Action Research Communities of Practice: Building Novice Teacher Self-Efficacy

by

William Vann

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Graduate Supervisory Committee:

Josephine Marsh, Chair
Erin Rotheram-Fuller
Kent Ashton

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ABSTRACT

Student teachers in their final year of college preparation enter a profession that is facing a severe shortage and an alarming rate of attrition. Novice teachers, those with five or fewer years of experience, are faced with myriad challenges that makes retention a problem for the colleges preparing them, the school districts that hire them, and the students that need them in their classrooms.

This mixed methods action research study investigated an innovation designed to build student teacher self-efficacy. The expectation was it would increase the likelihood that new graduates would stay in the profession. The innovation taught student teachers to conduct action research within communities of practice. The Concerns-Based Adoption Model was used to monitor their progress.

It involved two phases. The first phase measured student teacher self-efficacy prior to and following the innovation, and the second phase measured self-efficacy of former graduates, novice teachers, who had graduated from the preparation same program. Both populations were interviewed to elaborate on the self-efficacy data.

Results suggested that student teachers who conducted action research within communities of practice showed a significant increase in self-efficacy. Specifically, the structure of action research guiding their collaborative efforts at problem-solving played a substantial role in increasing their confidence to face their future classroom challenges. The study also found that novice teachers who had performed the same action research within communities of practice retained a higher level of self-efficacy in their first five years of practice.

DEDICATION

To my brand new and only grandson, Bryson Camp Pegram, and in memory of my late wife, Deborah Combs Vann who gave me the gift of my life in all that I treasure, my daughters, and now my grandchild.

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CHAPTER 1

INTRODUCTION AND PURPOSE OF THE STUDY

There is a severe shortage of teachers in Mesa, across the state of Arizona, and in many places in the U.S. Mesa is where I do my work for Arizona State University (ASU). This is particularly true in my field of special education (Hagaman & Casey, 2017, Samuels, & Harwin, 2018). Compounding the shortage, is a crisis of novice teachers leaving the profession (Sutcher, Darling-Hammond, & Carver-Thomas, 2016, Vittek, 2015). Teachers with two years' experience or less were only outpaced by retiring teachers in leaving the profession, and teachers who have two to five years on the job were close behind them (Gray & Taie, 2015, Hanushek, Kain, & Rivkin, 2004, Lochmiller, Adachi, Chesnut, & Johnson, 2016).

Nationally, in 2012-13, seven percent of teachers who had one to three years' experience quit teaching (USDOE, 2014). One year later, the USDOE reported that for teachers who began teaching in 2007; 10% were not teaching the next year, 12% were not teaching after two years, 15% were not teaching three years later, and 17% were not teaching after four years, cumulatively (USDOE, 2015). These national figures, while dismal, were surpassed in the State of Arizona, with an attrition rate of 42% between 2013 and 2016 (Hunting, 2017). I work to prepare teachers in Mesa, the largest of Arizona's school districts, and the problem of retaining teachers is as prevalent here as anywhere else in the state or country. In Mesa, up to 37% of teachers were no longer in the district after two years (O'Reilly, 2016.)

The rate of attrition comes at a high cost, and not just in dollars. Watlington, Shockley, Guglielmino, and Flesher (2010) reported the cost to districts in teacher

turnover exceeded $10,000 per teacher, with some individual districts spending up to $2.2 billion per year (Haynes, 2014). It also has costs in student achievement. Studies show lower math and ELA test scores, and even greater achievement declines in disadvantaged schools due to teacher attrition (Papay & Kraft, 2015, Ronfeldt, Lowe, & Wycoff, 2013).

Why do new teachers leave? Our profession is unlike many others because novice teachers are held to the same standard as those doing the job for years (Brownell, Sindelar, Bishop, Langley, & Seo, 2002,). This standard includes federal and local mandates for external accountability (Craig, 2014, Fullan, 2009). The evidence does not support the popular assumption that teachers leave to get higher wages in other professions (Joiner, 2008, Podolsky, Kini, Bishop, & Darling-Hammond, 2017, Rinke, 2017, Torres, 2012,). Factors related to the student populations teachers served, however, was found to contribute to higher rates of attrition (Papay & Kraft, 2015). The teachers I prepare will be certified to teach special education. Districts, like the one I serve, are in desperate need of filling such positions (Geiger, & Pivovarova, 2018, Sutcher et al., 2016). The attrition rate for special education teachers nationally is higher than that of general education teachers (Boe, 2006, Hagaman & Casey, 2017).

The No Child Left Behind Act focused on standardized testing and external accountability and has increased pressures on teachers beyond the challenges of the classroom (Fullan, 2009, Podolsky, 2018, U.S. Department of Education, 2001). The National Education Association (NEA) surveyed 1,500 teachers and found that although three-quarters of teachers reported high job-satisfaction, almost half (45%) had

considered quitting their jobs due to the external pressures brought about by high-stakes testing (NEA Today, 2014).

Is teacher attrition any different than other professions? Millennials (ages 25–34) have a median job tenure of three years (U.S. Department of Labor, Bureau of Labor Statistics, 2018). Perhaps the expectations for higher retention rates among teachers were unreasonable when they were considered in the context of all other employment. Then again, when asked about whether part of the teacher shortage was a generational issue, Dick Startz, a professor of economics at the University of California—Santa Barbara, and author of the book *Profit of Education*, replied, "No, turnover is higher in education and has been for a long time. I don't think it's a millennial thing" (personal communication, September 19, 2016). This point about millennials was reinforced by the Morrison Report, stating that the figures on millennials cover a wide population for which most do not have four-year degrees (Hunter, 2017). Compared to the previous generation, the baby boomers with four-year degrees had an average of 11.8 jobs 18 to 50, which when extrapolated for millennials is approximately 10.6 jobs over the same time in the workforce (USDOL, 2017.)

Why do new teachers stay? Intrinsic factors such as efficacy, student growth, and job satisfaction have been shown to factor equally with extrinsic motivations for staying on the job (Lochmiller, et al., 2016, Mertler, 2016, Perrachione, Petersen, & Rosser, 2008, Podolsky, 2018). In examining the retention of special education teachers, stress and recognition, were top indicators for attrition, whereas access to adequate resources, relevant information, decision making, and administrative support contributed heavily to these teachers' intent to stay in the profession (Hagaman & Casey, 2017,

Gersten, Keating, Yovanoff, & Harniss (2001). Another key issue, reported by Gersten et al. (2001) was special education teacher isolation, in which teachers reported a "need for increased opportunities to interact with colleagues" (p. 564). Gehrke & McCoy (2007) reported that induction and orientation programs, one key strategy that districts employed in an attempt to retain teachers, was not sufficiently tailored to meet the needs of special educators. Taylor (2013) recommended for all teachers that administrators model and provide professional development to increase the power of resilience and efficacy in the face of increasing challenges. Resilience and efficacy were also recommended by Tait (2008) in any effort to retain novice teachers.

Teacher Retention and Teacher Preparation.

The retention rate of first year teachers increases significantly because of the quality of their preparation programs according to a report by Lindqvist, & Nordänger (2016). Likewise, DeAngelis, Wall, and Che (2013) found that an important factor in whether new teachers remained in teaching was their perception of the quality of their preservice preparation. Novice teachers reported the quality of mentoring by faculty and engagement in rigorous curriculum during preparation affected their desire to stay in teaching (DeAngelis, Wall, & Che, 2013). Ingersoll, Merrill, and Mey (2014) also found new teachers' decisions to remain after their first year was highly dependent on "the content and substance of new teachers' preparation—especially the pedagogical preparation teachers acquired" (p. 29). Better prepared teachers are more likely to stay in teaching and come from longer and more rigorous preparation programs (Zhang, & Zeller, 2016, Sutcher et al., 2016, Darling-Hammond, 2003).

Teachers who are better prepared demonstrate resilience that translates into greater job satisfaction and longer professional careers (Mansfield, Beltman, Broadley, & Weatherby-Fell, 2016). Tait (2008) examined resilience in relation to teacher self-efficacy and emotional intelligence as a measure of a novice teachers' ability to find success in classrooms, commitment to the teaching profession and their students, and the likelihood that they will stay in teaching. Tait (2008) found resilient teachers were able to apply their preparation to develop personal strategies to meet hardships, maintained supportive relationships, and developed a balanced life when given the proper resources. Moreover, preservice teachers were more likely to find success having had experiences that led to self-efficacy and emotional competence, and ultimately built resilience (Elliott, Isaacs, & Chugani, 2010, Tait, 2008).

Local Context

What does teacher attrition look like in Arizona? The problem of retaining teachers in Arizona is critical. The state task force set up to investigate Arizona's teacher shortage, reversed the words 'recruitment' and 'retention' in their second report (Arizona Department of Education, 2016). When the Arizona started looking at the teacher shortage, at first their focus was recruitment, but as they looked deeper into the problem, they realized retention was the greater problem. In 2015, Arizona ranked 49th out of 50 states and the District of Columbia on a variety of issues, including salary, student to teacher ratio, state spending per student, and safety, all relevant to continuing in the teaching profession, (Bernado, 2015). In a more recent report and with slightly better results, Education Week (2019) ranked Arizona education as 45th in the nation using a different equation. The measures that factored into the rankings included average starting

salaries, median annual salary, income growth potential, future projections for teachers per 1,000 students, student-to-teacher ratios, school safety, and public spending on education (Bernado, 2015) Taken together, these issues certainly have influenced teacher job satisfaction and retention.

Across the state, teacher vacancies have placed school personnel departments in crisis mode. Straus (2015) at the Washington Post reported that "Teachers have been fleeing Arizona in droves, resulting in such a serious shortage of teachers that officials are warning of serious consequences if the exodus continues" (para. 1). The Arizona School Personnel Administrators Association (2018) surveyed 172 public districts and charter schools in the state and reported 866 teachers resigned or abandoned their jobs in the first month of school, 1,968 teaching positions were still vacant at the end of that month, and 3,403 positions that were filled were done so with non-certified personnel.

The Arizona Department of Education (2015) in a report on retention and recruitment, included figures from an Arizona School Administrators Association survey conducted four months into the 2013-2014 school year. These figures showed that 62%, of the 79 reporting districts still had full-time teaching positions to fill. Arizona district superintendents (Tirozzi, Carbonero, & Winters, 2014) reported approximately 30% of their novice teachers left the profession within three years, and 50% in their first five years. Similarly, in a 2013 survey of teachers in southern Arizona, 305 teachers predicted leaving the classroom in the next five years while only 14% would recommend teaching as a career choice (Tucson Values Teachers, 2015). Finally, there is widespread concern that new teachers in Arizona will continue to leave in larger numbers which

highlights Mertler's (2016) concern that retention of teachers is a critical crisis for all PK-12 education in Arizona.

In my position as a site coordinator and clinical assistant professor for the iTeachAZ, a teacher preparation program of the Mary Lou Fulton Teachers College (MLFTC) at ASU, I have a close connection to the problem of novice teacher attrition and retention. As a site coordinator for iTeachAZ, I teach, coach, mentor, and evaluate a cohort of special education teacher candidates through their entire senior year of student teaching each year. I meet them in April before they complete their junior year, recruit their mentor teachers in May, begin teaching them before schools started in August, and observe each of them at least three times a week in our classroom and in their placement schools, and I am there to congratulate them when they walk across the commencement stage in May. Additionally, many of my graduates are hired to teach in the one of the partner school districts in which they student taught and took their senior year classes. That means I regularly have seen my former student teachers in my placement schools when I come to observe my current ones. I maintain a connection with them and hear about their challenges and successes as novices.

The college itself, MLFTC, is among the largest teacher preparation programs in the U.S., partnering with 30 districts across the state to implement the comprehensive and innovative iTeachAZ program (Arizona State University, 2015). It was named the fastest rising top-tier college of education by U.S. News and World Report (2016). Although this innovative program and the college have already worked to increase teacher retention, 92% of iTeachAZ graduates were still teaching after three years, as compared to 80% nationally and 76% statewide (Arizona State University, 2015). That was not the case in

my partner district, however. A Mesa district administrator shared with me the district attrition rate for all new hires. It was much higher than state and national rates for novice teachers with two years and four years' experience (J. O'Reilly, personal communication, April 27, 2016). O'Reilly (2016) in his finalized report to the district superintendent reported that 20% to 37% percent were leaving Mesa after two years and 45% to 60% were resigning after four.

The attrition problem in Mesa contributes to the already dire shortage of teachers applying to fill vacant positions. Padilla (2016) quoted Dr. Shaun Holmes, who served as the assistant superintendent of human resources in Mesa as saying, "Hiring has become increasingly difficult and we are very concerned about the number of teachers going into teacher preparation programs. The shortages we see now are only going to grow in coming years" (p. 2).

ASU is my employer. On the other hand, nearly all the work I do for ASU serves the district as well. My position is called site coordinator for a very good reason. In addition to the teaching, evaluating, coaching, and mentoring my teacher candidates, I am also responsible to liaise with district personnel and developed and maintain a community of practice that includes mentor teachers and administrators who are in the schools every day with the teacher candidates. I am the first one called when the principals I know in Mesa need a high-quality teacher for a vacant position in the coming school year. I am often called when former graduates in the district need professional advice. In fact, over the last two years, I invited program alumni teachers into our community of practice as mentor teachers for the current student teachers. The personal relationship I have with

teachers, administrators, students and alumni, make it so much more impactful to me when a novice teacher decides to leave the profession. Troubled by this attrition, I designed an innovation aimed to increase novice teacher retention and provide more information about what might be done to keep novice teachers teaching.

Purpose Statement and Research Questions

According to the National Council for Accreditation of Teacher Education (2015), "well prepared teachers are more likely to remain in teaching" (p. 3). As I am critically charged with the direct preparation of teachers, the question becomes, "What can I, and others like me, do to prepare future teachers that will encourage them to stay in the profession?" Still a broad question, I did reconnaissance (Mills, 2011 as cited in Mertler, 2014). I did some reading, and talked to colleagues, cohort members, and others in this profession. I also interviewed novice teachers.

As I did reconnaissance, teachers and administrators both talked about new teachers feeling overwhelmed. Novice teachers felt they were not fully prepared to meet the daily challenges of the classroom. If I could deliver a treatment with the goal of increasing self-efficacy in student teachers, then it seemed they will be more likely to enter the profession ready and confident to meet those challenges. My research innovation involved each student teacher completing an action research project with the support of a community of practice. To ensure that their action research projects had the effect of increasing their self-efficacy beliefs, I made sure their practice was aligned to three of Bandura's (1997) four sources of self-efficacy: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states (see Chapter 2). Their action research projects were designed to provide them with mastery experiences.

Their communities of practice offered additional vicarious experiences, listening to each other's successes. And they encouraged each member that they would be successful, verbal persuasion.

I measured the impact of doing action research in communities of practice on student teacher self-efficacy and novice teacher intent to stay by conducting a two-phase mixed methods study. Phase one measured the impact of action research in communities of practice on student teacher self-efficacy. I used quantitative test of self-efficacy prior to and following the innovation. I collected qualitative data using student formative reflections during the innovation and interviews following the innovation. Phase One addressed my innovation, but to find out about its long-term impact on my problem of practice—teacher attrition—I initiated a second phase. The second phase informed how increasing student teacher self-efficacy possibly relates to improved teacher retention by surveying practicing teachers who were graduates of the same program as the student teachers in Phase One.

Thus, phase two measured how conducting action research during preparation impacted novice teacher self-efficacy and intent to stay. Phase Two participants were invited to complete the Novice Teacher Survey which measured both self-efficacy and provided the classification and demographic data needed to compare the three groups below. These three groups were: (a) participants who conducted action research during preparation; (b) participants who conducted action research in communities of practice during preparation; or (c) participants who did not conduct action research during preparation. I then interviewed two participants from each group to measure their self-efficacy against their intent to stay.

To that end, my research questions were:

RQ 1: How and to what extent will conducting action research within communities of practice impact student teachers' self-efficacy beliefs?

RQ 2: How and to what extent will working in communities of practice impact their action research experience?

RQ 3: How and to what extent was novice teacher intent to stay in the profession impacted by

a. conducting action research during preparation,
b. conducting action research in communities of practice during preparation, or
c. not conducting action research during preparation?

CHAPTER 2

THEORETICAL PERSPECTIVES AND RESEARCH

Action Research Communities of Practice

I begin by situating my innovation within activity theory to provide a foundation for the co-construction of knowledge and improved practices. I outline how the innovation, Action Research Communities of Practice (ARCP) will attempt to provide student teachers with Bandura's (1997) four sources of self-efficacy. I define self-efficacy, reporting on the research related to self-efficacy in the teaching profession and teacher education and describe the four sources of self-efficacy. Then, I discuss the use of action research in the grade-school classroom, as a strategy in teacher preparation and examine the process of action research itself as explained by Mertler (2014). Subsequently, I describe a connection between action research and the first source of self-efficacy, mastery experiences. Finally, I conclude with a discussion of communities of practice for teachers and for student teachers, based on the work of Wenger (1998).

Cultural-Historical Activity Theory

The constructivist perspective of making meaning through social interaction as described by Vygotsky (1978) underlies my approach to student teachers developing higher self-efficacy. Student teachers' application of knowledge and skills arise from their own construction of knowledge. One facet of Vygotsky's work, activity theory, formed the basis of this investigation. Looking into that work and the outgrowth of subsequent work of his students and others led me to Cultural Historical Activity Theory (CHAT). CHAT describes how people interact and communicate through their actions. They do so in a community, forming the base from which they make meaning of new

learning and their contexts (Foot, 2014). As described by Roth and Lee (2007), CHAT provides a framework to analyze the effectiveness of the student teachers doing their action research within communities of practice. Foot (2014) describes this framework by expanding on each component of the name itself.

Cultural. The cultural aspect of the framework reminds us that people are a product of culture and thus bring its influences into any interaction with others. There are unique aspects of culture in the teacher preparation classroom, as student teachers are straddling the division between their former predominantly higher-education student culture and the distinctly different professional and child-focused school culture (Peterson & Deal, 2002). With culture comes the history that each person brings individually to the interaction.

History. The student teacher's history is likely to include their own experiences in grade school working with others, and their previous experiences facing challenges. Student teachers measure their success in addressing new challenges in the classroom or problems of practice against their histories.

Activity. The specific activity, in my study, is the student teachers implementing an action research project within a community of practice. As defined by Vygotsky (1978), activity is the actions the people take together. The innovation is structured so that student teachers work together in their communities of practice on similar problems of practice. They will make meaning, understandings that will lead to higher self-efficacy, through social interactions in their communities of practice as they engage in action research.

