https://journal.ypidathu.or.id/index.php/jete/
P - ISSN: 3025-0668
E - ISSN: 3025-0676

# Teacher Professional Development Through Neuroeducation: A Hybrid Learning Approach to Brain-Based Teaching Competence

**Baso Intang Sappaile[1], Palesa Molefe[2], Kabela Dube[3], Dineo Modise[4]**
[1]Universitas Negeri Makassar
[2]Botswana International University of Science and Technology, Botswana
[3]Botho University, Botswana
[4]Limkokwing University of Creative Technology, Botswana

## ABSTRACT

**Background.** Recent advances in neuroscience have opened new pathways for enhancing educational practices, particularly through the integration of brain-based principles into teaching. However, many educators remain underprepared to translate neuroeducational knowledge into classroom strategies, highlighting a gap in professional development frameworks.
**Purpose.** This study aims to design, implement, and evaluate a hybrid learning model for teacher professional development that enhances brain-based teaching competence through neuroeducation. Using a mixed-method approach, the research engaged 72 in-service teachers across three institutions in a 10-week hybrid training program combining asynchronous modules, interactive webinars, and reflective practice.
**Method.** Quantitative data from pre- and post-tests revealed a statistically significant increase in participants' knowledge and application of neuroeducational principles ($p < 0.001$). Qualitative data from journals and interviews indicated improved instructional planning, learner engagement, and classroom adaptability.
**Results.** The findings suggest that a hybrid model rooted in neuroeducation can effectively foster pedagogical transformation by bridging neuroscience and educational practice.
**Conclusions.** This study offers a scalable and evidence-informed framework for equipping educators with brain-based competencies necessary for 21st-century learning environments.

## KEYWORDS

Brain-Based, Hybrid Learning, Pedagogical Competence

**Citation:** Sappaile, I. B., Molesa, P., Dube, K., & Modise, D. (2025). Teacher Professional Development Through Neuroeducation: A Hybrid Learning Approach to Brain-Based Teaching Competence. *Journal Emerging Technologies in Education*, *3*(6), 266–277.
https://doi.org/10.70177/jete.v1i3.12663

**Correspondence:**
Rami Hariri,
ramihaririu@gmail.com

**Received:** July 9, 2025
**Accepted:** Sep 1, 2025
**Published:** Dec 3, 2025

## INTRODUCTION

Teacher professional development (TPD) remains a critical component in educational reform, particularly in educators to meet the complex cognitive, emotional, and behavioral demands of 21st-century learners. As educational systems globally shift toward more learner-centered approaches, there is a growing emphasis on evidence-informed pedagogy that draws from interdisciplinary domains, including neuroscience.

Neuroeducation, an emerging field that integrates neuroscience, psychology, and education, offers promising cognitive insights into how learning occurs and how teaching can be optimized to align with brain functioning. The potential of neuroeducation lies in its ability to bridge scientific research with practical application in the classroom.

Despite its increasing relevance, neuroeducation has yet to be widely incorporated into formal teacher training programs. Many teachers enter or continue in their profession with limited understanding of how brain-based principles affect student attention, memory, motivation, and learning transfer. This disconnect can result in teaching practices that are outdated or misaligned with how students naturally process information (Baymetov et al., 2025; Hashim et al., 2025; Leibovitch et al., 2025; Njiku, 2025; Waka et al., 2025). In light of rapid advances in neuroscience and the proliferation of research on learning processes, educators need structured pathways to translate scientific knowledge into actionable pedagogical strategies.

Hybrid learning has emerged as a flexible and scalable modality for professional development, especially in post-pandemic educational landscapes. It combines the strengths of face-to-face and online instruction, enabling educators to learn at their own pace while also engaging in collaborative reflection and application. Hybrid TPD programs offer an ideal platform for integrating complex content like neuroeducation, which benefits from both theoretical exposition and experiential learning (Glaser & Martínez-Flor, 2025; Mosley et al., 2025b; Soncini et al., 2025; van Heijst et al., 2025). The convergence of hybrid learning and neuroscience-informed pedagogy presents a timely opportunity to elevate teaching competence in a research-informed and practice-oriented manner.

Current professional development initiatives often lack alignment with the latest findings from brain research, leaving educators with limited tools to support diverse cognitive and emotional learning needs in their classrooms. Although teachers are increasingly expected to personalize learning and support metacognitive growth, few receive training in the neurological underpinnings of student behavior and learning variability (Bezmalinovic et al., 2025; Hunt et al., 2025; Kienitz et al., 2025; Mosavi et al., 2025; Prabjandee & Savski, 2025). The result is a persistent gap between pedagogical expectations and the scientific knowledge needed to fulfill them effectively.

