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Geographically Distanced Teacher Researchers' Perceptions About Collaborative Research During a Pandemic

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Abstract

This study examined the experiences of two cohorts of graduate students completing their research capstone course during the COVID-19 pandemic. The aim of the study was to examine the novice teacher-researchers' perceptions about research as they engaged in a semester-long collaborative research project that was revised for their cohorts. The findings suggest that students' perspectives and experiences were influenced by the collaborative nature of the course and that the geographic separation between the students was not a challenge for the cohorts of novice researchers. The implications from this work are that educators, especially those geographically distanced, benefit from collaborative action research as a professional development strategy.

Keywords: teacher-researcher, online, distance education, community of practice, collaborative action research, professional learning communities

Introduction

Action research (AR) can be an effective means for practicing teachers to reflect on ways of improving their teaching and learning (Arhar et al., 2013; Bergmark, 2020; Cox et al., 2012; Mills, 2007). It has been defined as a form of investigation used by teachers as they seek to improve their professional practices in their classrooms (Parsons & Brown, 2002). Further, it has been

established as a natural part of teaching because teachers continually observe, collect data, and make data-driven decisions to improve student learning, the classroom functioning, and the school environment using a framework that guides the energies of teachers toward evidence-based understanding (Rutten, 2021).

Teacher research uses established protocols to guide the investigation of a topic of personal interest. Models of AR usually discuss it in terms of cycles or loops that begin with the teacher-researcher identifying a topic of concern based on their own reflections and observations in the classroom (McNiff & Whitehead, 2006). Reflection is a key component of AR, making it a powerful professional development (PD) tool for teachers and novice researchers. As teacher-researchers develop their research question, they investigate the existing literature before collecting and analyzing data to answer their research question, implementing an action plan to address the concern (Mills, 2007; Spencer & Molina, 2018). This process encourages in-depth study of teaching practices and implementation of practical strategies that ultimately improve instruction (Aras, 2020).

This study sought to better understand the AR process with novice teacher-researchers in an online community of practice (CoP). With investment in improving teacher quality in graduate programs, it is essential that we study methods pertaining to teacher training and the impact on teacher application in the classroom setting. Moreover, recent evidence suggests that AR is an effective method to encourage collaboration among colleagues to engage in the examination of current practices within school contexts (Zagona, 2022). Preparing teachers for successful AR experiences should be considered in teacher training programs. This paper contributes to existing research on teacher preparation while discussing a collaborative AR process implemented in a fully online cohort for early childhood education (ECE) graduate students. Furthermore, teacher perspectives regarding a capstone course are shared with emphasis on aspects of collaboration during the research process to support co-inquiry.

Teacher Action Research in Graduate Programs

The use of teacher research as a culminating activity in graduate education programs has become common in the past two decades as an opportunity to provide meaningful opportunities for teacher's PD (Dana & Silva, 2003; Skyhar, 2021; Spencer & Molina, 2018). Often professors serve as critical advisors and mentors during the research process and act as a source of support for the students as they engage in AR (Wetzel & Ewbank, 2013; Wisker et al., 2007). In the school setting, it is important for teachers to continuously reflect on and improve practice. AR is often used as a method to encourage dialogue among teams to engage in the examination of current practices within school contexts, as well as use qualitative methods to understand and assess those practices (Kuntz et al., 2013; Pine, 2009; Toews & Zagona, 2022). In addition to school colleagues, partnerships with university faculty have the potential to improve instruction in classrooms and the accuracy of educational research (Kuntz et al., 2013). Within the context of K–12 education, reform is a part of ongoing classroom transformation and requires that teachers are lifelong

learners. Critical colleagueship encourages teachers to closely engage with each other, serving as observers and critics to foster reflection, collegial discussion, and ongoing evaluation (Lord, 1994; Toews & Zogona, 2022). Feedback is a necessary piece of growth and requires that teachers trust and engage with colleagues. Consideration of collaborative AR approaches in graduate programs support the natural learning process that takes place in school settings among teams of teachers (Anderson & Dobie, 2022). Online collaborative rooms support the professional learning experiences as teachers dialogue and share their experiences. Further, collaborative AR is closely linked to strategies used in current teacher practice as they meet with grade-level teams to discuss data and implications for practice or meet as a professional learning community (PLC).

