Pennsylvania Teacher Educator

Volume 25, No. 2, Fall 2026

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Pennsylvania Teacher Educator

A Journal of the Pennsylvania Association of Colleges and Teacher Educators

Volume 25, No. 2

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Call for Manuscripts

The Pennsylvania Association of Colleges and Teacher Educators (PAC-TE) invites submissions to its peer-reviewed journal, *Pennsylvania Teacher Educator*. The journal provides a forum for teacher educators, researchers, practitioners, and other education professionals to share scholarship, innovative practices, critical perspectives, and emerging developments that contribute to the preparation and professional growth of educators.

Pennsylvania Teacher Educator welcomes manuscripts that explore current issues, research, policies, and practices relevant to teacher education. Submissions may include quantitative, qualitative, and mixed-methods research; rigorous theoretical and conceptual scholarship; practitioner perspectives; and critical examinations of contemporary educational issues.

All submissions must demonstrate a clear connection to teacher education and articulate their relevance to educator preparation, professional practice, or the ongoing development of educators. Authors are encouraged to explain how their work contributes to the knowledge, practices, or policies that inform teacher education.

The journal publishes two issues annually when a sufficient number of high-quality manuscripts are available. Publication decisions are made through a blind peer-review process.

Beginning with Volume 25 (2026), authors are not required to be PAC-TE members or affiliated with Pennsylvania institutions of higher education to be considered for publication. While preference is given to scholarship from Pennsylvania teacher educators, submissions from authors in other states and jurisdictions are welcomed and encouraged.

Types of Manuscripts Accepted

Pennsylvania Teacher Educator welcomes submissions in the following categories:

Research Articles

Original empirical studies using quantitative, qualitative, or mixed-methods approaches that investigate questions relevant to teacher education. Research manuscripts should clearly articulate the research problem, relevant literature, methodology, findings, and implications for teacher education.

Voices from the Field

Practice-oriented manuscripts that highlight innovative instructional approaches, educator preparation initiatives, field experiences, partnerships, or promising practices in teacher education. These manuscripts should connect practical experiences to relevant scholarship and offer meaningful insights or recommendations for teacher educators and practitioners.

Essays and Perspectives

Scholarly essays, theoretical or conceptual analyses, and informed perspectives that critically examine issues, trends, policies, challenges, or emerging directions in teacher education. Submissions should present a clear argument grounded in relevant literature and contribute to professional dialogue and reflection.

Book and Media Reviews

Critical reviews of recently published books, professional resources, digital tools, media, or other educational materials relevant to teacher education. Reviews should move beyond summary to evaluate the resource's contributions, limitations, and potential applications for teacher educators, teacher candidates, or practicing educators.

Submission Guidelines

1. **Manuscript Length and Formatting**

   Manuscripts should be no more than 15 pages of narrative, excluding references, tables, figures, and apendices. Manuscripts must be prepared using Calibri 12-point font, double-spaced text, and one-inch margins. All submissions must conform to the latest edition of the Publication Manual of the American Psychological Association (APA 7th edition).

2. **Required Submission Files**

   Authors must submit a minimum of two separate files:

   • **File 1: Cover Letter** — Contains author information and manuscript details.

   • **File 2: Blinded Manuscript** — Contains the manuscript without identifying author information.

   Figures, tables, graphics, and other illustrative materials must be submitted as additional separate files when applicable.

3. **Cover Letter Requirements**

   The cover letter must include:

   • Title of the manuscript.

   • Manuscript category: Research Article, Voices from the Field, Essay/Perspective, or Book/Media Review.

   • Brief abstract or summary of no more than 50 words.

   • Name, professional position/title, institutional affiliation or place of employment, mailing address, telephone number, and email address for each author.

   • A brief (2–3 sentence) description of each author's professional background and experience.

   • Identification of the corresponding author.

   • **A brief statement explaining the manuscript's connection to teacher education**, including its relevance or potential contributions to educator preparation, professional practice, scholarship, or policy.

4. **Blinded Manuscript Preparation**

   To support the blind peer-review process:

   • The manuscript title must appear on the first page.

   • Author names, institutional affiliations, and other identifying information must not appear in the manuscript.

   • Pages must be numbered consecutively, including references and appendices.

   • Authors should remove identifying information from document properties and use appropriately anonymized self-references when necessary.

5. **Tables, Figures, Graphics, and Illustrative Materials**

   All tables, figures, charts, graphics, photographs, and other illustrative materials must be clearly labeled and referenced within the manuscript.

   Authors must submit these materials as separate files, in addition to the cover letter and manuscript. Figures and graphics should be high-resolution and publication-ready. Acceptable formats include PDF, JPEG, or TIFF, as appropriate.

   Tables should be submitted in an editable format whenever possible.

   Photographs will be considered when they are of sufficient quality and appropriate for publication. The editorial board reserves the right to determine whether illustrative materials can be accommodated.

6. **References and APA Style**

   All citations and references must follow APA 7th edition guidelines.

   • References must be accurate, complete, and consistent with in-text citations.

   • Digital Object Identifiers (DOIs) must be included when available and formatted as hyperlinks (e.g., https://doi.org/xxxxx).

   • Article and book titles in reference entries should use sentence case, while journal titles should use title case, consistent with APA guidelines.

   • Authors are responsible for verifying the accuracy of all references, quotations, citations, tables, and figures.

7. **Connection to Teacher Education**

   Because *Pennsylvania Teacher Educator* focuses specifically on teacher education, all submissions must establish a meaningful connection to the field.

   Authors should clearly articulate the relevance of their work to one or more areas of teacher education, such as educator preparation programs, clinical or field experiences, teacher candidate development, instructional practices, professional learning, educator policy, educational leadership, or partnerships between institutions and schools.

   This connection should be evident within the manuscript itself, particularly in the discussion, implications, or concluding sections.

8. **Manuscript Submission**

   Manuscripts and accompanying materials should be submitted as email attachments to:

   journal@pac-te.org

   The subject line should read: Pennsylvania Teacher Educator Manuscript Submission – [Manuscript Title].

   Submissions must include the cover letter, blinded manuscript, and any applicable supplementary files.

9. **Review and Editorial Process**

   All manuscripts undergo a blind peer-review process. Reviewers evaluate submissions based on their relevance to teacher education, quality of scholarship, clarity of presentation, contribution to the field, and adherence to appropriate scholarly and professional standards.

Authors may be asked to revise their manuscripts in response to reviewer and editorial feedback. The editorial board reserves the right to edit manuscripts accepted for publication.

10. Author Responsibilities

Authors assume full responsibility for the accuracy, originality, and integrity of their submissions, including references, quotations, tables, figures, and other supporting materials.

Authors are responsible for securing any necessary permissions to reproduce copyrighted materials.

11. Copyright and Publication Rights

Authors of manuscripts accepted for publication are required to sign a copyright release to PAC-TE. This agreement permits PAC-TE to publish the work in Pennsylvania Teacher Educator, reproduce it in future PAC-TE publications, and grant permission for authorized reproduction of the material, in whole or in part.

12. Presentation Expectations

Authors whose manuscripts are accepted for publication are expected to present their work at a PAC-TE Teacher Education Assembly in either the fall or spring.

There is no remuneration for accepted manuscripts, and **there is no fee for manuscript submission or peer review.**

Submission Checklist

Before submitting a manuscript, authors should verify that:

- The manuscript clearly connects to teacher education.
- The manuscript category is identified in the cover letter.
- The narrative does not exceed 15 pages.
- The manuscript follows APA 7th edition formatting guidelines.
- A separate cover letter includes all required author and manuscript information.
- The manuscript has been blinded for peer review.
- Tables, figures, graphics, and other illustrative materials are submitted as separate files, when applicable.
- All citations, references, and DOI hyperlinks have been checked for accuracy.
- All required files are attached to the submission email.

Submit manuscripts to: journal@pac-te.org

Pennsylvania Teacher Educator welcomes scholarship that advances the preparation, development, and professional practice of educators.

Call for Manuscript Reviewers

The *Pennsylvania Teacher Educator* is seeking Pennsylvania-based teacher educators who are interested in becoming reviewers for the journal. Each manuscript that is submitted to the journal undergoes a blind-review process from three peer reviewers. Consequently, we are always in need of good reviewers who return manuscripts to the editors in a timely fashion. Members who are interested in becoming a reviewer should contact journal@pac-te.org.

Pennsylvania Teacher Educator

A Journal of the Pennsylvania Association of Colleges and Teacher Educators

Dear colleagues:

I am pleased to bring you Volume 25, No. 2 of the Pennsylvania Teacher Educator, on behalf of the journal's editorial team. We are grateful for the diligence and care of the Associate Editors and the many reviewers whose generous contributions of time and expertise make this journal possible. We also welcome the authors who, beginning with Volume 25, may submit from outside Pennsylvania and outside PAC-TE membership.

This issue presents six pieces of scholarship. Together they reflect the breadth of work our teacher education community pursues on behalf of the preservice teachers we serve and, ultimately, the K-12 students whose lives our graduates will touch.

Cultivating belonging in higher education through "Where I Am From" poems, by Jane Ammon and MaryJo Rosania Harvie, describes an arts-based project in which 62 undergraduate and 19 graduate students at two northeastern universities explored identity, memory, and culture through a process of poetry writing and peer sharing. Ammon and Rosania offer an adaptable model for enhancing belonging and fostering relational classrooms.

In *Well teachers, well classrooms: Reframing teacher burnout through teacher noticing and self-awareness*, Elizabeth Dlugolecki and Jennifer Butz focus on the continuing problem of teacher burnout and its prevention starting in teacher preparation programs. They introduce the idea of an "unnoticed overload" and propose a conceptual framework in which teachers can learn to notice, interpret, respond, reflect, and restore, so that strain is recognized before it becomes burnout.

Becoming a professor: Supporting K-12 educators' transition to higher education, by Sarah Fischer, Bonnie Jenkins, Tina Keller, Jeanette Monteith, Christina Simmons, and Laurie Zaring, is an autoethnographic case study of four former K-12 teachers who joined the faculty of a Christian university. Their narratives name the isolation, impostor feelings, and unfamiliar scholarly expectations that many, if not all of us, have experienced during our transition from roles in K-12 to higher education. Fischer and her colleagues also show how mentoring, modeling, and transparent communication at the department level can ease that transition.

Kathleen Post and Andrew Gavilas, in *Quiet excellence: Deconstructing the extravert ideal and leveraging introverted strengths in pedagogy and educational leadership*, ask whether our evaluation practices mistake energy for effectiveness. Their position paper suggests how clinical supervisors can use features built into Pennsylvania's PDE 430 framework to offer feedback to introverted candidates that reframes their introversion as an asset instead of a liability.

Artificial intelligence is the focus of the issue's final two articles. In *Restriction to readiness: Integrating the AI Assessment Scale (AIAS) into special education educator preparation program course syllabi*, William Schleicher and Ronald Carlisle describe replacing blanket AI prohibitions with a tiered, disclosure-based framework. They argue that for special educators, whose field has long relied on assistive technology, readiness matters more than restriction. Amber Torrance, Katie Waddell, and Kyle LaPaglia then present *Teaching future mathematics teachers in the age of AI: A systematic review of preservice teacher education research*. Their analysis suggests that AI may heighten, rather than reduce, the importance of content knowledge, because preservice teachers must be able to critically evaluate what AI produces.

Read together, these articles remind us that preparing teachers, as well as preparing the teacher educators who prepare them, requires relational work as much as technical skill. As new technologies develop, the human questions of belonging, well-being, mentorship, and professional judgment remain at the center of what we do.

We are grateful for your continued contributions to the Pennsylvania Teacher Educator and to the broader aims of PAC-TE. It is the scholarship and dedication of this community that makes this journal possible, and we are honored to serve as its stewards.

Respectfully,

Philip M. Kanfush, Ed.D., B.C.B.A.-D., I.B.A., L.B.A., L.B.S.
Managing Editor

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Contents

Cultivating Belonging in Higher Education through Where I Am From Poems 1
Jane Ammon and MaryJo Rosania Harvie

Well Teachers, Well Classrooms: Reframing Teacher Burnout through Teacher Noticing and Self-Awareness 19
Elizabeth Dlugolecki and Jennifer Butz

Becoming a Professor: Supporting K-12 Educators' Transition to Higher Education 26
Sarah Fischer, Bonnie Jenkins, Tina Keller, Jeanette Monteith, Christina Simmons, and Laurie Zaring

Quiet Excellence: Deconstructing the Extravert Ideal and Leveraging Introverted Strengths in Pedagogy and Educational Leadership 34
Kathleen Post and Andrew Gavilas

Restriction to Readiness: Integrating the AI Assessment Scale (AIAS) into Special Education Educator Preparation Program Course Syllabi 48
William Schleicher and Ronald S. Carlisle

Teaching Future Mathematics Teachers in the Age of AI: A Systematic Review of Preservice Teacher Education Research 59
Amber Torrance, Katie Waddell, and Kyle LaPaglia

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Pennsylvania Teacher Educator is an official publication of the Pennsylvania Association of Colleges and Teacher Educators. The journal is published as a service to the members of the organization and others concerned with teacher education.

Pennsylvania Teacher Educator serves as a forum for the open exchange of ideas and information related to the improvement of teacher education at all levels. Points of view and opinions are those of the authors of the articles and do not necessarily represent the views of the organization.

Pennsylvania Teacher Educator is a peer-reviewed journal that depends on both potential authors and reviewers to produce a high-quality publication each year. We are always in need of reviewers with a wide variety of perspectives and expertise to help us with the biannual review process. Becoming a reviewer is a helpful way to give back to the profession of teacher education and to PAC-TE as an organization. If you would like to be a reviewer, email journal@pac-te.org. Reviewers must be PAC-TE members.

PAC-TE is dedicated to providing strong advocacy for teacher education within the Commonwealth by promoting quality programs of teacher education and providing a variety of forums for discussion of issues that are of concern to all who are engaged in teacher education.

Pennsylvania Teacher Educator articles are provided digitally on the PAC-TE website.

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Cultivating Belonging in Higher Education through 'Where I am From' Poems

Jane Ammon
MaryJo Rosania Harvie

Abstract
This study shares an arts-based, narrative-centered project designed to foster belonging, relational awareness, and culturally responsive pedagogy in higher education. Inspired by Lyon's (n.d.) "Where I'm From" poem, the project invited 62 undergraduate and 19 graduate students across two northeastern U.S. private universities to explore identity, memory, culture, and lived experiences through poetry, visual media, and peer sharing. Guided by humanizing and reflexive frameworks, the study addressed how the project cultivated belonging in art and education courses and improved student-professor relationships. Participants engaged in instructor modeling, guided brainstorming, and flexible poetic structures before sharing their work aloud, in discussions, or via video. Post-activity anonymous surveys evaluated the impact on student identity, peer connections, classroom belonging, and pedagogical implications. This project offers an adaptable model for educators seeking to honor students' funds of knowledge and foster inclusive, relational learning environments.

About the Authors

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According to Cornell University (2023), belonging can be defined as "...the feeling of security and support when there is a sense of acceptance, inclusion, and identity for a member of a certain group." Maslow (1968) has defined belonging as one of the basic human needs, and in higher education, a feeling of belonging is critical in student retention efforts (Kahu et al., 2022). Currently, the discourse on belonging has been brought to light with a political climate which brings equality and equity into question, creating a sense of insecurity for many marginalized students. Recent research has shown "when students feel like they belong, they tend to stay enrolled, earn higher grades and report better outcomes overall" (Johnson, 2026, p. 3). Through story sharing of real-life experiences, a sense of connection, engagement, and belonging among classmates and educators can occur (Rhodes, 2019). Helping students get to know each other builds trust, improves social and academic interactions, and allows for perspective-taking (Goering, 2023).

According to Bell Hooks (1994), education is always political. Engaged pedagogy requires educators to teach *whole people* and to acknowledge the connection between knowledge, lived experience, and well-being. As educators, we are responsible for either reproducing the systems of dominance or fostering the practice of freedom (hooks, 1994). In teacher education programs, there is a sense of responsibility to model classroom spaces in which a sense of community fosters feelings of connection and belonging. It is crucial for teacher educators to show future teachers how to cultivate spaces of learning that allow students to use their own stories as agents for change and connection (Rhodes, 2019). Creating an environment where students of similar areas of study (education, art education, special education) can connect helps foster networks of peers with shared interests (Kahu et al., 2022). Hernandez Juarez (2017) posits that through learning about our own identity as well as our students' identities, educators can create spaces where "awareness, appreciation and sensitivity can be transmitted and practiced" (p. 52).

Recognizing the importance of critical consciousness (Ladson-Billings, 2021), we, as teacher educators who identify as White women, sought to discover, during in-class opportunities, how our students, across demographics, race, and culture, interpret texts, experiences, and the world around them. Initially inspired by George Ella Lyon's (n.d.) "*Where I am From*" poem format, we developed an activity to be utilized across both institutions, both in teacher education and within education and/or art departments, including a wider student audience, to learn more about the histories and backgrounds of our undergraduate and graduate students. Our intention, with each course we teach, is to foster communities of belonging in our higher education classrooms.

As this project progressed, for each of us, the urgency intensified to develop a space that is safe for identity discourse. Higher education communities are experiencing a critical shift as the political climate becomes more divisive. Our project took on a deeper, more urgent need to intentionally facilitate connections, regardless of how simple they may seem, among students and between faculty and students.

Problem Statement/Research Questions

We discovered a connection and similarity between our teaching philosophies and the paradigm by which we see education. We intend to deeply understand the learners we serve to better understand the relationship they have with their story and education. Our goal is to avoid cultural hegemony (Gay, 2018), and we designed this assignment to understand our students' worldviews, intending to inform instruction and foster belonging in our classrooms.

We seek to understand the following through our research:

- How does the use of Where I am From poems cultivate a sense of belonging in art and education courses?
- How does the use of Where I am From poems improve relationships between students and their professors?

Literature Review

Arts-integrated inquiry can allow students the freedom to explore and share their identity through familiar imagery as a method of cultivating belonging and connection in shared classroom spaces. Through the use of poetic inquiry as a methodology, educators can

help students bear witness to themselves and their peers, as well as step into ownership of their own stories (Phelps & Na, 2025). Szabo (2008) asserted that teacher educators need to use various forms of prose and poetry with preservice and in-service teachers to help them connect with their own identities and consider the identities of their future students. Cibils and Marlatt (2019) posited that the use of poetry in teacher education classrooms directly contributes to the development of agency in preservice and inservice teachers, thus encouraging the use of culturally sustaining pedagogy.

In our classrooms, arts-based inquiry is embedded and essential for developing a shared understanding that learning can be joyful, connective, and personal. Phelps and Na (2025) reflect on the use of poetry to reinforce the "shared belief that teaching is not just instruction—it is a radical act of love, liberation, and presence" (p. 42). We engage students in poetry as an arts-integrated methodology (Kennedy Center, n.d.), employing the use of poetry for its less formal structure, while providing students with a template to allow for creativity within the structure. This balance is aligned with the philosophy that "tools become catalysts—sparks that ignite voice, memory, and resistance" (Phelps & Na, 2025, p. 42).

Arts-Based Inquiry

Arts-based inquiry extends these ideas by positioning artistic processes as legitimate forms of research and knowledge production (Barone & Eisner, 2012). Arts-based methods employ self-reflection and imagination to let participants develop layered meanings that may not emerge through conventional assignments. Within this framework, creative practice becomes both epistemological and relational and is a means of knowing oneself and others. Identity exploration that happens through artmaking operates as inquiry, reflection, and relationship building.

Narrative identity theory suggests that individuals construct meaning and coherence in their lives by organizing experiences into evolving internal stories (McAdams & McLean, 2013). Identity, in this view, is not fixed but continuously authored through reflection and reinterpretation. This aligns closely with constructivist learning theory, which positions knowledge as actively built through experience rather than passively received (Bruner, 1996). In arts-based educational experiences, learners may interpret past experiences, assign meaning, and situate themselves within cultural and social worlds.

When students compose identity poetry and visual narratives, they represent identity and reconstruct it. Learning occurs through the iterative process of writing, revising, and interpreting one's own story. Scholarship on positionality emphasizes that educators' identities, shaped by race, gender, culture, and experience, influence classroom dynamics and curricular decisions (Sensoy & DiAngelo, 2017). Critical self-awareness allows teachers to act intentionally rather than implicitly reproducing dominant narratives. Positioning the teacher as a relational agent reframes instruction as co-construction rather than delivery. The educator becomes a facilitator, witness, and participant in identity work. Relational agency supports belonging by foregrounding care, responsiveness, and shared meaning-making.