Self-Efficacy

Bandura (1997) defined self-efficacy as individuals' beliefs in their ability to achieve desired goals. These beliefs influence their motivation, behavior, and in the end, how likely they are to achieve goals. Bandura (1997) claimed "different people with similar skills, or the same person under different circumstances, may perform poorly, adequately, or extraordinarily, depending on fluctuations in their beliefs of personal efficacy" (p. 31). In other words, how a person believes they will perform on any given task directly impacts their actual performance. If persons believe they can exert a level of control over their environment, their actions are more likely to be goal-oriented. They are more likely to persevere until their ends are achieved.

Thus, the question became how can I increase the self-efficacy of preservice teachers? Tschannen-Moran and McMaster (2009) stressed the importance of understanding how self-efficacy beliefs developed because of efforts to increase it. In other words, a teacher can take direct action to improve their own self-efficacy. They can access one or more of the sources of self-efficacy. Bandura (1997) identified four sources of self-efficacy including mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states to explain how self-efficacy is developed.

Mastery experiences. Personal mastery experiences were designated by Bandura (1997) as the most effective source for increasing self-efficacy because they provided direct and successful self-experiences. These mastery experiences are then generalized into other settings. Strong beliefs in one's self efficacy were most effectively fostered by one's own successes through the application of focused effort. Thus, experiences that

present the greatest challenges have the highest potential to build a greater sense of being able to achieve desired goals across a multitude of settings. Conversely, accomplishments made with little effort or mostly through the contributions of others, do little to increase self-efficacy. Once persons have become self-assured of their own abilities to achieve success through mastery experiences, they are more likely to show resilience in the face of challenges, and not let small failures stand in the way of reaching larger goals.

According to Bandura (1997), mastery experiences cannot be contrived, but they can be guided. Mastery experiences must allow individuals to make choices and select effective behaviors to move towards goal attainment. They cannot be, as Bandura described, "a matter of programming ready-made behavior" (p. 80). For the mastery experience to be a source of self-efficacy it must provide for individuals to apply their own thinking, act in an effective means, and involve self-regulation. The cognitive and self-regulatory capacity for operative performance is created through the mastery experience and will generalize to other settings and increase self-efficacy.

Norms of established groups are used to set standards for achievement for some activities, standards an individual can use to self-assess their own achievements. The performance of teachers is regularly compared to norms in the form of evaluation rubrics. iTeachAZ student teachers are evaluated on a rubric on which the norm is proficient. There are many student teachers that achieve above proficient on their final observations. Self-efficacy was shown to increase by meeting or surpassing established norms (Prelli, 2016).

As they progress through their preparation programs, such as iTeachAZ, preservice teachers are faced with ever-increasing difficulty in the numbers of tasks and

challenges. Student teachers begin their field experiences gradually, first observing and then gradually taking on larger parts of the teacher role. Relating this to Bandura's theory of mastery, preservice teachers' successes will increase their self-efficacy. By comparison, their failures will decrease it. For preserve teachers to benefit from mastery experiences they need to experience the success of accomplishments in the classroom. Moreover, these successes need to result from their own actions, thoughts, and self-regulation. Thus, to foster mastery experiences, those preparing student teachers need to provide scaffolded experiences that offer guidance, coaching, and reflection.

Vicarious experience. After mastery experiences, Bandura (1997) acknowledged observation of another person experiencing success is the next most effective means of increasing self-efficacy when it was aligned to a similar type of performance. Modeling allowed individuals to make cognitive connections between another's actions and outcomes to their ability to perform similar actions and achieve like results. Unlike more measurable experiences, such as the speed or distance that one can achieve running, many experiences are shown to be more ambiguous. Thus, individuals are required to judge their abilities to meet them through comparison with the accomplishments of others.

In vicarious experiences, self-efficacy perceptions are susceptible to a greater level of conditions than those for mastery experiences (Bandura, 1997). Individuals' lacking knowledge related to their own capacity in a skill area are not as likely to benefit from observing others. Meaning, if the skill area is totally unfamiliar to the observer, then they may unable to connect their own abilities to those observed. On the other hand, persons who brought a higher level of capacity to the experience, were likely to increase

their self-efficacy beliefs when taught even more effective means of achievement (Bandura, 1997). Because they had experienced success before through their own actions, they are more likely believe in a greater performance.

For iTeachAZ student teachers, modeling by their placement mentors served as the primary source of vicarious experiences for the building of self-efficacy in classroom capacities. Prior to direct experiences, student teachers begin each student teaching semester with the direct observation of the mentor teachers. They develop their own self-estimation of their own capacity by noting the actions of these mentors and comparing them their own perceived abilities. Saying to themselves, "I can do that," or alternatively, "I'm not sure I can do that." Mentor teacher actions that are self-estimated as doable by student teachers are likely to build their self-efficacy. Thus, student teachers who enter the classroom with a greater set of knowledge and skills, as well as, a higher self-awareness of those knowledge and skills should be better prepared to increase their perception of self-efficacy through the observation of their mentor (Pfitzner-Eden, 2016).

Verbal persuasion. Student teachers' beliefs in their capacities to accomplish desired goals can be strengthened through verbal persuasion by others such as mentors, colleagues, classmates, and administrators (Bandura, 1997). A sense of self-efficacy is better maintained, particularly when faced with difficult challenges, if others important to individuals verbally support those beliefs. Verbal persuasion is not considered to be the most effective means of supporting and sustaining self-efficacy, but it has been shown to encourage increased effort and resilience. This increased effort and resilience, in turn, supports individuals' beliefs in their ability to achieve desired outcomes. However,

verbal promotion of capabilities that are not attainable devalued the credibility of the person providing support and is likely to diminish self-efficacy beliefs (Bandura, 1997).

Feedback is the most common form of verbal persuasion. According to Bandura (1997) "It can be conveyed in ways that undermine a sense of efficacy or boost it" (p. 101). Feedback that was specific to incremental gains and directed towards effort in building capabilities increased efficacy. For example, a mentor might provide specific feedback with "I like how you reinforced behavioral expectations before asking the students to line up for recess." Feedback like 'Good Job! is not specific and does not support increased efficacy beliefs in the recipient. To improve self-efficacy beliefs, feedback must be clearly connected to the objective being attempted and specific to the person that is making the effort. It also should promote reflection on the connection between capacities applied and the outcome achieved (van Dinther, Dochy, & Segers, 2015).

Student teachers in iTeachAZ rely heavily on feedback for their growth in their academic coursework and placement settings. Feedback they receive can increase self-efficacy if it is specific to the situation and to the person. As they develop, student teachers who have limited experience rely on specific feedback to build beliefs in their capacities for success as teachers. It helps them make connections between their own performance and skill proficiency. High-quality feedback from their mentor teachers and college supervisors is necessary for them to make those connections and promote that reflection (Dicke, Parker, Marsh, Kunter, Schmeck, & Leutner, 2014).

Physiological and affective states. How people perceived their capacities to accomplish desired goals in specific situations vary depending on their current

physiological and affective states (Bandura, 1997). Likewise, efficacy beliefs can be affected by negative arousal states, such as fear or stress, or positive arousal states such as happiness or relaxation. The physiological reactions to stressful or fearful situations, sweating for instance, is often self-interpreted as lack of capacity to accomplish desired goals and diminishes beliefs about control or capability. Student teachers might interpret physical responses, sweating, shaking, or reddening to insurmountable general inabilities to perform. Negative emotional states with respect to arousal in one situation were shown to be generalized across other settings and thus decreased self-efficacy beliefs overall.

Bandura (1997) noted that individuals' perception and interpretation of their own physiological and affective states was more important than the influence of the arousal itself. Emotional and physical arousal that was perceived and interpreted by individuals as helpful increased self-efficacy. On the other hand, those who perceived emotional and physical arousal as constraining and indicative of failure were likely to face the situation with lower self-efficacy. Slightly heightened physical and emotional states lead to increased attention and improved skill performance. Conversely, extremely low emotional states decreased motivation and energy and thus diminished performance. Ultimately, the complexity of the activity determined whether arousal states impaired or enhanced performance.

Student teaching is a stressful endeavor, both physiologically and emotionally. iTeachAZ student teachers in their senior year spend nearly the same amount of time in the schools as their mentor teachers. They also attend two college classes. Many have additional paid jobs. For many them, these circumstances cause a major escalation in physiological demands. Student teachers are placed in a new environment in which they

know few other people and are under near constant observation. Every task performance is under the scrutiny of their mentor teachers, their college supervisor, the school administrator, or other professionals. Their sense of self-efficacy in this new setting and the constant surveillance is likely to influence negative arousal in their physical and emotional states.

Even so, student teachers need to build their own self-efficacy beliefs. Several studies point to the power of building a sense of efficacy in student teachers as a means of creating educators who are better equipped and more likely to be retained in the profession (Mansfield et al., 2016, Pfitzner-Eden, 2016, Sutcher et al., 2016, Tuchman, & Isaacs, 2011, Yavuz, 2010). Efficacy is shown to be related to a teachers' sense they have it within themselves to accomplish reasonable and desired goals. Efficacious teachers believe they are capable of effectively teaching their students, so they meet high academic expectations. Teachers who have a high sense of efficacy believe they have the skills needed to direct instruction and manage the classroom in all aspects.

Gibson and Dembo (1984) found high-efficacy teachers demonstrated a greater than average ability to engage their students during instruction. They also reported that low-efficacy teachers were more easily "flustered if there was any interruption in their routine" (p. 578). Tschannen-Moran and Woolfolk Hoy (2001, 2007) expanded on the concept of teaching efficacy and suggested it was composed of three separate constructs—self-efficacy for instruction, self-efficacy for classroom management, and self-efficacy for student engagement.

After reviewing teacher preparation programs, Yost (2006) concluded programs that created and nurtured personal efficacy in their candidates by allowing them wide-

ranging opportunities for accomplishment were more likely to produce confident and resilient teachers who were "highly successful in resolving academic and behavioral challenges using a model of critical reflection" (p. 73). Moreover, she argued that these programs tended to create teachers who "think deeply, problem-solve, and feel confident in their abilities to meet the needs of their students" (p. 74). Jamil, Downer, and Pianta (2012) reported new teachers with higher efficacy were more likely than those with low efficacy to stay after the first year. Lee, Patterson, and Vega (2011, p. 71) related the need for "well-designed and effective teacher education programs" that produce special education teachers with the confidence that comes from high efficacy. Dana (2016) suggested action research as a means of providing evidence for student teacher effectiveness and improved student outcomes.

Action Research

My innovation, Action Research Communities of Practice (ARCP) was centered on student teachers supporting one another while addressing problems of practice using the reflective and cyclical model employed in action research. Inquiry in the local setting, done systematically by those most directly involved, with an emphasis on collecting and reflecting on local data has opened a new path to problem solving for teachers. The idea of teachers as classroom researchers is well supported in the literature (Dana, 2013; Dana & Yendoll-Hoppey, 2104, Campbell, 2013, Freeman, 1996, Marsh & Gonzalez, 2018). Littlewood (2011) reported that teachers were best situated to study the implications of theories and research to learning and students. O'Conner, Greene, and Anderson (2006) wrote that action research increased the professional status of teachers as their role changed from consumers to producers of knowledge about teaching and learning. Ginns,

Heirdsfield, Atweh, and Watters (2001) noted the power of action research to encourage reflective practice among novice teachers.

Action research (sometimes known as teacher research or practitioner research) is often promoted as a means of supporting reflective practice and driving data-rich instruction for teachers. There is a limited but growing body of work examining its use and effectiveness in the preparation of preservice teachers (Dana, 2016; Littlewood, 2011; Moi Mooi & Mohsin, 2014; Price, 2001; Vaino, Holbrook, & Rannikmäe, 2013). Price suggested action research can play a significant role in shaping how student teachers construct teacher knowledge and skills, and in building their identities as reflective and effective teachers. Littlewood (YEAR) reported on the ability to of action research to build a more effective community of practice among student teachers. Smith and Sela (2005) claimed action research allowed student teachers to participate fully in their own professional development and it taught them how to be contributors to the community of practice.

Action research was found to be a powerful tool in developing knowledge about the way students learned as well as increasing the awareness about the need to differentiate the learning for various students (Moi Mooi & Mohsin, 2014). O'Conner et al. (2006) emphasized the reflective nature of action research that supported the development and refinement of pedagogical skills and knowledge in preservice teachers. Amobi (2006) argued that the emphasis on content rather than the development of reflective practice in teacher education was problematic because "Our immediate charge is to prepare them to teach, our enduring mission is to empower them to personalize and own the craft of teaching" (p. 24). Chant, Heafner, and Bennet (2004) found that action

research played a significant role in adding reflection as a tool to the student teachers' toolbox, and "helped the candidates become teacher leaders" (p. 37).

In writing about action research, Mertler (2014) claimed action research was teachers doing their own research to address problems in their own classrooms. He suggested teachers gained greater understanding of the effectiveness of the strategies they employed, the students they taught, and how they measured student learning. Additionally, Mertler (2014) maintained action research was a powerful tool that supported teachers' reflections on their own practices.

Efforts to improve practice in schools and for teachers are often driven by applied or formal research that attempted to apply outside findings to a local environment (Mertler, 2014, 2017). There was little room for adaptation that allowed for the application or the implementation of theory to practice. Action research has provided a means to bridge this gap. According to Mertler, "Action research offers a process by which current practice can be changed to better practice" (2014, p. 16). It raises the actions of teachers to a level of professional practice. The self-analysis and reflection that is central to teacher action research lets educators drive their own improvement and student outcomes (Dana, 2013; Dana & Yendoll-Hoppey, 2104, Campbell, 2013, Vaino, et al., 2013).

Action research includes identifying a problem of practice, exacting data collection, competent analysis, and effective reflection, all done in a cyclical and iterative process to achieve best possible local outcomes.

Mertler (2014) outlined and described the steps of action research:

1. Identifying and Limiting the Topic: The action research begins when researchers narrow their focus to what they want to study. With the objective of improving practice, a target was identified for study that was manageable and attainable.
2. Gathering Information: Once a topic is identified and the focus was narrowed, then action researchers carried out reconnaissance. They gathered information that included self-reflection, description, and explanation.
3. Reviewing the Related Literature: To help the researcher make decisions about the direction and plan, any related source of information that may be available was reviewed. These sources included books, journals, Internet sources, teacher resources, local documents, or even colleagues.
4. Developing a Research Plan: The method of carrying out the research was developed in a way that was most likely to answer the research question. The research question, or questions, were devised to drive each action taken during the study.
5. Implementing the Plan Collecting Data: The specific data to be collected were determined and decisions were made about the best methods to collect the data. The data were collected using one or more clearly defined methods.
6. Analyzing the Data: In traditional quantitative designs, the data were usually analyzed at the end of data collection, whereas in qualitative designs the data were analyzed during the collection process. Qualitative analyses were conducted to determine patterns and themes during data collection allowing for later collection of more targeted data.

7. Developing an Action Plan: The definitive objective of action research was identifying the action that was intended to improve practice. A strategy for improvement was proposed, put into action, and closely monitored for effectiveness.
8. Sharing and Communicating Results: Although the initial goals for action research were local, results that have the capacity for improving educational practice may be shared.
9. Reflecting on the Process: At the end of each research action cycle, critical reflection was an integral part of improving the teachers' practice. It was also an integral part of the action research process to reflect on each segment of the process.

In my study, student teachers addressed specific problems of practice within their Action Research Communities of Practice. My innovation was designed so student teachers discussing their action research in communities of practice would increase their teacher self-efficacy (Mintzes, Marcum, Messerschmidt-Yates & Mark, 2013; Weißenrieder, Roesken-Winter, Schueler, Binner, & Blömeke, 2015). It provided them with opportunities for mastery experiences, the first source of self-efficacy. Working in communities of practice, the student teachers provided each other with support that promoted better physiological and affective states. And they had opportunities to experience verbal persuasion and vicarious experiences as they discussed and listened to each other's action research within their communities of practice.

Communities of Practice

Wenger (1998) defined communities of practice as having three commonalities including mutual engagement, a joint enterprise, and a shared repertoire. Communities of practice have collective rituals, routines, artifacts and symbols, and stories and histories. Members of a communities of practice work to build an identity around shared visions and endeavors. Collaborating, they maintain three modes of belonging— imagination that allows for the creation of ideas about the world and its meaningful connections, engagement that provides for the mutual negotiation of meaning, and alignment that permits contribution to larger enterprise. Boundaries encompassing communities of practice were shown to be fluid and overlapped in membership. Wenger, McDermott, and Snyder (2002) identified seven principals for designing communities of practice:

1. Design for evolution.
2. Open a dialog between inside and outside perspectives.
3. Invite different levels of participation.
4. Develop both public and private community spaces.
5. Focus on value.
6. Combine familiarity and excitement.
7. Create a rhythm for the community. (p. 51)

In relation to education, Wenger (1998) stated that communities of practice begin with building modes of belonging and shaping identities, and then move into a mutual negotiation of skills and information. Communities of practice members "contribute in a variety of interdependent ways that become material for building an identity. What they learn is what allows them to contribute to the enterprise and to engage with others around

that enterprise" (Wenger, 1998, p. 271). Communities of practice come together to serve many varied purposes in schools (Mertler, 2017, Wenger, 2010) such as teachers collaborating to increase reading fluency across the school, or principals supporting one another to implement behavior support systems. Teachers must bring their identities of belonging and enterprise to the classroom, meaning how they see themselves and their roles in their schools. For instance, do they see themselves as teachers or learners, or both? This and how they engage with others outside of their institution will impact their sense of community. Wenger (1998) wrote "one needs an identity of participation in order to learn yet needs to learn in order to acquire an identify of participation" (p. 277).

Research was conducted on communities of practice and their influence on teachers and schools. Vescio, Ross, and Adams (2008) found that effectively functioning communities of practice positively influence student achievement and teaching practices. For instance, they posit that teachers working together and learning together raise the level of practices of all involved. Mertler's (2017) action research communities, a merger of professional learning communities and action research, combine meaningful professional development within a structure focused on improving practice and student success. Additionally, it fosters a more positive mindset for all community members. Improved teacher mindsets, lead to improved teacher practices, bringing about better student mindsets, and thus improved student outcomes (Spence & Scobie, 2010.)

The communities of practice framework supports the conditions identified by Darling-Hammond (2003); collaboration over isolation, curriculum and assessment evaluation, and analysis of student learning, policies, and practices. In doing their action research in communities or practice, student teacher participants in my study worked

collaboratively as they analyzed their own practices. In another supporting example, Barry Goldwater High School in Phoenix, Arizona turned around 20 years of failing student outcomes by "establishing a purposeful community" (Urquhart, 2012, p. 22). This community reinforced "efficacy, outcomes that matter to all, agreed-upon processes, and use of all available assets" and allowed them to create "a culture of continuous improvement and increased student achievement" (p. 22). Student teachers will be working together towards improvement through their action research.