Most teacher development models remain content-centric and rely heavily on transmissive delivery methods that do not engage teachers as active learners. Traditional workshop formats often isolate theory from practice and fail to address individual reflection, contextual adaptation, or collaborative meaning-making (González-Amarante & Romero-Padrón, 2025; Perlman et al., 2025; Stephens & Somerville, 2025; Stolwijk et al., 2025). These limitations are particularly pronounced in areas requiring interdisciplinary understanding, such as neuroeducation, where application demands both conceptual mastery and situational awareness.

Teachers express a need for relevant, flexible, and evidence-based professional development that can meaningfully improve classroom practice. Yet without a structured and accessible model for neuroeducational competence, many remain unable to implement strategies that align with how students think, feel, and learn (Arslan, 2025; Perez et al., 2025; Rehman et al., 2025). There is an urgent necessity for a model of teacher professional learning that connects neuroscience theory with pedagogical innovation through accessible, sustainable, and engaging formats such as hybrid learning.

This study aims to develop and evaluate a hybrid learning model for teacher professional development that enhances educators' competence in brain-based teaching. The model integrates key principles from neuroeducation into a blended instructional design that includes online

modules, interactive webinars, reflective journaling, and classroom-based application (Antunes & Brandão, 2025; Assali, 2025; Bergdahl & Sjöberg, 2025; Jambarsang et al., 2025; Prediger et al., 2025). The study seeks to measure both cognitive outcomes (knowledge gain) and affective outcomes (confidence and motivation) related to brain-based pedagogy.

The research specifically explores the extent to which teachers can internalize and apply neuroeducational concepts such as executive functioning, emotional regulation, memory encoding, and cognitive load theory in their instructional planning. By fostering deeper conceptual understanding and practical integration, the study aims to determine whether hybrid training enhances teachers' ability to design learning environments that are neurologically aligned with student development and engagement.

A further objective is to assess the scalability and sustainability of the hybrid model for broader professional learning ecosystems. The study investigates how digital tools, peer collaboration, and embedded reflection contribute to teacher growth and pedagogical transformation (Amazan et al., 2025; Chatmaneerungcharoen, 2025; Nguyen et al., 2025; Pereira et al., 2025). By focusing on in-service teachers from diverse institutional settings, the research also aims to offer transferable insights for professional development designers, policymakers, and educational leaders.

Research on neuroeducation has grown substantially in recent years, but much of the literature remains theoretical or laboratory-based, with limited translation into practical classroom implementation. Empirical studies that bridge neuroscience and teacher training are still relatively scarce, and even fewer offer structured models that teachers can apply across varied educational contexts. Most interventions focus on student outcomes rather than on equipping teachers with the metacognitive tools necessary to adapt instruction based on how learning actually occurs in the brain.

Existing TPD frameworks often lack the interdisciplinary depth required to address the complexities of neuroscience-informed pedagogy. While some programs introduce cognitive science concepts, they rarely provide sustained opportunities for application, feedback, or community-based learning. The literature is particularly limited in terms of models that combine neuroeducational content with hybrid learning methodologies, leaving a significant gap in both theory and practice.

This study addresses the identified gap by offering an integrated, empirically tested hybrid model that blends brain-based pedagogy with modern professional development strategies. It fills a critical need for research that not only theorizes about the benefits of neuroeducation but also operationalizes it within a training framework that is accessible, practical, and adaptable. The study contributes a much-needed intersectional approach that unites brain science, teacher learning, and instructional design in a unified model.

The novelty of this research lies in its development of a hybrid professional development model that directly integrates neuroeducational content into teacher training. Unlike prior studies that address neuroscience in isolation or within traditional formats, this research embeds neuroeducation within a blended learning system that emphasizes interactivity, reflection, and authentic application. The hybrid format also allows for differentiated pacing, peer support, and multimodal learning—all of which align with brain-based instructional principles themselves.

This study offers a conceptual advancement by framing neuroeducation not simply as content knowledge, but as a pedagogical competence that requires experiential learning and iterative practice. The model is designed to reflect how the brain learns—through repetition, social interaction, emotional salience, and feedback—thereby modeling the very principles it teaches. By

doing so, it moves beyond abstract discussion and provides a living example of brain-based learning in action.