Belonging in Higher Education

Belonging is increasingly recognized as a critical predictor of academic engagement and well-being. The Cornell University definition frames belonging as the feeling of being accepted, valued, and included in a community. Research on psychological safety (Edmondson, 2018) similarly suggests that individuals are more likely to take intellectual and creative risks when they perceive an environment as non-punitive and supportive. Relational pedagogies rooted in trust and affirmation operationalize these conditions. The principles articulated in Fred Rogers' Six Fundamentals, particularly a sense of self-worth, trust, and curiosity, align closely with contemporary belonging research. Rogers emphasized deeply attuned listening, and he encouraged the integration of the arts as a vehicle for emotional expression. Within classroom contexts, practices that center student voice, reflective dialogue, and creative exploration cultivate psychological safety (Fred Rogers Institute, n.d.).

Cultivating a sense of belonging in higher education classrooms emerged as an indicator of successful college experiences, especially for students who are traditionally marginalized (Tinto, 1975). Verbree et al

(2025) assert that when a student feels a lack of authenticity, connection and belonging in learning spaces within higher education, they experience a weaker sense of connection to the campus community and their academic performance can be diminished. Today, many institutions of higher education will implement diversity, equity and inclusion programs and form committees to address students' ever-growing need for a sense of belonging and community, yet most fail to consider the systems and policies they currently have in place that can lead to student dropout or failures (Covarrubias, 2024; Johnson, 2022). Similarly, many professors and practitioners in higher education have had limited exposure to or training for culturally relevant pedagogies which may foster belonging, connectedness, and authenticity in classroom spaces, as their degrees readied them for expertise in their subject, not in teaching technique and pedagogical approaches for inclusive learning. Gilani and Thomas (2025) identified several ways professors and practitioners could improve students' sense of belonging in their learning space including interactive pedagogies, faculty/student relationship building, building connections with peers in classroom activities, developing a growth mindset through reflective exercises, a welcoming and inclusive classroom culture, feedback that is continuous and positive, access to multiple avenues of support, clear communication and an understanding of life experiences outside of the classroom.

Synthesis

This study is grounded in interdisciplinary scholarship on teacher identity, empathy, and belonging. Together, these frameworks situate arts-based, narrative-centered pedagogy within broader conversations about relational learning to position narrative arts pedagogy as an intersection of identity construction, empathic development, belonging, and teacher formation. Narrative identity theory and constructivism explain how learners build meaning. Arts-based inquiry explains why creative processes matter epistemologically. SEL and culturally responsive teaching explain why perspective-taking and equity are essential. Belonging and psychological safety explain the conditions necessary for risk-taking and engagement. Reflective practice and positionality explain the teacher's role within this relational ecosystem. This intellectual grounding situates arts-based, narrative-centered classrooms as more than enrichment practices. Rather, they are rigorous relational pedagogies that cultivate identity coherence, empathic understanding, and community belonging.

Method

Participants

The research participants included 62 undergraduate students and 19 graduate students enrolled in education or art courses at a small private institution and a mid-sized private institution located in the northeastern United States. The demographic profile of the students was predominantly White (67%), with Hispanic/Latinx individuals constituting 10.87%, and Black/African American individuals 21.74%. A significant majority of the participants identified as female (71%), with 29% identifying as male. Nearly half of the undergraduate students (45%) identified as first-generation college students.

Procedure

Our research utilized an arts-based approach to embedded design methodology, with narrative inquiry being the primary source of data collected, and quantitative data collected through an online anonymous survey. Students were introduced to George Ella Lyon's (n.d.) Where I am From poem format through modeling and reading the instructor's Where I am From poem. These poems were selected as a pedagogical tool for building a sense of community after Jane discovered Lyon's (n.d.) poem framework during her pursuit of gaining further insight into her students' funds of knowledge. The poems serve as a way of understanding students' cultural frame of reference while simultaneously considering the cultural gaps in their classroom space.

Students were provided with a poem guide, seen in Appendix A, that included a brainstorming document for their poem, which included a fill-in-the-blank framework with details and sample poems written by their instructors. For the assignment, students were asked to reflect on their own details, which allowed them to create their own poems. All poems were submitted through learning management systems and were also shared with peers using two different methods. This is where the assignments differ between professors. In

Jane's class, students read their poems aloud in class; in MaryJo's class, students created a video in the style of a PechaKucha, using found and original images, combined with a voice-over, reading their poem aloud in the video. Following the full activity, students completed an anonymous online survey (see Appendix C) delivered via a Google form, within the learning management system. Students in Jane's courses completed this exercise in one three-hour class period, while students in MaryJo's course completed the full project over a four-week period.

Process and Researcher Positionality

Jane's Positionality

As a student, I was raised in the 80's and 90's in a lower-middle-class community; my K-5 school experience was in an elementary school with a primarily White student population, and my 6-12 school experience was in a mixed-race population of students. Though I had primarily White, female teachers in elementary school, I had more male teachers and some teachers of color in my secondary years. In my undergraduate work, my professors were all White, and in my graduate work, I had three Black women professors, and the rest were White women and men. I identify with my first-generation, working-class students, as my college experience was similar, having been raised by a single mother without a college education. However, my experience also differed since my deceased father held two higher education degrees. Therefore, I consider myself a pseudo-first-generation college student. I identify as a White ciswoman, hearing impaired, with Irish and English heritage, in the middle class, and in a mixed-race family.

I strive to be an accomplice for the undergraduate and graduate students I get to teach, as one who actively seeks to combat systemic racism through antiracist teaching and continuous self-reflection. Embracing womanist caring (Beauboeuf-Lafontant, 2002) as a pedagogy of love, also known as othermothering, "mothering of the mind" (Collins, 2014, p. 215) for Black feminists has been transformative for me in listening to and creating alongside my students.

Jane's Process

My approach for the Where I am From project is through the lens of self-exploration and self-reflection as an educator or future educator seeking to make connections with their current and/or future students. The project for graduate students enrolled in an education research course is introduced to help them spend time reflecting as a precursor to writing their positionality statements for their action research papers. Positionality statements are included in their research papers to establish researcher transparency through a reflective lens of self in relation to the topic, as well as the students/subjects being investigated (Kennedy et al., 2024). All students were given ample time in class to create their poems, using the template from Appendix A, as well as an example text. Upon completing the poems, students were asked to share their poems aloud with their peers. Following this exercise, graduate students are directed to use this reflective process as a foundation for writing their positionality statements for their research projects. Graduate students are also asked to reflect on the poem activity in their exit tickets and are encouraged to include their poems in their teaching portfolios.

For undergraduate students enrolled in a special education literacy course, this project is introduced as a creative tool for building a classroom community as well as introducing students to poetic form in literacy-based lessons. The project is introduced to students upon completion of reading the text, Cultivating Genius by Goldy Muhammad (2020), which focuses on creating equitable learning environments for all students. Students are provided with the poetic structure prompts as seen in Appendix A, as well as my poem as an example text. After sharing their completed poems aloud with their peers, the undergraduate students are directed to reflect on the impact and use of this tool in their exit tickets. Students are also encouraged to include their poems in their teaching portfolios.

MaryJo's Positionality

I write from the perspective of a first-generation college graduate, born in the 1970s and raised in a predominantly white, suburban, middle-class community in New Jersey. I am the youngest of four children, from a blue-collar family. My history was shaped by the racial and economic shifts of the cities where my family lived in New Jersey. Although my parents valued education, the value stemmed from their lack of higher ed-

ucation and a strong desire that their children did not end up missing the opportunities they felt were missed without an education. Our family had limited means to support education, and I often navigated school independently; the contradiction of high expectations, coupled with limited guidance, instilled in me both self-reliance and a belief that struggling in school was a reflection of my personal inadequacy, and I resigned myself to the idea that barriers were a natural part of education.

I attended a small, suburban school district in New Jersey, where I was an average student by conventional measures, but I thrived with creative, hands-on, arts-based learning. Early affirming experiences in school shaped my emerging identity as an artist and helped me imagine a possible future in the arts. These moments stand in contrast to what Armstrong (2009) refers to as paralyzing school experiences that reinforced the feeling that I did not belong in an academic setting.

My professional path has woven together art, teaching, and leadership in traditional and nontraditional ways. Teaching and leading within systems where the arts are undervalued caused me to cultivate a desire to push against these notions, to support educators and students who thrive in the arts, and to protect space for creativity and student-centered, arts-based learning. Understanding these tensions and frictions within the education system informs the way I approach power, voice, and belonging with the pre-service teachers I now work with.

MaryJo's Process

As I guided students through the Where I am From project, I approached it as both an artistic exploration and a reflective practice rooted in personal story and learner positionality. The course containing this assignment is built on Sensoy and DiAngelo's (2017) understanding that each student's perspective is shaped by their place in society, by culture, geography, migration, class, language, family structures, and lived experience. My role in the classroom is not simply to teach writing or art-making techniques, but to create classroom conditions where students feel that their stories are meaningful and worthy of artistic expression and interpretation. Our Where I am From project started with writing, originally using the poetic structure inspired by George Ella Lyon's (n.d.) "Where I'm From" poem (Appendix A). Lyon's (n.d.) structure gave students an accessible and evocative format for remembering sensory details, family sayings, objects, rituals, places, and people. As a learner, writer, and artist, I appreciate the use of guided prompts, brainstorming lists, and examples to help gather memories without worrying about form or polish. This stage is intentionally slow and reflective and is an opportunity for students to sit with their histories, presented in a new way, and notice what rises to the surface. Students share poem drafts with classmates in a non-graded discussion, where they are free to provide comments and feedback.

Because the assignment is situated within a visual art course, we then shift from written language to visual thinking. I model how to translate a poem into a storyboard for the students, by breaking lines and images into "scenes" on the storyboard. Students include personal photographs, re-appropriate family photos, images of symbolic objects, or artworks that capture emotion and atmosphere. On the storyboard, students sketch out their sequences, make choices about pacing, and consider how the visual cadence of the poem's structure can help them build rhythm, tension, and clarity. As students gather images and turn them into footage, we discuss representation, ethics, and aesthetics. In the course we draw on artists such as Amy Sherald (Art21, 2023) and Tanya Aguiñiga (Art21, 2021). The work of contemporary artists encourages students to think critically about how identity is framed, what choices they make in their own work, and how those choices reflect the stories they want to tell.

A critical step, often left for the end of the process, includes recording a voice-over of their poem. I invite students to experiment with sound, layering, and meaning. Students record their narration and, when appropriate, explore AI-generated voice options, not as a shortcut but as an accessibility tool. We look critically at issues of bias, access, and the digital divide when using technology to tell their stories. What does the use of AI leave out, flatten, or distort? Does the AI create a universality to the work, or does it take away the personal and expressive qualities of the piece? As a class, we also explore spoken word poets and the added dimension of hearing a poem read aloud.

Throughout the process, I emphasize that the assignment is not only about learning technical skill; it is about building confidence, belonging, and recognizing that their personal histories exist within a larger social, cultural, and global landscape. The goal is for each student to leave with a deeper understanding of themselves and a stronger appreciation for the rich diversity within our learning community. Students share their videos with the class and provide feedback using a structured peer feedback format.

Results

As we reviewed each of our students' poem submissions multiple times, we highlighted themes based on the research goals and found emergent themes within the data. While reviewing the poems related to the emergent themes, we also used in vivo coding, pulling specific phrases within the data/poems that illustrated and served as an example of the emergent themes. In Table 1, we have included sample phrases quoted directly from our students' poems that align with the emergent themes. The goal of the research was to understand if the use of an arts-integrated inquiry, such as poem writing and sharing, can cultivate a sense of belonging in higher education courses. We also aimed to discover how the use of the arts-integrated activity can build relationships between students and their professors. In our research, we highlighted deep reflection, empathy and connections, storytelling, creativity, celebrated identity, and emotionality as important elements of belonging in a learning environment. Our emergent themes aligned with these findings:

1. Deep Reflection and Self-Discovery
2. Empathy and Connection Through Shared Storytelling
3. Creative Expression as a Bridge to Belonging
4. Identity Work as a Foundation for Culturally Responsive Teaching
5. The Emotional Dimension of Artmaking and Storytelling

In Table 1 we have included lines, words, and phrases collected from poetry written by students in both groups selected as examples for each of the emergent themes.

Following the writing and sharing of the poems, students completed an online survey (Appendix C) about the whole experience. When asked if the experience of writing the poems changed their idea of how they think of themselves and their identity, sixty-four percent of the students indicated agreement. Students shared feelings of connection to their classmates, deeper self-reflection on their background, and wider perceptions of self-image. Students who did not feel the poem writing changed their idea of how they think of themselves made statements of already existing self-awareness and self-assuredness.

Many of the students indicated that reading and listening to the poems of their classmates impacted how they thought about others. Students expressed deeper insight into others, a better understanding of others, recognition of potential biases, and a more profound connection to their classmates. Many students shared specific examples of how a classmate's poem helped them relate to others. When asked if the experience cultivated a sense of belonging in them, seventy-one percent of the students said yes. Students were asked to provide three to five words that described their feelings of belonging. A word cloud of the most common terms used by students in both courses is shown in Figure 1. One student did not feel this experience cultivated a sense of belonging, citing their belief that belonging stems from actions, not words or written experiences.

Figure 1

Word Cloud of Words Used to Define Belonging



The students who were enrolled in teacher preparation courses all felt that using this exercise would help them understand the multiplicity of their students' identities. They felt that completing Where I am From poems with their students would help them understand their students' backgrounds and identities, allow for creative freedom in their classrooms, improve student-to-teacher connection, and increase overall classroom empathy. The teacher preparation students offered ideas of how they would build classroom belonging with suggestions such as using morning meetings, inclusive classroom images, and offering a variety of culturally inclusive texts. Students also shared how exploring their own identities as teachers was crucial in building student-teacher relationships, finding common ground, exploring shared interests, and cultivating classroom respect for others.

Discussion

Jane's Reflection

Introducing the use of Where I am From poems emerged as an implication for further teaching and research from my doctoral research as a method of creating connection within my classroom space. I have also come to recognize it as a powerful tool to utilize in understanding all my students' backgrounds and funds of knowledge from undergraduate students through graduate students. Through this research, I've gained a deeper appreciation of the importance of creating classroom community in higher education spaces, as well as the impact of using poetry to foster a creative spark in current and future educators. The current co-investigation of this tool with MaryJo gave me insight into the ways this project has significantly improved classroom community while also providing me with information on the limitations of my initial design of instruction.

In all my in-person classes, students are seated in a circle, so all information is disseminated in a shared, conversational, community-focused learning environment. This arrangement proved to be influential in this process, as I was able to watch the students work through their poems in real time. In each course, I found myself intrigued as I observed the different creative approaches students utilized in their writing. Some students used the fill-in-the-blank form to write the poem, some chose to handwrite their poem on lined paper, others chose to type their poem on their computers, and some elected to create a colorful poem using the in-class art cart (with colored paper and markers). The autonomy of their creative processes provided me with information on how each student approaches new tasks. Additionally, observing the students as they shared their poems, listened to the poems of their classmates, and asked questions of each other gave me insight into who they are as critical thinkers as well as who they are as listeners and reflective practitioners. After the lesson was over, I wrote notes on each student in a journal to help guide me through building relationships with each one. When reading and commenting on the individual students' exit tickets after class, I was able to give productive and connective feedback on what I observed as their strengths as community members.

Similarly, I discovered this project needed some shifts in its design. First, I came to realize, through student questions and personal reflection ("Do we have to write about the family we grew up with?"), it was important to suggest to the students that they could choose to write this poem about their family of origin or the family they have created. This reflection prompted me to create a second example poem about the family I created, which I now include in the examples for subsequent lessons. Additionally, I was able to share the second poem with the family I created, which was a source of joy and connection within my personal life, further proof of how our students impact our lives inside and outside of the classroom. Second, I recognized a missing prompt in the use of the poems as a foundation for the positionality statement. Initially, I had the graduate students share the poems and then just told them to use them as an inspiration for their positionality statement. This direction caused some confusion, and many students struggled to make the connections between the poems and the positionality statement assignment. Now, after the students have shared the poem, I ask them, "Tell me how your poem translates into who you are as a researcher and an educator?" This question typically opens up a critical thinking process for students, and more students are having success in using the poem as a highly effective reflection tool for a jumping-off point in writing their positionality statement.

Table 1

Emergent Themes and Phrases Found in Student Poems

Deep Reflection and Self Discovery	Empathy and Connection Through Shared Storytelling	Creative Expression as a Bridge to Belonging	Identity Work as a Foundation for Culturally Responsive Teaching	The Emotional Dimension of Artmaking and Storytelling
"...has told me about her childhood in Russian occupied Poland"	"...from the eerie silence when someone is mad"	"Playing soccer, running around the neighborhood with my best friends, dancing to Irish music."	"...countless stories my grandma has told me…"	"...from the eerie silence when someone is mad"
"I am from protestants, who claim to be more accepting."	"I am from the explosive anger and the emotionally distant."	"I am from rich red roses, but they're made out of legos cause they'll last longer and be more fun to have."	"...who I now think about when I see daughters smiling ear to ear around their moms."	"...loud on the inside, but calm on the outside…"
"I am the classic Puerto Rican food my grandpa, grandma, mom and aunts used to make…"	"...and my Grandpa who fought in the Vietnam war to become an American Citizen."	"Scattered tools, greasy hands, and laughs that still echo in the garage.	"...and never give up on what you believe."	"I am from the explosive anger and the emotionally distant."
"I am from Christian but also Catholic origins, like going to church every Sunday…"	"...laughter and joy in the backyard, and loud music when my dad is grilling."	"I am from baking cookies for holidays, and love."	"Born in Santiago, where the mountains kiss the sky…"	"...laughter and joy in the backyard, and loud music when my dad is grilling."
"I am from Bethlehem, rice and beans with a side of McDonalds."	"...and the story of my dad getting a wind up car stuck in his hair when he was young…"	"I am from my father's guitar, our after dinner dance parties to get our jitters out before bed."	"I am from a house kissed by the Caribbean sun, painted in pastel hues - blue, yellow, and coral and the heart of the island beats with every sign…"	"...Fridays as a family and long stories told by my mother and brother."
"I am from my mother's womb, a place where grandma's prayers are still keeping us safe."	"From burning my hand on the heater and not being able to go to the doctors for hours because my mom didn't want DHS to get involved."	"I am from church for people who don't like church, where I built my true family."	"I am from the generation raised in a culture of pornography, trying to respect women."	"From the photo albums in the living room under the coffee table, easily able to be grabbed and viewed holding all of our memories and good times in the center of the house."

Deep Reflection and Self Discovery	Empathy and Connection Through Shared Storytelling	Creative Expression as a Bridge to Belonging	Identity Work as a Foundation for Culturally Responsive Teaching	The Emotional Dimension of Artmaking and Storytelling
"Where I am from in New Jersey, makes me who I am in Philadelphia."	"From the one stoplight town to the Susquehanna River and frog hunts in the morning."	"I am from family gatherings, where stories weave through the room."	"From brotherly love and southern hospitality."	"Handmade quilts and books read out loud."

MaryJo's Reflection

When sharing the Where I am From project with students, I wondered if the single poem template unintentionally placed limits on student voice, identity, and emotional safety. While structured prompts can support learners, they may also reinforce assumptions about family, memory, belonging, and stability that may not reflect students' lived realities. I considered how I could present a more inclusive and trauma-informed approach in this project, and I shifted away from a single narrative structure and toward reflective, multimodal, and choice-based forms of storytelling, while maintaining structure.

Influenced by reflective writing practices and the work of Mary Pipher (2006), I became interested in the idea that writing is not only an act of communication but may also be an act of witnessing the self. Reflective writing, particularly when paired with artmaking and imagery, allows students to construct a new meaning from their experience rather than simply reproducing expected narratives. This approach recognizes identity as constructed and relational rather than fixed, shaped through memory, culture, relationships, environment, and lived experience (Pipher, 2006).

Drawing on the work of art educators Graeme Sullivan (2005) and Julia Marshal (Marshal & D'Adamo, 2011), the writing and video narrative project utilized artmaking as a form of inquiry. Marshal and D'Adamo (2011) position creative practice as a way of investigating ideas, experiences, and ways of knowing and describe artmaking as "a form of inquiry, a kind of open-ended, artist/researcher-driven learning process in which new knowledge is discovered or constructed" (p. 12). Within this framework, reflective practice becomes a form of self-authorship in which students actively shape and reinterpret their own narratives rather than conforming to institutional expectations of what identity-based work should look like.

