Levels of Engagement: Developing Pre-Service Teachers as Researchers

Engaging Education Students in Action Research Commentary

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Abstract

This commentary emerged from a robust discussion among five teacher educators around the role of research, specifically action research, in supporting the development of a teacher-as-researcher identity in preservice teachers. In sharing this commentary, we aim to advocate for more intentional inclusion of research processes within teacher preparation programs. Drawing on Mocker's (2011) model for forming and mediating a teacher's professional identity, we suggest that engagement in action research is a potentially important component of the developmental process. Furthermore, we offer a three-level, progressive framework for fostering research competencies within a teacher preparation program structured around 1) the research context, 2) building a researcher identity in preservice teachers, and 3) aligned teaching strategies.

Keywords: action research, preservice teachers, teacher preparation, teacher inquiry, teacher-researcher identity, undergraduate research

Background

In recent years, undergraduate research has surged in popularity and prominence across American universities, reflecting a broader shift towards experiential learning and interdisciplinary inquiry. Universities are increasingly prioritizing the high-impact practices of undergraduate research to foster innovation, creativity, and critical thinking skills among students, preparing them for success in an ever-changing global landscape (Kuh, 2008; Lanning & Brown, 2019). While expanding research opportunities for undergraduates has moved beyond its origins in traditional STEM disciplines to encompass a wide range of fields, it is still underdeveloped in education (Pearce et al., 2022; Szecsi et al., 2019).

Most undergraduate education programs are focused on teacher preparation, leading to state teaching certifications; however, despite nationwide teacher shortages, Florida colleges have experienced a 33% decline in teacher preparation program enrollment over the past decade (Patrick, 2023). Integrating research experiences into teacher training not only provides for a teacher workforce trained with the knowledge, skills, and perspectives needed to excel in today's complex educational environments but also provides transferable skills to learning contexts outside traditional K–12 classrooms (Harris et al., 2018). For example, Pearce et al. (2022) used a single-case study research design to examine the impact of an undergraduate action research experience designed for pre-service teachers ($n = 5$) on their STEM teaching self-efficacy, tracking their progress in developing and assessing their impacts on K–12 students over five months. The research team required the pre-service teachers in the case study to complete preliminary surveys to gauge their perspectives about their self-efficacy for teaching STEM and their views about research. Next, the pre-service teachers were required to identify learning targets and lesson plans for a curricular unit on natural disasters and to develop pre/post measures of content knowledge acquisition for their K–12 students, providing them with data to inform their growing competence as STEM teachers. Since the pre-service teachers were collecting such data, they were also actively engaged in the processes required for ethical human subjects' research, such as completing the Collaborative Institutional Training Initiative (CITI) training and securing parental consent and youth assent from their students. Findings from this case study demonstrated empirical, qualitative evidence supporting the impact of action research organized into four salient themes: 1) change in perspective on research, 2) increase in STEM self-efficacy, 3) societal value of STEM, and 4) enhanced professional advantage. Results from a one-year follow-up survey highlighted that the pre-service teachers viewed the action research experience as meaningful for altering their understanding of research processes and motivating their decision to pursue graduate education (Pearce et al., 2022). Similarly, Kennedy-Clark et al. (2018) tracked the progress of four pre-service teachers engaged in an almost identical action research project, finding similar benefits of experiential learning and identifying challenges for students in balancing university coursework and the research tasks simultaneously.

Guilbert et al. (2015) examined how much pre-service teachers ($n = 235$) engaged with research, as well as the factors that influenced degrees of engagement (or disengagement) using surveys and focus group interviews ($n = 11$; four male students and seven female students). Findings indicated that participants with prior research experience reported significantly more positive attitudes towards research than those without prior research experience, and focus group findings confirmed the survey results.