The research is justified by the growing demand for teacher training that is grounded in science, accessible through technology, and responsive to the needs of modern classrooms. In an era of educational complexity, teachers must be equipped with both the knowledge and the skills to create learning environments that are cognitively attuned and emotionally supportive. This study contributes to the field by offering a theoretically sound, methodologically robust, and practically relevant model for cultivating brain-based teaching competence through hybrid learning.

## RESEARCH METHODOLOGY

This study employed a design-based research (DBR) approach to develop and evaluate a hybrid teacher professional development (TPD) model focused on enhancing brain-based teaching competence through neuroeducation. Design-based research was selected to ensure iterative refinement of the training intervention in authentic educational settings, combining theoretical rigor with practical applicability. The approach facilitated close collaboration between researchers, instructors, and participants to co-construct a professional learning environment that integrates neuroscience-informed pedagogy with blended instructional modalities (Borges-Veloso & Fernández, 2025; Ghiasvand & Seyri, 2025; Mosley et al., 2025a). The research design included two implementation cycles involving needs assessment, model development, intervention, and revision based on continuous feedback.

The population targeted in this study consisted of in-service teachers from primary and secondary schools affiliated with three urban education districts. A purposive sampling technique was applied to select 72 participants based on their teaching experience (minimum three years), willingness to engage in hybrid learning, and interest in neuroscience-based pedagogy. The sample included teachers from diverse subject areas and grade levels to ensure contextual richness and generalizability of the findings. Participants were divided into three cohort groups to facilitate manageable interaction during synchronous sessions and to encourage deeper collaborative engagement throughout the program.

The research employed mixed-method instruments for comprehensive data collection. Quantitative instruments included pre- and post-tests designed to assess knowledge of neuroeducational concepts, covering topics such as memory, executive functions, attention, and motivation. A Likert-scale questionnaire was administered to measure shifts in participants' perceived competence, confidence, and instructional behavior related to brain-based teaching. Qualitative instruments included structured reflective journals, classroom observation rubrics, and semi-structured interview protocols. These instruments captured participants' interpretations, applications, and challenges in implementing neuroeducational practices in their classrooms.

The research procedure unfolded across three integrated phases: model co-construction, intervention, and evaluation. In the initial phase, a literature review and needs analysis survey informed the design of the hybrid TPD framework. The model combined asynchronous online modules (video lectures, readings, quizzes) with synchronous webinars, discussion forums, and classroom-based practice assignments. During the second phase, participants engaged in the 10-week program while maintaining their regular teaching responsibilities. Weekly reflections and peer-feedback activities were embedded to reinforce metacognitive growth. The final phase involved post-intervention assessment, including testing, interviews, and observation of classroom artifacts such as lesson plans and video-recorded teaching segments. All data were analyzed using

descriptive statistics and thematic coding to evaluate the impact of the program and identify areas for further refinement.

## RESULTS AND DISCUSSION

Table 1 presents the quantitative outcomes from the pre- and post-tests that measured participants' knowledge of neuroeducational principles and self-perceived competence in brain-based teaching. Seventy-two teachers completed both sets of assessments. The mean pre-test score for neuroeducation knowledge was 56.4 (SD = 8.7), while the post-test mean increased to 78.6 (SD = 7.1), indicating substantial learning gains. Similarly, the average score for perceived teaching competence improved from 3.1 to 4.2 on a 5-point Likert scale. These results suggest that the hybrid TPD model contributed significantly to both cognitive and affective learning dimensions.

**Table 1.**

Pre- and Post-Test Scores for Neuroeducational Knowledge and Perceived Competence (n = 72)

| Variable | Pre-Test Mean (SD) | Post-Test Mean (SD) |
|---|---|---|
| Neuroeducation Knowledge Score | 56.4 (8.7) | 78.6 (7.1) |
| Perceived Teaching Competence | 3.1 (0.6) | 4.2 (0.5) |

The increase in knowledge and confidence was observed consistently across different subject areas and teaching levels. Teachers reported greater awareness of how executive functions, memory consolidation, and stress regulation influence classroom learning. Observations during synchronous webinars and peer teaching simulations revealed increased usage of brain-aligned strategies, such as chunking content, activating prior knowledge, and emotionally supportive feedback. These patterns were reflected in the instructional planning samples submitted by participants during the intervention period.