The reframing of artistic process as inquiry reinforces the idea that the Where I am From project is not about producing a polished autobiographical statement, but rather a process that allows space for curiosity, agency, memory, and self-definition. In the project, students communicated through their choice of imagery, sound, poetry, collage, video, and fragmented text, demonstrating the expanded accessibility and inclusivity of multimodal storytelling by recognizing that individuals process, remember, and communicate experiences in multiple ways and shifts the emphasis from correctness and disclosure to reflection, connection, and personal meaning-making.

Simultaneously, the project highlights an ongoing tension between traditional educational structures which rely on standardized formats and assessments and places these structures in direct opposition with the reflective, ambiguous, and flexible creative processes, used to achieve meaning, a personal connection to learning, and the development of a learner's authentic voice. Adding to the value of arts-based inquiry, the arts-based activities like the Where I am From project encourage and foster personal creativity and curiosity, and as a result they build confidence and self-worth in academic environments (Rogers, n.d.). To this end, arts-based learning is not seen as *extra*, but rather, it is an essential practice to cultivate belonging, empathy, and self-understanding. The Where I am From project becomes more than a literacy or art activity; it creates the relational and reflective space where students can safely explore who they are, how they are connected to others, and how they wish to represent themselves within a learning community.

Implications for further research

Jane's future implications

As I continue to use this poem in my teacher education courses, I will continue to self-reflect through journaling after the in-person classes and reading the students' exit tickets. This reflection will be continuous, as I recognize the need to be aware of student feedback, implications of positive and negative impact from this assignment, shifts in the assignment that need to occur based on reflection, and listening to and being aware of student needs and concerns. Similarly, I plan to engage in research with my future students that seeks to explore how this project has influenced my students' current and/or future classrooms over an extended period.

MaryJo's future implications

Expanding the original Where I am From project, the next step will be to build this structure into other courses that I teach, across settings. The Where I am From poem format is easily adaptable and based on this research I have found that it presents the opportunity for participants to reveal multiple parts of their story. As an art educator, I am able to think about poem structure as material for creating and interpreting. Future research will include the continuation of the poem/writing structure as an arts-based methodology to interpret qualitative data. To do this, I intend to modify the poem format when necessary and allow students to develop their own structure, using the original research as a launch point for future inquiry.

Conclusion

The importance of cultivating belonging and fostering community in higher education classrooms continues to emerge as a crucial element in the success of educator and student relationships (Verbree et al., 2025). This research suggests that utilizing arts-based methodology and narrative-centered projects can contribute to cultivating and strengthening classroom communities while simultaneously helping students explore identity and become reflective creatives, scholars and practitioners (McAdams & McLean, 2013). Incorporating creativity and student autonomy into instruction can assist educators in their development of culturally inclusive and equitable assignments to foster a sense of belonging, such as the Where I am From poems, and projects for all learners across all levels of learning in higher education communities and classrooms.

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Appendix A
Original Where I am From poem template

Example of the original Where I am From poem template shared with students. This version was designed based on the work of George Ella Lyon (Lyon, n.d.)

Where I Am From - Poem Brainstorming List & Template
When thinking about the details that go in the poem, be sure to think about materials, objects, products, traditions, etc. particular to you. You may use a separate piece of paper for brainstorming before writing your poem, and keep it available when you start to build the poem.

There are no strict rules with this poem. Feel free to rearrange or write new items.

1. Ordinary item(s) (e.g., home remedies when you are sick, telenovelas, soap operas, etc.)
2. Product names (e.g., Adobo, Windex, brand name juices, etc..)
3. Home description (what was your home like, was it a religious/spiritual home [if so what religion], was it a quiet or busy home, etc.)
4. Adjectives and sensory details - these describe your home and go along with your home description
5. Plant/flower/ natural item (e.g., Ferns, Aloe Vera, cactus, etc.)
6. Description of plant/flower/natural item you chose in number 5
7. Family tradition (e.g., going to an event, cooking specific food for holidays, decorating for a specific holiday, etc.)
8. Family trait (tender-hearted, hard headed, etc.)
9. Name of two family members
10. Descriptions of family activities or routines (e.g., cleaning every weekend, baking once a week, etc.)
11. Sayings you were told as a child
12. Place of birth or where your family is from (e.g., area, hospital, or clinic name where you were born, where your parents or grandparents are from, where your family originated)
13. Food items that are important or commonly eaten in your family
14. Specific family story (usually stories that were told to you about how your grandparents migrated to where you and your family are now, or a funny story you were told about your mother, father, aunts, uncles, grandparents, etc. when they were children)
15. Location of family photo albums, memoirs, artifacts (e.g., cabinet, safe, basement)
16. Explanation of the importance of your family's items (e.g. "memories show us where we have been")

Where I Am From Poem Template

I am from _____ (specific ordinary item)

From _____ and _____
(product name) (product name)
I am from the _____(home description)

_____ , _____ , _____ .
(adjective) (adjective) (sensory detail)

I am from _____ _____
(plant, flower, natural item) (description of above item)

I am _____ and _____,
(family tradition) (family trait)
_____ and _____.
(name of family member) (another family name)

I'm from the _____ and _____,

(description of family tendency) (another one)
From _____ and _____.
(something you were told as a child) (another)
I am _____ , _____.
(representation of religion, spiritual practice, rituals, etc.) (further description)

I'm from _____,
(place of birth and family ancestry)

_____ , _____.
(a food item that represents your family) (another one)

and the _____.
(specific family story about a specific person and detail)

Where I am From Poem Examples

Where I am from
by J. Ammon

I am from untouchable antiques in the living room.
From Breyers mint chocolate chip ice cream and Twinkies.
I am from the colonial blue two-story cookie cutter house,
meticulously clean, nothing to be out of place, an illusion of perfect.
I am from the rock garden in the front yard, a magical place to pretend.
I am from “we trust no one” and board games on holidays.
From Marie and Tom.
I’m from we yell when we angry and forget I said that, later.
From you are hard to love and patience is a virtue.
I am from Catholic guilt, as nonpracticing ones.
I’m from Ireland, England, and Phalanx,
baked potatoes with mounds of butter and Entemann’s eclairs.
I am from the man everyone loved, who died too soon,
and left to grieve,
alone.

Where I am from
by MaryJo Rosania Harvie

I am from “The Price is Right” on sick days,
From Diet Coke and Brut cologne,
From the shared bedroom, unfinished renovations, chlorine in the pool, and barking dogs.
I am from birch trees too tall for the yard, and bees on the magnolia bush.
I am from chaos on Christmas morning and “we’ll talk about that later.”
From Franny and Alice, Anthony, and Michael,
from arcades in Seaside Heights, checking every parking meter for change, and the big “fancy” beach in Wildwood.
From “you’ll feel better when you get outside” and “don’t worry about it,”
and Newark, West Orange, Kearny, and Uncle Ralphie’s restaurant.
I am from meaty lasagna and chopped meat with noodles, from Grandma Alice on the beach and a station wagon covered in patio furniture, taking it all in one trip.
I am from dried out photo albums that fall apart when touched, and the glue that sticks memories back together.

Appendix B
The second "I Am From" Poem Template

The second "I Am From" poem template was adapted from Promising Practices (Hernandez Juarez, 2017) and developed after the first template was used.
"I Am From" by Mary Pipher is a written journey in search of past, present and future identity and individual culture.

Writing your own "I Am From" poem will help you remember past memories.
As you write your poem, start with I am from and then include references and descriptions about:

A specific or memorable place, details about that place.
Favorite weather
Your personality, describe how you are
Memories
a special birthday or occasion.
Special foods, meals, desserts, traditional foods, or candy.
Song lyrics, songs that family members sing.
Smells or tastes
Stories, poem verses, quotes.
Words, sayings, or phrases repeated often with your friends or family.
Household items or toys.
Something someone said to you that made you feel special.
Traditions and customs with family and friends.
Favorite color.
Favorite hobbies, sports, school subjects.
Dreams, feelings, values, experiences.
Hopes of who you want to be like in your future.
Pets.

"I Am From" sample questions:

I am from _____(nationality, country, city)
I am from _____(Describe home, a special place or room) I am from _____(Memory, special moment or occasion)
I am from _____(Describe personality)
I am from _____ (Holiday or tradition with family and friends)
I am from _____ and _____and _____ (Foods)
I am from _____ and _____ and _____ (Favorite toy or hobbies and color)
From _____(Things you enjoy doing)
From _____ (Favorite smell, flowers, plant, weather) I am from _____ and _____ (Family quotes or sayings)

I am from _____ (Experiences)
I am from _____and_____ and _____(Favorite sports, subjects, characters) From _____ (Something that makes you laugh)
I am from _____ (Lyrics to a song or inspirational quote)
From _____ (Feelings) and _____ (Something you are proud of)

I am from _____(Talent or something unique about yourself)
I am from _____ (pets) from _____ (Things you like)
I am from _____ (Story, books, quotes)
I am from _____(Something that someone said to you that made you feel special) From _____ ____ (A dream, something you want to accomplish) And _____ _____ (Hopes for the future, who you want to be when you become older)

Appendix C
Survey Questions asked of Student Participants

1. Did the experience of writing the "Where I am From" poem change the way you think about yourself and your identity and background?
2. You answered YES to Q1. In what ways did writing the "Where I am From" poem change the way you think about yourself and your identity? Provide at least one example. You may include as many as you wish.
3. You answered NO to Q1, why do you feel that writing the "Where I am From" poem did not change the way you think about yourself and your identity? Provide at least an example. You may include as many as you wish.
4. Did the experience of reading your classmate's "Where I am From" poem(s) change the way you think about others?
5. You answered YES to Q2. Please explain how the experience of reading your classmate's "Where I am From" poem(s) changed the way you think about others? Provide at least one example. You may include as many as you wish.
6. You answered NO to Q2. Please explain why the experience of reading your classmate's "Where I am From" poem(s) did not change the way you think about others? Provide at least one example. You may include as many as you wish.
7. According to Cornell University, Belonging can be defined as, "...the feeling of security and support when there is a sense of acceptance, inclusion, and identity for a member of a certain group." Do you feel the act of writing and sharing "Where I am From" Poems can contribute to a community's sense of belonging, as outlined in this definition?
8. You answered YES, that you feel the act of writing and sharing "Where I am From" Poems can contribute to a community's sense of belonging, as outlined in this definition provided. Please provide three to five words that describe your experience of belonging as defined by Cornell University, "...the feeling of security and support when there is a sense of acceptance, inclusion, and identity for a member of a certain group."
9. You answered NO, that you feel the act of writing and sharing "Where I am From" Poems cannot contribute to a community's sense of belonging, as outlined in the definition provided. Please provide three to five words that describe your experience of belonging as defined by Cornell University, "...the feeling of security and support when there is a sense of acceptance, inclusion, and identity for a member of a certain group."
10. You answered that you were NOT SURE if the act of writing and sharing "Where I am From" Poems can or cannot contribute to a community's sense of belonging, as outlined in the definition provided. Please provide three to five words that describe your experience of belonging as defined by Cornell University, "...the feeling of security and support when there is a sense of acceptance, inclusion, and identity for a member of a certain group."
11. Are you currently, or do you plan to major in education or seek education certification in the future?
12. As a future teacher, do you feel an exercise such as the "Where I am From" poem can help you to understand the multiplicity of your students' identities?
13. You answered YES, that as a future teacher, you feel an exercise such as the "Where I am From" poem can help you to understand the multiplicity of your students' identities? Please explain why you feel this way, and how this exercise can help you to understand the multiplicity of your students' identities?
14. You answered NO, that as a future teacher, you feel an exercise such as the "Where I am From" poem cannot help you to understand the multiplicity of your students' identities? Please explain why you feel that this exercise will not help you to understand the multiplicity of your students' identities?
15. As a future teacher, how can exploring your own identity enable you to better understand and relate to your students?
16. This is an optional bonus question: In what ways do you anticipate building a sense of belonging in your classroom?

Well teachers, well classrooms: Reframing teacher burnout through teacher noticing and self-awareness

Elizabeth Dlugolecki
Jennifer Butz

Abstract

Teacher burnout remains a persistent challenge in K–12 education, negatively affecting educator well-being, instructional quality, and student outcomes. Although burnout has been extensively examined, considerably less attention has been given to how teachers recognize and respond to early indicators of strain before burnout develops. This gap represents an important opportunity for teacher education and professional learning. This literature-informed conceptual article synthesizes research on teacher noticing, Attention Restoration Theory, self-regulation, and teacher well-being to position self-awareness as a foundational professional competency. We propose a conceptual framework that supports early recognition of burnout, intentional in-the-moment responses, and reflective practices that promote sustainable teaching. By reframing burnout prevention through the lens of teacher noticing and self-awareness, this article offers practical implications for teacher education, professional learning, and future research.

Keywords: teacher burnout, teacher noticing, self-awareness, attention restoration, teacher well-being

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Teacher burnout remains a persistent challenge in K–12 education, affecting educator well-being, instructional qualities, and student outcomes. Although burnout is commonly attributed to excessive workload, emotional labor, and systemic demands, these explanations focus primarily on external pressures while giving less attention to teachers' capacity to recognize and respond to early indicators of strain. Burnout is not only a problem of overload; it can also be a problem of unnoticed overload.

Building on Walker's (2019) discussion of distraction and digital overload, we use the term *unnoticed overload* to describe the gradual accumulation of cognitive, emotional, and instructional demands that teachers may experience before fully recognizing their effects. Throughout the school day, educators continuously shift attention among instruction, classroom management, assessment, communication, and decision-making, often with little opportunity for cognitive recovery. Over time, these sustained attentional demands may contribute to cognitive fatigue, reducing teachers' capacity for self-regulation and intentional decision-making (Kaplan, 1995; Maslach & Leiter, 2016).

Teacher burnout has been associated with emotional exhaustion, depersonalization, reduced personal accomplishment, diminished instructional quality, weakened teacher–student relationships, and increased attrition (Ingersoll, 2001; Maslach et al., 2001; Skaalvik & Skaalvik, 2017). National data further illustrates the scope of the problem. During the 2021–2022 school year, 8% of public-school teachers moved to another school and another 8% left the profession (National Center for Education Statistics, 2024). Additionally, 84% of public K–12 teachers reported insufficient time during the workday to complete responsibilities such as lesson planning, grading, paperwork, and communication with families (Doan et al., 2024).

While organizational factors remain major contributors to burnout, professional development has largely emphasized curriculum, pedagogy, and instructional practice rather than teachers' capacity to monitor and respond to their own cognitive and emotional experiences (Schussler et al., 2018). Strengthening self-awareness is not intended to replace organizational efforts to improve working conditions; rather, it represents one practical approach for helping teachers navigate the demands of teaching with greater intentionality.

Specifically, we propose a literature-informed conceptual framework that integrates teacher noticing, self-regulation, and Attention Restoration Theory to support early recognition of burnout, intentional in-the-moment responses, and restorative practices that promote sustainable teaching. We argue that teachers can strengthen professional sustainability by intentionally attending to, interpreting, and responding to their own cognitive, emotional, behavioral, and physical experiences before stress becomes chronic.

Burnout Through the Lens of Teacher Noticing

Teacher noticing refers to educators' ability to attend to, interpret, and respond to meaningful classroom events in ways that inform instructional decision-making (Sherin et al., 2011). Rather than simply observing what occurs in the classroom, teachers make professional judgments by selecting information they perceive as important and determining how to respond. This process is recognized as an important component of effective teaching because it shapes instructional decision-making in complex learning environments.

Although teacher noticing has primarily focused on students and instruction, the same cognitive processes can be applied inward. Throughout the school day, teachers experience cognitive, emotional, behavioral, and physical cues that provide information about their own professional functioning. Viewing these experiences through the lens of teacher noticing positions self-awareness as an active professional competency that supports intentional decision-making rather than as a personal wellness strategy.

This perspective aligns with self-regulation theory, which describes how individuals monitor their thoughts, emotions, and behaviors, evaluate their effectiveness, and adjust responses to achieve desired outcomes (Zimmerman, 2000). Self-awareness represents the first step in this process because teachers cannot regulate experiences they do not recognize. As educators become more aware of emerging patterns of fatigue, frustration, or cognitive overload, they create opportunities to respond before stress becomes chronic.

Attention Restoration Theory (Kaplan, 1995) further explains how sustained attentional demands gradually reduce the cognitive resources required for reflection, decision-making, and self-regulation. As attentional fatigue accumulates, teachers may become less likely to recognize early indicators of strain and more likely to rely on automatic responses. Viewing burnout through the combined lenses of teacher noticing, self-regulation, and Attention Restoration Theory reframes prevention as an ongoing professional practice focused on recognizing and responding to stress before burnout develops.

Recognizing and Responding to Early Indicators of Burnout

If burnout develops gradually, then recognizing early indicators becomes essential for prevention. Before emotional exhaustion or disengagement becomes evident, teachers often experience subtle cognitive, emotional, behavioral, and physical changes that signal increasing occupational strain. Developing the capacity to notice these indicators allows educators to respond intentionally before stress becomes chronic.

Early indicators commonly emerge as difficulty concentrating, mental fatigue, increased irritability, reduced instructional flexibility, withdrawal from colleagues, or persistent physical fatigue (Jennings & Greenberg, 2009; Kaplan, 1995; Maslach et al., 2001). Although these experiences are common during demanding periods of teaching, recurring patterns across multiple domains may indicate that cognitive and emotional resources are becoming depleted. Recognizing these patterns represents the first step toward intentional self-regulation rather than reactive coping.

Table 1 organizes these common indicators into four domains—cognitive, emotional, behavioral, and physical—to support professional reflection. Rather than serving as a diagnostic tool, the table is intended to help teachers identify emerging patterns of strain and consider whether intentional adjustments or restorative practices may be warranted.

Responding Through Self-Regulation

Recognizing early indicators is valuable only when followed by intentional action. Self-regulation involves

Table 1

Early Indicators of Teacher Burnout Across Four Domains

Cognitive	Emotional	Behavioral	Physical
Difficulty concentrating	Irritability	Withdrawing from colleagues	Persistent fatigue
Mental fatigue	Frustration	Avoiding collaboration	Headaches
Forgetfulness	Anxiety	Rushing instruction	Muscle tension
Indecisiveness	Feeling emotionally drained	Reduced instructional flexibility	Disrupted sleep
Increased distractibility	Reduced enthusiasm	Postponing responsibilities	Difficulty recovering after the workday
Difficulty adapting instruction	Diminished patience	Relying on habitual routines	Other stress-related symptoms

Note: Table 1 was developed by the authors as a literature-informed conceptual resource synthesizing common cognitive, emotional, behavioral, and physical indicators associated with teacher burnout. The table is intended to support professional reflection and self-awareness and should not be interpreted as a diagnostic or validated assessment instrument.

monitoring one's thoughts, emotions, and behaviors, evaluating whether they support professional goals, and making adjustments when necessary (Zimmerman, 2000). During the school day, these adjustments are often brief and occur within routine instructional activities rather than through formal wellness interventions.

Attention Restoration Theory suggests that short opportunities to redirect attention may help replenish the cognitive resources needed for effective decision-making (Kaplan, 1995). Consequently, brief intentional actions throughout the school day may help teachers interrupt escalating stress and maintain instructional effectiveness. Examples of these responses are presented in Table 2.

Operationalizing Self-Awareness in Professional Practice

Recognizing and responding to early indicators of strain represents only the beginning in developing self-awareness. Like other professional competencies, self-awareness is strengthened through repeated practice, intentional reflection, and the application of knowledge within authentic teaching contexts. Over time, these repeated experiences help teachers develop habits that support more intentional instructional decision-making and professional sustainability.

Figure 1 presents a conceptual framework for operationalizing self-awareness through five interconnected professional practices: noticing, interpreting, responding, reflecting, and restoring. Building on teacher noticing, self-regulation, and Attention Restoration Theory, these practices are presented as a continuous cycle that helps educators recognize emerging indicators of strain, make intentional adjustments, and restore cognitive and emotional resources before stress becomes chronic. Rather than occurring in isolation, each practice informs the next, supporting continuous professional growth.