Professional Learning Communities and Action Research

Research has shown that most effective forms of professional learning are ongoing and collaborative (Bergmark, 2020; Brancato, 2003; Cochran-Smith & Lytle, 2001; Rogers et al., 2005; Smith, 2003). PLCs have supported collaborative environments where teachers discuss and reflect on their practice in the school setting (Bergmark, 2020; El-Haj, 2004; Ness et al., 2010). PLCs in educational environments often include a group of education professionals working to create and sustain a culture of learning for the adults involved (Dufour & Marzano, 2011; Hipp & Huffman, 2010; Thornton & Cherrington, 2014; Waldron & Redd, 2011). The participants within the PLC create an environment of trust and collective inquiry (Thornton & Cherrington, 2014; Hord & Tobia, 2012). However, studies have shown that despite best efforts of PLCs, teachers often continue to work in isolation, in the closed-door environment of their own classrooms (Fecho & Allen, 2002; Richlin & Cox, 2004). That was, until the pandemic of 2020 when teachers and students moved behind screens and most of the teaching and learning around the world took place via online platforms. Instead of being confined to classrooms, teachers were anchored to their home computers reeling with the demands of virtual learning with no time to adequately prepare or cooperatively plan with colleagues.

PLCs are not new in the elementary and secondary education community; however, online versions put a twist on former brick and mortar meetings of the past. Online communities for professional learning have surfaced to support collaborative cohorts as they learn about specific content and reflect on their classroom application (Anderson & Dobie, 2022; VanOostveen et al., 2018; Yang et al., 2021). Collaborative online learning spaces expose teachers to diverse perspectives not always found in their school communities.

In connection to AR, PLCs encourage discussion with colleagues resulting in a collaborative opportunity to promote pedagogical and programmatic changes while sustaining professional relationships developed through sustained conversations (Bergmark, 2020; Kuntz et al., 2013). Collaborative opportunities are impactful when they support ongoing dialogue about classroom-based experiences and methods to impact change (Callaway-Cole & Kimble, 2021). This type of environment is necessary in collaborative AR, and therefore it is essential that we understand successful PLC settings. In a recent study, Xie (2022) found that online PLCs were impactful as

they offered current information for teachers, while promoting professional learning in a flexible environment.

Little is known regarding teacher perspectives encountered during online co-inquiry in a collaborative AR process. More research is necessary around online graduate education experiences, specifically using cooperative inquiry methods. Further understanding of trust in leadership is essential as it often drives the collaborative process. Differences in leadership styles can influence outcomes and group member interactions. It is imperative that collaborative AR processes include clear direction and vision to ensure a successful project completion among groups (Cameli, 2021). Further, an understanding of communities is necessary to support the collaborative AR process.

Communities of Practice and Action Research

While a PLC typically takes place in the school setting with the intent of improving student achievement and increasing collaboration, CoP focus on improvement of practice and are led from within the group. Membership is voluntary, whereas PLC participation is typically mandatory. Our graduate cohort experience is modeled after CoP, since members do not necessary work together daily; rather they build a relationship so that collaboration and knowledge sharing can occur (Lave & Wenger, 1991).

According to Wenger (2007), three crucial elements are found in CoP that separate them from a PLC: 1) *domain*: there is a shared interest among a group that extends beyond location and includes a long-term commitment to the goal; 2) *community*: members form a group that pursues a similar interest, and learning is encouraged through joint discussions; and 3) *practice*: members are practitioners that develop a shared repertoire of resources including experiences, tools, and ways of addressing recurring problems. In a graduate program cohort experience, students can share ideas and tools that are beneficial to understanding current topics of study. Interactions among graduate students foster a sense of community. Initially students join communities and learn at the periphery as the professor explains the process of AR, but later they move from legitimate peripheral participation into full participation (Lave & Wenger, 1991). Learning is then not seen as the acquisition of knowledge by individuals but rather as a process of social participation. In a study of learning cohorts, Wisker et al. (2007) found that the use of cohorts in a graduate program enabled group work, idea sharing, and supportive development. The ability to develop critical friendships contributed to the success of the cohort experience. For this to be possible, students in the cohort needed to learn how to converse and share their knowledge. This notion informed our study, but it did so in an online proximity.