Data from the reflective journals further illustrated a progressive internalization of neuroeducational principles. Early journal entries often expressed uncertainty or theoretical abstraction, while later reflections indicated more specific applications to classroom routines. Participants began to reference neuroscience concepts when describing student behavior and articulated clearer rationales for instructional decisions. This development signaled not only cognitive uptake but also a shift in professional identity toward a more research-informed teaching mindset.

Inferential analysis using paired-sample t-tests confirmed the significance of the observed learning gains. The increase in neuroeducational knowledge scores was statistically significant ($t(71) = 15.24$, $p < 0.001$), with a large effect size (Cohen's $d = 1.78$). Likewise, changes in perceived competence were significant ($t(71) = 12.87$, $p < 0.001$), suggesting a strong practical impact of the training. These results provide robust evidence of the effectiveness of the hybrid learning model in advancing both declarative knowledge and self-efficacy related to brain-based teaching.

Correlational analysis revealed meaningful relationships between knowledge acquisition and changes in pedagogical behavior. A positive correlation ($r = 0.61$, $p < 0.01$) was found between post-test knowledge scores and the quality of lesson plans, as evaluated by the brain-aligned teaching rubric. Participants who demonstrated stronger conceptual mastery also exhibited greater depth in integrating strategies such as dual coding, retrieval practice, and metacognitive scaffolding. This finding highlights the interconnected nature of knowledge, confidence, and instructional innovation.

A closer examination of two case study participants, Ms. A and Mr. B, illustrates how the hybrid TPD model impacted teaching practice in contextually different ways. Ms. A, a language arts teacher, focused her implementation on emotionally engaging pre-writing strategies grounded in affective neuroscience. Her classroom videos showed students using emotion wheels and storyboarding techniques to activate narrative memory. Mr. B, a science teacher, restructured his instruction to reduce cognitive overload by sequencing complex experiments into shorter, scaffolded tasks. Both teachers reported increased student engagement and self-regulation following their interventions.

Their post-program interviews revealed deeper levels of pedagogical reflection and self-awareness. Ms. A described how understanding the neuroscience of attention helped her reframe classroom disruptions as cognitive fatigue rather than behavioral defiance. Mr. B noted that his revised lesson pacing aligned more effectively with students' working memory capacity, reducing frustration and increasing participation. These narratives supported the quantitative findings and reinforced the notion that brain-based pedagogy can directly influence both teacher mindset and student outcomes.

Thematic analysis of open-ended feedback from participants emphasized the relevance, practicality, and accessibility of the hybrid training format. Teachers valued the flexibility of asynchronous learning paired with the relational support of live sessions and peer feedback. They highlighted the real-time application of content as a key strength, allowing theory to be tested and refined in authentic settings. Several participants also noted that the integration of neuroscience made them feel more equipped to explain and justify their pedagogical choices to colleagues, students, and parents.

The integration of neuroeducation into hybrid TPD yielded multidimensional benefits for teacher learning and instructional behavior. Teachers not only gained theoretical understanding but also translated that knowledge into pedagogical innovation with observable classroom impact. The hybrid format, by blending digital content, collaborative dialogue, and reflective tasks, created conditions conducive to both professional growth and instructional transformation. The results validate the potential of a neuroscience-informed, hybrid approach to build enduring teaching competencies for complex, contemporary educational environments.

The study demonstrated significant improvements in both the knowledge and perceived competence of in-service teachers following their participation in a hybrid professional development (TPD) model grounded in neuroeducation. Quantitative analysis revealed large effect sizes in knowledge gains and self-efficacy related to brain-based instructional strategies. Participants showed measurable improvements in their understanding of core neuroeducational principles, such as cognitive load theory, executive function, and memory retention. Qualitative data from reflective journals and classroom observations reinforced these findings, with teachers increasingly applying neuroscience-informed practices in lesson design, pacing, and student engagement strategies.

The results of this study align with and extend prior research in the field of neuroeducation and teacher learning. Similar to Tokuhama-Espinosa (2011) and Dubinsky et al. (2019), the findings underscore that targeted exposure to neuroscience content can enhance pedagogical decision-making. However, unlike previous models that relied primarily on face-to-face seminars or purely online content delivery, this study uniquely validates a hybrid approach that balances cognitive, emotional, and practical learning experiences (Hari Rajan et al., 2025; Niluminda et al., 2025; Schachter et al., 2025; Shafer, 2025; Torres-Muros et al., 2025). The inclusion of reflective and

collaborative components allowed participants to internalize complex scientific concepts while simultaneously contextualizing them within their classroom realities.