The framework is designed to be integrated into everyday teaching rather than implemented as a separate

Table 2

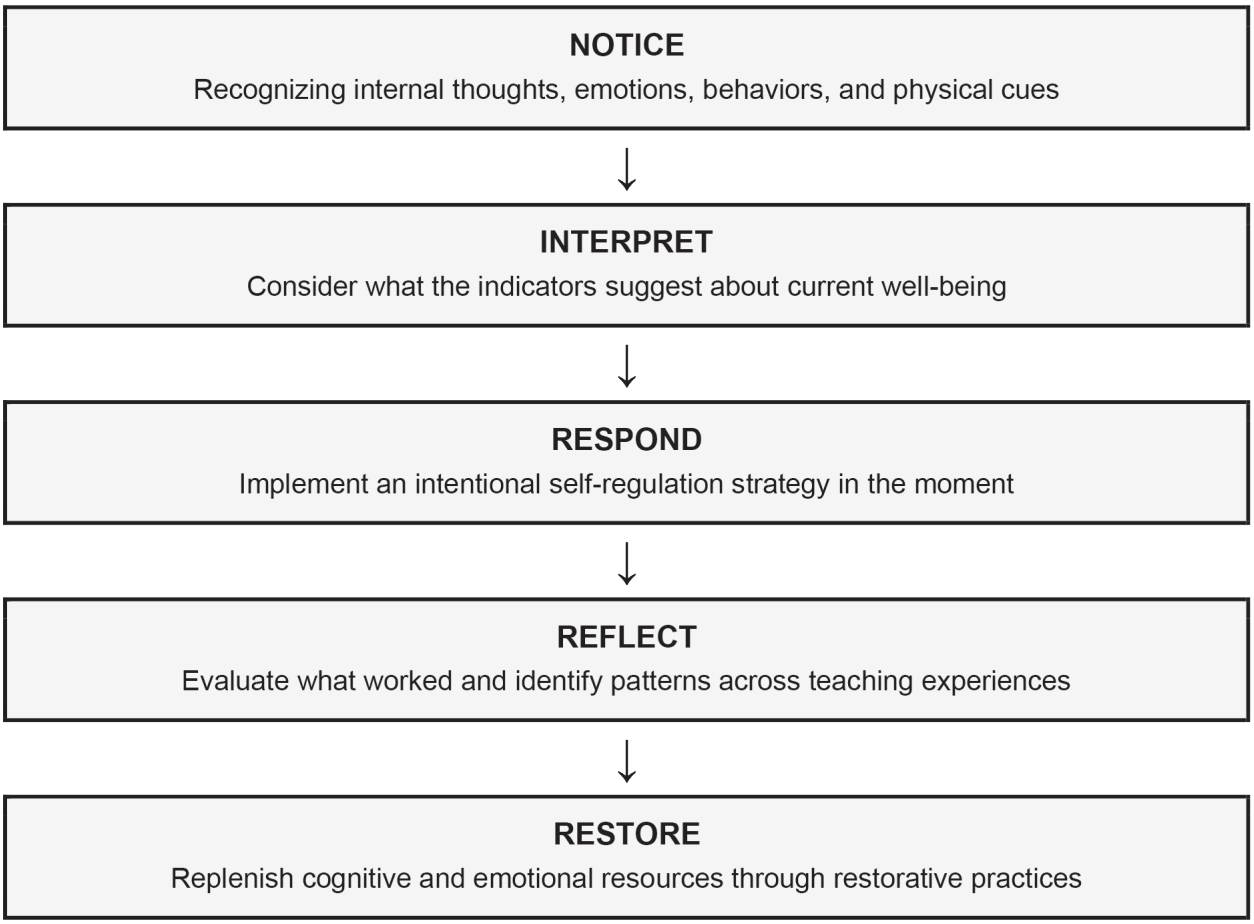
Examples of In-the-Moment Self-Regulation Strategies

Early Indicator	Possible Self-Regulation Strategy
Feeling mentally overwhelmed	Pause for one minute before transitioning to the next activity.
Difficulty concentrating	Review one instructional priority rather than multitasking.
Increased frustration	Use intentional breathing before responding to students.
Decision fatigue	Simplify choices and rely on established classroom routines.
Emotional exhaustion	Briefly step away during a planning period or transition when appropriate.
Feeling disconnected	Connect briefly with a trusted colleague.
Physical tension	Stretch, change posture, or take a short walk when possible.
Persistent stress	Schedule time for reflection and identify one manageable adjustment.

Note. Examples were developed by the authors through the synthesis of teacher noticing, self-regulation, Attention Restoration Theory, and teacher well-being literature. They are intended to illustrate practical applications of the proposed conceptual framework rather than prescribe a validated intervention

Figure 1

Conceptual Framework for Developing Teacher Self-Awareness Through Professional Practice



Note. Figure 1 presents a literature-informed conceptual framework developed by the authors to illustrate how teacher noticing, self-regulation, and Attention Restoration Theory can be operationalized through five interconnected professional practices and ten illustrative daily habits. The framework is intended to support professional learning and reflection and has not been empirically validated.

wellness initiative. To illustrate this process, Figure 1 includes ten daily habits that translate the five practices into practical actions that teachers can incorporate within existing instructional routines. These habits are intended to serve as flexible examples that educators may adapt to their individual teaching contexts rather than as prescribed intervention strategies.

The proposed framework positions self-awareness as a professional competency that develops through ongoing cycles of noticing, interpreting, responding, reflecting, and restoring. Similar to instructional planning, assessment, and classroom management, self-awareness can be intentionally strengthened through continued practice and reflection. Embedding these habits within everyday teaching may help educators support both instructional effectiveness and long-term professional well-being.

Implications for Teacher Education and Professional Learning

The framework presented in this article has implications for teacher preparation, professional learning, and future research. Although teacher education

programs have traditionally emphasized instructional planning, classroom management, assessment, and content knowledge, less attention has been given to developing self-awareness as a professional competency. Embedding opportunities for noticing, reflection, and self-regulation within teacher preparation may help future educators develop habits that support instructional effectiveness and long-term professional well-being.

Professional learning may similarly benefit from integrating self-awareness into existing instructional and leadership initiatives rather than treating well-being as a separate topic. Recognizing early indicators of strain, using brief self-regulation strategies, and reflecting on professional experiences may strengthen decision-making and support sustainable teaching. Although organizational changes remain essential for addressing burnout, self-awareness practices provide a complementary strategy educators can incorporate into their daily work.

As a literature-informed conceptual article, this framework is intended to generate discussion and guide future inquiry rather than establish effectiveness. Future research should examine its influence on teacher well-being, instructional decision-making, and professional sustainability across diverse educational settings, including teacher preparation and professional learning.

Conclusion

Teacher burnout continues to present significant challenges for educators, schools, and teacher preparation programs. While organizational conditions remain important contributors to teacher well-being, strengthening educators' capacity to recognize and respond to early indicators of strain represents one complementary approach to supporting professional sustainability. Viewing burnout through the lens of teacher noticing reframes self-awareness as an active professional competency that can be intentionally developed through everyday teaching practice. The framework's central contribution is the extension of teacher noticing from attention to students and instruction to intentional awareness of teachers' own professional functioning.

This literature-informed conceptual article integrates teacher noticing, self-regulation, and Attention Restoration Theory to propose a practical framework for recognizing, responding to, and reflecting on occupational strain before burnout becomes chronic. By operationalizing self-awareness through intentional professional practices, the framework moves beyond describing the causes of burnout to offering practical strategies that educators may adapt within their own teaching contexts. Future empirical research is needed to examine, refine, and validate the proposed framework across diverse educational settings. Until then, the framework offers teacher educators and school leaders a practical starting point for embedding self-awareness within professional learning aimed at sustaining educator well-being.

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Becoming a professor: Supporting K-12 educators' transition to higher education

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Tina Keller
Jeanette Monteith
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Abstract
This reflective autoethnographic case study examines four former K–12 educators' transition into full-time faculty roles at a Christian university. Using participant narratives, it explores shifts in professional identity, growth, and responsibilities. Participants reported feelings of isolation, impostor syndrome, and uncertainty, while mentoring and modeling supported their transition.

About the Authors

Dr. Sarah Fischer was a public-school elementary teacher before teaching literacy methods in higher education. Her research interests include place-based education, early childhood literacy, and reader identity.

Dr. Bonnie Jenkins is a second-year Assistant Professor of Education at Messiah University with 26 years of experience teaching kindergarten, first, and second grades. Her current work focuses on preparing preservice teachers with expertise in educational psychology, early mathematics instruction, and evidence-based practices in early childhood.

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Transitioning from K–12 teaching to higher education involves a substantial shift in roles, expectations, and professional identity. Despite strong pedagogical expertise, former K–12 teachers often face unfamiliar scholarly and institutional demands, particularly within education departments where they must adapt to academic culture while modeling practice for preservice teachers. This reflective autoethnographic case study examines four early-career faculty at a Christian university, highlighting the critical role of department-level mentoring, modeling, and transparent communication in supporting successful transitions.

Literature Review

Nature of Work

Although the work of K–12 teachers and professors of education may appear aligned, they involve distinct roles and expectations. The transition to higher education is often both exciting and stressful, as new faculty navigate competing demands such as course design, managing college students, understanding institutional norms, and initiating a research agenda (Fitzgerald et al., 2025; Page & Jenks, 2012). While former K–12 teachers bring strengths in instruction, assessment, and relationship building, aspects of academic life—particularly research expectations and institutional structures—may be less familiar (Fischweicher et al., 2015; Wilson-Hill & Ruffin, 2025). This transition requires navigating interpersonal, intrapersonal, and institutional challenges that differ from school settings (Eryılmaz & Dikilitaş, 2023), and is intensified in teacher education programs where faculty are expected to model exemplary teaching (Liang et al., 2024).

Many new faculty enter without prior socialization to core academic responsibilities such as research, service, and governance (Jimenez-Silva et al., 2019). Additionally, doctoral programs designed for working professionals often provide inconsistent preparation and mentorship, resulting in varied readiness for faculty roles (Alkathiri & Olson, 2019; Kumar, 2014). Together, these factors contribute to the complexity of understanding and adapting to the nature of work in higher education.

Identity

As new faculty transition into academia, they experience ongoing growth, tension, and uncertainty in developing their professional identities. Liang et al. (2024) identified four dimensions of teacher educator identity: research-oriented, teacher-oriented, expert-oriented, and learner-oriented, among which faculty often navigate with varying levels of confidence and tension. Those with K–12 backgrounds may feel as though they are starting over in the college classroom (Wood Varner, 2020), sometimes experiencing feelings of incompetence or impostor syndrome (Eryılmaz & Dikilitaş, 2023; Parkman, 2016; Yang et al., 2024).

A key tension lies in balancing a K–12 teaching identity, which supports credibility with preservice teachers, with a professorial identity valued in academia (Eryılmaz & Dikilitaş, 2023). Research-oriented identity is frequently identified as an area of challenge and development (Liang et al., 2024). To manage these competing expectations, some faculty develop "parallel identities" (Niklasson, 2019). Overall, identity development is multifaceted and marked by both struggle and fulfillment.

Departmental Support for New Faculty

Despite growing research on faculty transition, gaps remain in understanding departmental-level supports for former K–12 educators entering higher education. Existing literature largely focuses on institutional supports such as induction programs (Fitzgerald et al., 2025), faculty development workshops (Niklasson, 2019), and peer mentorship (Wilson-Hill & Ruffin, 2025).

Studies that address departmental practices emphasize the importance of clearly communicating expectations—from job postings through induction—and providing ongoing support such as faculty shadowing (Niklasson, 2019). Additionally, leadership from department chairs and opportunities for professional socialization have been shown to support identity development (Farwa et al., 2025). However, research remains limited in examining how departments can systematically scaffold the transition of K–12 educators into the professorial role.

Method

This study was designed as a qualitative autoethnographic case study. Arguing that the term case study

can be used to describe both the object of a study and the methodological approach, Creswell and Poth (2025) describe the qualitative methodology as the study of a phenomenon explored through one or more cases within a bounded system. The phenomenon explored in this inquiry—K-12 educators' transition to higher education—is specifically contextualized within the undergraduate Education Department at Messiah University in which four of the seven full-time faculty, all former K-12 teachers, are within their first four years of teaching in higher education. Since our interest primarily lies in the role of an education department's support of new teaching faculty as they transition from K-12 teaching to instructing pre-service teachers, we examined our department as one case, rather than studying each new faculty member in isolation of one another. This gave us the advantage of looking for themes and nuances across the data collected from all four participants.

Data Collection

The main data sources for this case study were autoethnographic narratives written by each of the four participants. Prior to generating their narratives, the researchers met to establish the study's research questions and determine the parameters for participants' reflections. The two main research questions guiding this study were: (a) *What are the initial expectations and concerns of educators coming from the K-12 world into higher education?* and (b) *What supports aid in the transition into higher education?* Participants then used these questions as the framework through which they reflected on their own experiences. While the resulting narratives made up the data to be coded, other secondary data sources were revisited, reflected upon, and referenced through participants' reflective process including institutional documents and protocols, departmental policies and protocols, course management systems, syllabi, and student course evaluations.

Researcher-Participant Profiles

As an autoethnographic case study in which the participants are also researchers/authors, critical reflexivity was a central component of both data collection and analysis (Preissle & deMarrais, 2015). Throughout the phases of the study, participants were encouraged to write not only about their objective experiences but also about the ways their biases, professional experiences, and positionality may have contributed to their experience of the phenomenon. Here, we provide a brief synopsis of some of the realities of positionality that arose through each participant's reflection process.

Bonnie taught for 26 years as a primary grade educator, with experience in kindergarten, first, and second grades. She had no prior teaching experience in higher education.

Christina taught for 15 years as an English Language Development teacher which included three years at the elementary level and 12 years in middle and high school. Prior to entering higher education full time, she taught as an adjunct at both the undergraduate and graduate levels for 7 years.

Jeanette taught for 22 years as an early childhood educator, 15 of which were dedicated to early childhood special education. She had no prior teaching experience in higher education.

Laurie was a middle and high school math teacher for 23 years. She had no prior teaching experience in higher education.

Qualitative Content Analysis

Our approach to coding and analyzing participants' autoethnographic narratives was based on Schreier's (2012) methods for Qualitative Content Analysis and was made up of four phases. The first phase of data analysis began by establishing a coding frame from our research questions. The resulting coding frame was made up of four dimensions: (1) Supports that Positively Aided the Transition, (2) Barriers that Inhibited the Transition, (3) Initial Expectations and Misconceptions, and (4) Initial Concerns. During the second phase, each researcher independently coded all four narratives using the established coding framework over a two-month period. During two calibration meetings, researchers reviewed areas of disagreement, discussed their interpretations of the coding categories, and refined their shared understanding of category definitions. Once independent coding was completed, the research team met to compare coding decisions and discuss areas of agreement and disagreement. Through structured discussions aimed at

establishing coding consistency, researchers examined representative excerpts, clarified their interpretations of category definitions, and worked toward a shared understanding of the coding framework. Agreement among coders was established through consensus, with discrepancies resolved through discussion until all researchers concurred on the most appropriate application of the codes. While there was initially some discrepancy among raters regarding the nuances differentiating barriers that inhibited the transition and initial concerns, this was resolved with the decision to code the data under both dimensions of the framework since some experiences may speak to both. This consensus-building process helped ensure consistent application of the coding framework across all narratives. In the final phase of data analysis, the research team met with the coded data to determine themes that emerged across the dimensions of our coding frame (Saldaña, 2013). These themes—Professional Identity, Professional Responsibilities, and Professional Growth—are presented in the Findings section below.

Findings

Professional Identity

Each contributor arrived at higher education with a well-developed pedagogical identity built over decades of K-12 practice. For Bonnie, pedagogical concerns emerged early as she worried that her instructional methodologies would be perceived as too "primary" for college students. Jeanette faced a more fundamental reorientation, moving from a context where individualization and differentiation were expected to a context where consistent standards for all students were expected. Christina dealt with shifts in accountability for professional expectations yet found that her work with high school students prepared her to engage preservice teachers. Laurie's experience offered a counterpoint as she found that skills in engaging students, providing clear instructions, and building relationships transferred readily from her middle school classroom to the university setting.

Contributors also navigated significant shifts in relational identities. The loss of an immediate, relational professional community was felt across multiple narratives. Jeanette described her former role in K-12 in terms of *in loco parentis* responsibility – she was not solely her students' teacher but was also a primary source of emotional security. In higher education, that dynamic shifted dramatically to more defined, adult-centered relationships that required Jeanette to intentionally reconstruct her relational identity. Bonnie described uncertainty about what collegial relationships would look like at the university level, having been accustomed to the closeness of elementary grade-level teams who interact daily, often eating lunch, supervising students, and planning together.

Another shift that participants described involved their vocational identity. Contributors viewed vocational identity as the 'why' behind what they did as teachers. All four moved from a commitment to teaching children and adolescents to a commitment to training the next generation of teachers. Jeanette noted that moving to a Christian university added another dimension, explicitly integrating faith in her teaching, something her public school context never permitted. This was viewed as an expansion of her professional identity.

Professional Growth

For individuals making a transition from K-12 education environments to higher education, the approach and expectation for professional growth differ. The goal for continuing one's education at the K-12 level is multifaceted, including maintaining one's professional certification, progressing through the pay scale, and remaining up to date in educational trends and practices. Through the participants' narratives, there is evidence that their experiences with district-led professional development provided guardrails and direction for how they experienced a collective approach to professional growth. Bonnie described the K-12 teacher professional focus as prioritizing the district and community alone, indicating that "teachers' involvement with educational research or educational trends is limited to what their district may provide during professional development." A district's uniform approach to professional development is further emphasized through the experience of the participants when in pursuit of their terminal degrees. While continuing education is required in the profession, the participants, who all pursued terminal degrees during their tenure as K-12 educators, indicated that the doctoral pathway set them apart from colleagues in a way that was not always positive. In Christina's example, she noted the

struggle to get permission to present her dissertation research at an internationally recognized educational conference, thus feeling like her individual growth was not "appreciated, celebrated, or emphasized by the district."

Across all four narratives, participants expressed a professional development disconnect between the two educational environments with a consistent focus on how scholarship in higher education, as a demonstration of one's professional growth, felt intimidating and drew out feelings of imposter syndrome. Three participants—Bonnie, Christina, and Jeanette—described feelings of isolation, which aligned with several comments expressing hesitation about the adequacy of university-level preparation for the transition into their professional roles. At the K-12 level, further education feels like growth for the collective; at the higher education level, scholarship feels like prestige for the individual. All participants described a shift from collective to individual responsibility for professional growth. In particular, the increased expectations for independently pursuing scholarship and disseminating research to broader audiences contributed to feelings of underpreparedness and professional inadequacy. Christina shared, "I did not feel equipped to put focus and emphasis on my own scholarship when I made the transition" and in a similar sentiment, Bonnie noted that she had a "limited understanding of [...] scholarship expectations" when starting her role in higher education.

Given that individual scholarship for the purpose of professional advancement felt pronounced for the participants in their transition to higher education, feelings, expectations, and perceptions of scholarship were significant topics within the participants' reflective narratives about the job transition. Participants agreed that university and seasoned faculty support around research and scholarship can potentially lessen one of the anxieties held in the transitions into higher education. New faculty could benefit from the modeling of scholarship structure and practice by seasoned faculty, as well as opportunities to partner in collaborative projects to learn alongside a mentor.

Professional Responsibilities

All four participants noted age differences in their vignettes. Laurie initially worried about teaching students up to 10 years older than she was used to but ultimately found it manageable. Christina felt that her experience teaching high school students prepared her for working with undergraduates. In contrast, Jeanette, with an early childhood background, did not anticipate how intimidating teaching adults would feel, and she experienced criticism early in the semester, which triggered self-doubt. Similarly, Bonnie, who had taught K-2, was concerned about her lack of experience with young adults and whether her planning and instructional methods would suit college students.

Christina described challenges adjusting to a new workflow as she transitioned from K-12 to a college schedule. Moving from a rigid contracted hourly day to one that afforded flexibility and autonomy was initially difficult. During her first semester, autonomy was both beneficial and challenging as she felt that she needed to prove her productivity. Likewise, Jeanette, who previously taught six hours of instruction daily using IEP data, had to adjust to planning without IEPs to guide her.

Two participants indicated that course resources were key supports during their transition. Laurie found access to a previous Canvas course invaluable. While she had experience grading objective assessments, she now needed to evaluate more subjective work, such as essays and presentations. Having course textbooks in advance was also helpful. Bonnie appreciated receiving syllabi and materials from the previous professor as she was accustomed to working with a set district curriculum.

All participants emphasized the importance of guidance and modeling from established faculty. Christina highlighted how faculty mentors supported her with time management, structuring workdays, planning for scholarship, and navigating annual reviews. Laurie noted the strong professional support and encouragement within the department. Jeanette emphasized the value of practical onboarding and mentoring and was grateful to begin alongside a colleague who had also transitioned from K-12. She noted that colleagues, faculty development staff, and students collectively impacted her experience. Bonnie was initially unsure about collegial relationships at the university level because she was familiar with the closeness of elementa-

ry grade-level teams who worked together on planning and sharing ideas.