Borg (2012) argued that for communities of practice in schools to evolve into effective producers of student achievement three conditions must exist (a) initial support and nurturing fostered the development of collegial relationships, enhanced capacities through professional development, and a balanced workload, (2) school leaders needed to provide vision and recognition for accomplished goals, and (3) volunteer members of the communities of practice needed to meet responsibilities that sustained purpose and collaboration. Takahashi (2011) found teacher sharing and examining student data within communities of practice useful in the co-construction of meaning in their work and in increasing self-efficacy beliefs. Likewise, Vaino, et al (2013) found that by working together in a shared purpose of student success, teachers strengthened their understanding of the collective power they have over student achievement (Vaino, et al., 2013).

Communities of practice can provide an effective structure for preservice teachers to collaborate with both their classmates and mentor teachers in an increased mutually beneficial and professional way (Auhl, & Daniel, 2014, Le Cornu & Ewing, 2008). When student teachers worked together in communities of practice to review their teaching performance it led ultimately "to the development of a more open, dynamic, and effective

teaching and learning environment" (Harford & MacRuairc, 2008, p. 1891). Sim (2006) noted that the structure of communities of practice helped to build improved relationships among student teachers and mentor teachers and provided for a more effective structure to study and reflect on complex teaching practices.

Communities of Practice and Sources of Efficacy. In my innovation, student teachers conducted action research within the supportive network provided in communities of practice. They were grouped by similar problems of practice. They supported each other through modeling and verbal support and working in collaboratively within their communities of practice. It was my notion that their physiological and affective states would be improved through stress reduction. It was my expectation that by participating in their action research, discussing their work, and reflecting on the progress of each member of the community would also improve their self-efficacy beliefs. (Prelli, 2015). If my student teachers entered the field with greater self-efficacy, my hope and the reason for doing this study, was that they would be more likely to stay in teaching where they are sorely needed.

CHAPTER 3

METHODS

Study Design Overview

This was a mixed-methods action research study to investigate the impact on student teachers conducting action research within a community of practice on their self-efficacy beliefs and intent to stay in teaching. It was conducted in two phases. The first phase took place as the then current iTeachAZ preservice teachers participated in their own action research projects during their internships. The second phase investigated how novice teachers, teaching fewer than five years, perceived the effects of doing action research as preservice teachers on their efficacy as novice teachers. Both phases contributed to the understanding of how doing action research in communities during preparation impacted the likelihood novice teachers stay in profession.

I measured their self-efficacy as student teachers before and after their Action Research Communities of Practice (ARCP). And then, using a different survey and interviews, measured novice teachers' self-efficacy and intent to stay in the profession. Student teachers completed ARCP focusing on a problem at their placement sites. They met in the communities of practice each week during the two-hour student teaching class. Their work in ARCP attempted to increase the self-efficacy of these student teachers prior to their graduation from the program.

In the second phase, former iTeachAZ graduates were asked to complete a survey designed to measure their teacher self-efficacy and the effects of participating in a similar ARCP project as preservice teachers. Responses were compared to novice teachers who did action research during student teaching, novice teachers who did action research

within communities of practices, and novice teachers who did not implement action research at all. Selected participants, two for each group were interviewed about how their student teaching actions impacted their experiences in their first years of teaching. I used convenience sampling (Teddlie & Yu, 2007), those teachers for whom I was able to arrange the Zoom conference, to interview two representatives with from each group, (1) lowest mean self-efficacy, (2) mid-range self-efficacy, and (3) highest mean levels of self-efficacy, as indicated on the survey from each group for a total of six interviews.

Table 1 provides an illustration of how each phase addressed my research questions and the aligned measurement instrument.

Table 1

Phases of the Study

Phase	Research Question	Instrument
1 - Student Teachers	RQ 1: How and to what extent will conducting action research within communities of practice impact student teachers' self-efficacy beliefs?	• Teacher Self-Efficacy Survey • Formative Reflections • Student Teacher Interview
1 - Student Teachers	RQ 2: How and to what extent will working in communities of practice impact their action research experience?	• Teacher Self-Efficacy Survey • Formative Reflections Student Teacher Interview
2 - Novice Teachers	RQ 3: How and to what extent was novice teacher intent to stay in the profession impacted by: (a) conducting action research during preparation; (b) conducting action research in communities of practice during preparation; or (c) not conducting action research during preparation?	• Novice Teacher Survey • Novice Teacher Interview

Previous Cycles of Research

I did three cycles of action research to prepare myself, refine both my methods and innovation, prior to this study.

Cycle 0. This first cycle was an investigation into why novice teachers stayed or did not stay in teaching. It was qualitative and consisted of interviews with iTeachAZ graduate teachers who were either still teaching after four to five years or had left the profession. I began to review the literature to determine, beyond the scope of my setting, the factors related to teacher attrition. My primary finding was that a lot of these novice teachers went into the field lacking the confidence and not feeling prepared to face the challenges of being a new teacher.

Cycle 1. The next cycle of my research was enacted to determine an effective method to employ for my innovation. It was a mixed-methods study. My research question for this cycle was: What could I do with my student teachers to increase their self-efficacy? Through by literature review, I learned about the sources of self-efficacy, the social learning of it, and how to measure it in teachers. I developed and delivered modules to teach my student teachers to conduct action research and participate in communities of practice. My student teachers conducted action research with the support of their communities of practice. I measured their self-efficacy before and after they conducted their action research using the TSES. I then interviewed three of my student teachers. My findings showed a significant increase in self-efficacy means for the cohort (N=15).

Cycle 2. My most recent cycle, prior to this study, was conducted to answer the research question of how I might measure the effect of increasing self-efficacy in student teachers on novice teacher intent to stay in teaching. It was in this cycle, I developed and field tested the Novice Teacher Survey. (Field test results of analysis for reliability and construct validity included below). I then conducted interviews with five participants to elaborate on the results of the survey. My findings validated my instrument and reinforced some of my findings from Cycle 0.

Phase One – Student Teachers

Participants. Participants were 26 student teachers from a senior-year cohort in the iTeachAZ program for certification both in general and special education. The group included student teachers ages 21 to 35, with three males and 23 females. Some of these candidates attended ASU since their freshman year, and the remainder transferred from a community college. Upon completion of their ARCP, all potential candidates had completed one semester of student teaching. All student teachers participated in ARCP, as this is an approved curriculum addendum for the student teaching course. All student teachers in the cohort agreed to participate in the study and signed consent forms to be included.

Setting. The Mary Lou Fulton Teachers College of Arizona State University (ASU) offers the iTeachAZ program for student teachers. Seniors in the program are placed for a full year of practical experience in one of approximately 30 partner districts. During this final year, student teachers take all their classes and do all their internships in that district, under the supervision of a site coordinator. All participants for this study were members of two combined cohorts working to be dually certified in general

education (1-8) and special education (K-12). The candidates were placed in either an elementary or middle school All the placement schools were in Mesa and Gilbert public school districts. Roughly half were in special education classrooms, with caseloads of 30 to 40 students, and the remainder were in general education classrooms with approximately 25 to 30 students. Each student teacher had a mentor teacher with at least three years' experience. Student teachers spent one day each week attending college classes and one other afternoon for a two-hour student teaching class with their site coordinator.

Procedure. At the beginning of the fall semester, I explained the project and recruited participants for the study. I used an IC Map (Appendix A) to guide both my early evaluations of their work and later in their own regular self-assessment (Hall & Hord, 2015). All student teachers facilitated their own action research project based on an identified problem of practice. They met weekly to discuss their research in the iTeachAZ classrooms within communities of practice. Student teachers were grouped in communities with similar problems of practice.

I revised the modules for teaching action research and communities of practice based on feedback from the two previous administrations during earlier cycles of research. The first module taught action research using the agenda outlined in Table 2. The second module was designed to introduce communities of practice to student teachers as illustrated in Table 3.

Table 2

Action Research Module Agenda

Agenda Item	Description
What is Action Research?	Action research is a means of supporting reflective practice and driving data-rich instruction for teachers to address problems in their local environment.
Why Do Action Research?	Allows teachers to gain a greater understanding of the effectiveness of the strategies they employ, the students they teach, and how they measure student learning.
How is it Done	Action research is a cyclical process of; (1) Identifying and Limiting the Problem of Practice (2) Gathering Information (3) Reviewing the Literature (4) Developing a Research Plan (5) Implementing the Plan Collecting Data (6) Analyzing Data (7) Reflecting on the Process
Planning for Your Own Action Research	Describes the procedures we will undertake in our ARCP, my role in supervising and monitoring, and the expectations for student teachers.

Table 3

Communities of Practice Module Agenda

Agenda Item	Description
What are Communities of Practice?	Communities of practice are groups of professionals that come together with a shared purpose and collaborative learning.
Why Communities of Practice?	Allows teachers to support and learn from one another as they address the challenges of their profession.
How Do They Work?	Communities of practice allow for the creation of ideas about the area of practice and its meaningful connections, engagement that provides for the mutual negotiation of meaning, and alignment that permits contribution to larger enterprise.
Planning for Your Own Communities or Practice	Describes the procedures we will undertake in our ARCP, how we will form our groups, my role in supervising and monitoring, and the expectations for student teachers.

After module instruction, but before they began conducting their own action research, the 24-item Teacher's Sense of Efficacy Scale (TSES) pretest was administered (Tschannen-Moran & Woolfolk Hoy, 2001). The TSES measures teacher self-efficacy cross three constructs; student engagement, instructional practices, and classroom management. The full 24-item TSES, rather than the 12-item short form, is recommended for student teachers by the authors. (Tschannen-Moran, et al., 2001).

Following the administration of the TSES, student teachers worked with their mentor teachers to determine the problem of practice in their classroom to address with their projects. Student teachers submitted an action research proposal that included their research question(s). They discussed their proposals within their ARCP before submitting them to me. For some of the student teachers, I provided individual guidance on their research, mostly in regard to their problems of practice. Some needed to narrow their focus and two others wanted to address problems outside of their locus of control. As they worked in their communities of practice, I used the open-ended statements to measure stages of concern for the cohort (Hall & Hord, 2015). The stages of concern were recorded in student formative reflections. Student teachers completed their ARCP by mid-November to allow time for structured reflection. The TSES post-test assessment was administered following a week-long reflection period.

Table 4 provides an illustration of the Phase One timeline.

Table 4

Timeline and Procedures of Phase One

Time Frame	Actions	Procedures
August	Administered pre-TSES	• Proctored survey with student teachers.
August-September	Delivered action research modules	• Held discussions to explain process, relevance, and timeline of action research projects • Instruction on action research and communities of practice using modules • Developed and applied IC Map
September	Action research proposals	• Student teachers worked with their mentors to determine a problem of practice in their classrooms • Student teachers submitted an action research proposal including their research questions • Stages of Concern Open- Ended Questions
September	Assigned communities of practice	• Grouped student teachers by similar problems of practice • Communities divided into groups of four to five • There were five ARCP • Monitored for fading using LoU and IC Map
November	Action research project completed	• Student teachers completed their action research projects • Student teachers participated in a week-long structured reflection
December	Administer post-TSES	• Proctored survey with teacher candidates.

Role of the Researcher. As the site coordinator for the student teachers described above, I was responsible for their supervision, evaluation, and instruction. I administered the pre- and post-tests and analyzed the data. I delivered instruction of the modules on action research and assigned the members, based on placement and problems of practice, to the communities of practice. As the candidates' progressed through their ARCP, I conferenced with each of the five communities and individuals to provide feedback and promote reflection.

As in insider, I needed to maintain a keen awareness of my positionality. Without it, according to Herr and Anderson (2015), we cannot do "the kind of intense self-reflection that is the hallmark of good practitioner research" (p. 58). I was in a position of authority over them. I was the one person who had the most to say as whether they would graduate to become teachers. I took care in how I collected, analyzed, and reported any quantitative and qualitative data (Herr & Anderson, 2015).

I was careful to help them understand that any quantitative data would only be reported in aggregate, explaining what that meant, so they would not be individually accountable for results. I had them code (pick a number they would remember) the TSES so I could compare results without identifying any participants. I put their numbers in three groups based on amount of pretest to posttest change on a presentation slide and asked for a volunteer from each group to contact me to be interviewed. I never knew who was connected to any code, although I did know which group they were in once they had volunteer to be interviewed. For the qualitative data, I explained that all communications would be presented using a pseudonym.

The Innovation: Action Research Communities of Practice (ARCP)

My innovation involved each student teacher completing an action research project with the support of their community of practice. To teach, model, and monitor their progress, I implemented a five-step process. The five steps were:

Inspire and teach. I began by making the work we did together personally relevant for them by discussing what they might do when faced with a challenge in the classroom. Action research and communities of practice were taught to student teachers in two previous cycles of my own research. I revised the modules based on student feedback from earlier cycles. I demonstrated how action research is effective for problem solving in their classrooms. I expanded their curriculum and taught them about the broader concept of communities of practice. As a cohort, we worked and acted as a community of practice. I then grouped the student teachers in communities of practice, based on similar problems of practice.

Model and practice. I used our own student data, addressing a cohort deficit based on low scores in one indicator of their evaluation rubric, in this case academic feedback, as a model for the collection, sharing, analysis, planning, and reflecting action research cycle for our larger community of practice. I modeled each step of the action research cycle As I taught the two modules on action research, student teachers worked to identify their problems of practice. Working with their mentors, they identified a student, or group of students, with a specific need to address. Their problem of practice could be academic or behavioral. We practiced together, using their authentic student data, each of the action research steps. I used formative assessment and feedback, checks for understanding (fists to five, etc.) and probative questions, along with notes from the IC

Map to refine and reinforce their skills. At this point, I used open-ended statements to measure Stages of Concern for each community of practice (Hall & Hord, 2015). Open-ended statements were a formative qualitative measure of an innovation users' concerns (Open-ended statements used are found in Table 17). Student teachers were given an open-ended statement, such as "I am not sure about…" and they completed the statement to allow me to measure their concerns Their responses were collected as student formative reflections.

Coach and release. I monitored each community as they worked collaboratively, provided feedback and coaching in a gradual release model. Each ARCP met most every week and was be structured so that it included time to discuss each group members' projects and provide feedback and support to one another. As their skills developed, I faded my level of participation to allow them to work more and more without my support. I used the IC Maps and Levels of Use to structure the fading. Their collaborative work and encouragement of one was designed to function both as verbal persuasion and supported physiological and affective states. Again, I used open-ended statements to measure Stages of Concern for each community of practice and added student teacher response to my student formative reflections (Hall & Hord, 2015).

Evaluate and reinforce. I provided them with an Innovation Configuration (IC Map) (Appendix A) that was used both in my early evaluations of their work and later in their own regular self-assessment (Hall & Hord, 2015). The IC Map assessed the student teachers progress moving from novice to effective action researchers and community of practice members. The ideal behaviors for student teachers was precisely described for both the steps of their action research projects and how they collaborated in their

communities of practice. Following a gradual release model, I used the map initially and then passed the responsibility over to the student teachers to use to self-assess their participation in ARCP. This tool was used to reinforce and align their growth, both as individual members and as they built identities as contributing members of the ARCP.

Table 5 provides and illustration of how ARCP was assessed using the IC Map.

Table 5

IC Map Configuration

IC Map Section	Ideal ARCP Behaviors
Data Collection and Sharing	Collects and analyzes problem of practice and intervention data at regular intervals and shares the data with community members.
Data Analysis	Analyzes data collaboratively with all members. Identifies trends, bright spots, and targets for remediation.
Community Collaboration	Actively collaborates with community members to support members' research and seeks feedback and ideas on their own work. Utilizes collaborative efforts to increase success for all members to include verbal and emotional support.
Reflection	Shares stories of success with community members. Celebrates successes of other members. Reflects on the self-efficacy because of personal efforts.

I allowed room for participants to grow in a direction that is tied to the work at hand, but flexible enough not to damper the dynamics of the group. Their communities of practice overlapped with others within their schools, so I made room for contributions from those outside their ARCP. For instance, I encouraged them to regularly get feedback from their grade-level teams or PLC and directed some to seek help from experts in their schools (Title 1 specialists, reading specialists, behavioral caches, etc.). I encouraged

feedback and input from mentors and administrators that they brought back to their communities. I wanted the student teachers to learn that after they graduate, they can draw on the resources of any community of practice of which they are members. Their ARCP provided a focus on data and allowed for the regular production of artifacts. They were able to share they work, gaining verbal persuasion, and celebrate one another's successes (Wenger, McDermott, & Snyder, 2002).

Reflect and write. Prior to the post-test administration of the TSES, we reflected in open discussions on their progress and possible long-term outcomes. Student formative reflections described the tenor of these discussions. Student teachers were asked to write about their personal growth. They were encouraged to describe their self-efficacy beliefs for meeting the challenges they might face in their future classrooms.

The rationale for having student teachers participate in ARCP was to increase their self-efficacy beliefs by providing them experiences aligned to the four sources of self-efficacy (Bandura, 1997). Their action research projects were designed to provide them mastery experiences. The action research they saw me model provided an initial vicarious experience. Their ARCP work was designed to provide vicarious experiences, verbal persuasion, and their reliance on one another supported physiological and affective states.

Change Adoption and ARCP

Innovation Adoption. The use of communities of practice as an agent of change is supported in the literature (Darling-Hammond, 2009; Kaschak & Letwinsky, 2015; Vaino, et al., 2013). Darling-Hammond (2009) wrote, for reformative change to take hold three things must happen with teachers:

> Teacher isolation must be overcome so that opportunities to study teaching and discuss problems of practice can be frequent and regular. Teachers need opportunities to develop and evaluate curriculum and assessments with colleagues—and engage students in authentic demonstrations of learning, so that learning standards come alive, are publicly shared, and shape ongoing diagnosis and improvement of practice. Finally, teachers must be involved in evaluation of student learning and in decision-making about policies and practices. (pp. 64-65)

Student teachers met weekly in their ARCP, grouped by their problems of practice They shared and supported one another in their ARCP, providing the other three sources of self-efficacy, vicarious experience, verbal persuasion, and physiological and affective states. As the student teachers progressed through the learning and implementing their ARCP, I used the Concerns Based Adoption model to monitor their level of concern (Hall & Hord, 2015). This monitoring provided the basis of my student formative reflections. I collected written and oral student reflections using stages of concern as a guide. For example, one community of practice might complete the open-ended statement, "*We have questions about* how we should share in our communities." I would then know I needed to explain further about what I wanted them to share in their meetings.

Concerns Based Adoption Model. Hall and Hord's (2015) Concerns Based Adoption Model (CBAM) provided three diagnostic dimensions I used to monitor and adjust the student teachers' actions throughout the innovation. It provided me a scaffolding within which to sustain the direction and application of their work. As they moved through the innovation, I used innovation configurations (IC Map), Stages of

Concern, and Levels of Use to assess and monitor participation. I used an IC Map to define ideal behaviors, both for my own role as a model, and for each step of the student teachers' action research and how they collaborate in their communities of practice. Stages of concern provided prompts that encouraged the student teachers to voice their concerns so I could record them in my student formative reflections and adjust as needed. Levels of use provided a framework upon which to account for the student teachers' application readiness as I monitored the innovation.