Developing CoP among educators has been found to encourage teacher-researchers to reflect on classroom practices and support a sense of inquiry related to pedagogical beliefs; this impacts student learning in ways directly related to the classroom setting while increasing the learning potential of teachers (Hawkman et al., 2018; Kuntz et al., 2013). To impact student learning

outcomes, it is essential to increase collaborative opportunities among teachers (Hawkman et al., 2018; Kuntz et al., 2013; Kuntz, 2010; Shulman & Shulman, 2004). CoP can motivate teachers as they reflect on their practice within situated contexts while sharing in leadership opportunities (Kuntz et al., 2013; Loose, 2020). CoP can alleviate problems often identified in schools such as isolation and the need for sustained learning opportunities. CoP seek to exemplify the characteristics of a team by encouraging people to interact with one another and challenge standard classroom practices (Lave & Wenger, 1991). These communities differ from normal group structures in that members are required to contribute and analyze classroom practices. CoP can be fostered through collaborative AR.

This community experience is beneficial for graduate students that work within a cohort. CoP offer a model to support and empower students as they develop skills for AR and share knowledge of their own classroom experiences (Gawlicz, 2021; Lillo, 2018; Wisker et al., 2007). Learning in this environment is found to be effective if it is in an area that the learners are passionate about (Lucero et al., 2022; Wenger, 2007).

Teacher Education Capstones

Because literature has revealed that educators who are involved in AR become more reflective, critical, and analytical about their work in the classroom, it has become an essential PD tool for teachers (James & Augustin, 2017; Keating et al., 1998; Rock & Levin, 2002; Valli, 1997). Due to the success and value of AR in the education field, our graduate-level teacher education program culminates in a teacher research course that serves as the capstone to the program. The program provides students with the breadth and depth of knowledge needed to become an effective early childhood teacher and educational leader. Our students are often employed in public, private, and charter schools, as well as early education programs with young children from birth through fifth grade. The program is designed using a cohort model in which students take courses together for two years, interacting in both synchronous and asynchronous learning activities while completing both individual and group work. Research shows that cohorts lead to community building and collegiality among learners, especially when the program is fully online (Brooks, 1998; Pendleton & Gibson, 2021). It also intentionally supports building relationships with each other, developing long-lasting networks of colleagues, and creating a community of learners that have common understandings (Burris & Prudhoe, 2019). Additionally, collaborative planning during the AR process results in better student learning outcomes (Richman et al., 2019).

Teachers in classroom settings are often stripped of professional decision-making and creativity (Kuntz et al., 2013). They are empowered and feel more like professionals when they are provided with the time and the skillset to engage in dialogue pertaining to educational practices (Loose, 2020). To promote creativity among teachers, the AR process is used to examine classroom practices and student responses, and it ultimately leads to changes in pedagogical goals. For a group performing AR or ongoing inquiry, encouraging dialogue can bring group assumptions to the surface, a necessity before actual change can transpire (Johannesson, 2022). This type of

learning among teachers demonstrates the potential of AR and the necessity of CoP that support learning through reflection and dialogue with teams of teachers. Recent research has confirmed that virtual CoP are just as effective as face-to-face settings (Jocius et al., 2022). Teachers who participated in virtual environments gained new ideas for their practice. Further, teacher interviews indicated that teachers' self-efficacy increased because of the virtual CoP (Jocius et al., 2022).

The research capstone course embodies many of these characteristics and guides students as they learn about and complete an AR project. Because most of our students have little or no experience with research, we were interested in examining their perceptions about research and their knowledge related to AR specifically. Teacher knowledge, perceptions, and experiences were probed before and after the course. Additionally, the cohorts studied completed their capstone in fall 2020 or fall 2021 when the COVID-19 pandemic was greatly impacting childcare programs, schools, and higher education. As a result of the pandemic conditions, many schools and programs experienced closures, and typical face-to-face PD options were not accessible as they traditionally had been. Fortunately, because the program and its courses are 100% online, the graduate cohort was not disrupted and, in fact, we observed how robust AR can be as a professional development tool when students are geographically distanced. The following research question guided our inquiry: How are novice teacher-researchers' perceptions about research impacted by collaboration when they are geographically distanced?

Methods

The Capstone Course

The capstone, along with all the courses prior, was offered 100% online using the university course management system. It serves as the culminating experience for students in the ECE graduate program. Course content was organized and delivered using weekly modules that included readings, videos, and other supplemental materials to guide students around specific learning objectives. In the first third of the course, students were introduced to the AR model and concentrated on developing an independent research question that focused on improving their own professional practices. After each student had an approved question and completed a review of their ethical responsibilities through human subjects training, they began a review of the literature to inform their topic. Students also secured permissions regarding informed consent and site permissions. Once they had the appropriate approvals, the students independently designed their research instruments as they prepared for data collection. The second third of the course focused on students collecting their data and beginning analysis and interpretation of the data. As students completed their data analysis, the final step was to write up their findings, conclusions, implications, and action plan in the final third of the course. The culminating activity in the course was for students to share their research with a small group of their peers in the form of a website. The presentations took place via Zoom in the final week of the course. The website was required

to include the following: 1) origin of the research and research question; 2) description of the literature reviewed; 3) research intervention or innovation; 4) research timeline, collection, and analysis procedures; 5) findings/results; and 6) implications and impact on teaching. As students worked on their independent research projects, they received feedback from their peer group and engaged in asynchronous discussions to support their knowledge building and skill development related to AR.