Discussion

The process of recruiting, hiring, and retaining highly qualified teacher educators is a vital task for departments of education. This desire to support new faculty is often evident, yet can be negatively influenced by time restraints, resources, and a lack of awareness of what new faculty members need. Incoming faculty members may be reluctant to share their concerns as they desire to manage the appearance of a competent professor. Unspoken norms and expectations in higher education that are unfamiliar to educators coming from K-12 can undermine their sense of belonging. Tenured faculty may have forgotten their own transition to higher education and may not intuitively know how best to support their colleagues. These factors can contribute to further isolation and feelings of imposter syndrome. Departments can move past these misconceptions through a combination of proactively anticipating new faculty members' needs and tenured faculty members modeling vulnerability in how they transitioned into higher education to provide an environment where new faculty members can openly share their concerns.

While participants often described their experiences in personal terms, the findings suggest that many transition challenges were rooted in broader institutional structures rather than individual inadequacies. Participants moved from K-12 systems characterized by clearly defined schedules, prescribed curricula, and collective professional development into academic environments where expectations for scholarship, service, and faculty productivity were often less explicit. The uncertainty and self-doubt described by participants frequently reflected the need to navigate these institutional norms while simultaneously establishing themselves as teacher educators.

University leaders, starting with department chairs and including leaders across campus, are vital to the success of new faculty. Their acknowledgement of the difficulties and joys in the transition from K-12 to higher education sets the tone for the rest of the department. The four participants in this study, while having diverse backgrounds, shared common themes. Providing a department-specific orientation that addresses these challenges may prove especially beneficial. This orientation may include informal times when tenured faculty members share their own transition to higher education stories. This has a double benefit of reminding tenured faculty of their own past transition tensions while helping incoming faculty members feel more comfortable expressing vulnerability with their own experiences. Additionally, asking tenured faculty to share their own scholarship journeys and how they now conceptualize research may prove helpful. Inviting new faculty members to co-present or co-author upcoming articles can strengthen the ties across the department.

The findings further suggest that successful transition is influenced not only by individual effort but also by departmental structures and institutional supports. Access to mentoring, onboarding practices, shared course resources, collaborative scholarship opportunities, and transparent communication of expectations helped participants navigate unfamiliar aspects of academic life. These supports made implicit expectations more visible and provided practical pathways into the faculty role.

Our department's collaborative effort for this article provided our newer faculty with intentional, guided practice alongside seasoned faculty. With the regular check-ins for the collective task, we provided support and connection for scholarship and collegial relationships, positively contributing to the health and success of our department. Taken together, these findings suggest that institutions can reduce feelings of isolation and uncertainty by developing structures that intentionally support faculty socialization, mentorship, and professional learning during the transition from K-12 education to higher education.

Limitations

This study is limited by its context and design. Drawing on autoethnographic reflections from four faculty members within a single Education Department at one Christian university, the findings are not generalizable beyond this setting. The narratives reflect participants' subjective experiences, and although reflexivity was used to mitigate bias, self-report necessarily involves selective recall. Participants represented dif-

ferent stages of transition, ranging from one semester to three years. As a result, those further removed from their initial transition may have reconstructed or omitted details of earlier experiences, while those more recently transitioned may have recalled events with greater immediacy. Although these differences enriched the analysis by providing perspectives across stages of adjustment, they may also have influenced the consistency and depth of participants' recollections. Additionally, the study includes only faculty perspectives and excludes insights from administrators, mentors, or students.

Finally, the faith-based institutional context may have shaped both perceived challenges and supports therefore requiring particular consideration when interpreting the findings. Participants were situated within a small undergraduate Education Department at a private Christian university characterized by close collegial relationships, shared disciplinary backgrounds, and a mission-driven culture. These features may have influenced both the challenges participants encountered and the supports they perceived as valuable. For example, the department's collaborative culture, accessibility of senior faculty, and opportunities for informal mentoring may not be present in larger universities, research-intensive institutions, community colleges, or departments with different organizational structures. Likewise, the integration of faith and vocation described by some participants may not be relevant to faculty transitions in secular settings. As a result, the findings should be understood as contextually situated rather than broadly representative of all K-12 educators transitioning into higher education.

Future Considerations

Future research across diverse institutional types and using multiple data sources would help determine which transition experiences and support structures are transferable across contexts, and which are unique to particular settings. Such research would deepen understanding of the K–12 to higher education transition. In small departments, professors might be the only faculty member in a particular field. Assisting new faculty members to find discipline-specific networks might also prove useful. Organizations such as the American Educational Research Association, Association of Teacher Educators, Pennsylvania Association of Colleges and Teacher Educators, Higher Education Consortium for Special Education, and The Association of Mathematics Teacher Educators provide avenues for mentorship that are discipline-specific and can allow for advice and mentorship outside the department. While supports for new faculty may vary according to the department's specifics, the universal intent should focus on assisting the transition and investing in the individual.

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Quiet Excellence: Deconstructing the Extravert Ideal and Leveraging Introverted Strengths in Pedagogy and Educational Leadership

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Abstract
This position paper challenges the extravert ideal in teacher preparation, urging teacher educators to reframe introversion as a pedagogical asset rather than a professional deficit. By examining current evaluation tools, the authors provide a framework for quiet excellence—leveraging deep reflection, intentional planning, and a calm, steady presence. This paper offers actionable strategies for clinical supervisors to move beyond performance-based rubrics toward asset-based feedback, ensuring that introverted educators, and students who share their reflective nature, thrive through depth, stability, and authentic classroom connection.

Keywords: Introversion, Educational Leadership, Pedagogy, Professional Development, Extravert Ideal, Classroom Management.

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In this position paper, we advocate for stronger support of introverted teachers and suggest ways in which introversion is an asset to students in the classroom. Building on Chuhran's (2020) analysis of introverted teachers' lived experiences, we examine how the extravert ideal may shape teacher evaluation and suggest ways teacher preparation programs can foster more inclusive and strengths-based approaches to assessment. We share insights from our own firsthand perspectives as introverted educators who have spent decades balancing our temperament with a profession whose heavy demands for constant communication and social adeptness seem incompatible with our introverted nature. We suggest strategies for field observers to leverage the built-in dialogue protocols of a state-mandated assessment to evaluate and celebrate quiet excellence. Drawing on teachers' lived experiences, we examine how the extravert ideal may shape teacher evaluation and suggest ways teacher preparation programs can foster more inclusive, strength-based approaches to assessment.

While modern organizational leadership research increasingly affirms introverted temperaments as strategic assets, teacher preparation programs have largely taken little notice of the potential pedagogical value of these strengths, which is similar to the general public sentiment. According to Lawn et al. (2019), approximately 96% of individuals believe that extraverted characteristics are more highly valued in society than introverted ones. This cultural bias is so pervasive that 53.6% of participants expressed a desire to embody more extraverted characteristics, and 82.2% believed it was necessary to display extraverted behaviors in their daily lives. Furthermore, while 52% of Americans believe that extraverts make better leaders (Ballard, 2023), contemporary management models have actively debunked this notion. The preference for extraverted teachers may be particularly evident in teacher preparation programs. This may be problematic for highly visible tasks like public speaking, modeling activities, and managing transitions that are frequently evaluated through a performative lens that may sometimes conflate an energetic personality style with overall instructional competence. However, the critical offstage responsibilities of the profession—such as instructional design, lesson differentiation, data analysis, and one-on-one mentoring with students—depend on reflective and analytical strengths that characterize the introverted side of the personality continuum.

In the following section, we explore how mainstream cultural preferences for extraverted behaviors may affect beginning educators and how these preferences can overshadow the reflective and analytical strengths associated with the introverted side of the personality continuum.

Effects of the Extravert Ideal

Cain (2012a; 2012b) asserts that societal norms value extraverted characteristics as markers of success, a belief she describes as the *extravert ideal*. In schools, this belief may manifest as an intense pressure for educators to operate as highly energetic individuals who enliven classrooms through volume and quick interactions. Consequently, introverts—who comprise roughly half of the population—must constantly navigate a system that treats their natural temperament as a deficit (Myers et al., 2018). They are frequently told they are too quiet, need to be more outgoing, or lack an authoritative presence (Cain, 2012b). This bias is empirically supported by qualitative research, which found that introverted educators are often criticized for lacking classroom command simply due to their deliberate use of wait-time, processing space, and active listening (Chuhran, 2020). However, we assert that a balanced educational ecosystem does not merely need extraverted teachers; it also needs teachers who can design intricate lessons, allow time for processing, and create room on the stage for the rest of the classroom community. By recognizing and affirming the unique strengths of the introverted mind, teacher preparation programs can shift teacher candidates from a mindset of merely surviving the classroom to genuinely thriving within it. Failing to support these educators risks driving a segment of talented, reflective individuals out of an already depleted workforce (Fuller, 2022). Furthermore, it may deprive our students of the very teachers they need most. When introverted educators engage students with quiet confidence, they provide a powerful model for the roughly half of our students who are similarly negotiating an extravert-dominated world. As we identify the strengths of introverted teachers, we will also define introversion from a psychological, physiological, and historical viewpoint.

What is Introversion?

While Jung (1923) is widely credited with coining the terms, *extraversion* and *introversion*, the concept's early framing was heavily influenced by Sigmund Freud. According to Laney (2002), Freud's initial research often characterized introversion as a psychological deficit or disorder, a negative lens that established a long-standing stigma. Despite a century of personality research, introversion continues to be misunderstood as shyness or poor social skills (Cain, 2012b). Rather than being recognized as a distinct personality with its own strengths, introversion is too often viewed simply as the absence of extraverted characteristics. Moreover, management research asserts extravert traits like assertiveness, sociability, charisma, action, and quick thinking as evidence of leadership success (Judge et al., 2002). However, recent scholarship is shifting this narrative. Blevins et al. (2022) defined introversion by what it is instead of what it is not. This strength-based understanding of introversion focused on the benefits of this temperament, especially in professional roles such as teaching. They group these strengths into three distinct domains–*autonomous*, *analytical*, and *internally driven*. (Blevins et al., 2022).

Importantly, because an individual's position on the introversion-extraversion continuum is often context-dependent, the inclusion of these positive descriptors is not intended to rigidly categorize candidates; rather, it serves as a framework for understanding how to support introverted educators. When evaluators rely primarily on traditional observation metrics that emphasize visible classroom performance, they may be overlooking indicators of instructional competence that manifest in reflective practice, intentional instructional design, and thoughtful student engagement. By articulating these explicit adjectives, we aim to help evaluators identify and name the pedagogical assets—such as deliberate reflection, deep context-building, and purposeful one-on-one connections—that may be obscured by an extraverted observer bias (see Table 1).

Currently, the American Psychological Association (n.d.) defines introversion as an "orientation toward the internal private world of one's self and one's inner thoughts and feelings, rather than toward the outer world of people and things" (para. 1). The extravert thrives when engaged in social environments, whereas the introvert finds strength in solitude and quiet reflection. This preference for low-stimulation settings allows introverts to excel in tasks requiring autonomy, analytical thinking, and long-term meticulous planning, and these strengths are what we believe define introverted teachers.

The Physiology of Temperament: Neurobiology and the Quiet Mind

Now that we have defined the introverted teacher, it is important to understand the physiological differences that may manifest as specific classroom behaviors. To better understand introverted educators, teacher preparation programs would benefit from looking beyond surface-level classroom behaviors and examining the neurobiological foundation of temperament that impacts perceptions of teacher effectiveness. For many introverts, a lifetime of navigating a world that emphasizes the extravert ideal may contribute to a persistent, internalized anxiety that something is fundamentally flawed in the way they process and engage with the world. Within educational preparation programs, this systemic pressure frequently manifests as a misconception that introversion reflects a lack of confidence or a psychological deficit. To reframe this narrative, it is essential to recognize that introverted candidates are physiologically different. While we do not claim neurobiological expertise, a review of personality and physiological literature reveals that these differences are structural and chemical, rather than behavioral flaws or mere lifestyle preferences (American Psychological Association, n.d.; Granneman, 2016; Johnson et al., 1999; Koepp et al., 1998). Grounding our evaluation models in this physiological reality shifts the conversation away from potential personal bias.

Introverts and extraverts possess distinct physiological pathways and neurotransmitter preferences that dictate how they process information. While the extraverted brain utilizes shorter, faster neural pathways geared for immediate action, the introverted brain relies on longer, more complex routes designed for deep reflection (Johnson et al., 1999; Koepp et al., 1998, as cited in Laney, 2002). Specifically, neuroimaging studies reveal that introversion is associated with higher resting blood flow and distinct gray matter volume variations within the prefrontal cortex—the region responsible for complex cognition, long-term memory, and metic-

Table 1

Positive Facets and Descriptors of Introversion

Positive Facets of Introversion	Descriptors/Adjectives
Introspective thoughtfulness	Reflective, observant, sense-making, deep thinking, analytical
Independent Mindset	Works independently, autonomous, self-sufficient, self-reliant, enhanced sensory processing
Solitude Preference	Internally driven, enjoys being alone, recharge/recover internally, appreciates solitary activities, quieter

Note. Descriptors represent positive introverted facets of a continuous personality spectrum; behavioral expression is context-dependent and situational.

ulous planning (Johnson et al., 1999). While this complex, long-term processing facilitates deep analysis, it is often misunderstood by observers as hesitation or a lack of confidence. Consequently, what an outside observer might misinterpret as an educator's diminished instructional presence is often the physiological manifestation of a highly reflective mind at work.

Furthermore, research suggests these two temperaments exhibit differing sensitivities within the autonomic nervous system. Extraverts demonstrate a higher sensitivity to dopamine-driven pathways tied to the sympathetic nervous system, which thrives on external reward, novelty, and high-energy stimulation (Granneman, 2016). Alternatively, introverts exhibit a lower threshold for dopamine overstimulation; instead, their neural architecture is strongly associated with pathways linked to the parasympathetic nervous system and the neurotransmitter acetylcholine (Granneman, 2016). In plainer terms, these neurological differences may help explain why introverts tend to experience fatigue in highly stimulating environments. This may also contribute to a preference for sustained concentration and reflective thought. These physiological characteristics explain why introverted candidates often benefit from quiet pauses in the midst of their busiest days (which we will later describe as the *gift of the pause*). Overall, what an evaluator might perceive as a lack of confidence is in reality, an active, high-level cognitive process where the introvert is internally iterating and pondering before choosing to speak.

Introversion: From Disorder to Diversity

Outside the field of education, the perception of introversion has shifted significantly over the last century. In the early 1900s, introversion was frequently pathologized and labeled as a psychological deficit. As personality theory evolved, the Myers-Briggs Type Indicator (MBTI) began to categorize introversion more neutrally, focusing on environmental preferences (Myers et al., 2018). This shift toward a more neutral understanding was further reinforced with the emergence of the Big Five personality traits (OCEAN), which

standardized the study of extraversion alongside openness, conscientiousness, agreeableness, and neuroticism (Kim et al., 2019).

Additionally, the comparison between extraversion and introversion has been one component of educational research throughout the 20th century. For example, some studies have viewed extraversion as a primary predictor of high teacher self-efficacy and leadership effectiveness (Klassen & Tze, 2014). Scholars frequently use personality traits to characterize effective teachers or to make sense of student classroom behavior. Similar assumptions have appeared in research about students, such as Evans and Wrenn (1942), often labeled introversion as a barrier to academic achievement, favoring the highly vocal and socially active nature of extraverted students.

Since the turn of the 21st century, and particularly following Cain's (2012a) presentation "The Power of Introverts," academic and professional discourse has increasingly recognized introverted attributes as distinct strengths rather than deficits. Kahnweiler (2020) emphasizes the role that leaders, managers, and human resource professionals play in redesigning the workplace to support and value introverted diversity, moving beyond awareness toward meaningful inclusion. Overall, business and management leadership has grown to see introversion as a source of potential and have developed frameworks to support and provide feedback for introverted employees. Ultimately, the field of education, specifically in teacher preparation programs, would benefit from adopting a similar asset-based perspective.

Introversion in the Classroom: Hidden Strengths

Although we recognize that introversion and extraversion exist on a continuum, the traits commonly associated with introverts may serve as hidden assets in the classroom. As we examine these hidden classroom assets, we will focus on specific traits of introverts; however, teachers, like all individuals, fall on a continuum. While any teacher may exhibit some of these traits, here, we aim to illustrate how introverted teachers' strengths may impact the classroom. We suggest ways to identify these hidden introverted assets.

A key difference between introverts and extraverts is their approach to action and context. Rather than engaging in immediate action, introverts tend to prioritize internal cognitive iteration, evaluating situations within a broader situational context before acting (Blevins et al., 2022). As a result, thoughtful and detailed lesson plans are often a strength of an introvert. However, teacher educators primarily observe teachers during instruction, often evaluating planning and preparation through the lesson's execution. This may be problematic for introverted teachers because thoughtful planning is not always fully reflected in classroom performance, especially for novice teachers. To fully appreciate an introverted teacher's depth of planning, it is beneficial to spend time discussing the planning process in addition to the execution of the observed lesson. This kind of discussion will honor the context-oriented thinking that is a strength of the introvert.

Because introverts are comfortable with slow processing, another strength is that they are able to create a slower-paced classroom environment where curiosity and deep engagement occur. When students are not expected to have an immediate response, they are given the opportunity to think more deeply. Although introverted educators' quieter instructional style may not look exciting, their classrooms can be equally engaging since they provide opportunities for deep cognitive processing. Introverted teachers may excel with questioning because asking a question that does not have a straightforward answer does not make an introvert uneasy; rather, it invites curiosity. While leaving a question open might be seen as an error or appear as if the teacher lost track of the classroom discourse, there is the possibility that the choice was intentional. Introverts are comfortable in the space of possibility. Being comfortable in liminal spaces–letting a big question unfold without the immediate need to answer it–means that the class can explore a concept more deeply. Pedagogically, we call these big questions essential questions, which are known to deepen learning when taught in thoroughly designed lessons (Bulgren et al., 2011). For teacher educators, discussions about the pace of the lesson may reveal intentional planning that deepens thinking rather than poor planning or uncertainty which can be attributed to weak teaching. Beyond intentional planning, introverts may excel in developing learning communities.

Building classroom communities results from giving

proper attention to individuals. Because introverts tend to prefer interactions with individuals and small groups, their strength is engaging with individuals or small groups of students. While whole-class instruction is important, small-group and individual instruction is also very effective across grade levels and subject areas (Foorman & Torgesen, 2001; Pai et al., 2015). Teacher educators might consider observing small group or one-to-one interactions as well because introverts may display some of their hidden strengths in these lesson formats. Recognizing these strengths may lead to a deeper understanding of how the introverted teacher plans lessons, monitors learning, and engages the individual students in the classroom.

Introversion: From Deficit to Development

For many teacher candidates, the journey to becoming a teacher has been paved with years of being told their natural disposition is a deficit to be corrected. According to Kahnweiler's (2020) framework, traits such as a reserved demeanor or a subdued facial expression are frequently misinterpreted in K-12 settings as a lack of engagement. To effectively reframe this narrative, teacher preparation frameworks must delineate innate temperament from professional dispositions. Dispositions extend beyond personality, encompassing observable behavioral tendencies, pedagogical mindsets, and ethical commitments. Yet, in practice, evaluation metrics often obscure this distinction by framing active engagement through high-energy, extraverted indicators. For example, a review of our locally developed dispositions assessment highlights descriptors such as *active*, *initiative*, *collaborative*, *leadership*, and *passion*, that evaluators may subconsciously associate with highly visible, energetic, and verbally expressive forms of engagement. If left unexamined, these criteria risk penalizing introverted candidates who process internally and lead calmly, turning a standard professional review into an unintended measure of extraverted temperament. Table 2 outlines these contrasting behavioral tendencies between temperaments as described by Kahnweiler (2020). The characteristics of introverts, such as listening, deep focus, problem-solving, and quiet presence, may be valued in the classroom as indicators of thoughtful learning when teacher candidates are students, but may come under scrutiny as they develop into professional educators.

In teacher education, we have a responsibility to help these candidates unlearn the deficit-based narrative surrounding introversion and instead recognize their temperament as a specialized pedagogical toolset. While the extravert ideal suggests that teacher energy must be visible and constant, the introverted teacher provides an equally vital asset: a steady, calm presence.