Innovation configurations. Hall and Hord (2015) reported that the first step should be to determine whose roles the map will describe. Sim (2006) showed that it was critical to teach student teachers about communities of practice, rather than hope they would develop on their own. The IC Map began by describing my role in teaching and supporting the development of communities of practice, and their efforts in action research. The ideal behaviors for student teachers were precisely described for both the steps of their action research projects and how they collaborated in their communities of practice. Additionally, clearly defining my role and behaviors, and the ideal behaviors of the student teachers in the innovation, provided for fidelity in each cycle of my action research. As I moved through each iteration of my research and innovation, the IC Map helped me ensure I conducted both with equal or better rigor and accuracy. By preserving this fidelity, I worked towards better possible outcomes and provided the best model for my student teachers.

Stages of concern. Hall and Hord (2015) categorized the feelings and perceptions of persons moving through innovation into different stages of concern. Knowing the student teachers' stages of concern through the steps of my innovation improved

facilitation and support of both the individual and groups of students. As the student teachers began to develop their identities as members of communities of practice, I used my student formative reflections to collect their responses to open-ended statements to estimate stages of concern. Open-ended statements were provided to allow the respondent to express concerns as they moved through an innovation Newlove & Hall, 1976). I then used the data to adjust my ongoing training and feedback to better insure they conduct their research and collaborate with one another effectively.

Levels of use. Hall and Hord (2015) classified levels of use levels of use to describe and predict how people behave in relation to innovation. Levels of use enriched my understanding and allowed me to predict what behaviors I should see as my student teachers moved through the steps during implementation of my innovation.

- Level I, Orientation: Student teachers will be learning about conducting action research and how to be effective members of communities of practice.
- Level II, Preparation: Students teachers will work with their mentors to identify a student as a focus of their research and begin to develop their identities as community or practice members.
- Level III, Mechanical Use: Student teachers will be doing the regular steps of their own action research projects with my guidance and following prescribed steps for participation in their communities of practice.
- Level IVA, Routine: Student teachers will begin to work without my guidance on their action research projects and work collaboratively without my direct instruction in their communities of practice.

- Level IVB, Refinement: Student teachers will reflect both on their action research projects and community of practice participation.
- Level V, Integration: Student teachers will integrate refinements suggested by their reflections.
- Level VI, Renewal: Student teachers will take greater ownership as they move through subsequent cycles. They will also provide greater support for their group members.

Student Teacher Data Sources

Teacher's Sense of Efficacy Scale. I measured the effectiveness of their ACRP on self-efficacy beliefs of the student teachers pre and post innovation, using the 24-item Teacher's Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). Student teachers were asked to respond to each of the questions considering their current capabilities and not what they might imagine for the future. The TSES had three sub-scales: efficacy for student engagement, efficacy for classroom management, and efficacy for instructional strategies. Student teachers rated each of the 24 items on a 9-point scale. Each item has anchors at 9 (a great deal), 7 (quite a bit), 5 (some degree), 3 (very little), and 1 (none at all).

To illustrate the nature of the items, the following examples came from each of the three sub-tests. For student engagement, an example item was: "How much can you do to get students to believe they can do well in school work?" For classroom management, an example item was: "How much can you do to calm a student who is disruptive or noisy?" Finally, for student engagement, and example item was: "How well can you implement alternative strategies in your classroom?"

Student Formative Reflections. As I monitored the work of the ARCP, I collected field notes using stages of concern as a guide. I used them to estimate stages of concern formatively during innovation adoption and reflected on any need for adjustment in my role. As they are meeting, I circulated among the groups and asked questions, used open-ended statements, and listened to their discussions to build a picture for myself of how they are developing. Students responded to the open-ended statements either orally, which I would record on the template, or write their responses to the statements on a slip paper. The latter, I would later transfer to the template. After class, I looked at the individual student responses and decided on the stage of concern it represented. Finally, I took all the responses as a whole to determine where my students were in adopting the practices of action research and participation in communities of practice.

The template for Student Formative Reflections can be found in Appendix E.

Student Teacher Interview. Three student-teacher participants were selected based on their TSES results; one that showed the highest overall self-efficacy, one mid-range, and one with the lowest overall self-efficacy. All three were asked open-ended questions. The complete set of interview questions may be found in Appendix D.

I designed the questions to determine how they perceived heir action research projects impacted their self-efficacy, how doing their projects within the structure of a community of practice impacted their self-efficacy, and how they felt their self-efficacy impacted their intent to stay in teaching. To illustrate the nature of the interview items, the first question asked about their action research, “What impact do you think completing your action research had on your ability to face the challenges of being a novice teacher?”. The next question asked about their work in communities of practice,

"How did sharing your work with the others in your community of practice impact your action research project?" And the last question asked about their intent to stay, "How would you describe your likelihood to stay in teaching, if you feel better prepared to meet the challenges of being a novice teacher?"

I communicated purpose of the study and the interview to all interviewees. I asked the questions in order. As the subjects answered, I listened for opportunities to encourage them to elaborate on a theme, or to redirect if answers are not directed to the intended purpose of the question. Interviews were audio and video recorded using the Zoom conference application in order to obtain recorded transcripts. After recording, session videos and transcripts were downloaded and saved using a coded pseudonym, and then uploaded to my password protected Google cloud space.

I analyzed the interview data collected using grounded theory, I watched and listened to each of the recordings at least three times (Charmaz, 2014). Creswell (2015) describes the process in greater detail using a constructivist grounded theory design for research. It enables the generation of a broad theory about a qualitative phenomenon that is grounded in the data. Grounded theory allowed me to develop a thematic picture of the beliefs and intents of my novice teachers. The constructivist design allowed me to co-construct a theory about my participants intents and beliefs melding their responses with my observations (Charmaz, 2014). As I listened and watched to the recordings, using the systematic design of grounded theory, I first used: (1) open coding – forming initial categories; (2) properties – subcategories of open codes that serve to provide more detail (3) and then axial coding – looking at the constructed whole for extents and extremes (Creswell, 2015, Leedy & Ormrod, 2001, Williams, 2011).

The first time, I viewed to get an impression of the overall demeanor of the interviewee and remind myself about key nuances that stand out during the interview. The second time, I made notations of ideas that might become thematic when all the interviews were taken together. Then the third time, I stopped the video at the key places to highlight exact quotes on the transcript under the relevant thematic heading from the second analysis (Kvale & Brinkmann, 2015). I then compared my notes to the audio transcripts to ensure fidelity of my interpretation. This method of analysis, viewing the interviews three times, allowed me to capture more than just words. I listened for inflection and emotion that helped me develop my themes and address the first two research questions:

- RQ 1: How and to what extent will conducting action research within communities of practice impact student teachers' self-efficacy beliefs?
- RQ 2: How and to what extent will working in communities of practice impact their action research experience?

Phase Two – Novice Teacher

Participants. The participants were former iTeachAZ graduates with fewer than six years teaching experience. Demographics for this group was collected in the Novice Teacher Survey (Appendix C). They were asked to complete a survey designed to measure their teacher self-efficacy and the effects of participating in a similar ARCP project as preservice teachers. This survey first determined one of three groups from the sample:

- Did not conduct action research during student teaching

- Conducted action research during student teaching,
- Conducted action research during student teaching within communities of practice.

Selected participants from the three groups were then be interviewed about how action research, or action research in communities of practice impacted their self-efficacy beliefs and intent to stay in teaching. I used convenience sampling (Teddlie & Yu, 2007) to interview two representatives with varying levels of self-efficacy from each group for a total of six interviews.

Procedure. The novice teacher survey and permission letter were sent to former iTeachAZ graduates in September, to give them time to adjust to the new school year. Site coordinator colleagues provided email addresses of likely participants. I sent the survey electronically using Qualtrics survey software. I analyzed the responses and identified potential participants for interviewing.

Table 6 provides an illustration of the Phase Two timeline.

Table 6

Timeline and Procedures of Phase Two

Time Frame	Actions	Procedures
August	Prepared the survey	• Converted the survey to be delivered using Qualtrics • Identified potential participants and means of contact
September	Delivered the survey	• Used identified means of delivery to distribute the survey to novice teacher participants

October - November	Collected and coded survey data	• Coded provided email addresses to match surveys for potential interviews • Stored coded survey results and email addresses separately for data security
November - December	Interviews	• Interviewed six novice teachers in their schools

Novice Teacher Data Sources

Novice Teacher Survey. Participants were asked to complete a survey designed to collect demographics to determine if they did action research, and if they did action research with support from their communities of practice. The survey measured three constructs of teacher self-efficacy in their first years of teaching; (1) student engagement, (2) instructional effectiveness, and (3) classroom management. These three constructs were designed to encompass those areas of performance measured by teacher evaluations and representing most task-specific self-efficacy beliefs for practicing teachers (Tschannen-Moran, M, & McMaster, 2009). Novice teachers rated each item on a 9-point scale. Each item had anchors at 9 (very able), 7 (able), 5 (more or less able), 3 (unable), and 1 (very unable).

To illustrate the nature of the items, the following examples come from each of the three sub-tests. To measure teacher self-efficacy regarding their ability to engage students, an example item was: "How able are you to encourage families to participate in their child's learning?" For teacher confidence in their own instructional effectiveness, an example item was: "How able are you to use classroom data to drive your

instruction?" Finally, to determine how teachers felt about their ability to effectively manage their classroom, an example item was: "How able are you to respond effectively to students who are disruptive?"

I field-tested the survey during an earlier cycle of the research. All survey participants were iTeachAZ graduates and novice teachers with fewer than six years' experience. I collected responses from 27 novice teachers, then used that data to determine internal reliability and construct validity with the results shown in Tables 7 and 8. I also interviewed six of the respondents to help me elaborate on the quantitative data.

The collected data were analyzed for reliability using SPSS software. Internal consistency was calculated using Cronbach Alpha for each construct and then overall for all 15 items. Fraenkel and Wallen (2005) describe the Cronbach Alpha coefficient as a measure of internal consistency, thus requiring only one administration. Rather than having to test and retest to measure reliability, internal consistency compares two different subsets of items against one another. The software gives you a reliability coefficient. A coefficient greater than .75 is considered acceptable reliability. The coefficient alpha is applicable for items that are scored as continuous variables, such as on a Likert scale (Creswell, 2015).

These results are reported in Table 7.

Table 7

Coefficient Alpha Reliability: Novice Teacher Survey (n=27)

Construct	Within Construct Items	Coefficient Alpha Estimate of Reliability
Engagement	1 – 5	.883

Instruction	6 – 10	.964
Classroom Management	11 – 15	.950
Overall Alpha	1 – 15	.972

Upon calculation of the Cronbach Alpha, one construct, engagement, had a coefficient that was noticeably lower than the other two constructs and the overall alpha. Accordingly, further analysis was done by calculating the coefficient for four of items in that construct, leaving one item out each time. The first, then the last item were excluded, then each item of the remaining items respectively. It was not surprising that each coefficient for four items, in four of the item combinations (.841 to .854) was lower than the overall alpha (.883) because the number of items is a factor in reliability (Fraenkel & Wallen, 2005). However, the additional analysis revealed that when Item 3, Engagement Families, was excluded, the coefficient (.897) was higher for the four remaining items, than overall for this construct (.883). Though the coefficient is still within the acceptable range (greater than .75), this one question was somewhat of an outlier and could be considered to slightly skew the results for the construct when making inferences in comparison to other constructs. In other words, if I wanted to make a finding based on comparative analysis between the three constructs, I might want to rewrite the question. For the purpose of this study, I did not make that comparison.

This analysis is reported in Table 8.

Table 8

Coefficient Alpha Reliability: Construct Item Analysis (n=27)

Construct	Analyzed Items	Coefficient Alpha Estimate of Reliability
Engagement w/o Relevance	2 – 5	.854
Engagement w/o Collaboration	1 – 4	.844
Engagement w/o Confidence	1, 3, 4, 5	.845
Engagement w/o Families	1, 2, 4, 5	.897
Engagement w/o Diversity	1, 2, 3, 5	.841
Overall Construct Alpha	1 – 5	.883

The complete survey can be found in Appendix C.

Novice Teacher Interview. The interview instrument consisted of seven items. Two participants from three group were interviewed: (Group 1) those that did not facilitate action research, (Group 2) those that conducted action research during student teaching, and (3) those that conducted action research during student teaching within communities of practice. All six participants were asked open-ended questions designed to determine their perceptions about the impact of action research projects on their self-efficacy, how doing their projects within the structure of a community of practice impacted their self-efficacy, and how they felt their self-efficacy impacted their intent to stay in teaching. For example, questions included: “What impact do you think completing your action research during student teaching had on your ability to face the

challenges of being a novice teacher?" and "How would you describe your likelihood to stay in teaching, if you feel better prepared to meet the challenges of being a novice teacher?". The complete set of interview questions may be found in Appendix F. Each interview was conducted during a Zoom online conference. I communicated the purpose of the study and the interview to all interviewees. I asked the questions in order. As the participants answered, I listened for opportunities to encourage them to elaborate on a theme, or to redirect if answers are not directed to the intended purpose of the question. Interviews were audio and video recorded using the Zoom conference application in order to obtain recorded transcripts. After recording, session videos and transcripts were downloaded and saved using a coded pseudonym, and then uploaded to my password protected Google cloud space.

I again used grounded theory for analysis of the novice teacher interview data, following the same procedures I did with the student teacher interviews. Analysis of the novice teacher data attempted to address my final question: How and to what extent was novice teacher intent to stay in the profession impacted by:

a. conducting action research during preparation;
b. conducting action research in communities of practice during preparation or;
c. not conducting action research during preparation?

Role of the Researcher. It was a possibility that I was the site coordinator for some of the novice teachers participating in this phase of the study. This cannot be determined based on the anonymity of the survey results. Interestingly, a few were mentor teachers to the cohort of student teachers who were participants in this study.

Data Analysis

Quantitative. The two quantitative data sources for the study were the TSES and the Novice Teacher Survey. The TSES (Appendix B) was used to assess the student teachers' self-efficacy before and after their ARCP. The results of the TSES pre and posttest were analyzed using SPSS for distribution, or variance from the mean (Fisher & Marshall, 2008). By calculating descriptive statistics and analysis of variance I was able to determine if the two sets of scores were distributed fairly equally around the mean. In quantitative measures, trends in the data are shown by a majority being less than one standard deviation from the mean of all scores. In other words, the fewer the scores that deviate from a close grouping of all the scores, the easier it is to make inferences using those data. Using the same software, I determined P values between the pre and posttest using a paired-samples t-test to determine significance and allow for rejecting the null hypothesis (Ren, 2009).

I used the Novice Teacher Survey (Appendix A) to assess iTeachAZ graduate teachers' self-efficacy and the effects of participating in a similar ARCP project as preservice teachers.

I sent the survey electronically using Qualtrics survey software. I analyzed the responses using SPSS for distribution, or variance from the mean between the three constructs, *engagement, classroom management,* and *instruction* (Fisher & Marshall,

2008). By calculating descriptive statistics and analysis of variance I was able to determine if the results within construct and between the three are distributed nearly equally around the mean. Using the same software, I determined P values using a paired-samples t-test to determine significance and allow for rejecting the null hypothesis. The null hypothesis says that the results could be as a result of random chance. By rejecting the null hypothesis, I was able to determine that the results were statistically significant and not a result of random chance. (Ren, 2009).

Qualitative. There were three sources of qualitative data for the study. I used the stages of concern as an a priori code to make assertions as to the student teacher's progression through the innovation. And I used grounded theory with open and axial coding to develop themes from both sets of interview data. Table 9 illustrates the data sources and their use.

Table 9

Qualitative Data Sources of the Study, Their Use, and Analysis

Data Source	Use	Analysis
Student Formative Reflections	Estimate stages of concern formatively during innovation adoption. Stages of Concern used as *a priori* codes.	Manual for Assessing Open-ended Statements of Concern about an Innovation (Newlove, & Hall, 1976).
Student Teacher Interview	Qualitative assessment of student teacher self-efficacy, and beliefs about action research and communities of practice after ARCP (RQ1 & RQ2).	Thematic Coding (Gibbs, 2007), Grounded Theory (Creswell, 2015).
Novice Teacher Interview	Qualitative and assessment of novice teacher self-efficacy, and beliefs about action research, communities of practice, and intent to stay (RQ3).	Thematic Coding (Gibbs, 2007), Grounded Theory (Creswell, 2015).

Research Summary

There were two phases of the study: the first phase measured the impact to self-efficacy beliefs with student teachers participating in the ARCP, and the second phase investigated novice teacher self-efficacy and their perceptions about how conducting action research and participating in communities of practice during their teacher preparation may have influenced the likelihood to stay in teaching.

CHAPTER 4

ANALYSIS AND RESULTS

Introduction

This study investigated a means of increasing student teacher self-efficacy with a goal of decreasing novice teacher attrition. Specifically, the research questions guiding my study were:

RQ 1: How and to what extent will conducting action research within communities of practice impact student teachers' self-efficacy beliefs?

RQ 2: How and to what extent will working in communities of practice impact their action research experience?

RQ 3: How and to what extent was novice teacher intent to stay in the profession impacted by

a. conducting action research during preparation,
b. conducting action research in communities of practice during preparation, or
c. not conducting action research during preparation?

The study used mixed-methods collection of data for which the results are presented in two sections providing quantitative and qualitative data. The study was conducted in two phases. The first phase of the study involved the student teachers and consisted of the quantitative results from the Teacher's Sense of Efficacy Scale (TSES) and qualitative results from student formative reflections and interviews. I present descriptive statistics and factors of internal consistency using the study data collected for

the TSES to measure reliability and reject the null hypothesis (Renn, 2009). I present the analysis of the student formative reflections and interviews to elaborate on the results of the TSES. I describe my qualitative analysis of the student teacher formative reflections and student teacher interviews (Creswell, 2015, Gibbs, 2007).

The second phase involved Novice teachers who were graduates of the same program in which the student teachers were enrolled. The results of the second phase of the study consisted of the Novice Teacher Survey and interviews with six survey participants. For the Novice Teacher Survey, I measure variance from the mean between the three constructs, engagement, classroom management, and instruction (Fisher & Marshall, 2008), and provide factor analysis for reliability. I present the qualitative analysis of the interviews to compliment the quantitative results of the survey. For novice teacher interviews, I describe my coding methods to support the development of themes enhancing the quantitative survey results (Gibbs, 2007).

Phase One – Student Teachers

Quantitative data for the student teacher phase of the study was comprised of 24-item Teacher's Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). Student teachers were given the scales prior to and following the innovation to provide a pre and post test score.