The capstone course was redesigned prior to the 2020 cohort, although the course objectives remained largely the same. Students indicated their research topic choices by ranking them in week one and the instructor assigned students to teams shortly thereafter. Beginning the following week, students worked in their teams as they progressed through the AR cycle. Table 1 describes the course schedule.

Table 1. Overview of the research capstone course

Week	Topics	Assignments
Week 1	Introduction and Ethical Responsibilities	Reflection 1
Week 2		Annotated Bibliography
Week 3	Examining Professional Literature	Literature Review
Week 4	Collaborative Inquiry: Identify Your Focus	Log 1
Week 5	Situating Your Research	Data Timeline
Week 6	Preparing for Data Collection	Reflection 2
Week 7	Data Collection	Log 2
Week 8	Data Collection	
Week 9	Data Collection	
Week 10	Interpreting Data/Identifying Findings	Research Themes, Log 3
Week 11		Dissemination Report, Reflection 3
Week 12	Themes, Conclusion, and Implications	
Week 13	Action Planning	
Week 14	Disseminating the Results	Final Log
Week 15	Final Project	Final Project, Presentations
	Final Project	
	Final Project	

The Participants

This study was submitted to and approved by the IRB prior to the start of the course revision and included a pre-survey, post-survey, and review of course assignments. The pre-survey was adapted from Biruk (2013) and O'Connor, Green, and Anderson (2006) and presented as part of the weekly module for week one. Students were invited to review the consent form, and if they agreed to participate, they clicked the link to complete the consent form to access the pre-survey. The students/novice researchers were all graduate students enrolled in an online early childhood education graduate program at a university in the United States graduating in December 2020 or December 2021. The sample of 26 graduate students was overwhelmingly white (N=26, 100%), female (N=25, 96%), and teachers working in public school settings (N=21, 81%) compared to private (N=5, 19%). Only one student was male, and the majority were 25–35 years old (62%) with 27% between 36–45 (N=7), and the fewest were 46 or older (N=3). At the time of this study, the cohort students were primarily first-time graduate students (N=22, 85%), working full-time as teachers (N=23, 88%) or administrators (N=3, 12%).

Procedures

With IRB approval, the consenting students were asked to complete the pre- and post-survey, both of which were developed and delivered in Qualtrics, a well-known survey tool. Links were provided in the course management system, and after a one-week collection period, the link expired, and data collection closed to prepare for analysis once final grades were posted. The pre-survey was used to examine the students' initial knowledge about AR and co-inquiry, their current practices and experiences, and perceptions about research. Delivered in the first week of the course, it was designed as a series of statements that asked the participants to agree or disagree. The post-survey, deployed in the last week of class, consisted of the same agree/disagree questions from the pre-survey and aimed to explore the students' knowledge, experiences, and perceptions about action research following their course experience.

Using a five-point scale of responses (completely agree, agree, neither, disagree, completely agree), we examined research knowledge, attitudes, and perceptions both before the course and at the end of the course. In its most basic form, knowledge is simply what a person has acquired through their life in response to education and experiences. Building on that construct, we defined knowledge as an awareness of research based upon the formal and informal experiences. We wanted to know what their level of familiarity was with research and what, if any, experiences they had. We provided statements like, "I do not have enough knowledge to do action research" and "I keep up with the literature/current trends in research related to my work." Attitudes were thought of as feelings or an emotional response to research. For example, they were to consider whether the knowledge or use of research had positive or negative effects on some other aspect of their professional role. Their perceptions, collected separately, were explored as the ways they

interpreted their knowledge and attitudes related to research. For each of the agreement statements, Qualtrics provided percentages to compare pre- and post-responses.

In addition to the surveys, students' reflections were also downloaded from the course management system and analyzed as another means for interrogating the data. Each student submitted three reflections during the semester, assigned in weeks one, six, and eleven. The researchers selected one question from each of the three reflections to represent the beginning, middle, and end of the research process. Those questions were as follows:

Reflection 1: What concerns do you have about co-inquiry?