Szecsi et al. (2019) conducted an empirical evaluation of efforts to infuse courses within a teacher preparation program with research skills identified and tracked concurrently through its university "quality enhancement plan" (QEP), a requirement for ongoing accreditation. As part of the QEP, fostering and mentoring undergraduate scholarship for all students, including teacher candidates, sought "to improve transferable skills among students (i.e., written communication, information literacy, and critical thinking) through the integration of undergraduate research opportunities into the curriculum of every major" (Szecsi et al., 2019, p. 21). Select courses were identified for reform to address these skills, and the researchers tested the impact of these curricular modifications on student learning by running ANOVA permutation tests to compare assessment results of written artifacts produced by students in the beginning, middle, and capstone courses. Szecsi et al. (2019) reported significant improvements in developing transferable skills associated with undergraduate scholarship across the three selected education courses within the teacher preparation program.

Taken together, these studies provide evidence supporting our purpose in sharing this commentary—to advocate for a more intentional and robust inclusion of research processes within teacher preparation programs. We suggest that such experiences enhance critical thinking, deepen content knowledge, foster reflective practice, and empower pre-service teachers to become effective

practitioners. Through hands-on inquiry, collaborative exploration, and meaningful engagement with educational theory and practice, undergraduate research offers a transformative pathway for aspiring educators to cultivate their professional identities and make meaningful contributions to improving teaching and learning outcomes. Additionally, we propose a framework for curriculum design at the undergraduate level within teacher preparation that supports teacher-as-researcher identity development. The framework may be useful in determining the scope and sequence of student learning outcomes imbued with research competencies (see Table 1).

Teacher Researcher Identity: What, How, and Why?

The authors of this commentary engaged in robust discussion around the role of research, specifically *action research*, in supporting the development of a teacher research identity in our preservice teachers. Our experience integrating action research into undergraduate teacher education programs has allowed us each to personally see the value of supporting teachers in developing a research component of their teacher identity; however, the importance of teachers serving as researchers is already well-documented in seminal texts in the field (Cohran-Smith & Lytle, 2015; Dana & Yendol-Hoppey, 2020). Cochran-Smith and Lytle (2015) posit that teachers knowing how to conduct an inquiry in their classrooms are essential as school improvement initiatives now lean heavily on gathering and interpreting multiple forms of school and classroom data. Without their own set of research skills, teachers may be ill-prepared to take part in key decision-making conversations with policymakers and administrators. Furthermore, important classroom data (not collected through standardized assessments) may also be absent from those conversations. *Action research* is a particularly suitable approach for introducing pre-service teachers to the systematic steps of inquiry because it is conducted by practitioners, often within their own professional context, and is focused on solving specific problems or improving practices (Mertler, 2024). Designing coursework that engages students in developing a teacher-as-researcher identity fosters the creation of practical knowledge to bring about positive change among learners. As preservice teachers engage in action research within their teacher preparation program, they begin to understand the role that research can play in their developing teacher identity. In Figure 1, Mocker (2011) presents "an alternate model for understanding the formation and re-formation of teacher professional identity across the length and breadth of teachers' careers, focused on the overlapping and interacting dimensions of their work rather than on a linear progression from phase to phase as teachers move from neophyte to elder" (p. 520).

The complexities involved in 'being a teacher' are apparent as we look closely at the model's center and visualize the myriads of forces (political, professional, personal) teachers must navigate to work with their students.

Figure 1. *Formation and Mediation of Teacher Professional Identity*
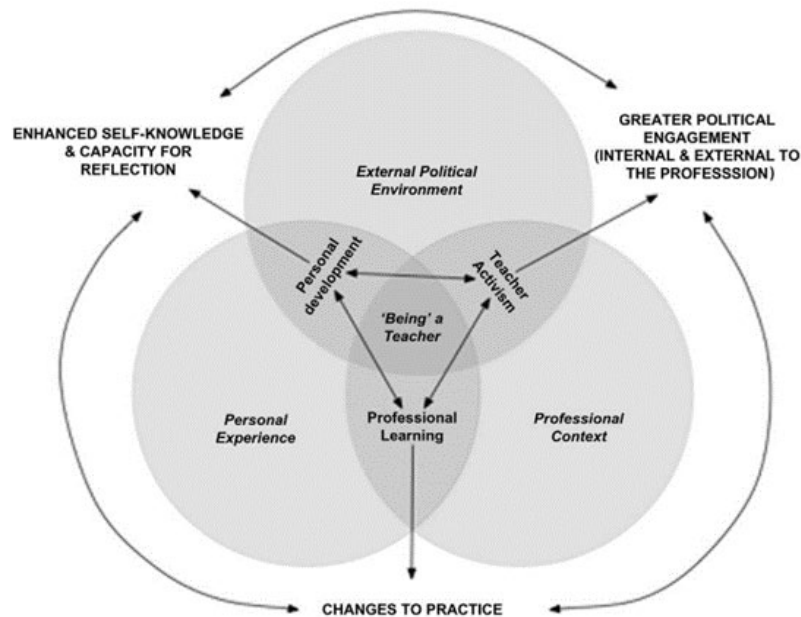
Note. The formation and mediation of teacher professional identity. Reprinted from Mockler (2011).