Qualitative data for Phase One of the study included interviews with student teachers and student formative reflections taken during the monitoring of communities of practice meetings. The communities of practice met each week and I documented and monitored their work using open-ended Levels of Use statements from the manual of Levels of Use and Stages of Concern (Hall & Hord, 2015). Open-ended statements used

are found in Table 17. Each community monitored their own work using an ICMap (Appendix C). I conducted the interviews following an analysis of pre and posttest TSES data. I used this data to select three participants to be interviewed—one representative from each of three groups. The first group were those student teachers who demonstrated the greatest change pre and posttest, thus seeing the most change in self-efficacy. The second group were those in the middle range of score change. And the third group consisted of student teachers who showed the least amount of change pre and post TSES administration.

Student Teachers – Quantitative Data

To begin my analysis of the TSES pre and post data, I used SPSS to run descriptive statistics using a paired samples t-tests at $\alpha = .05$. The mean for both TSES administrations is close to the median which suggests the scores are distributed fairly equally around the mean, with standard deviation smaller in the post test scores grouping them closer than the pretest. The TSES pretest, taken prior to the innovation, showed a mean self-efficacy score of 5.40 (SD = .723) and the posttest showed a mean self-efficacy score of 7.31 (SD = .650). These results are displayed in Table 10.

Table 10

TSES Pre and Post Test Descriptive Statistics

Item	N	Mean	Median	Standard Deviation
PreTest	26	5.40	5.48	.723
PostTest	26	7.31	7.39	.650

There was a significant difference in the TSES scores between the pretest (M=5.40, SD=.723) and posttest (M=7.31, SD=.650; t (25) = -16.297, p < 001). The paired samples t-test shows that the mean difference between the pre and post test scores, with a p value less than .0001, is statistically significant. This allows for the rejection of the null hypothesis meaning the change in scores is statistically significant. The null hypothesis says that the results could be as a result of random chance. Therefore, I rejected my null hypothesis which meant that for my study, the increase in self-efficacy means pre and posttest was not a result of random chance.

I further analyzed the TSES by comparing the three sub-constructs of the test; student engagement, instruction, and classroom management. The construct of student engagement was measured with questions 1, 2, 4, 6, 9, 12, 14, and 22. An example engagement question, question 2, asks "How much can you do to help your students think critically?" The construct of instruction is measured with questions 7, 10, 11, 17, 18, 20, 23, and 24. An example instruction question, question 7 asks, "How well can you respond to difficult questions from your students?" And the construct of classroom management is measured by questions 3, 5, 8, 13, 15, 16, 19, 21. Question 8, "How well can you establish routines to keep activities running smoothly?", is an example of a question from the latter construct. I conducted analysis across constructs for two purposes, first to determine internal reliability across the post-test TSES results, and second to compare growth in self-efficacy by construct following the innovation.

The collected data were analyzed for reliability using SPSS software. Internal consistency was calculated using Cronbach Alpha for each construct and then overall for all 15 items. Fraenkel and Wallen (2005) describe the Cronbach Alpha coefficient as a

measure of internal consistency, thus requiring only one administration. The coefficient alpha is applicable for items that are scored as continuous variables, such as on a Likert scale (Creswell, 2015). These results a reported in Table 11.

Table 11

Coefficient Alpha Reliability: Teacher Survey of Self-Efficacy (n=26)

Construct	Within Construct Items	Coefficient Alpha Estimate of Reliability
Engagement	1, 2, 4, 6, 9, 12, 14, 22	.749
Instruction	7, 10, 11, 17, 18, 20, 23, 24	.863
Classroom Management	3, 5, 8, 13, 15, 16, 19, 21	.893
Overall Alpha	1 – 24	.906

Upon calculation of the Cronbach's alpha, one construct, engagement, had a coefficient that was noticeably lower than the other two constructs and the overall alpha. Accordingly, further analysis was done by calculating the coefficient for four of items in that construct, leaving one item out each time. The first, then the last item were excluded, then each item of the remaining items respectively. It was not surprising that each coefficient for all but two of the seven items in combination (.683 to .721) was lower than the overall alpha (.749) because the number of items is a factor in reliability (Fraenkel & Wallen, 2005). However, the additional analysis revealed that when Item 1 or Item 12, Engagement w/o Difficult Students and Engagement w/o Foster Creativity respectively, were excluded, the coefficients (.751 and .770 respectively) were higher for the seven remaining items, than overall for this construct (.749). This analysis is reported in Table 12.

Table 12

Coefficient Alpha Reliability: Engagement Construct Item Analysis (n=27)

Construct	Analyzed Items	Coefficient Alpha Estimate of Reliability
Engagement w/o Difficult Students	2, 4, 6, 9, 12, 14, 22	.751
Engagement w/o Assist Families	1, 2, 4, 6, 9, 12, 14	.727
Engagement w/o Think Critically	1, 4, 6, 9, 12, 14, 22	.683
Engagement w/o Motivate Students	1, 2, 6, 9, 12, 14, 22	.693
Engagement w/o Student Beliefs	1, 2, 4, 9, 12, 14, 22	.734
Engagement w/o Value Learning	1, 2, 4, 6, 12, 14, 22	.690
Engagement w/o Foster Creativity	1, 2, 4, 6, 9, 14, 22	.770
Engagement w/o Failing Student	1, 2, 4, 6, 9, 12, 22	.721
Overall Engagement Construct alpha	1, 2, 4, 6, 9, 12, 14, 22	.749

To effectively make inferences between constructs pre and posttest, I used SPSS to run paired sample *t-tests* between each pair of data. These data are shown in Table 13 and Table 14.

Table 13

TSES Pre and Post Test Descriptive Statistics by Construct

Construct		Engagement		Instruction		Classroom Management	
Item	N	Mean	SD	Mean	SD	Mean	SD
PreTest	26	5.43	.338	5.40	.499	5.40	2.71
Post Test	26	7.38	.556	7.24	.368	7.33	2.03

Table 14

Pair-Samples T-Test of Construct Means (n=26)

Construct		Engagement		Instruction		Classroom Management	
Item	N	p	df	p	df	p	df
Pre and Post Test	26	.000	7	.000	7	< .001	7

p = significance level df = degrees of freedom

Paired samples t-tests at α = .05 were conducted to compare pre- and post-intervention mean scores of the three constructs included in the TSES. After eliminating the possibility that the differences were by random chance, rejecting the null hypothesis, I analyzed the significance of the student teachers' (N=26) scores following delivery of the innovation. All three constructs in the instrument, engagement, instruction, and classroom management were analyzed.

Engagement. The eight-item engagement construct subscale mean for the pre-test (innovation) assessment was 5.43 and increased to 7.38 out of a nine-point scale on the post-test (innovation) assessment. The student teachers (N=26) as a group demonstrated 36% increase, post innovation, in the engagement construct.

Instruction. The eight-item classroom management construct subscale mean for the pre-test (innovation) assessment was 5.40 and increased to 7.24 out of a nine-point scale on the post-test (innovation) assessment. The student teachers (N=26) as a group demonstrated 34% increase, post innovation, in the instruction construct.

Classroom management. The eight-item classroom management construct subscale mean for the pre-test (innovation) assessment was 5.40 and increased to 7.33 out of a nine-point scale on the post-test (innovation) assessment. The student teachers (N=26) as a group demonstrated 38% increase, post innovation, in the classroom management construct.

Student Teachers – Qualitative Data

The responses from the student formative reflections open-ended statements (Hall & Hord, 2015) were analyzed using *a priori* coding to align the responses with the stages presented in Concerns-Based Adoption Model. The seven stages of concern included: awareness, informational, personal, management, consequence, collaboration, and refocusing (see Table 16) (Hall & Hord, 2015). I, then, conducted interviews following an interview guide (Appendix D) with three selected participants during individual online Zoom conferences. I The interviews were analyzed using open coding based to extract and label possible thematic ideas, and then with axial coding to make connections between the initial ideas to identify concurrent themes and the quotes that supported them

(Creswell, 2015, Leedy & Ormrod, 2001, Williams, 2011). The axial coding allowed me to apply deductive reasoning and inductive reasoning in my analysis. Axial coding is the defining the relationships between the data that allows for the identification of major themes (Strauss & Corbin, 1998). First, I looked at the larger themes (deductive) that emerged and saw if they aligned to specific data points (quotes), and then I drew thematic lines to make connections (inductive) between the initial ideas to identify concurrent themes and the quotes that supported them (Creswell, 2015, Leedy & Ormrod, 2001, Williams, 2011).

Data Collection – Student Formative Reflections

Hall and Hord (2015) categorized the feelings and perceptions of persons moving through innovation into different stages of concern. Knowing the student teachers' stages of concern through the steps of my innovation improved facilitation and support of both the individual and groups of students. I began to collect my student formative reflections following instructional modules for action research and communities of practice. I continued to collect student formative reflections as I circulated weekly and sat with each community of practice. My last set of student formative reflections were obtained during a final post-innovation reflection session. I used open-ended statements to allow students to express concerns as they moved through the innovation (Newlove & Hall, 1976).

As the student teachers began to develop their identities as members of communities of practice, I used my student formative reflections template to collect their responses to open-ended statements to estimate levels of use and stages of concern during their meetings. I provided both written and oral open-ended statement prompts for each stage of concern. Students teachers responded either orally or in writing. I wrote their

oral responses as they replied and collected the written responses before they left class. For example, one open-ended statement prompt began, “I am not sure about…” and the student teacher would either orally or in writing finish the statement. I then used the data to adjust my ongoing training and instructor feedback to better insure they conducted their research and collaborated with one another effectively.

Data Analysis – Student Formative Reflections

To analyze the data collected in my field notes, I used the stages of concern to code their responses and illustrate how effectively or ineffectively the student teachers moved through the innovation. The stages of concern are described in Table 15.

Table 15

Concerns-Based Adoptions Model (CBAM) – Stages of Concern

0	Awareness	Not concerned or involved with the innovation
1	Informational	General awareness of the innovation. Some interest in learning more about the innovation.
2	Personal	Participants show uncertainty towards the innovation and what demands it might be made and their ability to meet those demands.
3	Management	The focus of concern becomes the tasks and processes involved in the innovation.
4	Consequence	The focus of concern becomes the outcomes of the innovation.
5	Collaboration	The focus of concern becomes cooperation with others in the community conducting the innovation.
6	Refocusing	The focus becomes applying tasks and processes learned in the innovation to other settings and outcomes.

As I coded the quotes, each received a notation as to where it fell along the timeline of the innovation. This alignment allowed me to make assertions as to their

adoption of the task and processes involved in the innovation, their action research communities of practice. I could infer, based on how individuals or groups completed the open-ended statements how they were feeling about their skills adoption and the effectiveness of their work. The analysis of these statements gave me real-time insight into the thinking of the student teachers as they moved through the innovation. I then matched their thinking to the CBAM stages of concern. The stages of concern alignment of representative responses are shown in Table 16.

Table 16

Student Formative Reflections – Estimated Stages of Concern

Stage	Representative Response Quotes (in italics) to Open-Ended Statements	Timeline
Awareness	We will be doing action research this semester to *learn more about how to face problems.* We will be doing Action research this semester to *something we can do to stop the problems in our classes.* *We will meet in communities of practice to* work together to solve problems. *We will meet in communities of practice ~~to~~* every week. *	Explaining the course syllabus and expectations. (August)
Informational	Action research is *like a structured way of approaching problems in the classroom.* Action research is *something we can do to stop the problems in our classes.* Communities of practice are *kind of like PLCs except they work together.* Communities of practice *meet for a specific purpose.*	Instructional modules on action research and communities of practice. (September)

Personal	I am not sure about *finding the right kind of problem [of practice.]* I am not sure about *what my mentor will want me to do.* I am not sure about *whether the problem should be academic or behavior.* I am not sure about *I can find the right kind of problem.*	Student teachers working with mentors to identify problem of practice. (September)
Management	We have questions about *how we should share in our communities.* We have questions about *defining my problem of practice.* I am not sure about *what to do next.* I am not sure about *how to collect my data.*	First eight weeks of community of practice meetings (September – October)
Consequence	We have questions about *how this work applies to our being teachers.* We are not sure about *how we should be helping each other.* I am not sure about *my solution and will it help."* I am not sure about *that I chose the right problem of practice.*	Last eight weeks of community of practice meetings (October – November)
Collaboration	We have questions about *how we are supposed to help each other.* I am not sure about *how much I am helping the others.* I am not sure about *that I am helping the others because my problem is so different.* In the future I ~~will~~ *might like working with my team to help me solve problems.*	All weeks of community of practice meetings (September – November)

Refocusing	In the future I will *feel better about solving problems in my classroom."* In the future I ~~will~~ *hope I have a team like this to work with.*	Final post-innovation reflection. (December)

After aligning the response quotes from the student teachers to the stages of concern, I then used each stage as an a priori code to make assertions as to the student teacher's progression through the innovation. Using the Student Formative Reflections template (Appendix E), I matched the stage with my own explanation of where they feel in the Stages of Concern. Then I coded their responses to make assertions regarding the student teachers' the concerns they were expressing. This alignment is found in Table 17.

Table 17

Student Formative Reflection – Explanations and Assertions

Stage	Explanation (with exemplary quotation.)	Assertion
Awareness	Open-ended responses from the student teachers tend to indicate a beginning understanding of the procedures they will be doing, without perhaps an understanding of the reasoning behind them. ("*We will meet in communities of practice* ~~*to*~~ every week.")	Concerns reflect needed to build a more effective understanding of the process. They can give the basics but are still unsure of the validity of the process. They want to show engagement but might not show a full understanding.
Informational	Student teacher quotes begin to reflect a greater understanding of the innovation and the work they will be doing. ("*Communities of practice are* kind of like PLCs except they work together.")	Student teachers' concerns are centered around clarifying the expectations for the work they are being asked to do. They are clarifying in nature.

Personal	Student teacher quotes reflect how they might meet innovation expectations in their individual classrooms. ("*I am not sure about* what my mentor will want me to do.")	Student teachers' concerns are based on the ability to perform the required work in their personal classrooms. They are individualized and not reflective of the community work.
Management	Student teacher quotes show a need for assistance in understanding specific steps in the process. ("*I am not sure about* how to collect my data.")	Student teachers are concerned whether they are performing in the prescribed manner. They are worried that they might not be conducting their work in a way that meets expectations.
Consequence	Student teacher quotes show they are not sure about how this work will be helpful to them and their students. ("I am not sure about my solution and will it help.")	Student teacher concerns are focused on the relevance of the work and will it benefit their practice.
Collaboration	Student teacher quotes show they are beginning to talk like researchers and community members. ("*I am not sure about* that I am helping the others because my problem is so different.")	Student teachers concerns revolve around wanting to be an effective member of a collaborative team. They do not want to let their community members down.
Refocusing	Student teachers are beginning to be adopters and thinking about making acquired skills part of their professional practices. ("In the future I will feel better about solving problems in my classroom.")	Student teachers concerns reflect thinking about how this work might be beneficial to them in the future.

Open-ended statements that were completed by student teachers, either orally or in writing, reflect a clear progression from beginning to learn about the processes involved in action research and communities of practice. They start out asking questions and looking for clarification about the expectations of the innovation, universal student concerns, clarifications about specific processes, and how the work is personally relevant

to them now and for their development as practitioners. They begin then to adopt concerns regarding their individual performance and the ability to use the process to create better outcomes for their students. Student teachers move next to wanting to perform in a way that is beneficial to their community of practice as a whole, and finally thinking about how they might take what they learned and be better teachers.

As the student teachers moved through the innovation and the various stages of concern, their evolving statements evoke a movement from following directions as students, to adopting a position of doing authentic, effectual work. The concerns they expressed about being effective members of their communities of practice suggest that they find efficacy in the innovation. If they did not infer some importance to the work, they would not be as concerned about supporting the work of their community members. This progression also reflects a growth in their self-efficacy as a result of both the individual and community work. If they were not becoming more confident in their own abilities to apply these processes, they would not be thinking about replicating them in their future practices.

Data Collection – Student Teacher Interviews

Each of the interviews was conducted in during an online Zoom conference that provided me with a visual and audio recording along with a transcript of the audio. I emailed the consent form along with the Zoom appointment, they signed and then gave verbal consent for recording. I conducted the interviews following an analysis of pre and posttest TSES data. I used this data to ask for three participants to be interviewed asking for one representative from each of three groups. One student teacher was among those who demonstrated the greatest change pre and posttest. One student teacher fell in the

middle range of score change. And the third student teacher was among those who showed the least amount of change pre and post TSES administration.

There were seven interview questions (Appendix D). The questions were asked in order. As the subjects answered, I listened for opportunities to encourage them to elaborate on a theme, or to redirect the query if answers were not directed to the intended purpose of the question. After recording, sessions were downloaded from the Zoom cloud service, renamed using an alphabetically assigned pseudonym, and then uploaded to my password protected Google cloud space.

Data Analysis – Student Teacher Interviews

To analyze the interview data collected, I watched and listened to each of the recordings three times with the transcripts at hand. The first time, I listened to get an impression of the overall demeanor of the interviewee and remind myself about key nuances that had stood out during the interview. The second time I listened, I made notations of ideas on the transcripts that might become thematic when all the interviews were taken together, jotted down these ideas, and made note of the time at which they were expressed. Following the second review, I made headings for the themes emerging from the recordings. When listening the interviews, a third time, I stopped the recording at the key places to write down exact quotes under the relevant thematic heading. I then used axial coding to arrange the minor themes into emerging major themes (Creswell, 2015, Leedy & Ormrod, 2001, Strauss & Corbin, 1998, Williams, 2011).

Specifically, I took the identified quotes arranged under the relevant thematic heading and drew axial lines from the key words to each minor theme. For instance, key word groups such as “action research approach” and “scientific way” I connected axially

to the minor theme *structured approach*. For the key word groups, "supporting one another", "to get a better picture on how we did", and "answering their questions", I drew axial lines to the minor theme *listening to other's problems*. These two minor themes developed into the major theme *Action Research to Address Problems of Practice*. A representative diagram of the axial coding I used is provided in Figure 1.