Beyond classroom management, these introverted traits facilitate a depth of relationships that fast-moving environments often overlook. Because introverted teachers are energized by solitude and thrive in focused conversations, they are uniquely positioned to excel in one-on-one interactions like conferences or small groups. This natural inclination toward reflection before responding ensures student concerns are met with intentionality rather than a reflexive reaction. By validating these traits as professional assets rather than limitations, teacher preparation programs empower candidates to lead with authenticity. Ultimately, the introverted teacher does more than manage a room; they curate an environment where depth is valued over speed, providing a vital mirror for all students who need to see that leadership does not always require a loud voice. We propose actively adopting an asset-based mindset when working with introverted teacher candidates to recognize the diverse ways excellence is expressed in the classroom, cultivate environments where depth is valued over speed, and provide a vital model for students who need to see that leadership does not always require a loud voice.

Reimagining Teacher Evaluation: Beyond the Extravert Ideal

Pennsylvania's recent adoption of the new *PDE 430 – PDE Framework for Evaluation of Preservice Teacher* (Pennsylvania Department of Education, 2025) provides an excellent opportunity to examine this rubric and refine evaluator training to ensure the effective identification of the strengths and developmental needs of all teacher candidates. While we cannot alter the rubric itself, we can transform how we train our clinical faculty and cooperating teachers to implement it. Completed twice during student teaching, the PDE 430 mirrors the Commonwealth's in-service evaluation system aligned to the Danielson Framework for Teaching (Danielson, 2011; Pennsylvania Department of Education, 2025). Importantly, these frameworks

Table 2

Common Characteristics of Introverts and Extraverts according to Kahnweiler (2020)

Introverts	Extraverts
Energized by solitude	Energized by other people
Must have breaks	Breaks are nice but not required
Reserved	Enthusiastic
Express thoughts after reflection	Express thoughts immediately
Private at first	Share openly
Low-key facial expression	Expressive face
Prefer writing	Prefer talking
Like small group, one-on-one focused conversations	Prefer larger groups where they can move fast and change topics
Humble	Talk about their accomplishments
Need time to prepare	Wing it
Calm	Excited

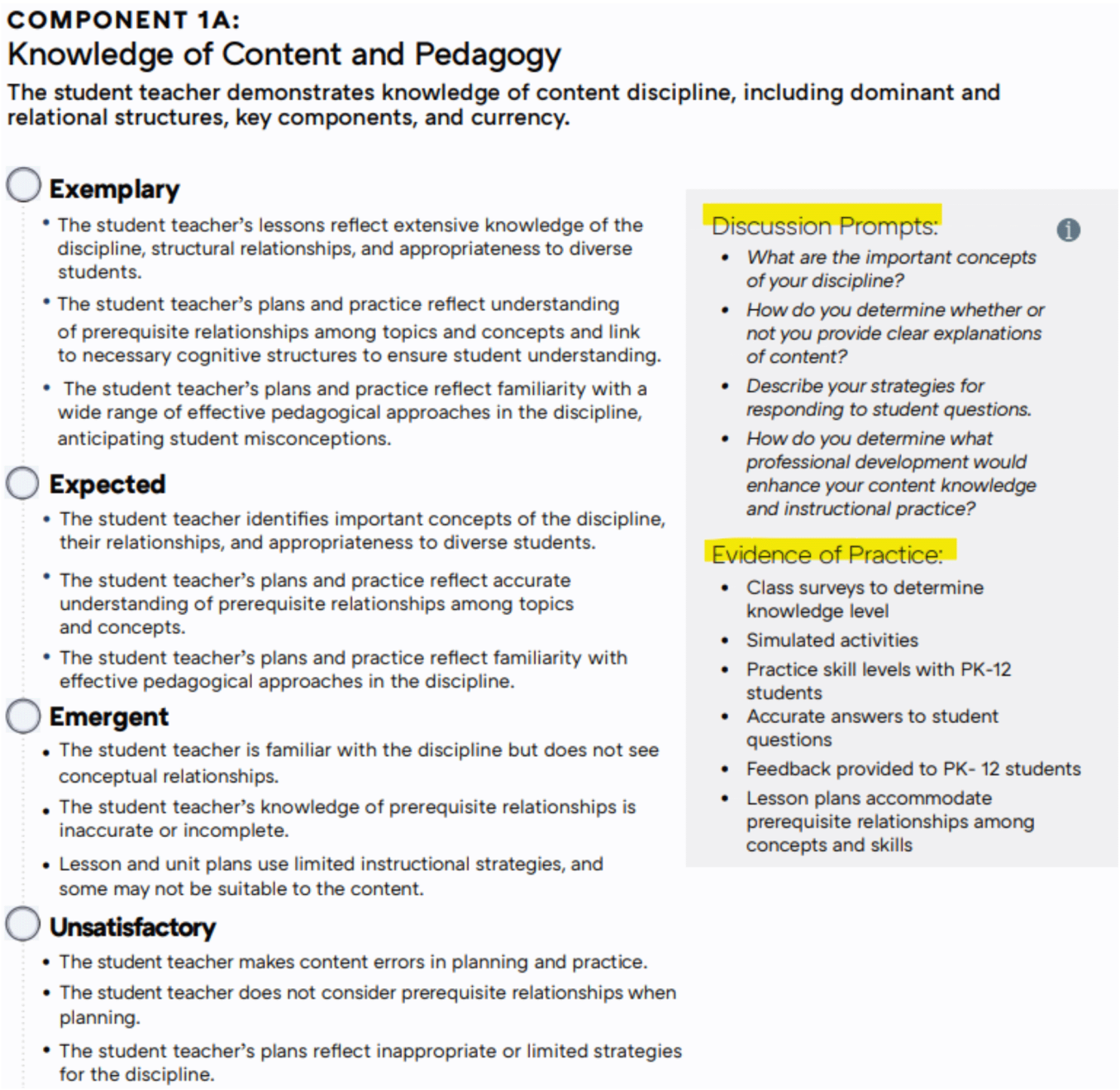
Note. While these characteristics are categorized to highlight distinct behavioral tendencies, personality exists on a continuum. Expression is highly context-dependent, and most educators dynamically shift between these styles based on situational demands, professional roles, and individual energy reserves.

recognize both the visible onstage elements (Domain 3: Instruction) and the behind-the-scenes work (Domain 1: Planning and Preparation) that makes instruction possible, as well as the interconnectedness of each domain. Additionally, the state-adopted metric intentionally embeds built-in *Discussion Prompts* and candidate-curated *Evidence of Practice* artifacts alongside the rubric. This intentional design enables evaluators to look beyond a candidate's onstage teaching performance, pairing observed performance with an investigation of the planning and decision-making that shaped the lesson (see Figure 1).

Chuhran (2020) reminds us that introverted teachers are routinely penalized in field observations for a perceived lack of classroom command, despite employing highly effective pedagogical strategies like intentional wait time. This bias persists despite research indicating that extraversion is not a statistically significant predictor of instructional effectiveness or student achievement (Kim et al., 2019; Klassen & Tze, 2014). Because traditional clinical observation models prioritize observable teacher behaviors, they may fail to capture invisible instructional processes, including planning, reflection, and cognitive decision-making. This challenge can be exacerbated when supervisors are responsible for evaluating multiple candidates. By utilizing the PDE Framework for Evaluation of Preser-

Figure 1

Snippet of PDE Framework for Evaluation of Preservice Teacher



COMPONENT 1A:

Knowledge of Content and Pedagogy

The student teacher demonstrates knowledge of content discipline, including dominant and relational structures, key components, and currency.

Exemplary

- The student teacher's lessons reflect extensive knowledge of the discipline, structural relationships, and appropriateness to diverse students.
- The student teacher's plans and practice reflect understanding of prerequisite relationships among topics and concepts and link to necessary cognitive structures to ensure student understanding.
- The student teacher's plans and practice reflect familiarity with a wide range of effective pedagogical approaches in the discipline, anticipating student misconceptions.

Expected

- The student teacher identifies important concepts of the discipline, their relationships, and appropriateness to diverse students.
- The student teacher's plans and practice reflect accurate understanding of prerequisite relationships among topics and concepts.
- The student teacher's plans and practice reflect familiarity with effective pedagogical approaches in the discipline.

Emergent

- The student teacher is familiar with the discipline but does not see conceptual relationships.
- The student teacher's knowledge of prerequisite relationships is inaccurate or incomplete.
- Lesson and unit plans use limited instructional strategies, and some may not be suitable to the content.

Unsatisfactory

- The student teacher makes content errors in planning and practice.
- The student teacher does not consider prerequisite relationships when planning.
- The student teacher's plans reflect inappropriate or limited strategies for the discipline.

Discussion Prompts:

- *What are the important concepts of your discipline?*
- *How do you determine whether or not you provide clear explanations of content?*
- *Describe your strategies for responding to student questions.*
- *How do you determine what professional development would enhance your content knowledge and instructional practice?*

Evidence of Practice:

- Class surveys to determine knowledge level
- Simulated activities
- Practice skill levels with PK-12 students
- Accurate answers to student questions
- Feedback provided to PK- 12 students
- Lesson plans accommodate prerequisite relationships among concepts and skills

Note. The instructions for the PDE 430 illustrate the integration of state-mandated evaluative rubrics with built-in discussion prompts and candidate-curated evidence of practice artifacts.

vice Teachers built-in *Discussion Prompt*s during pre- and post-conferences, clinical mentors and university supervisors can illuminate the offstage components an observation may miss. These prompts allow evaluators to probe a candidate's underlying thinking, shifting the focus from energetic performances to instructional design and responsiveness to student needs. This balance directly honors the Pennsylvania Department of Education's (2024) *Common Ground Framework*. Specifically, it applies asset-based perspectives to teacher

candidates by framing both their reflective, offstage technical expertise and their onstage instructional presence as distinct yet equally valuable professional assets. By applying the state-mandated rubrics through this lens, teacher preparation programs ensure that an introverted temperament is recognized as a pedagogical asset rather than penalized as a professional deficit. Developing this mindset requires a deliberate shift in feedback, as evaluators must actively reframe deficit-driven critiques into asset-based growth opportunities (see Table 3).

Psychological Safety and Introverted Growth

We advocate for the psychological safety required of teacher candidates to develop their innate talents, particularly those who process the world internally. Forcing teacher candidates into performative extraversion ignores their natural strengths and may cause lasting anxiety. When we provide alternative ways to develop professionally, such as reflective writing or small-group contributions, we ensure that growth happens at a sustainable pace. This allows aspiring educators to engage in ways that can support both authentic and sustainable professional growth.

The common tropes used to describe differences in teaching styles are the sage-on-the-stage and the guide-on-the-side. In the classroom, the most impactful teachers are rarely just front-of-the-room entertainers; instead, they are learners who guide alongside their students. These educators leverage high emotional intelligence and active listening to create a space where students feel seen and heard. Introverted teachers transform their natural quietude into a professional superpower by leveraging the four Ps: preparation, practice, push, and presence (Kahnweiler, 2025). Preparation allows for mastery of the material, while practice streamlines student interactions. When a lesson requires high-energy delivery, they push into the spotlight, balancing it with quiet reflection to avoid burnout. Ultimately, their presence, rooted in quiet power rather than volume, fosters a classroom culture built on authentic connection and deep insight.

To truly support the introverted educator, schools must normalize “the gift of the pause.” In fast-paced staff meetings or collaborative planning sessions, introverts are often sidelined by rapid-fire dialogue. By providing agendas in advance and respecting phrases like, *"I’d like to process this and follow up via email,"* schools empower teachers to offer their most thoughtful contributions rather than their quickest reactions. This shift ensures that the most valuable perspectives are not lost to the loud voices, allowing introverted teachers to thrive as a steady force for student success.

Conclusion: What Can Teacher Educators Do?

There are a number of ways teacher educators can cultivate introverted educators. Two considerations may be particularly important in the development of quiet excellence: modeling introverted pedagogies and providing asset-based feedback based on the preservice teacher’s natural strengths. Both changes, though subtle, may lead to introverted teachers gaining confidence in their gifts. Additionally, they may contribute to further refinement of pedagogies that foster interactive and engaging classrooms.

As noted, teacher educators can model instructional strategies that suit both introverts and extraverts. For example, many educators learn how to model a task explicitly. Less commonly modeled, though, is how to facilitate discussions and group work. These pedagogies rely heavily on planning and knowledge, which align with the strengths of an introvert.

Additionally, when educators provide feedback, they should consider how a preservice teacher's temperament shapes their instructional strengths. One of the most significant barriers for introverted educators is the language used in professional evaluations. Traditional feedback is often laden with extraverted bias, penalizing introverted teachers for their natural processing styles. To address this, we might actively reframe common deficit-focused critiques into asset-based growth opportunities (see Table 3) and analyze concrete classroom scenarios where these biases manifest (see Appendix A).

The current educational landscape remains deeply tethered to the extravert ideal, a cultural bias that frequently misinterprets high-energy performance as the primary benchmark for teaching excellence. As it stands, many introverted teacher candidates navigate a system that views their natural inclination toward reflection, intentionality, and deep focus as a deficit to be overcome rather than a strength to be harnessed.

By overvaluing the sage on the stage, we inadvertently marginalize the guide on the side. In doing so, we risk both the burnout of talented educators and the loss of relatable role models for the significant portion of the student population who also process the world internally. We are at a critical juncture where the neurobiological reality of temperament must be integrated into our professional identity, shifting the narrative from one of "fixing" introverts to one of valuing their unique capacity for quiet excellence.

Moving forward, teacher preparation scholars and professionals must actively flip the script by embedding asset-based frameworks into their mentorship and evaluation processes. Crucially, this framework does not suggest that effective instructional planning, deliberate pacing, or community-building are exclusive to the introverted temperament; rather, it highlights that while these practices represent universally accepted markers of high-quality pedagogy for all educators, traditional observational bias uniquely risks misinterpreting them as deficits when enacted quietly. This requires a systemic shift: university supervisors and clinical mentors must be trained to recognize and validate the gift of the pause, community-building mindset, and deep instructional design as evidence of professional mastery. We must move beyond observation rubrics that prioritize performance and speed, instead rewarding the deliberate pacing and psychological safety that introverted educators provide. By

Table 3

Reframing Deficits as Assets

Traditional Feedback (Deficit)	The Introverted Reality	Reframed Feedback (Asset)
"Your voice gets lost in the room."	Use of calm demeanor and proximity.	Effective Proximity Management
"You need to increase student excitement."	Fostering deep thoughts and reflection.	Cultivating Calm Learning Spaces
"You seem hesitant to answer."	Active listening and reflecting.	Deliberate and Thoughtful Contributor
"You are not networking enough."	Preference for authentic, 1-on-1 interaction.	Purpose-Driven Connection

Note. Conversational scaffolds are adapted from Kahnweiler's (2020) framework to assist clinical mentors during post-observation conferences. These reframed responses counteract negative stereotypes and highlight objective instructional mechanisms. See Appendix B for an expanded guide.

modeling introverted pedagogies and providing feedback that celebrates internal processing, teacher educators can empower a new generation of leaders who prove that the most profound classroom impacts often occur in the quiet spaces of authentic connection, reflection, and deep learning.

Limitations

This position paper explores the ways introverts may interact in the classroom from the perspectives of two introverted educators. While we present research to support our claims, it is important to recognize some of the limitations of this paper. A primary limitation is that much of the research we present comes from the fields of business or psychology. Because we were importing ideas into the field of education, we recognize that field-research may yield more nuance or differences in how introversion and extraversion affect educators in the classroom. Additionally, because we self-identify as introverts, our experiences and perspectives may color our presented positions. Lastly, to illustrate some of the notions we are presenting, we used examples that represent the highly introverted position of the introvert/extravert continuum. Most people do not exclusively fall on one end of the continuum or the other but exhibit a mix of traits that may be context specific. With these limitations in mind, our position remains that introverted teachers are an asset to the classroom and school community.

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Appendix A

Case Study in Reframing

Consider the common critique: *"You need to be more commanding in the classroom."* This feedback assumes that management is a product of volume and high energy. However, when we reframe this through the introverted lens, we see Effective Proximity Management. An introvert uses a calm, steady demeanor and physical proximity to create a focused environment where students feel secure. The introvert's "quiet presence" is a tool for stability, not a lack of authority.

Similarly, when an evaluator says, *"The lesson lacked excitement,"* they are often measuring "noise" rather than "learning." The reframed strength is Cultivating a Focused Learning Space. High-energy excitement is often fleeting; the introvert fosters a stable atmosphere that encourages deeper thinking and allows students of all temperaments to engage meaningfully with the content.

Appendix B
Reframing Common Feedback

Common Feedback Phrase	Introverted Action or Tendency	Reframed Introverted Strength
Concerns about classroom presence, voice volume, concerns about classroom management. Phrases: "Your voice gets lost in the room." "You need to be more commanding."	Quiet Presence Using a calm, steady demeanor and proximity to manage the classroom rather than relying on volume or high energy.	Effective Proximity Management "Your composed and steady presence, combined with your effective use of proximity, creates a calm, focused environment where students feel secure and respectful."
Concerns about engaging students. Phrases: "The lesson was a little boring." "You need to increase student excitement."	Fostering a Calm Environment Using a calm atmosphere for deep thought, reflection, and collaboration instead of constant high-energy engagement.	Cultivating a Calm and Focused Learning Space "The calm and stable atmosphere you create is an asset, especially during moments of high tension. It encourages deeper thinking and allows all students, regardless of temperament, to engage fully with the content."
Concerns about pedagogy (knowing content is not the same as teaching content). Phrases: "You're overthinking it." "You're too stuck in the details."	Diving Deep (content knowledge) Exhibiting a reflective rather than reactive teaching style, thinking deeply to see complex connections within the content.	Deep Pedagogical Preparation & Reflection "Your ability to thoughtfully reflect and see intricate connections between topics allows you to present content with remarkable depth and insight, providing a rich learning experience for students."
Concerns about engaging students and families; not asking for help. Phrases: "You need to be more visible and vocal." "You need to build stronger rapport."	Creating Classroom Community (knowing students) Excelling at one-on-one connections, using empathy to motivate, and providing varied ways for students to participate.	Empathetic Community Builder "You excel at creating a culture of learning where all students feel seen. Your empathy and skill in one-on-one interaction allow you to build strong, caring relationships, which is a powerful motivator for students."

Restriction to Readiness: Integrating the AI Assessment Scale (AIAS) into Special Education Educator Preparation Program Course Syllabi

William Schleicher
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Abstract

This article describes the integration of the AI Assessment Scale (AIAS) into special education educator preparation course syllabi. The authors examine how structured AI guidance promotes ethical use, transparency, accessibility, and professional readiness while preparing future special educators to navigate AI-integrated PK-12 environments with confidence and responsibility.

About the Authors

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Pennsylvania is currently facing a significant staffing crisis, with special education representing the greatest area of need across all certification areas. A survey conducted by the Pennsylvania School Boards Association (PSBA) found that 67.2% of reported staffing shortages involved special education, with 73.3% of districts identifying it as their most critical need (2024). Within this demanding landscape, Artificial Intelligence (AI) offers more than technological innovation; it provides scalable and responsive support that can assist with individualized interventions, adaptations for diverse disabilities, and assistive technology recommendations (Hussein et al., 2025). These tools can aid in the reduction of barriers while allowing educators to devote more time to direct student support (Klein, 2024).

Despite the growing relevance of AI in educational practice, educator preparation programs (EPPs) have been slow to incorporate meaningful AI training, often leaving new teachers to "learn on the fly" once they enter the profession (Weiner et al., 2024). As higher education faculty responsible for preparing future special educators, we began questioning whether restrictive syllabus policies were adequately preparing teacher candidates to use AI ethically and effectively. If future educators are expected to develop classroom AI policies, evaluate AI-generated supports, and integrate AI into instructional design, they must first have structured opportunities to engage with these tools during their preparation programs (Black et al., 2024).

In this article, we describe the implementation of the Artificial Intelligence Assessment Scale (AIAS) within EPP course syllabi as a tiered framework for AI integration. We discuss its influence on student engagement and comfort with AI while maintaining clear expectations related to ethics, professional responsibility, and academic rigor.

Why Special Education Courses Require a Different AI Conversation

As teacher educators preparing future special educators, we are navigating an educational landscape increasingly influenced by artificial intelligence (AI). While higher education discussions often focus on academic integrity, plagiarism, and misuse, special education requires a different conversation. Many AI tools resemble the assistive and instructional technologies long used to support students with disabilities. As a result, approaches centered solely on restriction may unintentionally conflict with the practices we expect future special educators to implement in schools.