As teacher educators, we believe it is vital to offer our students a tool they can use from the first day to their last day, serving as professional learning, personal development, and teacher activism. We argue that the tool is action research and that developing a teacher's research identity should be integral to every teacher's identity.

Because action research can be defined as an intentional and systematic inquiry into one's own practice and methods, the approaches may vary based on one's individual contexts, needs, and abilities (Cochran-Smith & Lytle, 2009). Mertler (2024) suggests four phases—planning, acting, developing, and reflecting—to organize an action research study but allow it to be flexible enough to solve the unique problems teachers may address in their practice. Additionally, Dana and Yendol-Hoppey (2020) include the following definition of action research in their text:

> Elliot (1988) describes action research as a continual set of spirals consisting of reflection and action. Each spiral involves (1) clarifying and diagnosing a practical situation that needs to be improved or a practical problem that needs to be resolved, (2) formulating action strategies to improve the situation or resolve the problem, (3) implementing the action strategies and evaluating their effectiveness, and (4) clarifying the situation, resulting in new definitions of problems or areas for improvement, and, so on, to the next spiral of action and reflection (Dana & Yendol-Hoppey, 2020, p. 6).

What does not change in each study is that the teacher is at the heart of each study, applying essential insider knowledge to the research outcomes. When teachers engage in action research, they not only develop educational practices to become more effective teachers, but they experience professional growth and contribute meaningfully to the research being collected in the field (Mertler, 2024). We believe preservice teachers need to understand the value of their insider knowledge within educational research. There is often an absence of teacher voice in educational research. Through creating teacher research identities in preservice education, we seek to encourage our students to become teachers who regularly contribute to the dialogue within educational research as advocates for change. We know that when teachers are positioned as researchers, they report feelings of empowerment and agency

(Vaughan et al., 2019), so why not provide these opportunities for growth to our newest teachers so they may face the complexities of the current teaching climate with the best tools we have?

From Theory to Practice

Many university or college programs have an undergraduate research program as a part of their school enrichment for students in Honors programs, pre-medical programs (STEM), and psychology (Sommers et al., 2021). For all other degree programs, faculty may not have engaged in their university undergraduate program based on course load, research agenda, service commitments, or full awareness of the opportunity to build that bridge toward it. When considering enhancing a course with undergraduate research or being a faculty mentor supporting an undergraduate student interested in research, faculty may feel overwhelmed with where to start. Like other skills, instructors may scaffold research skills to meet students where they are and encourage students' success. Drawing from the tradition of differentiated instruction, depending on student interest and readiness, we can differentiate or tailor any of the four classroom elements: content, process, product, or learning environment for any learning objective (Tomlinson, 2017). Taking this approach to becoming an undergraduate faculty mentor scaffolds the process toward becoming an advanced undergraduate research faculty mentor. Undergraduate educators are already positioned in higher education to implement or shift their instructional practices to align with students' emerging, developing, or advanced research-skill needs. Table 1 presents these three broad levels of the research context for engaging pre-service teachers that are labeled using language common in student learning outcome assessment practices. Although, we recognize that other labels may be more meaningful at specific institutions. At each level, we suggest complementary research dispositions and skills, and we propose practical teaching strategies based on our interdisciplinary knowledge and experiences as faculty who engage undergraduate students in all levels of the research process. These framework components are aligned across levels to aid educators as they intentionally implement opportunities for their students to develop and hone their research skills, supporting the teacher-as-researcher identity development process.