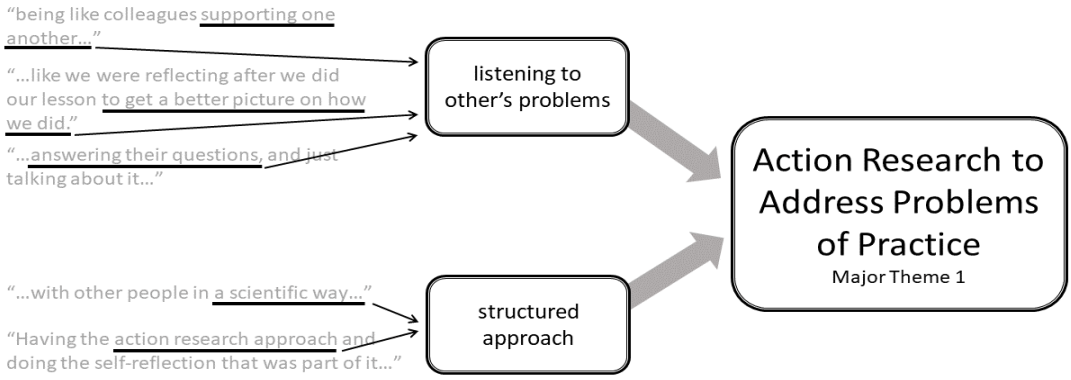

Figure 1: Student Teacher Interviews: Axial Coding Representative Diagram

There were six themes were developed from the interviews. Not all interviews touched on each theme, but at least two of the interviewees addresses those ideas either specifically, or in a comparable way. The six themes in no order, were (1) *structured approach* (2) *talking about my problems,* (3) *listening to others' problems,* (4) *increasing confidence*, (5) *positive approach,* and (6) *feeling better for the future*.

The axial relationship between the minor and major themes from student teacher interviews is illustrated in Figure 2.

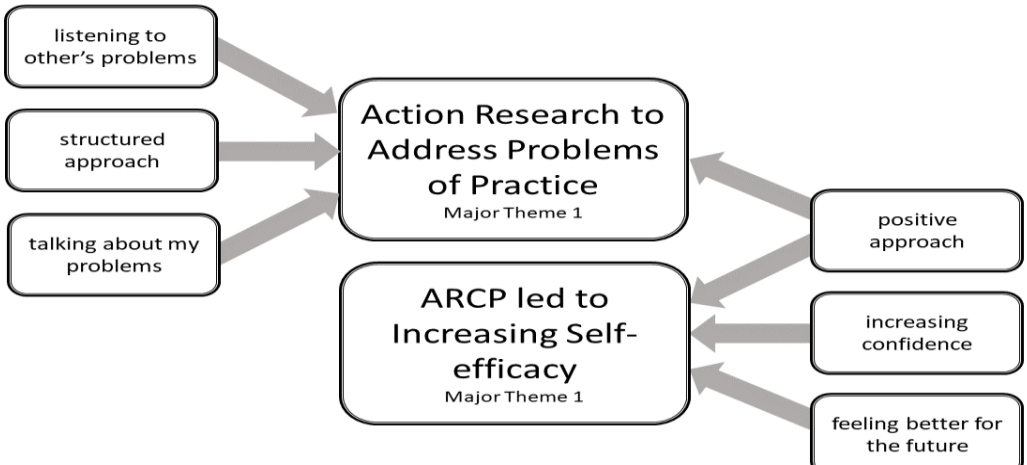

Figure 2: Student Teacher Interviews: Axial Relationship of Minor and Major Themes

Results – Student Teacher Interviews

Two major themes were developed as a result of interview data analysis: *Action Research to Address Problems of Practice* and *ARCP Led to Increasing Self-efficacy*. Their action research provided a structure for the community of practice; and the community of practice supported effective conversations, positive experiences thus contributing to the student teachers' increasing confidence, or *Action Research to Address Problems of Practice.* Those positive experiences, along with feeling better for the future added to the student teachers' increasing confidence to address classroom challenges, and thus the second theme, *ARCP Led to Increasing Self-efficacy.*

The table below summarizes the assertions made regarding each theme. These assertions are displayed in Table 18. And will be explained below.

Table 18

Student Teacher Interviews – Assertion by Theme

Theme	Assertion

Structured Approach	Student teachers saw the value in using the structured approach of action research to approach the problems they might face in the classroom. Their collaborative work was more effective within the structure of action research.
Talking About My Problems	Student teachers found it advantageous to discuss their problems and problem-solving approaches with their colleagues who were doing the same.
Listening to Others' Problems	Student teachers saw it as efficacious to hear their community members discuss their own approach to problems. It sharpened their perspective on their own problems.
Increasing Confidence	Student teachers grew in confidence, developed greater self-efficacy, as they moved through the action research communities of practice process.
Positive Approach	Student teachers expressed appreciation for the focus and positive approach provided by their action research communities of practice. They found this work to have greater value then what they had experienced in PLC.
Feeling Better for the Future	Student teachers after doing their action research in communities of practice had greater confidence going into their first years of teaching. By learning to work together in more structured and positive way they felt better prepared to take on future challenges.

Student Teacher Interview Major Theme 1 – Action Research to Address Problems of Practice. Four minor themes from the student teacher interviews; structured approach, talking about my problems, listening to other's problems, and positive approach were collapsed into one major theme: *Action Research to Address Problems of Practice*. The student teachers talked about how action research provided a structure for their discussions which led to a better collaborative environment. They found it helpful to talk aloud about their own action research. Student teachers also saw it

as an advantage to listen to others in their group talk about their studies. And they added that having the structure of action research within their communities made for a positive approach to problem solving. Below I present descriptions of minor themes and show how they informed the major theme. For reporting responses on each theme, I gave each participant a gender-aligned pseudonym, in alphabetical order relative to the order of their interviews, so they became Aida, Bianca, and Carlos.

Three student teachers spoke to the theme of *structured approach* – meaning their action research provided then a common platform for their community discussions around their problems of practice. They each cited some aspect of how action research provided a common agenda for their work so that the communication had a purpose and thus more effective. For instance, Bianca spoke about effectiveness of having the action research as a guide for self-reflection to help become more effective in the classroom, "*Having the action research approach and doing the self-reflection that was part of it…I was not only able to help my teachers* [mentor teacher], *but…*[help]*in setting general or special ed setting.* Carlos found the action research within the community of practice provide him a place to address his problems related to student teaching, "*It kind of showed me that if I have a problem, I have ways I can deal with it and if I have people that I trust I can talk it out with them, and it helps me deal with it.* Carlos continued, "*Like I said before, talking about the problems I have with my kiddos with other people in a scientific way helps me get a better perspective on the problem, sort of step outside of the problem because maybe it's something I can't see as good because I am too close to it."* Aida touched on the idea she liked that action research is a cyclical approach to her

problems when she said, *"I like the idea that it's not a one off. If you don't get it down, the problem, then you just try a different solution in the next go round."*

The student teachers gave answers that were related to the theme of *talking about my problems - meaning the effectiveness of being able to talk about the problems of practice in their communities of practice.* They expressed a certain value in sharing aloud their problems of practice and how they worked to address them. Carlos said, *"I liked being able to talk with the other guys about what the biggest problem in my classroom was. I think it was helpful just to talk about it even if someone if they weren't listening."* Aida, talking about the confidence she gained from being able to talk about her problems said, *"Yeah, it was sort of like it helped me step back from the problem and get a complete picture for myself. I think that help me think about how I might, what I could maybe do about it, you know."* Along those lines, Bianca said, *"Talking about my classroom problem with my community helped me get like a different perspective. It was like being able to look at it from the outside and see it the same way somebody else, who wasn't in the class, could see it."*

On the theme of *listening to others' problems – meaning the effectiveness of hearing their community members talk about their own problems* – all three participants, Aida, Bianca, and Carlos talked about how listening to each other talk about their problems helped them gain perspective on their own work and at the same help build the feeling of community in that they all had problems and they all wanted to help each other solve them. As Aida said, "*answering their questions, and just talking about it, was kind of like what we did when we did our PA, like we were reflecting after we did our lesson to get a better picture on how we did*." Likewise, Bianca and Carlos stressed that listening

to each other's problems helped them feel "*closer together*" and develop a sense of collegiality. As Carlos said, "*being like colleagues supporting one another…Getting feedback for* [sic] *other people that have been through it and been successful at it means a lot to me,"*

Minor Themes to Major Theme – Action Research to Address Problems of Practice. In the minor theme of *structured approach*, the student teachers talked about how action research provided a framework for their discussions which led to a better collaborative environment. They found it helpful to talk aloud about their own action research, the minor theme of *talking about my problems*. In *listening to other's problems*, student teachers also saw it as an advantage to listen to others in their group talk about their studies. And they added that having the structure of action research within their communities made for a *positive approach* to problem solving. All four of these minor themes came together to leave the student teachers feeling more confident to meet classroom changes and address problems of practice as they come along.

Student Teacher Interview Major Theme 2 – ARCP Led to Increasing Self-efficacy. Three of the minor themes came together to build the major theme of ARCP Increasing *Self-efficacy*; *positive approach*, *increasing confidence*, and *feeling better for the future.* As with *Action Research to Address Problems of Practice*, student teachers were consistent about how action research provided a structure that maintained a positive mindset in their communities. All students said they came away from the ARCP with greater confidence in their abilities to face the challenges of teaching. And their increased confidence made them feel better about their futures as teachers. They felt better

prepared and not as concerned about the problems they imagined they would face their first years of teaching.

The theme *increasing confidence expressed a belief that student teachers felt more confident in facing the challenges in their classrooms.* This theme was present in each of the three participants' responses. They all talked in some way how working together within the community of practice increased their self-efficacy as it applied to classroom challenges. Talking about working with her community of practice, Aida said, "*At one point, I was about ready to say, I'm not going to make it as a teacher. I am not going to graduate. It's going to be a long year. Then doing our community work together I realized that there were things I could do. Towards the end of the semester I did a one-eighty, and I realized I was more prepared than I felt."* Bianca reflected, "*That first month, I was like, this is never gonna get better. But then after a while, by talking to the others and helping each other solve our problems, it was starting to make sense, the stuff I learned in class, the action research, and I started to think I was better prepared*." Finally, the ARCP innovation helped to build Carlos' sense of confidence as he stated "*I really did start to get fresh eyes after working on our problems in our communities. Like, oh well, you know with my kids, this might just work out…."*

Carlos talked a lot about how much he appreciated what was found in the theme of *positive approach – meaning the structure of the ARCP allowed the student teachers to address their problems of practice in a positive and thus more productive manner.* He said, *"If I had communities of practice like this in the school setting that I'm going into, I feel, I'd be very much capable and relying on my teacher team, because this is done with a purpose and with a positive attitude, and not a bitch session. While the PLCs I see in*

schools now might be done with a purpose, but the purpose gets thrown off to a lot of griping and complaining and not solving real problems in a constructive way." Briana talked about it saying, *"That was one of my big takeaways from action research we did in our communities that made me feel more success. That we can be positive about our problems if we work together instead of just complaining about them and getting all burnt out by facing them every day."* Like Carlos, Aida also talked about the difference she felt between a PLC and the communities of practice. She said, "*You know, you mentioned you called a PLC earlier* (I told them when teaching about communities of practice that I used to have my student teachers meet in PLC.) *and you and lots of schools have them, but they're focused on either or their gripe sessions. You know the problems teachers have and feel stressed about. They just complain about them not really doing anything positive about them. Yeah, but if you're combining the action research with that you're talking together. Each tying to help solves each other's problems."* This was the idea that they seemed to want to talk the most about, and therefore found the most rewarding aspect of their work in the ARCP.

And finally, the theme of *feeling better for the future* (6) was addressed by two of the student teachers. In talking about managing behavior in her classroom, Aida said, *"I think a lot of teachers really can't handle the stress and maybe that's why they don't stay. But I learned from working with the others in my community of practice that success with one student breeds success with other students.* Bianca said, *"In the caution going, oh my gosh, I don't know how to do this, I don't know, this isn't working. And I feel like that's a huge problem with teaching is finally talking about teachers feeing so alone. Well, if we get over that hump of teachers not feeling so alone because all of their*

problems that are just secluded to the classroom. If we're able to kind of be more comfortable talking about the problem and talking about everything. It's maybe you're not dealing with it alone." She continued, "*I think I'm going to be more comfortable going into the classroom, and after the honeymoon period is over, I can keep doing it."*

Minor Themes to Major Theme – ARCP Led to Increasing Self-efficacy. In the minor theme of *increasing confidence*, the student teachers talked about how they began to feel more confident in their abilities to solve teaching related problems as they worked in their ARCP. In *feeling better for the future*, student teachers predicted they would enter their first years of teaching with more confidence. They added that having a *positive approach* to problem solving also made them feel better about their abilities. All three of these minor themes came together to leave the student teachers feeling greater self-efficacy.

Student Teacher Interview Analysis Summary. Taken together, the two major themes, *Action Research to Address Problems of Practice* and *ARCP Led to Increasing Self-efficacy*, combine to indicate that student teachers valued having the action research provide a structure for their collaboration. They also felt they would enter their first years better equipped to meet any challenges. They believed it was the structured, personally relevant, purposeful work they did in their communities of practice that made the biggest difference in how they felt about the experience and in increasing their self-efficacy.

Phase Two – Novice Teachers

I used the Novice Teacher Survey quantitatively and interviews of six survey respondents qualitatively to answer the third and final research question:

RQ 3: How and to what extent was novice teacher intent to stay in the profession impacted by

a. conducting action research during preparation,
b. conducting action research in communities of practice during preparation, or
c. not conducting action research during preparation?

Quantitative data for the novice teacher phase of the study was comprised of a15-item Novice Teacher Survey. Qualitative data for the novice teacher of the study included interviews with six novice teacher respondents to the survey.

There we 81 novice teachers who completed the survey. All the teachers were still in teaching with five or fewer years of paid classroom experience. That none of them had made the choice to leave the profession does limit my scope of my findings when investigating teacher retention. I discuss this the next chapter. There were no teachers in the ARCP group who completed the survey with five years teaching. Of all respondents, 67 (83 %) were female and 14 (17%) were male, which is a lower distribution male (23%) to female (77 %) than recent statistics from the U.S. Department of Education (2017). Out of all teachers responding, 22 (27%) were in their first year of teaching and 11 (14%) were in their fifth. The demographics by group for the teachers who took the survey are displayed in Table 19.

Table 19

Novice Teacher Survey Demographics by Group

Group	N	Female	Male	One Year	Two Years	Three Years	Four Years	Five Years
AR_No	27	24	3	8	5	5	3	5
AR_Yes	27	21	6	4	5	7	5	6
ARCP	27	22	5	10	7	6	4	0

Novice Teachers – Quantitative Data

To begin my analysis of the novice teacher survey data, I used SPSS to run descriptive statistics for each of the three groups. For data reporting the three groups are labeled (**AR_No**) did not do action research during student teaching, (**AR_Yes**) did do action research during student teaching, and (**ARCP**) did do action research in communities of practice during student teaching. I determined P values between the groups using a paired-samples tests to determine significance and allow for rejecting the null hypothesis (Ren, 2009). In my study, this meant that the mean differences between the ARCP group of novice teachers and the other two groups were not a result of random chance. I then analyzed the responses using SPSS for distribution, or variance from the mean between the three constructs, *engagement*, *classroom management*, and *instruction* (Fisher & Marshall, 2008). By calculating descriptive statistics and analysis of variance I was able to determine if the results within construct and between the three are distributed fairly equally around the mean (Norman, 2010). These results are displayed in Table 20.

Table 20

TSES Pre and Post Test Descriptive Statistics

Item	N	Mean	Median	Standard Deviation
AR_No	27	6.51	6.53	0.704
AR_Yes	27	6.38	6.53	1.033
ARCP	27	7.71	7.67	1.453

I ran paired sample t-tests between each of the three groups to determine if was able to draw any inference between the groups' means. There was a significant difference between survey scores of those who had done ARCP (M=7.71, SD=1.453) compared to those who just did AR (M=6.38, SD=1.033; t (26) = -3.931, p = 001). The was also a significant difference between the ARCP group (M=7.71, SD=1.453) and the group that did not do AR (M=6.51, SD=.704; t (26) = 6.120, p < 001). There was no significant difference on the survey between the groups that did AR (M=6.38, SD=1.033) and the group that did not do AR (M=6.51, SD=.704; t (26) = -.332, p = .743).

The analysis of the Novice Teacher Survey showed a significant difference in self-efficacy scores between two sets of groups. The self-efficacy mean for those novice teachers who did action research within communities of practice during their student teaching (ARCP, M = 7.71) was significantly higher than either of the other two groups, those that did not do action research during their student teaching (AR_No, M = 6.51) and those that did action research on their own (AR_Yes, M = 6.38). No inference can be made between the latter two groups (AR_No, M = 6.51, AR_Yes, M = 6.38). Of interest

is the finding that those novice teachers that did action research in communities of practice retained a higher level of self-efficacy after graduation and within the first five years of teaching.

Novice Teachers – Qualitative Data

The qualitative data for the student teacher phase of the study consists interviews with novice teachers, teachers with fewer than six years of teaching, following the completion of the Novice Teacher Survey. I conducted the interviews during an online Zoom conference with a guide of seven interview questions (Appendix F). The six interview participants were selected using survey responses to draw two participants from each of the three groups, novice teachers who did action research within communities of practice during their student teaching (ARCP), those who did not do action research during their student teaching (AR_No), and those that did action research on their own (AR_Yes).

The interviews were analyzed based on grounded theory using open coding to extract and label possible thematic ideas. I then used axial coding to apply deductive reasoning and inductive reasoning in my analysis. Axial coding is the defining the relationships between the data that allows for the identification of major themes (Strauss & Corbin, 1998). First, I looked at the larger themes (deductive) that emerged and saw if they aligned to specific data points (quotes), and then I drew thematic lines to make connections (inductive) between the initial ideas to identify concurrent themes and the quotes that supported them (Creswell, 2015, Leedy & Ormrod, 2001, Williams, 2011).

Data Collection – Novice Teacher Interviews

Each of the interviews was conducted in during an online Zoom conference that provided me with a visual and audio recording along with a transcript of the audio. I had emailed the consent form along with the Zoom appointment, had them sign the form for later collection, and give their verbal consent on the recording.

There were seven interview questions (Appendix F). The questions were asked in order. As the subjects answered, I listened for opportunities to encourage them to elaborate on a theme, or to redirect the query if answers were not directed to the intended purpose of the question. After recording, sessions were downloaded from the Zoom cloud service, renamed using an alphabetically assigned pseudonym, and then uploaded to my password protected Google cloud space.

Data Analysis – Novice Teacher Interviews

To analyze the interview data collected, I watched and listened to each of the recordings three times with the transcripts at hand. The first time, I listened to get an impression of the overall demeanor of the interviewee and remind myself about key nuances that had stood out during the interview. The second time I listened, I made notations of ideas on the transcripts that might become thematic when all the interviews were taken together, jotted down these ideas, and made note of the time at which they were expressed. Following the second review, I made headings for the themes emerging from the recordings. When listening to the interviews a third time, I stopped the recording at the key places to write down exact quotes under the relevant thematic heading. I then used axial coding to arrange the themes and the associated quotes for data reporting (Creswell, 2015, Leedy & Ormrod, 2001, Williams, 2011).