Reflection 2: How do you feel about the progress your team has made?

Reflection 3: How would you describe your group dynamic and collaboration?

The student responses were collected in a collaborative document for review. Employing a coding strategy is the most typical means for realizing themes across participant data (Anderson, 2007; Herr & Anderson, 2005; Merriam, 2002). In this case, journal reflections were analyzed to better understand student perceptions of a team approach to AR. After scanning the responses by question, and familiarizing themselves with the data, two researchers started to inductively code the data, using a commenting system to assign broad themes. The researchers repeated this process three times, using in vivo coding to build on the students' own words, as initial themes emerged for each of the three target questions. As we revisited the data each time, and discussed the initial themes, we found that the initial categories were refined, while others changed as they splintered to identify subthemes. When there was agreement in the three major themes, we scanned the data one final time with no changes.

Results

After semester grades were submitted for each cohort, we downloaded the survey responses and downloaded de-identified reflections. This section details the results from the data we collected, organized into three themes. Themes were a result of survey data and recurring responses in the reflections. This is further discussed through the tables and summaries below.

Theme 1: The capstone leveraged the students' pre-existing attitudes toward research to strengthen researcher identity among the cohorts.

Understanding the cohorts' experiences conducting research was the first step to addressing our inquiry. Referring to their pre-survey responses, the students indicated that, while some of them (46%, N=12) had prior research experience before graduate school, the majority (96%, N=25) had not presented findings from their research professionally despite attending conferences in their field. As teachers, they regularly used reflection to make decisions (96%, N=25) and changed their practice based on data they collected themselves (92%, N=24). Although research can be time-consuming and demanding, these students (62%, N=16) felt they had time in their current

schedules to do research, which was somewhat surprising given the pandemic changes and demands on teachers and other education professionals. Aspects of the survey reflected no change in the students' perceptions. These were unanimous responses that remained unchanged from pre- to post-survey. They are presented in Table 2.

Table 2. No change from pre- to post-survey

	Response %
Doing research will enhance my professional skills.	100
Empowerment is gained through research.	100
Teachers' doing research is valuable for students.	100
Teachers' doing research will positively impact students' learning.	100
Doing research enables teachers to examine problems and explore solutions.	100

Comparing the pre- and post-survey responses also indicated that the capstone experience impacted the students' perceptions of their identities as teacher-researchers (see Table 3). The responses reflected an increase in this view, as well as a positive change in their opinions about the importance of research to their professional role. They reported an increased belief that doing research is valuable to them personally and that it will positively impact their teaching. In contrast, they also reported that they felt less supported to do research following the course once they were no longer enrolled in a graduate program and under the direction of professors.

Table 3. Pre- and post-survey response change

	Pre- Survey %	**Post- Survey %**	**Change %**
I view myself as a teacher-researcher.	41	87	+46
Research is important to my role.	86	96	+10
I am supported to conduct research in my current role.	66	61	-5
Doing research is valuable to me as a teacher.	97	100	+3
Doing research will positively impact my teaching.	93	100	+7

I do not have enough knowledge to do action research.	59	4	-55
I keep up with current trends in my field.	86	100	+14
I have no interest in doing research.	21	17	-4
I don't understand the role of research in my work.	21	0	-21
I find doing research time-consuming.	97	61	-36

Prior to their capstone, the students had somewhat positive opinions about research, which were enhanced by their research experience (see Table 3). The students surveyed stated that they believed "doing research will develop and enhance my professional skills" and confirmed this belief at the end of their research projects. Not only did their knowledge about action research and current trends improve as a result, but so did their interest in doing action research. Further, their belief that research was time-consuming decreased while their understanding of the role research plays in their professional lives increased.

Theme 2: Collaboration supported co-inquiry and team progress for capstone completion.

When asked about aspects of collaboration, it was clear that the participants perceived an impact on their views. Following the capstone, students agreed that research is more interesting when it is collaborative (see Table 4). Further, their interest in publishing or presenting research increased considerably, while their views that they are lifelong researchers slightly improved.