At an *emerging level*, think of differentiating content, where faculty can add or change an assignment that introduces students to an exploration of research through the provision of engaging in a research activity of a graduate student or undergraduate program that incorporates research as a requirement (honors college, STEM field, psychology, etc.). Through these experiences, students may participate in a study and then engage in a colloquial event where the study is disseminated at the university's research symposium or educational enrichment webinar. An approach such as this would require an in-class sharing of what was learned both within and outside their field of study and extension activities that lead to developing a student's inquiry. Another option to explore research at an emerging level would be to create an assignment where students search through their library to answer a question related to an evidence-based practice of interest from a research journal (not practitioner-based) and present their findings from a research article on that practice. In-class discussion can develop students' ability to discuss the literature and prior research shared in the article, examine the methodology and findings, and review the discussion, perhaps even identifying a future research question to explore based on the discussions. This newly discovered question can lead students toward working with faculty at the developing level.

Table 1. *Teacher-Researcher Identity-Building Framework*

Research Context Overview	Building Researcher Identity	Teaching Strategies
Level 1: Emerging		
• The student's class is the primary audience • Students' work is primarily communicated orally to their class • Work is likely part of a course assignment • Skill development may be developed with one instructor and one class • Students rely heavily on guidance from the instructor to develop research skills	• Information literacy • Evaluation of information • Collaboration • Access to and acquisition of content knowledge • Reflection as a research skill	• Model and discuss researcher identity • Provide intentional instruction for oral communication skills • Provide templates for presentation slides • Provide intentional instruction on reading academic material, including research articles • Students engage in reflection regarding their identity as an emerging researcher
Level 2: Developing		
• The department or college is the primary audience • Students' work is communicated orally and in writing (e.g., research poster) • Work is likely a final project or capstone experience that may span across courses • Skill development requires more than one instructor and multiple classes • Students can work independently with guidance from an instructor to develop research skills	• Research ethics/integrity • Research used as a tool for testing new ideas, practices, and interventions • Critically evaluate evidence • Awareness of varied data sources in classroom/school	• Model and discuss researcher identity • Provide intentional instruction for written communication skills • Provide templates for research posters • Provide intentional instruction for APA Style writing standards and formatting • Host poster sessions within the department or college • Attend research conferences with students (e.g., FERA, FURC, EERA) • Students engage in reflection regarding their identity as a researcher

Research Context Overview	Building Researcher Identity	Teaching Strategies
Level 3: Advanced		
• The larger academic or practitioner community is the primary audience • Students' work is primarily communicated in writing (e.g., research poster, article publication) • Work is likely to extend beyond a course and may take place after a student graduates • Skill development requires an instructor or advisor • Students can work independently with limited guidance from an instructor or advisor to develop research skills	• Knowledge creation • Creating new streams of data collection • Use research to improve teacher agency inside the education system • Review others' research outcomes and contribute to the discourse • Research fuels purpose in teaching practice • Learn disciplinary conventions • Dissemination as a part of research	• Model and discuss researcher identity • Provide advanced instruction for written communication skills • Provide templates for research articles and conference presentations • Provide guidance on Research Methodology • Assist students with conference proposal submissions or publication submissions • Review feedback with students after conference presentations or publication submissions • Students engage in reflection regarding their identity as researchers in the discipline

At the *developing level,* faculty support differentiation of the process of learning in addition to differentiated content by providing students the opportunity to expand their knowledge of research ethics by achieving their Collaborative Institutional Compliance Training (CITI), and then with faculty guidance, students can explore small-scale action research by providing pre-tests and post-tests for an academic or behavioral intervention over a series of lessons or time or perhaps exploring perceptions or opinions through a survey instrument. A student may even complete a small literature review to guide them to a more significant research question they are looking to answer. These research explorations allow the faculty member to teach students about the scientific process of research, guiding them to understand the ethics and procedures toward finding an answer to a question they have through data collection and analysis. Faculty mentorship on developing and presenting using poster-type presentations would be a critical skill as these research-based activities could lead to student presentations at their school undergraduate research symposium or a professional organization conference in their field (e.g., FERA, EERA, FCEC, FURC, etc.) when held within their school's state.