Specifically, I took the identified quotes arranged under the relevant thematic heading and drew axial lines from the key words to each minor theme. For instance, key word groups such as “relying on others” and “collaborate with my team”, I connected axially to the minor theme *collaborative experience*. For the key word groups, “frustrated with our PLC”, “more helpful than like a regular PLC meeting”, and “a whole bunch better than what we do in our PLC”, I drew axial lines to the minor theme *PLC versus community of practice*. These two minor themes developed into the major theme *ARCP Experience versus the PLC Experience*. A representative diagram of the axial coding I used is provided in Figure 3.

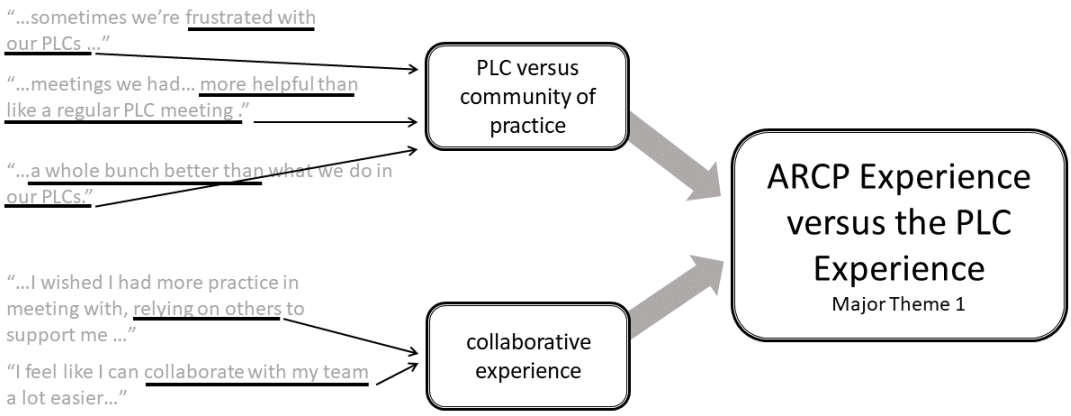

Figure 3: Novice Teacher Interviews: Axial Coding Representative Diagram

Results – Novice Teacher Interviews

There were two major themes that emerged from the novice teacher interviews, *Better Prepared to Enter Teaching* and *ARCP Experience versus PLC Experience*. *Better Prepared to Enter Teaching* resulted from how the novice teachers felt going into their

first years of teaching and how collaborative experiences during student teaching played a role in forming those perceptions. *Better Prepared to Enter Teaching* was also strongly connected to how novice teachers felt about staying in teaching. Positive experiences with ARCP and often negative experiences with PLC, both collaborative settings, merged to become *ARCP Experience versus PLC Experience*.

Novice Teacher Interview Major Theme 1 – Better Prepared to Enter Teaching. Two of the minor themes that emerged from the novice teacher interviews; *better prepared* and *collaborative experience,* both contributed to the major theme of *Better Prepared to Enter Teaching*. The novice teachers who were in ARCP felt better prepared and desirous to replicate the collaborative experience they had during student teaching. Both of these minor themes help to explain why those teachers maintained a higher level of self-efficacy.

My analysis suggested that the minor theme of *considered leaving* did not contribute to the novice teachers feeling better prepared. Instead it indicated being better prepared reduced the likelihood they might think about quitting the profession.

Novice Teacher Interview Major Theme 2 – ARCP Experience versus PLC Experience. Three of the minor themes came together to build the emerging major theme of *ARCP Experience versus PLC Experience*; *collaborative experience, PLC versus community of practice,* and *PLC versus action research.* Novice teachers who participated in ARCP expressed either their frustration with PLC in their schools or voiced their desire to have a collaborative experience, one with the structure provided with action research, equal to that they experienced as student teachers. Those who did

not have the community of practice experience as student teachers did not think highly of their school's PLC.

The axial relationship between the minor and major themes from novice teacher interviews is illustrated in Figure 4.

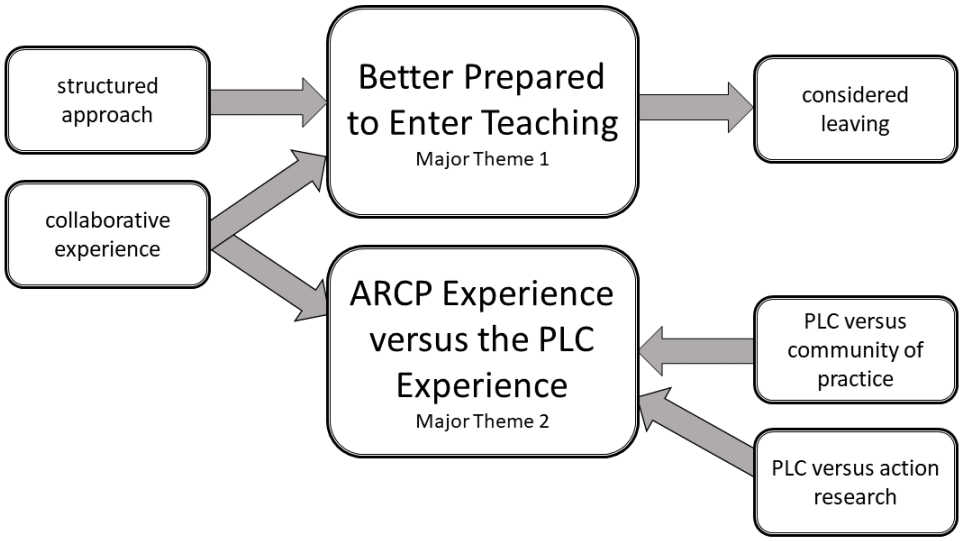

Figure 4: Novice Teacher Interviews: Axial Relationship of Minor and Major Themes

The five themes that arose from the grounded theory coding of the three student teacher interviews; (1) *better prepared,* (2) *collaborative experience,* (3) *PLC versus community of practice,* (4) *PLC versus action research*, and (5) *considered leaving*. The assertions I made from the associated quotes to along each theme are displayed in Table 23.

Table 21

Novice Teacher Interviews – Assertions by Theme

Theme	Assertion
Better Prepared	Novice teachers who did action research within communities of practice felt better prepared for their first years of teaching.
Collaborative Experience	Novice teachers who did action research within communities of practice gained experiences that allowed them to more effectively collaborate with their colleagues or were desirous to do so in the new setting.
PLC Versus Community of Practice	Novice teachers who did action research within communities of practice discovered a beneficial difference between the purposeful structure of the action research community of practice and the PLC in their school settings.
PLC Versus Action Research	Novice teachers who did action research within communities of practice sought to apply the structure provided by action research to the PLC in their school settings.
Considered Leaving	Novice teachers who did action research within communities of practice reported that the learning achieved in those communities provided some reassurance when faced with problems, so they were able to persist during their first years.

Minor Themes from the Novice Teacher Interviews. Not all interviews expanded on each of the five themes, but at least three of the interviewees addressed those ideas either specifically, or in a related way. It was important to show which group they belong to because it might change the way their responses to questions were interpreted. For instance, a novice teacher who had been part of an ARCP expressing their frustration with the PLC in their current setting is more meaningful because of their prior positive experience. So then to account for perspective, I assigned each participant

a pseudonym designating their membership in one of the three groups. The two novice teachers in the ARCP group were Anita, and Bryson. Casey and Dana were the two novice teachers who had done action research as student teachers, but not in communities of practice. And the novice teachers who did not do action research as part of their preparation were Emery and Fallon. The five themes in no particular order, were (1) *better prepared,* (2) *collaborative experience,* (3) *PLC versus community of practice,* (4) *PLC versus action research,* and (5) *considered leaving*.

Five novice teachers spoke to the theme of *better prepared* – meaning they felt better prepared to meet classroom challenges after graduation if they had or would have participated in action research. Emery said, "*Just, you know, it's impossible because we don't know what we're going to face. But instead, what they could have taught us is a better approach to any problem, whether it's academic or behaviors. If we had learned a set way that we could apply to any problem, I probably would have felt better prepared."* Fallon said, *"I don't really think I felt all that prepared. I learned a lot that first year that I didn't learn before."* Dana said, "*I felt pretty good. I think the action research we did with* [our professor – name omitted] *made it easier when I started teaching because we had already known how to, what to do a problem in our classroom."* Anita reflected, "*You taught me that if I have a problem, I have ways I can deal with it and I can get others around me that care about the kiddos too to help me, and I can help them with their problems. So, yes, I did feel better starting out than I think some of the other new teachers here did.* Bryson commented that, *"Yeah, I felt a lot better because of the meetings we had."* These latter two teachers spoke to the idea that those who did action

research within communities of practice felt better prepared for their first years of teaching. Those who did neither did not feel as prepared.

Three novice teachers gave answers that were related to the theme of *collaborative experience* – meaning they saw value in having practice as a student teacher to collaborate in a structured way to solve problems of practice. Anita said, *"I like that the action research like we collaborated with each other. And so, I feel like I can collaborate with my team a lot easier. And we work together to solve problems."* Bryson talking about how working in a community of practice and being able to talk about her problems said, *"And I definitely feel better, as far as getting support now from my teammates, and things like that. So, I like what I learned doing the meetings and how it was something I could take with me and use to help me get through."* Fallon said, "*I wished I had more practice in meeting with, relying on others to support me when I had a problem. Those first couple of years, I kind of felt like I was alone. They had district support people, but all they ever did was come in and ask questions and give you an idea or two to try. I never got to really talk about things with somebody that was interested in helping me and letting me help them. You know, on the same level kind of."* This one teacher lamented that she did not have a collaborative problem-solving experience prior to teaching, and the other two teachers who did action research within communities of practice gained experiences that allowed them to more effectively collaborate with their colleagues or were desirous to do so in the new setting

On the theme of *PLC versus community of practice* – meaning teachers compared their experiences in PLC to their experiences in communities of practice. Two participants, Anita and Bryson talked about how much more effective, the communities

of practice they had done while student teaching, were than the PLC that were in place when they started teaching. Anita said, *"Sometimes we're frustrated with our PLCs and you know the grade level teams and all that and after having had the experience with you, of communities of practice, it was even more frustrating. Where do you go?"* And Bryson remarked, "*For individual problems in my classroom, I found the meetings* [community of practice] *we had were [sic] more helpful than like a regular PLC meeting where it's either you're focused on student data for the whole grade level or it's a gripe session and really not accomplishing anything, right."* After a brief description of the communities of practice implemented in the innovation, Emery said, "*That sounds like it would be a whole bunch better than what we do in our PLCs.* When asked to elaborate, she continued, *"It really is a waste of time most of the time. We really don't get a lot of real work done because there is [sic] no goals for what we talk about every week. We share ideas for lesson plans and talk about one or two students, usually the same one or two students but its more about what somebody else should do than what we can do ourselves."* Taken together, the positive and negative experiences, novice teachers who did action research within communities of practice discovered a beneficial difference between the purposeful structure of the action research community of practice and the PLC in their school settings.

The *PLC versus action research* (4) theme was present in three participants' responses. Dana described how much more effective she found the action research they did as student teachers than what was currently being done in their PLC. Dana said, *"I wanted to get my PLC to try action research. I had had such good use of it with* [my professor – name omitted] *that I was hoping they could be talked into trying it in my PLC*

but all they really do is complain about some of the same kids and then share worksheets." Anita said, "*I think the action research we did in our communities of practice made it work better. We had a purpose in what we were doing. We all had problems and we all we trying to help with our problems, so it kept us working on our problems. Plus, we felt good when one of showed some progress on fixing a problem. It felt like we had accomplished something. I wish we had that action research now in our PLC."* Bryson, along the same lines, compared the work she did as a student teacher on action research to the PLC at her school now. She continued, "*When we did our action research in our meetings, we were all following the same steps, so we knew what we were doing and what to offer in the way of help. Yeah, I felt a lot better because of the meetings we had."* Thus, the novice teachers who did action research within communities of practice sought to apply the structure provided by action research to the PLC in their school settings.

And finally, the theme of *considered leaving* – meaning the participant expressed at some point they had thought seriously about leaving teaching. Alarmingly, this was addressed by four of the novice teachers. In talking about managing behavior in her classroom, Emery said, *"I really came close to giving it all up. There were so many problems and I felt completely alone with problems they never got me ready for. Like I said, if we had learned a way that we could apply to every problem, I probably would have felt better."* Casey said, "It was really tough, I don't think the action research I did really helped but then I found a few friends there and we talked about each other's problems, but in a positive way, not bitching about them, and that really helped. Dana said, *"I remember I wanted to get my PLC to try action research like I learned from* [my

professor – name omitted]. *And when nobody was interested, I was thinking it's not going to work. Maybe I need to leave. I don't know whether I meant that school or teaching. But I was definitely feeling down."* Anita said, "*The first few months, I was like, is never gonna get better or just be this way until I do something else. But then I started trying to something like what we did, kind of like action research, and getting some others to talk to me about it, and ask about their problems, it was starting to get better. What I learned in your class, I think helped me not give up that first year."* Thus, the two novice teachers who did action research within communities of practice reported that the learning achieved in those communities provided some reassurance when faced with problems, so they were able to persist during their first years, despite having considered at some point leaving the profession.

Minor Themes to Major Theme – Better Prepared to Enter Teaching. Novice teachers talked about how being *better prepared* and their *collaborative experiences* as student teachers helped them feel Better Prepared to Enter Teaching. Their work in their ARCP provided them with higher self-efficacy in thinking about the problems they might face. Both minor themes explain in part why those teachers felt better prepared.

Minor Themes to Major Theme – A**RCP Experience versus PLC Experience.** The minor themes that built into the major theme of ARCP Experience versus PLC Experience were collaborative experience, PLC versus community of practice, and PLC versus action research. Student teaching ARCP experiences set a higher bar for the cooperative efforts at problem solving and they had not gotten that with PLC. Frustration with their PLC led to a negative feeling about the collaborative experience for most of the novice teachers.

Novice Teacher Interview Analysis Summary. The two major themes from the novice teacher interviews in Phase Two provide a contrasting picture comparing those who had positive collaborative experiences as student teachers and those who did not. Specifically, it was the structure imposed by the ARCP that made for a collaborative positive experience, one that they hoped to replicate in their schools. This served to highlight what they were missing in their present reality of their experiences in PLC. Novice teacher dissatisfaction with PLC experiences was consistent regardless of their student teaching practices.

Analysis and Results Summary

I reported on the data and analysis from the two phases of the study; the first phase measured the impact to self-efficacy beliefs with student teachers participating in the ARCP, and the second phase investigated novice teacher self-efficacy and how action research work during preparation impacted their likelihood to stay in teaching. I structured my analysis to show how each phase was designed to answer the corresponding research questions.

For Phase One, I showed how there was a significant increase in self-efficacy after the innovation. I further showed that the increases were nearly consistent (34% to 38%) across all three measured constructs of teacher self-efficacy. This shows the increase in self-efficacy was substantial in each construct, not leaving any area of teacher concern out. And, perhaps more importantly, regardless of where the individual problem of practice fell, the aggregate effect for the cohort was the same. Then I used qualitative data from student formative reflections and interviews to expand on and help explain the quantitative results. I made assertions from the student formative reflections that showed

progress growth in learning about and applying the innovation designed to increase student teacher self-efficacy. The statements they completed suggest a clear line of growth from doing the work because they were being asked to, to taking ownership in their research and finding both the outcomes and their own developing self-efficacy meaningful. Finally, for Phase One, I made assertations from student teacher interviews that explained their growth through their own words. They all expressed, in varying levels of degree, that the felt better prepared and more hopeful about their abilities to meet the challenges of being a novice teacher. Both the student formative reflections and the interview responses explain the increase in self-efficacy means shown in the quantitative data. As their responses to the formative reflections grew more sophisticated, better informed, they expressed greater confidence in the work they were doing. In their interview responses, they attribute their increasing self-efficacy to the collaborative work they did in a structured, personally relevant, and purposeful way.

For Phase Two, analysis of the Novice Teacher Survey indicated a significant difference in self-efficacy between the group that did action research within a community of practice during student teaching and the other two groups. Thus, the one ARCP group maintained a higher level of self-efficacy during their first years of teaching. No inferential comparison was made between the latter two groups. The qualitative data provided novice teachers perceptions about how action research in communities of practice made them better prepared to teach and less likely to leave the profession.

CHAPTER 5

DISCUSSION

I began this study as an investigation of what I could do in my work with student teachers to ameliorate the problem of teacher attrition. What could I do to increase the likelihood that my graduates would stay in the profession longer? In my local area, in my state, Arizona, and in very many places across the county, teacher attrition and the shortage of qualified teachers is a critical problem. This is even more so in my segment of the profession, special education. These shortages have high costs, measurable in billions of dollars annually, and in a longer term, more pervasive detriment to student achievement. It greatly saddened me when a few of my own graduates quit teaching. So. what could I do?

Throughout my studies, I was encouraged to do work that was relevant to me and on a problem, I cared very deeply about. As a joint result of my instruction and earlier cycles of action research investigation, I began to understand that novice teachers who entered the field with a higher degree of self-efficacy were more likely to remain in the profession. In this program, I learned how to conduct and implemented multiple cycles of action research. Along with that I did hours of reconnaissance, both in the literature and in the field, into why teachers stayed and why teachers left. I talked to teachers who had stayed and teachers who had left.

I also learned about how to foster innovative collaboration through communities or practice. I considered that structured and purposeful cooperation may serve each of the sources of self-efficacy. Thus, my innovation, targeting higher self-efficacy in my graduating seniors, became the combination of having them do action research within

communities or practice. In one of their last semesters with me, they would participate in Action Research Communities of Practice (ARCP).

Expanding and Explaining of the Quantitative Data

This was a mixed methods study. In both phases I collected quantitative and qualitative data: the TSES, the Novice Teacher survey, student formative reflections and interview transcripts. Both Ivankova (2014) and Green (2007) discuss the importance of having two types of data complement one another. It is my impression from this work, this study and leading up to it, that when one is working with people, teachers and future teachers in this case, the numbers are not enough. I could not have painted a complete picture without the thoughts and perspectives of my participants to color in between the means. In looking only at the quantitative data, I likely would have made incorrect, or at least, biased inferences. On the other hand, without the numbers to add statistical truth to the participants perspectives, I might not have been able to expand my inferences, growing out of the words of a relatively few, to larger populations.

Specifically, in Phase One, the TSES pre and posttest (N = 26) showed an increase in the mean self-efficacy score from 5.40 (SD = .723) to 7.31 (SD = .650). Following analysis of the student formative reflections, I was able to elaborate on the student teachers' growth during the innovation. Their responses to open-ended statements show a clear line of development toward becoming effective members of an ARCP. They began by knowing nothing about the innovation to expressing more specific and knowledgeable concerns about their roles in the work. That was followed by voicing concerns that displayed a real interest in wanting to achieve meaningful goals with their work, and then finally to wanting to continue using what they had learned after the

innovation. These student formative reflections allowed me to make the inference that the sources of self-efficacy embedded in the innovation were impactful.