Table 4. Reported research interests

	Pre Survey %	Post Survey %	Change %
Research would be more interesting if it were collaborative.	97	100	+3
I am interested in publishing or presenting research.	34	65	+31
I do not see myself as a lifelong researcher.	38	30	-8

Reflections were completed by students during the semester. Those themes and subthemes are summarized in Table 5. Despite co-inquiry concerns due to individual differences, challenges presented by the pandemic, and inexperience with research, students worked to successfully complete their capstone during the course. Team progress was evident with noted positive

interactions and shared responsibilities. Respectful collaboration led to open-minded and constructive conversations. Most noted among student responses were reflections centering on strong communication resulting in an environment of trust, which led to an open sharing of ideas. In reflection 2, the students responded to the question, "how do you feel about the progress your team has made?" and a clear subtheme emerged regarding the relationship between progress and building trust. Examples of responses included: "through dialog and trust, we stopped overthinking and became more relaxed allowing us to make progress," "I'm proud of my team's progress, and because we trust each other's intentions, we are more relaxed and better able to communicate our ideas," and "we are making good progress and building trust along the way." The subtheme of trust is nestled under the theme of strong communication because it is clear that the teams focused on strategies to build team communication, and from opening communication, trust was built, and progress followed. At this stage, the teams had been working together for six weeks.

Table 5. Summary of the reported themes

Reflection	Themes	Subthemes
1 Co-Inquiry Concerns	Individual differences	*Grades/subjects taught*
		Not pulling own weight
	Pandemic changes	*Finding time*
		Adjusting to virtual
		Feeling overwhelmed
	Inexperience with research	*Lack of practice*
		Collecting enough data
		Finding a good focus
		Work/research balance
2 Team Progress	Steady	*Positive interactions*
		Well-planned, organized
		Supportive
		Shared responsibility
	Strong communication	*Excited to share*
		Constant sharing
		Building trust
		Sharing ideas openly

3 Dynamic/Collaboration	Supportive	*Shared voice*
		Cooperation
		Encouraging
	Respectful	*Prepared*
		Constructive
		Open-minded

Theme 3: The capstone allowed the cohort students to embrace the uncomfortable.

Although the students expressed understandable reservations about doing research, it was clear that they also embraced the opportunity to fully immerse themselves in the process. The responses to the first reflection question, "what concerns do you have about co-inquiry?" were grouped into three distinct themes: individual differences, pandemic changes, and inexperience with research. Although the idea of teamwork was initially concerning, expressed in terms of others "not pulling their own weight" or "differences in the teaching level or subject," at the end of the semester the teams had only positive reflections regarding their team dynamic. Bleach (2013) stated dialogue is key for collaborative inquiry to be effective, and that was never more evident than in the final reflections submitted by the students. When asked about their team dynamic in reflection 3, and specifically their collaboration, the individual responses represented the theme of support characterized by feelings of a shared voice among the team members, cooperation toward a common or shared goal, and encouragement through various methods of feedback. The students also reflected on the respectful nature of how their teams shared constructive feedback once trust was established. These respectful relationships were characterized by open-minded discussions and team members coming to the meetings prepared.

Discussion

As with any AR process, the result should cause reflection and potential change in practice. During this process, each person brought forth different perspectives and unique experiences that benefited the research project and encouraged group members who were at first skeptical. They recognized the value of having a range of knowledge to approach the research from multiple angles, resulting in well-rounded topic generation. As members began the AR process, they felt more comfortable with each other, and this element of trust encouraged sharing and progress in the art of constructive conversation. This element of support resulted in conversations centered on instructional and classroom practices. For example, teachable moments was one topic that resulted from shared dialogue. This led to discussion regarding ways to define, collect, measure, and analyze teachable moments. Team members were excited to complete research so that they could grow in their teaching practice, gaining practical strategies that could be used within their own classrooms.

After the researchers read and identified themes in the responses to the reflection questions, benefits of a team approach to AR were evident. Initially, it was obvious that the graduate students were apprehensive about working collaboratively on research because they came to this course with a variety of research and classroom experiences. They were also worried about the quality of contributions from their teammates. Past course experiences that involved teams often resulted in one or two people doing most of the work. However, after the teams began meeting on a regular basis, they established a timeline that encouraged all members to stay on task and achieve deadlines in a timely manner. Each person was assigned tasks and contributed based on their strengths and experiences. For example, the literature review was divided among the team members based on topics of interest. As a result, the teams created an environment of trust, collective inquiry, and shared leadership (Thornton & Cherrington, 2014; Hord & Tobia, 2012).

