol:

| | |
|---------------------|--|
| Type of Review: | Modification / Update |
| Title: | More Than Math: A Middle School Math Teacher Collective |
| Investigator: | Sherman Dorn |
| IRB ID: | STUDY00017392 |
| Funding: | None |
| Grant Title: | None |
| Grant ID: | None |
| Documents Reviewed: | <ul style="list-style-type: none"> • Consent Addendum (1).pdf, Category: Consent Form; • Norcini_IRB Social Behavioral Protocol.pdf, Category: IRB Protocol; |

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the “Documents” tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Erica Norcini
Erica Norcini