The interviews from Phase One were more elaborative regarding the test scores, in, for me, a surprising way. My concept going into the innovation was based on Bandura's (1997) four sources of self-efficacy; mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Thus, my expectations were that their action research, my planned mastery experience for them, would be the most effective source. The analysis of their interviews proved me wrong. Each of the student teachers interviewed spoke to the value of having the action research provide a structure for their collaboration, but each was clear, it was that collaboration that made the biggest difference. Put in theoretic terms, it was the vicarious experiences, verbal persuasion, and physiological and affective states that contributed more to their increase in self-efficacy. Their vicarious experiences came from hearing about the successes of their community members, and they listened and encouraged the other members to provide verbal persuasion. The current student teachers and the novice teachers both spoke to positive experience during their ARCP work and thus were less likely stressed – physiological and effective states – conducting their action research.

This idea, that it was the structured collaboration, the communities of practice, that made the difference was reinforced by both the quantitative and qualitative findings in Phase Two. The results of the Novice Teacher Survey demonstrated that there was a significantly higher degree of self-efficacy in the novice teachers that had done action research in a collaborative setting during their student teaching. The self-efficacy means for were ARCP ($M = 7.71$) versus AR_No ($M = 6.51$) and AR_Yes ($M = 6.38$). While I

was not able to reject the null hypothesis between the two other groups, AR_Yes and AR_No, the fact that they were both similar in variance from the community of practice group implies that is was not action research alone that made a substantive difference, but rather the structured collaboration.

When I interviewed the six novice teachers in the second phase, I was able to make several assertions that supported this same idea. Perhaps, even beyond it to suggest areas for further study. (More on that later.) Novice teachers who did action research within communities of practice felt better prepared for their first years of teaching and gained experiences that allowed them to more effectively collaborate with their colleagues or were desirous to do so in the new setting. Both of the participants, Anita and Bryson, who had had the opportunity to participate in communities of practice doing their action research lamented that the function PLC of their present setting was not analogous. Two others spoke to their dissatisfaction of the effectiveness of the PLC, suggesting that without the structure provided by action research component of the ARCP, meetings devolved in ineffectual gripe sessions. And perhaps, in the strongest evidence yet of the value of the ARCP in teacher retention, four of the participants shared that they had considered leaving. Two who had the positive experience of the ARCP, again were discouraged by their inability to recreate the experience they had during their student teaching. The other two were simply disheartened by their sense of isolation, even those who regularly participated in PLC (Again, more on this later) and the inability to collaborate with their colleagues in solving their most stressful issues.

Results in Relation to Presented Literature

As mentioned above, the results suggest that the greater source for developing of self-efficacy for student teachers were those supported by the communities of practice; vicarious experiences, verbal persuasion, and physiological and affective states (Bandura, 1997). For vicarious experiences, student and novice teachers both talked about how listening to their colleagues discuss the effectiveness of their action research was a positive experience. With verbal persuasion, three participants reflected that the supportive dialog provided by their community members was an important part of their own success. And while there may not be direct evidence for physiological and affective states, just the fact that novice teachers wanted to relive the experience they had as student teachers and were saddened they could not replicate it in their present settings, speaks to the stress reducing impact of their student teacher experiences.

Another finding that was encouraging and in line with the literature was the impact on self-efficacy as it related to classroom management. For novice teachers, the management of behavior in classrooms consistently ranks as the number one concern (Headden, 2014; Langdon & Vesper, 2000). And in regard to my stated purpose of the study, the inability to effectively manage their classrooms is the number two reason for teachers leaving the classroom (Ingersoll & Smith, 2003). Bandura (1997) demonstrated that self-efficacy is task specific. With this in mind, it was substantial that the one construct in which student teachers made the greatest increase (38%) in self-efficacy was classroom management.

Coming full circle to where I started with literature, perhaps I should not be as surprised as I was with the impact that working in communities of practice with the

structure of action research had on both student teachers before and after they graduate. I began my literature review from the constructivist perspective of making meaning through social interaction as described by Vygotsky (1978). My approach to help student teachers develop higher self-efficacy built on student teachers' collaborative construction of knowledge. They did not conduct their action research as individuals, but in support of one another. They developed greater confidence about their future practices because they learned that together, each was stronger.

I found one facet of Vygotsky's work, activity theory, particularly useful and allowed it to form the basis of this investigation. Looking into that work and the outgrowth of subsequent work of his students and others led me to Cultural Historical Activity Theory (CHAT). CHAT describes how people interact and communicate through their actions. They do so in a community, forming the base from which they make meaning of new learning and their contexts (Foot, 2014). Their learning is enhanced, and they make their own meaning through acting together cooperatively. I might have predicted my findings. For student teachers, more than the individual mastery experience of action research alone; it was the other three sources of self-efficacy that made the greater difference. It was vicarious experience, verbal persuasion, and physiological and affective states, resulting from their participation in communities of practice, in support of their action research that had more of an impact on their confidence. It was the collaborative effort, the assistance and encouragement of their peers in a highly structured task, that played the larger role in increasing their self-efficacy.

CHAT also helps to explain my finding for novice teachers that those who did ARCP as student teachers maintained a higher level of self-efficacy. The student teachers, both the ones conducting the innovation during the study, and those who did it in previous cohorts, expressed in their own words that it was the social learning, the co-construction of knowledge that made their efforts meaningful for their future practice. In both cases, it was the opportunity to interact with each other over common problems within the structure of a community of practice, of listening and responding to each other with this structure that impacted them most.

Lessons Learned Regarding the Innovation

One tangential finding not directly related to my problem of practice, regarding the innovation was the effectiveness of adopting the Concerns-Based Adoption Model (CBAM) in supporting participant development of and engagement in the innovation (Hall & Hord, 2015). Both concepts were entirely new to the student teachers. As an educator for over 20 years, I have learned the value of academic feedback in student learning. The ability to effectively monitor student understanding of new concepts as they learn them is highly supported in the literature (Falchikov & Boud, 2008, Hattie & Timperley, 2007, Ramsden, 2003, Seaton, 2013). The use of the IC Map (Appendix A) to teach my student teachers to monitor their own development, gave the participants ownership in their progress towards a professional approach to problem solving. The Levels of Use (see Chapter 3) allowed for my own understanding of the need for increasing, or fading, developmental scaffolding as needed. And the Stages of Concern provided me with not only a sounding board to address their apprehensions as they moved into the innovation, but also provided an informative data source supporting my

investigation. The latter became my student formation reflections which gave voice to their movement to becoming professional problem solvers, and thusly increasing their self-efficacy.

Implications for Practice, Profession, and Research

For the field of teacher education, the study's findings shine light on one avenue I can employ to possibly increase retention for my graduates. The innovation not only taught them the skills of action research, it also taught them an effective context in which to apply these skills, communities of practice. As an instructor charged with teacher preparation, with such innovation, I can adapt my practices to help my teacher graduates feel better prepared. As one teacher said in her interview, no college of education is able to teach its students every successful method for every challenge they will face in their classrooms. Giving them a tool in their toolbelt to meet the all the trials not even they can foresee, is a big step in the right direction.

For the profession of teaching, this study suggests further investigation into to applying the structure provided by action research to meetings that go on every day in schools. In the novice teacher interviews, it was made plain many teachers are frustrated by the PLC experience. As PLC are being facilitated at their schools, many teachers are not finding professional value. Novice teachers spoke to the fact that many PLC meetings devolve into gripe sessions. The discussion, if it can be called that, centers on expressing frustration with professional problems, but rarely moves towards addressing them.

Mertler (2018) shares personal stories from his investigations that highlight the all too often ineffectiveness of what teachers, principals, and districts are calling PLC. DuFour, Eaker, and DuFour (2008) recognized that many teams of teachers go into the

PLC without a solid understanding of the work they should be doing. These implications suggest a line of further research.

Mertler (2018) writes about moving from the standard model of PLC to the Action Research Community. What he proposes, and aligned to my findings, suggest the providing a structure for collaborative teacher communities would make the work and time of teachers far more productive and positive than the present practices. Within one school, or choosing two or more schools comparatively, some of the grade-level teams or existing PLC could be taught the skills of action research and effective community of practice membership. By teachers applying this structure over the time they are already spending and the work they believe they are doing, it would make their efforts much more personally relevant for the individual and may even support greater levels of collaboration. The impact of these adoptions might be studied to determine both the teacher perception of effectiveness and teacher satisfaction across their practices.

Limitations of the Study

In addressing my problem of practice, the attrition of novice teachers, I did not collect any data in Phase Two from teachers who had left the profession. During previous cycles, when I did my reconnaissance, I did interview three of my graduates who were no longer teaching. They gave various reasons for leaving. I asked them questions regarding their perceived self-efficacy but did not collect data to elaborate on this study. The input from teachers who had left, would have provided a more complete picture of the intent to stay as it connects to higher self-efficacy and their experiences in student teaching. It can be surmised that teachers who are no longer teaching would be among the best to put a voice to the reasons behind attrition.

Another limitation of the study might be that the innovation was employed during the first of two semesters student teaching. In previous cycles, the innovation was used during the student teachers' second and final semester. Pendergast, Garvis, and Koegh (2011) investigated the difference in self-efficacy between first and second semester student teachers and determined that it was higher in their first semester. They found that first semester student teachers lacked the knowledge to accurately estimate their own abilities and so tended to be overconfident.

Final Thoughts on Personal Lessons Learned

Regardless of the outside reach of my study into the practice of teaching, doing this type of practitioner research has strengthened my resolve to continue to apply the cyclical and reflective practices of action research in my own practice. Our preparation program emphasizes the value of reflective practice. It is a tenet I am always proselytizing to my student teachers. One of my favorite things to tell principals looking to hire my highly-effective student teachers is they are reflective, always looking to improve their practice. As a result of this study, I want to turn that reflective lens on myself. I want to adopt a cyclical process of applying the things I learned in this study, with a reflective eye towards how I might do it better. As I alluded to above, it deeply saddens me when I learn that one of my graduates, fine teachers all, has left the profession. Maybe, if I continue this mission of self-improvement through practitioner research, that might happen a lot less often.

With this study, I now have evidence that supports the use of my innovation, ARCP, in preparing teachers to better equipped for their classrooms and quite possibly to stay in them longer. One of my student teacher participants said, "you couldn't prepare us

for everything we might have to deal with." This is true of any teacher preparation program. The challenges of the classroom are often so unique and variable that there is no one formula to apply to all. That being said, with the ARCP, I believe I do have a means of providing them with an authentic set of experiences that they can later apply to any set of problems they will face. And more to the point, having done the ARCP, they will have a greater belief in themselves they can meet those same set of problems.

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APPENDIX A

INNOVATION CONFIGURATION MAP

IC Map: Action Research in Communities of Practice

Component 1: Data Collection and Sharing				
1 Collects and analyzes problem of practice and intervention data at regular intervals and shares the data with community members.	2 Collects and analyzes problem of practice or intervention data at regular intervals and shares the data with community members.	3 Collects and analyzes problem of practice and intervention data irregularly and shares the data with community members.	4 Collects and analyzes only intervention data and shares the data with community members.	5 Does not collects and analyze problem of practice and intervention data at regular intervals and share the data with community members.
Component 2: Data Analysis				
1 Analyzes data collaboratively with all members. Identifies trends, bright spots, and targets for remediation.	2 Analyzes data collaboratively with some members. Identifies trends, bright spots, and targets for remediation.	3 Analyzes data collaboratively with few or no members. Identifies trends, bright spots, and targets for remediation only in own data.	4 Analyzes data without CoP members. Does not Identify trends, bright spots, and targets for remediation.	5 Does not analyze data. Does not identify trends, bright spots, and targets for remediation.
Component 3: Community Collaboration				
1 Actively collaborates with community	2 Collaborates with community members to	3 Passively collaborates with community	4 Limited collaboration with community	5 Does not collaborate with community

members to support members' research and seeks feedback and ideas on their own work. Utilizes collaborative efforts to increase success for all members to include verbal and emotional support.	support members' research and seeks feedback and ideas on their own work. Utilizes collaborative efforts to increase success for some members to include verbal and emotional support.	members to support members' research, receives feedback and ideas on their own work. Utilizes collaborative efforts to increase success for some members to include verbal support.	members to support members' research, receives feedback and ideas on their own work. Does not utilize collaborative efforts to increase success for members to include verbal or emotional support.	members to support members' research or receive feedback and ideas on their own work.
Component 4: Reflection				
1 Shares stories of success with community members. Celebrates successes of other members. Reflects on the self-efficacy achieved through personal and group efforts.	2 Shares stories of success with community members. Celebrates successes of other members. Reflects on the self-efficacy as a result of personal efforts.	3 Shares stories of successful remediation with community members. Celebrates successes of other members.	4 Reflects on the self-efficacy achieved through personal and group efforts.	5 No reflection on the self-efficacy achieved through personal and group efforts.

Bold border – Ideal behaviors
Left of dotted line – Minimally acceptable behaviors

APPENDIX B

TEACHER'S SENSE OF SELF-EFFICACY SCALE

Teachers' Sense of Efficacy Scale[1] (long form)

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

APPENDIX C

NOVICE TEACHER SURVEY OF SELF-EFFICACY

Novice Teacher Survey of Self-Efficacy

Dear teachers,

My name is William Vann and I am a doctoral student in the Mary Lou Fulton Teachers College (MLFTC) at Arizona State University (ASU). This work is being supervised by my faculty chair, Dr. Josephine Marsh. This study will investigate the self-efficacy beliefs of novice teachers to assist us in understanding how we might better prepare our future graduates for the challenges of the classroom.

Your participation is entirely voluntary, and you may choose to exit the study at any time. Your participation is in the form of a 15-item survey, followed by items asking demographic information. On each self-efficacy question, you will ask to rate your beliefs regarding your ability to meet challenges in the classroom. Please select the rating that best fits your beliefs. The survey will take approximately 10 minutes and will be a one-time occurrence.

Your participation has the potential to improve outcomes for our graduates who will become novice teachers like yourselves. There are no foreseeable risks resulting from your participation. If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you may contact the Chair of the Human Subjects Institutional Review Board through the ASU Office of Research Integrity and Assurance at (480) 965-6788. I will be happy to address and questions you might have regarding this survey and can be contacted at wvann@asu.edu or (480) 760 1352, or you may contact my chair, Dr. Josephine Marsh at josephine.marsh@asu.edu or (602) 803 0219.

Thank you!

William Vann
Doctoral Student

Novice Teacher Survey

Tell us a bit about your student teaching

a.	**I did <u>not</u> perform action research during my student teaching.**	◯	**c.**	**When I performed my action research I worked on my own without regular support from my classmates.**	◯
b.	**I did perform action research during my student teaching.**	◯	**d.**	**When I performed my action research I worked with a regular group of my classmates, sharing and supporting one another's research.**	◯

Self-Efficacy Beliefs

Engagement

Directions: Please indicate your belief in your own present ability to do the items described below by indicating only one of nine levels ranging from "Very able" to "Very unable".		**Very able**		**Able**		**More or less**		**Unable**		**Very unable**
1	**How able are you to make content relevant to your students?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
2	**How able are you to instill confidence in your students?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
3	**How able are you to encourage families to participate in their child's learning?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
4	**How able are you to create a classroom culture that is inclusive of diverse backgrounds?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
5	**How able are you to encourage students to work together to solve problems?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①

Instruction

Directions: Please indicate your belief in your own present ability to do the items described below by indicating only one of nine levels ranging from "Very able" to "Very unable".		**Very able**		**Able**		**More or less**		**Unable**		**Very unable**
6	**How able are you to measure student progress during a lesson?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
7	**How able are you to use questioning to prompt student thinking?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
8	**How able are you to tailor your instruction to meet the needs of students with varying abilities?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
9	**How able are you to use classroom data to drive your instruction?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
10	**How able are you to teach concepts so that they are understood by your students?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①

Classroom Management

Directions: Please indicate your belief in your own present ability to do the items described below by indicating only one of nine levels ranging from "Very able" to "Very unable".		**Very able**		**Able**		**More or less able**		**Unable**		**Very unable**
11	**How able are you to keep students on task during instruction?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
12	**How able are you to establish and maintain procedures to maximize instructional time?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
13	**How able are you to respond effectively to**	⑨	⑧	⑦	⑥	⑤	④	③	②	①

	students who are disruptive?									
14	**How able are you to clearly communicate and reinforce behavioral expectations?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①
15	**How able are you to effectively manage students with chronic disruptive behaviors?**	⑨	⑧	⑦	⑥	⑤	④	③	②	①

Demographics

16	**What grade levels do you teach?**	Ⓚ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
17	**How many years have you taught?**	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
18	**What level is your school?**	◯ **Elementary** ◯ **Middle** ◯ **High**
19	**What is your gender?**	◯ **Female** ◯ **Male**
20	**What is your racial identity?**	◯ **African American** ◯ **White, Non-Hispanic** ◯ **Other**
21	**Do you teach general or special education?**	◯ **General** ◯ **Special**

APPENDIX D

INTERVIEW QUESTIONS FOR STUDENT TEACHERS

Interview Questions for Student Teachers:

1. What impact do you think completing your action research had on your ability to face the challenges of being a novice teacher?
2. Now that you know how to do action research, how might this knowledge impact your ability to meet other challenges in your classroom?
3. How did working in your community of practice impact your action research project?
4. How did sharing you work with the others in your community practice impact your action research project?
5. How did seeing and hearing about the work that others did on their action research projects impact the work on yours?
6. How would you describe your preparedness to meet the challenges of being a novice teacher?
7. How would you describe your likelihood to stay in teaching, if you feel better prepared to meet the challenges of being a novice teacher?

APPENDIX E

STUDENT FORMATIVE REFLECTIONS TEMPLATE

Student Formative Reflections Date: Time: Community of Practice:

Descriptive Notes: (Open-ended statements and responses.)	Reflective Notes:
Approximate Level of Concern	Actions Needed or Taken

APPENDIX F

NOVICE TEACHER INTERVIEW

Interview Questions for Novice Teachers:

1. What impact do you think completing your action research during student teaching had on your ability to face the challenges of being a novice teacher?
2. Now that you know how to do action research, how did this knowledge impact your ability to meet challenges in your classroom?
3. If you work in a community of practice, how does it impact your action research?
4. If you work in a community of practice, how does sharing you work with the others impact your action research?
5. How does seeing and hearing about the work that others did on their action research impact the work on yours?
6. How would you describe your preparedness to meet the challenges of being a novice teacher?
7. How would you describe your likelihood to stay in teaching, if you feel better