The themes that resulted provided evidence that team approaches to AR support productive learning experiences where professional backgrounds are shared and trust is established through feedback loops and open communication. Reflection 1 took place during week one of the course. Students were still developing their understanding of co-inquiry and the aspects of working with a team. The question "What concerns do you have about co-inquiry (working in small teams on your research)?" was included because it related to their feelings regarding a team-oriented project. There were concerns, but they were addressed during discussion groups among peers. A theme that emerged concerned the differing backgrounds present within the group. Team members taught different grade levels and were worried that they would have a hard time finding common ground in their research. Trust in group members was the second evident theme. There was apprehension about the ability of group members and their level of understanding regarding data collection and review. They were also uneasy about getting along with their teammates as dominant personalities can impact collaboration. The third theme, teamwork, was repeatedly discussed in journals as students shared concerns about team members putting in more work than other members. Effort in productivity was also considered, as some were concerned that peers would not manage their time effectively due to schedule conflicts and outside obligations.

The collaborative aspect of the team approach was praised for its success in applying their classroom experiences to assist with selecting research topics. This was compared to benefits of critical friend groups to assist one another in growing as researchers (Thomas & O'Kane, 1998). Each team recognized its success in thinking critically about their research topics and implementing the AR process. Team members noted their apprehension when they worked alone during the week and acknowledged their appreciation of team dialogue that increased their confidence as they shared data collection results. Feedback was specifically mentioned as a common thread among teams, resulting in better analysis and comparison efforts. Working with team members created an environment conducive to discussion, analysis, and comparison.

Students appreciated the open-endedness of this project. They recognized areas where they lacked expertise and found training tools to educate their group. For example, one team wanted to post items to a website but felt uncomfortable with their ability to create a website. They used access to YouTube to train themselves on how to create a valuable website to post information. Initially students were unsure of how to manage time because of the open-endedness of the course. They

were used to course instructors telling them what to do and when. As they progressed in the research content, they appreciated the control they had over their research experience. It increased their confidence and strengthened their ability to communicate effectively in order to manage the research tasks effectively.

They were encouraged by the overall progress they made during the AR process. Finding ways to communicate effectively enabled them to monitor group member contributions and ensure timelines were being met. This collaborative method also allowed them to recognize when it was necessary to change directions in their research plan. Although daunting, realigning inquiry topics and methods is a necessary and natural part of AR. Team members appreciated the ability to shift plans as a result of open communication. This supportive network created a cohesive environment where group members felt safe and empowered.

These results have implications for teacher preparation programs and systems focused on teacher professional development. The collegial interactions and teamwork documented here are important aspects of collaborative action research to combat aspects of teaching, like isolation. Further, engaging in this practice heightens the opportunity for sharing, change, and teamwork that may lead to improved communication and empowerment. Following their capstone, most of the students continued to believe that doing research enhances their professional skills, and they now see themselves as teacher-researchers. Unanimously, the students responded that research positively impacts students' learning, improves their teaching, and enables them to examine classroom problems and solutions more effectively. Furthermore, the students felt that research was valuable to the teaching profession. It was clear that the capstone revisions were viewed in a positive manner and that future cohorts of novice teacher-researchers would also benefit from the collaborative structure of the course.

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Appendix 1: ECE 550 Pre-Survey*

*Adapted from Biruk (2013) and O'Connor, Greene, & Anderson (2006)

A. Consent Form

B. Demographics

    a.   Name:
    b.   Email address:
    c.   Current position (e.g., teacher, director, literacy coach):
    d.   Public or private:
    e.   Grade(s) taught (e.g., 4th, 1st, pre-K):
    f.   Topic(s) taught (if applicable; e.g., math, science, language arts):
    g.   Experience teaching (years):
    h.   Education (highest degree earned):
    i.   Birth year:
    j.   Gender:

C. Research Knowledge
[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

    a.   I do not have enough knowledge to do action research.
    b.   I keep up with the literature/current trends in research related to my work.
    c.   I have no interest in doing research.
    d.   I don't have access to research activities.
    e.   Research is not recognized at my place of work.
    f.   I don't understand the role of research in my professional life.
    g.   When I became a teacher, doing research was one of my goals.
    h.   I find doing research time-consuming.

D. Research Experiences
[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

    a.   I have done research during my professional life, outside of my graduate studies.
    b.   I use reflection in my work to examine my own practices.
    c.   I change my practice based on data-driven decisions.
    d.   I have used action research.
    e.   I keep a journal or log of my ideas and thoughts about my work that I use to inform changes.
    f.   I have attended a conference related to the work that I do.
    g.   I have presented at a conference related to the work that I do.
    h.   I am too busy in my personal and professional life to do research.