Accessibility, Universal Design for Learning, and AI

Equitable access to learning is a foundational principle of special education. Universal Design for Learning (UDL) promotes multiple means of engagement, representation, and expression, and AI increasingly supports these goals through tools such as translation, text simplification, speech-to-text, text-to-speech, summarization, and personalized feedback. As we worked with preservice special educators in the past, we often observed tension between institutional restrictions on AI and the accessibility-focused practices expected in special education. While K–12 educators routinely use technology to reduce barriers, teacher candidates are sometimes discouraged from using similar supports. DiBattista (2025) noted that AI can reduce barriers, streamline instruction, and expand individualized support, making AI literacy an increasingly important professional competency.

AI as Instructional Support Rather Than Academic Shortcuts

Special educators regularly distinguish between supports that provide access and those that alter learning expectations. Similarly, AI should be viewed as an instructional support rather than solely a content-generation tool. AI can assist with lesson planning, differentiated materials, reading-level adaptations, and behavioral supports. Goldman et al. (2024) argued that EPPs should integrate AI through the TPACK framework so candidates understand not only how to use technology but also when and why to use it. At the same time, preservice teachers must learn to critically evaluate AI outputs, recognize inaccuracies and biases, and make informed instructional decisions. Further, a central concern in AI integration is balancing support with dependency. While AI can improve efficiency and accessibility, overreliance may limit the development of professional competencies. Hur (2024) found that guided exploration and critical evaluation help preservice teachers develop confidence with AI, reinforcing the importance of AI literacy rather than restrictive policies alone.

Preparing Future Special Educators for the Field

AI is increasingly embedded in educational practice through personalized learning systems, progress monitoring tools, communication supports, and instructional planning. National survey findings indicated that while educators recognize the potential of artificial intelligence to enhance teaching and learning, they also reported significant barriers related to professional development, training, confidence, and implementation (Woodruff et al., 2023). These findings further highlight the need for EPPs to intentionally develop AI literacy before candidates enter the profession. Holman et al. (2024) emphasized that EPPs should prepare candidates to navigate these AI-enhanced environments. Integrating AI literacy into coursework provides opportunities to explore ethical decision-making while considering issues such as privacy, bias, accessibility, equity, and student autonomy. Many institutions initially responded to AI through blanket prohibitions. However, concerns regarding academic integrity have been complicated by the limitations of AI-detection tools, prompting a shift toward transparency, disclosure, and intentional assignment design.

For special education EPPs, the question is less about whether AI should be used and more about how its use aligns with learning outcomes and professional growth. Frameworks such as the AI Assessment Scale (AIAS) provide a structured approach for promoting ethical AI integration while maintaining academic rigor. Ultimately, special education requires a more nuanced AI conversation. As teacher educators, our responsibility is not simply to regulate AI use but to prepare future special educators to use these tools with competence, ethics, and professional judgment.

Integrating the AI Assessment Scale (AIAS) Into Special Education Teacher Preparation

When generative AI tools first emerged in education, many educators viewed them as a threat to authentic assessment, academic integrity, plagiarism, and authorship (Klein, 2024, as cited in Goldman et al., 2025). Similar concerns surfaced in higher education, where scholars questioned whether reliance on AI might diminish critical thinking and writing skills (Civil, 2023; Warschauer et al., 2023, as cited in Chan, 2023). Reflecting these concerns, Chan (2023) noted, “Eight out of 24 universities in the prestigious UK Russell Group have declared the use of the AI bot for assessment as academic misconduct included Oxford and Cambridge. Meanwhile, many other universities around the world are rushing to review plagiarism policies citing concerns about academic integrity” (p. 2).

As AI has become increasingly integrated into PK-12 education, EPPs have faced growing pressure to prepare teacher candidates to use these tools responsibly. Will (2024) reported that EPPs are beginning to incorporate AI into coursework while recognizing that graduates will encounter AI in schools from the start of their careers. Historically, EPPs have approached AI cautiously. Even though Weiner et al. (2024) found that approximately 59% of surveyed EPPs provided some form of AI-related instruction, only 25% offered training focused on using AI to support future classroom practice. Likewise, Daher (2025), citing a UNESCO survey of approximately 450 schools and universities, reported 40% of institutions communicated AI guidance only orally, while 20% of respondents were unsure whether their institutions had AI policies at all.

Early in our careers as special education faculty, we adopted similarly restrictive approaches. Course syllabi often prohibited all AI use, creating apprehension among some students while encouraging others to use AI without disclosure. In both cases, opportunities for meaningful conversations about responsible AI use were limited. Conversely, as AI became increasingly relevant to accessibility, instructional planning, and professional practice, we recognized the need to move beyond a simple "ban or use" approach. We sought a framework that would support transparency, ethical use, and academic integrity while helping teacher candidates develop practical AI skills. This exploration led us to the Artificial Intelligence Assessment Scale (AIAS) (Perkins et al., 2025).

AIAS Framework

Introduced by Perkins and colleagues, the AI Assessment Scale (AIAS) provides a structured approach to integrating generative AI into educational assessment through varying levels of AI use and student responsibility (Perkins et al., 2024; Perkins et al., 2025). The framework allows educators to align learning outcomes with appropriate levels of AI integration while main-

taining academic integrity and clearly communicating expectations for how, when, and where AI may be used (Perkins et al., 2024). The five-level AIAS framework (Table 1) is used internationally across schools and universities and illustrates varying degrees of AI implementation within assignments and learning activities. Perkins et al. (2024) provided a summary of the Scale Levels to aid educators in better understanding of how this framework can be tiered across courses:

Level 1: No AI - Students are not permitted to use any form of GenAI, as students are to rely on their own knowledge, skill sets, and comprehension of material. Such tasks could include discussions, oral forms of assessments, class group work, or debates in which all are free from technology; all under supervision of the teacher or instructor.

Table 1

The Artificial Intelligence Assessment Scale (AIAS) Framework

AIAS Level	Description	Primary Educational Purpose
Level 1: No AI	Students complete the assessment independently without AI assistance.	Measures students' own knowledge and skills without AI support.
Level 2: AI Planning	AI may be used for brainstorming, outlining, research, and idea development, but not for generating the final submission.	Supports planning while ensuring the final work reflects the student's own thinking.
Level 3: AI Collaboration	AI may assist with drafting, revising, editing, and refinement. Students must critically evaluate and modify AI-generated content.	Promotes collaboration with AI while maintaining student authorship and critical thinking.
Level 4: Full AI	AI may be used throughout the assessment to help accomplish learning objectives. Students remain responsible for directing AI and evaluating all outputs.	Develops students' ability to use AI strategically while demonstrating professional judgment.
Level 5: AI Exploration	Students and instructors may collaboratively explore innovative AI applications and co-design learning experiences.	Encourages creative, discipline-specific exploration of AI to solve authentic problems and generate new ideas.

Note. Adapted from Perkins et al. (2024). The AIAS framework is freely available for educational use and institutional implementation through https://aiassessmentscale.com/

Level 2: AI Planning - It is permissible for students to integrate GenAI in the brainstorming and feedback process; using the tools to also aid in the organization of ideas. However, final submissions should not contain AI-generated content. Planning approaches consist of using AI to help with generating ideas or solutions to problems, support with the structuring of outlines, or in the form of a research assistance with source or topic suggestion prompting.

Level 3: AI Collaboration - Here, students are permitted to integrate AI in the processes of enhancing content/language, refining, and editing. It can be used to help with grammar, punctuation, spelling, word choice, structural and/or visual edits like image generation tools. It is imperative for students to critically evaluate and modify the suggested outputs produced by AI, which will aid in displaying their understanding of analysis (Perkins et al., 2025).

Level 4: Full AI - Moving to a more complex level, students are responsible for tasking Gen AI to deliver content to achieve particular assessment goals and must critically engage with and assess AI outputs that were created. Students take on the role of directing AI as a thought partner and also demonstrating their own critical thinking capabilities.

Level 5: AI Exploration - At the most advanced level of AIAS, AI can be used at the teacher's or student's discretion. Instructors and students can join together to co-design assessments, develop solutions to solve problems. For example, students can use GenAI for real-time feedback on the strengths/areas of growth of their work, they can be given broad parameters of a task then must prompt Gen AI with more specific guidelines, etc.

AIAS Framework and Syllabus Overhaul

The self-discovery of the AIAS Framework had completely shifted our mindset of how we approached special education coursework and syllabi design within EPP programs. This allowed us to determine a good starting point in which we wanted to expand our regulations of GenAI usage within the courses. One of the first changes we made was replacing restrictive AI language in our syllabi with a concise AIAS policy statement. Such change emphasized ethical decision-making, professional readiness, accessibility, and academic integrity while reassuring students that AI was a tool to support learning rather than something to fear or conceal. The statement also clarified that each assignment specified the appropriate AIAS level and corresponding expectations for AI use and disclosure (Perkins et al., 2025).

Following this syllabus statement, we briefly described the AIAS Levels (as stated previously in this article) and stressed to students that the use of AI was not required if an individual was hesitant or uncomfortable with its integration into assignments. It was vital for us to construct disclosure requirements for GenAI usage (Weiner et al., 2024) so that students would be comfortable regarding transparency in authorship leading to fostering trust between instructors and students (Kim & Koo, 2026; Weiner et al., 2024). A subportion of the syllabus policy specifically identified transparency and disclosure requirements:

When *AI* use is permitted:

- Students must clearly disclose how AI tools were used, following the instructions for that assessment.
- Disclosure must be completed on the AI Acknowledgement Disclosure Form and submitted with each assignment. This is mandatory for Level 2–5 assignments.
- The purpose of disclosure is transparency and learning, not punishment.

Use of AI without disclosure or use that results in misalignment with the stated AIAS level or task conditions, will be addressed under the course offense structure and university policies.

The Disclosure Form (Appendix A) was required for all students to submit alongside their assignments based on the AIAS Level, but if learners were unsure whether a particular use of AI was appropriate, the syllabus also directed them to review the *Generative AI - Student FAQ* (Appendix B) and always encouraged them to collaborate with the instructor for further clarification to ensure they were responsible for accuracy of the final work submitted (Perkins et al., 2024).

Throughout the academic year in which the AIAS Levels were implemented, students within the special educa-

tion courses grew to be more open regarding conversation about GenAI but also were more comfortable in displaying developing usage of such tools, citing in course evaluations the need for more opportunities to use AI to help prepare them for future coursework and professional responsibilities.

Preparing Future Special Educators for AI-Integrated Practice

Professional judgment has always been central to special education. Decisions regarding accommodations, interventions, assessments, and individualized supports require thoughtful analysis of student needs and contextual factors that AI cannot replace. As AI becomes increasingly embedded in PK–12 education through instructional planning, personalized learning, progress monitoring, and communication (Tan et al., 2025; Will, 2024), we believe EPPs have a responsibility to provide opportunities for teacher candidates to engage with these tools before entering the profession.

In our experience, guided exploration helped candidates move beyond simply using AI to thoughtfully evaluate its strengths, limitations, and ethical implications. Rather than viewing AI as a source of answers, students began recognizing it as a tool that supports professional decision-making. This aligns with findings that structured AI experiences build confidence and promote responsible AI use among preservice teachers (Hur, 2024). Likewise, Kim and Koo (2026) argued that generative AI is reshaping teaching and learning, making AI literacy an essential component of educator preparation.

These experiences also reinforced that AI literacy extends beyond technical skills. Future special educators must critically evaluate AI-supported tools for bias, accessibility, privacy, transparency, equity, and their impact on individualized decision-making. Throughout our courses, we emphasized reviewing, verifying, and adapting AI-generated recommendations rather than accepting them at face value, reinforcing that technology should support (not replace) professional expertise. Ultimately, the goal of special education teacher preparation is not AI compliance but AI readiness. By intentionally integrating AI literacy, ethical decision-making, and authentic opportunities to engage with AI, educator preparation programs can prepare future special educators to navigate evolving technologies while remaining grounded in accessibility, equity, and student-centered practice (Daher, 2025).

Conclusion

Artificial intelligence is becoming an increasingly integrated component of educational practice, including instructional planning, assessment, differentiation, accessibility, and communication for students with disabilities (Tan et al., 2025; Waterfield et al., 2024). As AI continues to reshape PK–12 education, educator preparation programs have an opportunity to embrace AI integration as a core component of preparing future special educators to use these tools thoughtfully, ethically, and professionally.

Our experience integrating the AI Assessment Scale (AIAS) shifted our perspective from regulating AI use to developing AI readiness. Rather than focusing primarily on restriction, we found that providing clear expectations, opportunities for guided practice, and transparent disclosure encouraged meaningful conversations about ethical AI use while maintaining academic integrity (Perkins et al., 2024; Perkins et al., 2025). We believe the AIAS offers a practical framework that can help EPPs prepare teacher candidates for the realities of increasingly AI-enabled schools while remaining grounded in accessibility, Universal Design for Learning, evidence-based practice, and professional judgment.

Further, we were able to identify several opportunities for further exploration based on these experiences. Future studies could examine faculty and teacher candidate perspectives on AI integration, changes in AI confidence and ethical decision-making over time, and institutional approaches to implementing the AI Assessment Scale across EPPs. Exploring department-wide and college-wide adoption may also provide valuable recommendations for establishing consistent expectations while supporting responsible, equitable, and transparent AI integration throughout teacher preparation.

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Appendix A

AIAS Use Disclosure Form

Student Name:	
Assignment Title:	
Course Week:	
AIAS Level:	
AI Tool(s) Used (e.g. Chat GPT, Claude, Gemini, Copilot, Grammarly)	
Purpose of AI Use: (e.g. brainstorming, outlining, drafting, revising, problem solving)	
Prompt(s) Used: Below, paste the exact prompt(s) you entered into the AI tool for this assignment. If prompts were refined over time, include the *final version(s)* used to generate or revise content. *(If multiple prompts were used, list them in order below numerically [1., 2., etc.])*	
How AI Contributed to This Work: Briefly explain how the AI tool supported your process and what decisions you made as the author. You may include: ● What you accepted, modified, or rejected that was generated by the AI tool. ● How you verified accuracy or quality ● How the AI output was integrated with your own thinking	
Responsibility Statement: *I confirm that I have reviewed, edited, and take full responsibility for all content submitted, including verifying accuracy, citations, and alignment with the assignment's AIAS level.*	
Name (serves as digital signature):	
Date:	

Appendix B

AIAS Framework Student FAQ

What is this AI policy for?
This course uses the AI Assessment Scale (AIAS) to clearly explain when and how AI tools may be used so that assessments fairly measure your learning and align with university academic integrity policies.

What is the AI Assessment Scale (AIAS)?
Each assignment is assigned an AIAS level (1–5) that defines the role AI may play.
The level will always be stated in the assignment instructions.

Does using AI mean I'm cheating?
No. AI use is not automatically misconduct.
Problems arise when AI use is misaligned with the assignment's AIAS level or instructions, or when required disclosure is missing.

What does "misalignment with assessment conditions" mean?
Misalignment occurs when:

- AI is used in a way that contradicts the assignment's AIAS level
- AI use is not disclosed when disclosure is required
- The submission does not demonstrate the type of learning the assignment is designed to assess

The issue is not AI use itself, but whether your work accurately represents your learning under the stated conditions.

When do I need to disclose AI use?

- Level 1 (No AI): AI use is not permitted
- Levels 2–5: AI use must be disclosed using the AI Acknowledgement Disclosure Form

Always follow the instructions for the specific assignment.

Why do I have to include my prompts?
Including prompts:

- Demonstrates transparency
- Shows intentional and responsible AI use
- Helps explain your process if questions arise

Prompts are used to support learning, not to penalize you.

Am I responsible for errors made by AI?
Yes. You are responsible for:

- Accuracy
- Bias

- Fabricated or incorrect citations
- Tone and appropriateness

Always review and verify AI outputs before submitting work.

Will AI-detection software be used?

AI-detection tools may be used, but they are not used as sole evidence of misconduct. Academic integrity decisions are based on assignment requirements, your disclosure and explanation, academic judgement, and available evidence.

What happens if I misuse AI?

Misuse may include:

- Using AI in a Level 1 (No AI) task
- Using AI beyond what is permitted
- Failing to disclose required AI use
- Submitting work misaligned with assignment conditions

These cases are handled using the offense structure outlined in the syllabus and university policies.

What if I'm unsure whether AI use is allowed?

Ask before submitting.

Requests for clarification are encouraged and will not result in penalty.

What's the key thing to remember?

This course is not trying to catch you using AI.

It asks you to:

- Follow assignment instructions
- Be transparent about AI use
- Ensure your work genuinely represents your learning

If you do that, you are using AI responsibly.

Teaching Future Mathematics Teachers in the Age of AI: A Systematic Review of Preservice Teacher Education Research

Amber Torrance

Katie Waddell

Kyle LaPaglia

Abstract

This systematic literature review examined how course instructors engage preservice mathematics teachers in using artificial intelligence (AI) within instructional activities. Analysis of 12 studies revealed themes including lesson planning, mathematical task design, reflective practice, problem solving, prompting skills, and AI literacy, highlighting the importance of critical evaluation in AI-supported teacher preparation.

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Artificial intelligence (AI) is rapidly transforming education by influencing how teachers design instruction, develop assessments, and support student learning (Celik et al., 2022; Trust et al., 2023). As AI technologies continue to evolve, educators and teacher preparation programs (TPPs) are being challenged to reconsider traditional instructional practices and prepare preservice teachers (PSTs) for AI-supported classrooms. These developments make it increasingly important for TPPs to consider not only whether PSTs engage with AI, but also how they are prepared to use these technologies within their future instructional practice.

The expanding capabilities of AI present opportunities for teacher preparation. AI has the potential to support instructional design, automate educational tasks, and enhance student learning through data-driven technologies (Chen et al., 2020). At the same time, tools such as ChatGPT require critical examination of how AI can support teaching and learning and how future teachers are prepared to evaluate its use (Trust et al., 2023). Accordingly, understanding how teacher educators are engaging PSTs with AI is important for informing how TPPs can respond to the increasing presence of AI in educational practice.

This need is particularly important within mathematics teacher education, where AI presents both instructional opportunities and discipline-specific challenges. AI can enhance mathematics instruction but must be integrated strategically given potential limitations, including inaccurate mathematical computations and limited problem-solving capabilities (Opesemowo & Ndlovu, 2024). Additionally, AI should be used in ways that enhance student learning opportunities without reducing productive struggle (AI for Education & Student Achievement Partners, 2025; National Council of Teachers of Mathematics, 2014). Guided by the PRISMA framework (Page et al., 2021), this systematic literature review examines how course instructors engage mathematics PSTs in using AI to support instructional activities, providing insight into how they are being prepared for AI-supported classrooms.

Background

Existing systematic and narrative reviews have largely focused on specific domains. Zawacki-Richter et al. (2019) conducted a systematic review of AI applications in higher education, identifying trends such as adaptive systems, assessment tools, and student support, but with limited attention to teacher preparation contexts. Similarly, Crompton and Burke's (2023) systematic review of AI use in K–12 settings highlighted applications in writing, feedback, and instructional support, though primarily from a student-use perspective. In contrast, Chassignol et al. (2018) and Chen et al. (2020) offered broader literature reviews of AI in education, with a strong emphasis on STEM and technical applications rather than pedagogical implementation. While these reviews demonstrate the growing interest in AI across educational settings, they remain largely generalized or discipline-focused, with limited attention to how AI is implemented within TPPs. Notably, there is a lack of focused synthesis examining AI use specifically within mathematics education, particularly in preservice teacher coursework.

Technological Pedagogical Content Knowledge (TPACK) provides a useful lens for considering the knowledge PSTs need when integrating AI into mathematics instruction (Celik, 2023). TPACK emphasizes that effective technology integration requires more than technological knowledge alone; teachers must consider the relationships among content knowledge, pedagogical knowledge, and technological knowledge, as well as the intersection of knowledge in instructional practice. Within mathematics teacher education, content knowledge includes the mathematical understanding needed to solve and evaluate problems, pedagogical knowledge includes knowledge of lesson planning and instructional decision-making, and technological knowledge includes understanding how to effectively interact with and use technology. Celik (2023) extended the framework through Intelligent-TPACK, emphasizing AI-specific technological and pedagogical knowledge as well as teachers' capacity to evaluate the ethical implications of AI-supported decisions. This perspective is particularly relevant to mathematics teacher preparation, where PSTs must not only learn how to interact with AI tools but also determine whether AI-generated mathematical content is accurate and whether its use supports appropriate instructional goals.