Moving on toward an *advanced level,* faculty further differentiates the learning environment by supporting students in their research endeavors. Faculty may involve students in a larger-scale research project of their own or engage the student to explore a research topic of their own scientifically. Students may delve into a comprehensive literature review or implement an intervention based on their area of study. The product at this level is ultimately differentiated to the level of a regional or national conference presentation or publication in an action research-type journal through greater faculty governance and guidance throughout the research process (see sample poster template in Figure 2).

Figure 2. *Sample Poster Template*

Title of the Poster Here
Author Name & Co-Author

Introduction

Textboxes can be inserted into each of the white boxes to type the text. Do not use a font size smaller than 32. All text should be the same size with the exception of the references. The text in the reference section can be smaller. Keep in mind that people with be viewing your poster from several feet away. Headings should be the same size as the other headings. You may wish to set the text as "justified" rather than "left justified" so that is has a more uniform appearance.

The boxes can be expanded, deleted, or reduced depending on the needs of the author(s) and the study design. Ultimately, presenters should aim for a clean, uncrowded, and informative poster.

This first section of your poster may be the Abstract, Background, or Introduction. Choose a heading that fits your research project or proposal and adjust the size of this section accordingly.

Method

Often the method section includes a chart or bullet points about the sample or proposed sample for the study. Viewers should be able to quickly determine the method or proposed method of your study at a glance.

Discussion & Limitations

Briefly present the conclusion or implications of your work. If the work is a proposal, present the possible implications, or why the study is important to conduct.

Appropriate headings include: Future Directions, Implications, Conclusion.

Results

This section may have the heading of Findings, Results, Anticipated Findings, or Anticipated Results. If the study is a Mixed Methods study, consider expanding this section and including subheadings. Charts and figures can convey the findings quickly.

Hypothesis

This section may have the heading of Research Question, Hypothesis, Purpose, or Theoretical Framework. Choose a heading that fits your research project or proposal.

References

Use APA formatting, including a hanging indent

Faculty members will want to ensure that students adhere to research ethics and maintain integrity throughout research methods, data collection, and study analysis. Greater oversight and guidance are required by meeting regularly with the student to discuss the research process and findings and to support students in ultimately developing their paper for dissemination at a national-level professional organization conference or a manuscript for journal submission. Throughout all the levels of faculty research involvement, faculty are differentiating the learning environment. The learning environment levels change as students become exposed to larger-scale research activities and the ritual questions being asked as they explore their own questions. The goal for faculty is to think about starting somewhere within the continuum of levels and enjoying the experience and that of their students as well.

Regardless of a student's major, future employers will benefit from individuals with an added researcher skillset. For example, when teacher candidates graduate and move into their role as educators, they will be expected to evaluate their students' data, develop hypotheses, and determine a plan of action related to improving the data outcomes for all students. They will need to identify curricular and behavioral programs, supports, or services that will move their students on a continuum of learning and, when needed, research and evaluate those programs, supports, and services. Opportunities for action research within a program embeds the skills needed to perform these tasks more easily. Examples of action research projects that have built these skills of students supported by the faculty of this commentary include an exploration of general education teacher candidate familiarity with special education evidence-based practices for students with disabilities through a survey, a review of the literature of the effective academic practices for students with emotional-behavioral disorders, an exploration of the impact of a learning package (presentation & activity) on teacher candidates' knowledge of bullying and bullying prevention for students with disabilities using

a pre-test/post-test, and a wide variety of both academic instructional or behavioral interventions across all content areas using a pre-test/post-test in both special education and general education classrooms. In addition to these specific examples, Table 1 includes teaching strategies that instructors can modify to their specific needs and courses. Figure 2 shows a sample poster template that could be modified as an action research artifact.

We believe a more intentional approach to imbuing teacher preparation programs with curricula designed around our proposed teacher-as-researcher identity formation framework has many practical implications. We encourage readers to consider the design and testing of interventions that adopt and test this framework for effectiveness. We hope the practical suggestions included are helpful to educators as they continue the dialogue regarding elements of their courses and curricula.

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