E. Perceptions About Research

[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

a.   Doing research will develop and enhance my skills professionally.

b.   I view myself as a teacher-researcher.

c.   Research is important to my role.

d.   Empowerment is gained through conducting research into teaching practice.

e.   I am supported to conduct research in my current role.

f.   Doing research is valuable to the learning process for me as a teacher.

g.   Doing research is valuable for my students.

h.   Doing research will positively impact my students' learning.

i.   Doing a research project will positively impact my teaching.

j.   Doing research encourages critical self-reflection.

k.   Doing research enables teachers to examine classroom problems and their solutions.

F. Interest in Co-Inquiry

[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

a.   Research would be more interesting if it were collaborative.

b.   Research should not be part of my master's program.

c.   I know I would enjoy doing research.

d.   I am interested in publishing or presenting research.

e.   Research has the potential to have long-lasting effects on my professional career.

f.   I see myself as a lifelong researcher.

g.   The challenges outweigh the benefits of doing my own research.

G. Study Topic

Identify your top two research topics in the list below by selecting 1 and 2 in the appropriate drop-down boxes.

a.   Social emotional development/mindfulness in the classroom

b.   Curriculum and teachable moments

c.   Parent engagement and homework

d.   Technology and teacher training

e.   Process versus structural quality

f.   Challenges to lesson planning

Appendix 2: ECE 550 Post-Survey**

**Adapted from Biruk (2013) and O'Connor, Greene, & Anderson (2006)

A. Demographics

    k.   Name:

    l.   Email address:

    m.   Current position (e.g., teacher, director, literacy coach):

    n.   Public or private:

    o.   Grade(s) taught (e.g., 4th, 1st, pre-K):

    p.   Topic(s) taught (if applicable; e.g., math, science, language arts):

    q.   Experience teaching (years):

    r.   Education (highest degree earned):

    s.   Birth year:

    t.   Gender:

B. Research Knowledge

[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

    i.   I do not have enough knowledge to do action research.

    j.   I feel more current with the literature/current trends related to my work.

    k.   I have no interest in doing research.

    l.   I want to pursue research activities after I graduate.

    m.   I don't understand the role of research in my professional life.

    n.   When I entered this graduate program, doing research was one of my goals.

    o.   I find doing research too time-consuming to do in my professional life.

C. Research Plans

[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

    i.   I plan to continue to use action research after I graduate.

    j.   I will use reflection in my work to examine my own practices.

    k.   I will change my practice based on data-driven decisions.

    l.   I will keep a journal or log of my ideas and thoughts about my work to inform changes.

    m.   I will attend conferences to share my research.

    n.   I plan to publish my research.

    o.   I want to publish or present my work but I need more support.

D. Research Reflections
[Not Difficult, A Little Difficult, Moderately Difficult, Highly Difficult, Extremely Difficult]

    a.   Defining the research questions
    b.   Writing the literature review
    c.   Developing and planning the methodology
    d.   Analyzing the data
    e.   Organizing and identifying themes in the findings
    f.   Keeping a research journal
    g.   Working as a group to conduct research
    h.   Developing a plan for dissemination

E. Perceptions About Research
[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

    l.   Doing research will develop and enhance my skills professionally.
    m.   I view myself as a teacher-researcher.
    n.   Research is important to my role.
    o.   Empowerment is gained through conducting research into teaching practice.
    p.   I am supported to conduct research in my current role.
    q.   Doing research is valuable to the learning process for me as a teacher.
    r.   Doing research is valuable for my students.
    s.   Doing research will positively impact my students' learning.
    t.   Doing a research project will positively impact my teaching.
    u.   Doing research encourages critical self-reflection.
    v.   Doing research enables teachers to examine classroom problems and their solutions.

F. Reflections on Co-Inquiry
[Completely Agree, Agree, Neither, Disagree, Completely Disagree]

    h.   Co-inquiry made research more interesting.
    i.   I'm glad research was part of my master's program.
    j.   I enjoyed doing research with others.
    k.   Now that I've conducted research, I am interested in publishing or presenting.
    l.   Co-inquiry made our findings more robust.
    m.   Research has the potential to have long-lasting effects on my professional career.
    n.   I see myself as a lifelong researcher.
    o.   The challenges outweigh the benefits of doing my own research.
    p.   Co-constructing research was more meaningful to my understanding.

G. Study Topic
Identify which topic you studied and provide a rationale for why you selected the topic.

H. Follow-Up

Please indicate if you are interested in continuing your participating in this study. It would include short follow-up surveys/interviews in the following increments after your graduation: three months, six months, one year, three years, and five years.

Yes, please contact me. Non-WCU email address: _____
No, thank you.