Existing work has not systematically examined how AI is being integrated into mathematics-related courses

or how PSTs are engaged in using these tools to support instructional activities. Although the studies were synthesized inductively based on patterns in instructional activities, TPACK provides a useful framework for interpreting how these activities engage technological, pedagogical, and mathematical content knowledge. We sought to answer the following research question: *In what ways have course instructors engaged preservice mathematics teachers in using AI to support instructional activities?*

Method

This systematic review utilized three databases commonly used in education research:

The Education Resources Information Center (ERIC), Gale OneFile: Educators Reference, and SAGE Journals. ERIC provides extensive coverage of education-focused, peer-reviewed research, while Gale OneFile and SAGE Journals offer broader interdisciplinary and teacher education literature. Together, these databases supported a comprehensive search of literature related to AI use in preservice teacher education within mathematics contexts.

The search strategy was intentionally broad while targeting studies relevant to the research focus. The same filters were applied across all databases. Only peer-reviewed, full-text, English-language articles published from 2011 to the present were considered. Different keyword combinations were used across databases to align with each platform's search functionality. In ERIC, the search included ("artificial intelligence" OR "ChatGPT") AND ("preservice teacher*" OR "teacher candidate*") AND (mathematics OR math) NOT perception*. In Gale OneFile: Educators Reference, the search combined ("artificial intelligence" OR "ChatGPT") with ("preservice teacher*" OR "teacher education") and terms related to instructional use, including assignment*, "course design," "course redesign," implementation, integration, "instructional strategy," and "learning activity." In SAGE Journals, the search included ("artificial intelligence" OR "ChatGPT" OR "generative AI") AND ("teacher education" OR "preservice teacher" OR "initial teacher education") AND ("mathematics" OR "math education") AND (pedagogy OR curriculum).

The review followed a structured screening process guided by the PRISMA framework

(Page et al., 2021). Initially, 122 records were identified across the three databases: ERIC (n = 19), Gale OneFile: Educators Reference (n = 22), and SAGE Journals (n = 81). After removing two duplicate records, 120 articles remained and were screened at the title level. Title and full-text screening were conducted independently by two reviewers, with discrepancies resolved through consensus. During title screening, 83 records were excluded for not focusing on AI, not involving PSTs, or not being situated within a mathematics context. This resulted in 37 articles being retrieved and assessed for eligibility. Following full-text review, 30 studies were excluded for reasons including not being mathematics-specific (n = 9), not focusing on AI (n = 5), involving in-service teachers rather than PSTs (n = 6), not being empirical studies (n = 4), or not examining AI use within preservice teacher course assignments (n = 6).

This resulted in seven studies from database searches being included in the review.

These 7 studies were then used for citation searching, where reference lists were examined to identify additional relevant literature. This process yielded 12 additional records, six of which were excluded during title screening. The remaining six studies were retrieved, assessed for eligibility, and included in the final sample. In total, 12 studies were included in the review

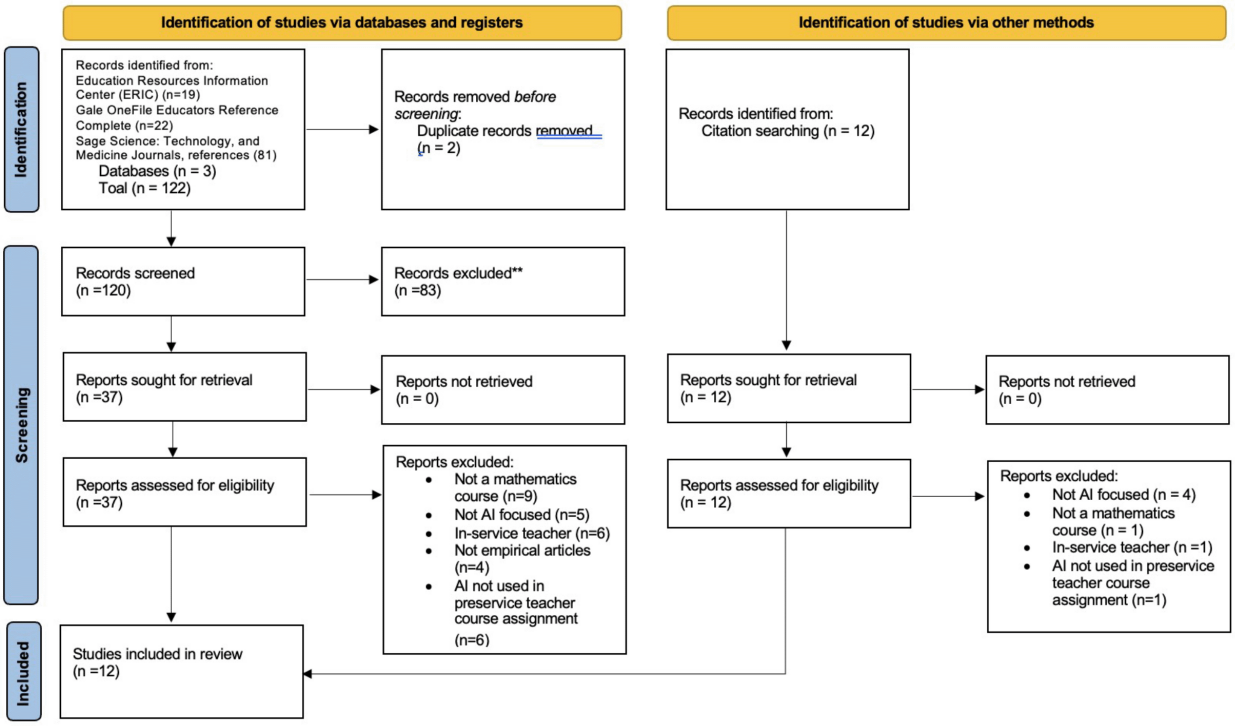
Descriptive information from each study was organized using a structured Excel spreadsheet that included categories such as research questions, study design, participant characteristics, course context, AI use within the course, and overall themes. Following screening, each article was reviewed by two of the three authors to support multiple perspectives during analysis. After data extraction, the reviewers met to identify common patterns across studies. An inductive thematic analysis approach was used to group recurring ideas into broader themes describing how AI was integrated into instructional activities within preservice teacher education (Saldaña, 2021).

Results

This systematic literature review examined the question: I*n what ways have course instructors engaged preservice mathematics teachers in using AI to support*

Figure 1

PRISMA Flow Diagram of Study Selection for AI Use in Preservice Mathematics Teacher Education



Note. Adapted from the PRISMA framework (Page et al., 2021).

instructional activities? A total of 12 studies met the inclusion criteria. The studies represented a range of methodological approaches, including six qualitative studies, two quantitative studies, three mixed-methods studies, and one quasi-experimental study.

Across the studies, course contexts varied. Four studies were situated in mathematics methods-related coursework, where PSTs engaged in designing instruction (Gurl et al., 2025; Pişkin Tunç, 2024; Tapan Broutın, 2024; Yanar & Ergene, 2025). Three studies were conducted in mathematics content-focused contexts, including geometry and advanced mathematics courses (Biton & Segal, 2025; Dilling & Herrmann, 2024; Segal & Biton, 2024). The remaining five studies were situated in broader teacher education or general mathematics education contexts without a clearly defined course structure (Asare & Boateng, 2025; Dinçer, 2026; Filiz & Gür, 2025; Getenet, 2024; Pavlova, 2024).

The grade levels represented across the studies also varied. Two studies focused on elementary or primary mathematics contexts (Filiz & Gür, 2025; Getenet, 2024), two studies focused on middle school mathematics (Pişkin Tunç, 2024; Yanar & Ergene, 2025), and two studies focused on high school or advanced high school mathematics (Biton & Segal, 2025;

Segal & Biton, 2024). One study was situated in a general secondary mathematics context (Gurl et al., 2025), while the remaining studies did not specify a particular grade level and instead focused on general mathematics or teacher education contexts (Asare & Boateng, 2025; Dilling & Herrmann, 2024; Dinçer, 2026; Pavlova, 2024; Tapan Broutın, 2024). Analysis of the included studies resulted in six themes describing how PSTs engaged with AI in instructional activities. Although these themes emerged inductively, they also reflect different dimensions of the knowledge represented within TPACK, including pedagogical, content, and technological knowledge, and the intersections among them.

AI as a Tool for Lesson Planning and Instructional Design

Across multiple studies, AI was used to support lesson planning and instructional design, reflecting pedagogical knowledge integrated with technological

knowledge. PSTs used ChatGPT to generate lesson activities, explanations, assessments, and lesson objectives. Yanar and Ergene (2025) reported that PSTs used ChatGPT across all phases of the 5E instructional model to develop lessons, while Pişkin Tunç (2024) found that AI was used to create instructional content, examples, and assessments. Gurl et al. (2025) reported that PSTs generated lesson objectives using ChatGPT and revised them to align with instructional goals. Similarly, Tapan Broutın (2024) found that PSTs used AI to organize lesson components and improve instructional flow over time. PSTs used AI to make decisions about lesson structure, instructional goals, assessment, and learning activities. AI also supported revision and refinement during lesson planning. Gurl et al. (2025) and Yanar and Ergene (2025) found that PSTs compared their lesson plans with AI-generated outputs and revised their work accordingly. Pişkin Tunç (2024) and Tapan Broutın (2024) similarly highlighted how AI supported refinement of lesson structure and organization. PSTs were expected to determine how AI-generated ideas could be adapted to support instructional purposes rather than simply use the technology to produce content.

AI for Designing Mathematical Tasks and Instructional Content

Several studies demonstrated that AI was used to design mathematical tasks and instructional materials, requiring PSTs to integrate pedagogical, content, and technological knowledge. PSTs used ChatGPT to generate mathematical problems, examples, and explanations for classroom use. Biton and Segal (2025) found that PSTs generated and refined mathematical problems using AI to improve clarity, challenge level, and alignment with learning goals. Similarly, Segal and Biton (2024) reported that AI was used to adapt and extend mathematical tasks to support instructional objectives. Pişkin Tunç (2024) also found that PSTs used AI to create mathematical problems and explain concepts while developing lesson materials. PSTs evaluated both the mathematical quality of AI-generated tasks and their usefulness.

AI was additionally used to evaluate and revise mathematical tasks. Biton and Segal (2025) and Segal and Biton (2024) described how PSTs modified AI-generated problems to improve instructional usefulness. Dinçer (2026) found that AI-supported work demonstrated higher levels of accuracy, but lower levels of originality compared to non-AI-supported work.

AI for Comparison, Revision, and Reflective Practice

AI was frequently used as a tool for comparison, revision, and reflection, demonstrating the importance of drawing on content and pedagogical knowledge to make informed judgments about technologically generated content. PSTs compared their own work with AI-generated outputs and evaluated differences in accuracy, quality, and instructional usefulness. Gurl et al. (2025) found that PSTs compared lesson objectives with ChatGPT-generated objectives and reflected their usefulness. Similarly, Getenet (2024) reported that PSTs compared their own problem-solving strategies with AI-generated solutions.

Evaluation of AI-generated responses was a consistent pattern across studies. Getenet (2024) and Yanar and Ergene (2025) found that PSTs assessed the correctness and usefulness of AI-generated outputs, often identifying responses that were too general or incomplete. Based on these evaluations, PSTs revised lesson plans and instructional materials. Asare and Boateng (2025) also found that ChatGPT supported self-reflection and self-regulated learning.

AI for Mathematical Reasoning and Problem-Solving Engagement

Several studies highlighted AI use in mathematical reasoning and problem-solving, foregrounding the need for strong mathematical content knowledge to evaluate and reason with AI-generated solutions. PSTs used ChatGPT to solve problems, verify solutions, explore alternative strategies, and analyze mathematical reasoning. Pavlova (2024) described how PSTs engaged in dialogue-based interactions with AI to work through mathematical problems and refine reasoning. Similarly, Filiz and Gür (2025) found that PSTs used AI to verify solutions and explore alternative strategies through step-by-step reasoning.

PSTs also analyzed AI-generated mathematical solutions. Getenet (2024) and Dilling and Herrmann (2024) reported that students examined AI-generated responses to better understand mathematical processes. Dilling and Herrmann (2024) specifically found that

PSTs used ChatGPT to generate and analyze mathematical proofs, although many relied on simple prompts requesting direct answers.

Development of Prompting and AI Interaction Skills

Several studies demonstrated that PSTs developed skills related to prompting and AI interaction, an emerging form of technological knowledge needed to effectively use AI. Biton and Segal (2025) and Segal and Biton (2024) found that PSTs practiced writing and refining prompts to improve AI-generated outputs, demonstrating that prompt quality influenced response usefulness and accuracy. PSTs also engaged in iterative dialogue with AI systems. Pavlova (2024) found that students refined questioning strategies over time through repeated interaction with ChatGPT. However, Dilling and Herrmann (2024) observed that many PSTs relied on simple one-step prompts with limited follow-up interaction, demonstrating variability in prompting skills. Therefore, the usefulness of this technological knowledge depends on PSTs' ability to connect their interactions with AI to mathematical and pedagogical knowledge.

Critical Evaluation and AI Literacy

Across studies, PSTs were consistently required to critically evaluate AI-generated content for accuracy, instructional usefulness, and mathematical quality, requiring them to combine their pedagogical, mathematical content, and technological knowledge. Gurl et al. (2025), Getenet (2024), and Yanar and Ergene (2025) found that PSTs evaluated AI-generated lesson materials and mathematical responses, often identifying outputs that were overly general, incomplete, or incorrect. Similarly, Biton and Segal (2025), Segal and Biton (2024), Pişkin Tunç (2024), and Tapan Broutın (2024) demonstrated that AI-generated instructional materials and mathematical tasks required revision and refinement to align with instructional goals.

Several studies also emphasized the role of metacognition, reflection, and intentional engagement when interacting with AI. Filiz and Gür (2025) found that PSTs with higher levels of metacognitive awareness were better able to critically assess AI-generated responses, while Asare and Boateng (2025) reported that AI-supported activities promoted self-regulated learning and reflection. Pavlova (2024) similarly highlighted the importance of identifying and correcting errors through dialogue-based interaction with AI.

Challenges related to overreliance on AI were also identified. Dinçer (2026) found that AI-supported work demonstrated lower levels of originality, while Dilling and Herrmann (2024) observed that many PSTs relied on simple prompts requesting direct answers rather than critically engaging with AI-generated content. Across lesson planning, mathematical task design, and problem-solving activities, studies consistently demonstrated that effective AI use depended on PSTs' ability to critically evaluate, adapt, and refine AI-generated outputs (Biton & Segal, 2025; Filiz & Gür, 2025; Getenet, 2024; Gurl et al., 2025; Pavlova, 2024; Pişkin Tunç, 2024; Segal & Biton, 2024; Tapan Broutın, 2024; Yanar & Ergene, 2025).

Discussion

This systematic review examined how course instructors engaged preservice mathematics teachers in using AI to support instructional activities. Consistent with previous reviews (e.g., Celik et al., 2022; Trust et al., 2023), the reviewed studies indicate that AI is becoming an increasingly important component of mathematics teacher preparation. Collectively, these findings suggest that mathematics teacher educators are moving beyond introducing AI as a standalone technological tool and are instead embedding it within authentic teaching practices. This shift may better prepare PSTs to make informed instructional decisions in classrooms where AI is becoming increasingly common.

Course instructors integrated AI into lesson planning and instructional design activities, including generating lesson ideas (Yanar & Ergene, 2025), planning instructional flow (Tapan Broutın, 2024), and exploring different ways to solve mathematical problems (Pişkin Tunç, 2024). Across these learning activities, PSTs were consistently required to reflect upon, revise, and adapt AI-generated content before submitting their final assignments. Rather than emphasizing AI as a tool for producing lesson materials, these instructional activities positioned AI as a thought partner that supported PSTs' thinking throughout the lesson planning process. Mathematics teacher educators are intentionally designing learning experiences that reinforce teachers' pedagogical and technological knowledge by requiring

PSTs to critically evaluate and refine AI-generated ideas before incorporating them into instructional decisions.

Additionally, course instructors leveraged AI to support mathematical reasoning and problem-solving by engaging PSTs in generating problems, verifying solutions, evaluating proofs, and exploring alternative solution pathways (Dilling & Herrmann, 2024; Filiz & Gür, 2025; Pavlova, 2024; Getenet, 2024; Gurl et al., 2025; Yanar & Ergene, 2025). However, across these studies, PSTs did not consistently identify incorrect AI-generated responses and sometimes accepted initial outputs without sufficient evaluation. Collectively, these findings indicate that AI does not reduce the need for mathematical content knowledge; rather, it may increase its importance. As AI becomes more integrated into mathematics instruction, PSTs must possess sufficient content knowledge to evaluate AI-generated responses, recognize inaccuracies, and determine whether AI-generated content is instructionally appropriate before using it in classroom practice.

Finally, the findings argue for building strong technological knowledge, so PSTs can effectively interact with generative AI tools. Across most studies, it was evident that successful use of AI relied on PSTs' ability to critically evaluate AI-generated output for accuracy and pedagogical strengths and weaknesses (e.g., Getenet, 2024; Gurl et al., 2025; Yanar & Ergene, 2025). Given the range of interactions and prompting strategies, AI literacy is an important competency that PSTs need to develop alongside their content and pedagogical knowledge.

Effective AI integration requires PSTs to understand how, when, and why to use AI to support mathematical learning goals, using their pedagogical, content, and technological knowledge to evaluate the accuracy, instructional value, and ethical implications of AI-generated content (Celik, 2023). Collectively, PSTs should be equipped with content knowledge to determine whether AI-generated solutions and tasks are accurate, pedagogical knowledge to decide whether those outputs support student learning, and technological knowledge to use and refine AI-generated responses. AI integration should be part of a teacher's professional knowledge rather than treated as a separate technology skill.

The value of AI in preservice mathematics teacher education lies not in the technology itself, but in how teacher educators intentionally design learning experiences that promote critical reflection, mathematical reasoning, and professional judgment.

Action Steps for Teacher Educators

- Design AI assignments that require critical evaluation and revision of AI-generated content.
- Embed AI within teaching activities to provide application opportunities for development of integrated technological, pedagogical, and mathematical content knowledge.
- Build AI literacy through explicit opportunities to practice prompting, content evaluation, and instructional decision-making

Limitations of the Review

This systematic literature review has several limitations. Although a structured and systematic search process was employed, it is unlikely that all relevant studies were captured, as the use of specific databases, search terms, filters, and inclusion criteria may have excluded relevant research. Additionally, this review intentionally focused only on mathematics-related preservice teacher education contexts in which AI was used within instructional or course-based activities, excluding studies from other subject areas as well as studies centered solely on perceptions or general AI use outside structured coursework. The small sample size (n = 12), along with the varied course contexts and educational levels represented, allowed us to identify broad patterns of AI integration but did not support context-specific conclusions or broad generalizations across teacher education programs. More large-scale and longitudinal research is needed. Finally, this review focused on identifying patterns in how AI was integrated into instructional activities, not evaluating the effectiveness of these practices. We do not provide evidence regarding impacts on learning outcomes, instructional quality, or long-term preservice teacher development.

Conclusion

Course instructors are integrating AI into preservice mathematics teacher coursework in a variety of ways,

including lesson planning, instructional design, mathematical task development, reflective practice, and support for mathematical reasoning and problem solving. Preparing preservice mathematics teachers for AI-supported classrooms requires integrated development of technological, pedagogical, and content knowledge rather than technological skills alone. As AI continues to evolve, further research is needed to examine the effectiveness of AI use and its influence on PSTs' mathematical knowledge, instructional decision-making, critical use and evaluation of AI-generated content.

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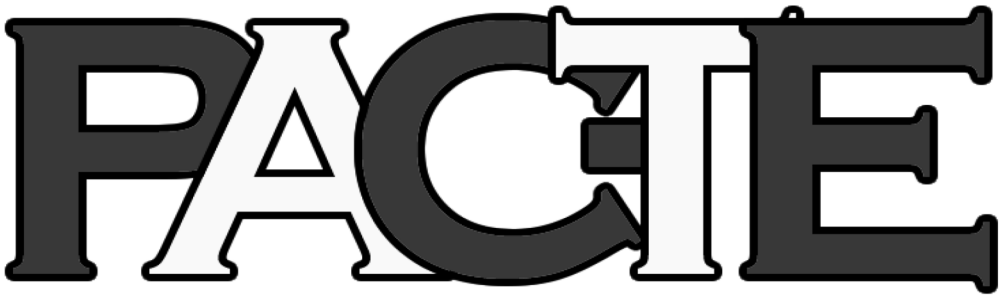
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