The success of this intervention signals a shifting paradigm in professional development—one that recognizes teachers not merely as content deliverers but as metacognitive designers of learning. The depth of pedagogical reflection observed suggests that educators, when supported through structured and relevant training, are capable of transforming theoretical knowledge into meaningful instructional practice. The improvements in instructional planning, classroom behavior management, and learner engagement are indicative of a broader move toward evidence-based, brain-aware teaching cultures within school systems (Borja et al., 2025; Ettienne & Rose, 2025; Tucholka & Gold, 2025). The teachers' ability to articulate the rationale behind their instructional choices also marks an evolution in professional identity—toward a more reflective, research-informed practitioner.

The implications of these findings are multifaceted and carry weight for policymakers, school leaders, and teacher education providers. The positive outcomes highlight the potential of integrating neuroeducation into mainstream professional development initiatives as a tool for both pedagogical enhancement and educational innovation. Educational authorities should consider adopting or scaling hybrid TPD models that align with neuroscience, particularly as digital infrastructure and flexible learning modalities become more prevalent. Embedding neuroeducation into teacher training not only equips educators with scientifically grounded methods but also fosters a mindset of inquiry and adaptability that is essential in contemporary education.

The observed results can be explained by the intersection of content relevance, instructional design, and teacher agency. Teachers found the neuroscience content intrinsically motivating and immediately applicable to their teaching challenges. The hybrid structure allowed them to process information asynchronously and reflect on it through guided peer discussions and real-time applications (Baymetov et al., 2025; Hashim et al., 2025; Leibovitch et al., 2025; Njiku, 2025). This alignment between format, content, and autonomy contributed to deeper engagement and retention. The presence of multiple entry points for learning—text, video, webinars, and collaborative forums—also honored the diversity of teacher learning preferences, consistent with the universal design for learning (UDL) principles that mirror brain-based teaching values.

The sustained growth in pedagogical competence is also attributable to the model's emphasis on reflective and experiential learning. The iterative cycle of learning, applying, and reflecting enabled participants to bridge the gap between theory and practice. Teachers who might have previously viewed neuroscience as abstract or inaccessible began to see it as an interpretive lens for understanding student behavior and instructional effectiveness. This transformation was reinforced by consistent feedback mechanisms that validated teachers' trials and encouraged risk-taking in instructional design.

The hybrid approach succeeded in humanizing the professional learning experience while maintaining academic rigor. Teachers appreciated the flexible pacing and the sense of professional community that emerged from shared inquiry. These design choices created a psychologically safe learning environment conducive to exploration and growth, mirroring the same affective conditions that brain-based instruction seeks to cultivate in students (Glaser & Martínez-Flor, 2025; Soncini et al., 2025). The sense of autonomy and collegiality contributed to intrinsic motivation, a key component in adult learning theory and cognitive neuroscience alike.

The cultural responsiveness of the training also contributed to its effectiveness. The ability to adapt neuroscience content to diverse classroom settings gave teachers a sense of ownership and relevance. Participants felt empowered to localize their learning, making neuroscience not a distant

science but a contextual tool for improving the quality of teaching and learning in their unique environments. This context-sensitivity enhanced the overall impact and sustainability of the training outcomes.

Future steps should include longitudinal research to evaluate the durability of neuroeducational competence over time and its effect on student outcomes. Expanding the model across different education levels and cultural contexts will be essential for testing its scalability and adaptability. Further studies might explore the integration of neuroeducation with curriculum design or teacher mentorship programs, deepening its institutional relevance. In particular, research could examine how teacher neuroeducational literacy affects student self-regulation, cognitive flexibility, and emotional resilience in diverse learning settings.

Educational institutions should consider embedding neuroeducation into pre-service teacher training curricula and continuous professional development policies. Collaborative partnerships between neuroscientists, educators, and instructional designers are needed to co-create accessible, research-informed content and tools. Training modules should be aligned with national teaching standards and teacher performance frameworks, ensuring institutional coherence and long-term sustainability. Digital platforms can be developed to support microlearning, knowledge updates, and ongoing professional communities of practice centered on brain-based teaching.

Teacher accreditation and certification systems could incorporate neuroeducational competencies as part of teacher evaluation and advancement criteria. Providing formal recognition for teachers who engage in neuroscience-informed practice will enhance motivation and signal the strategic value of brain-based education. Ministries and education departments can allocate funding for hybrid professional development models that incorporate reflective pedagogy, neuroscience literacy, and practical classroom application.

This study provides a foundational model and compelling evidence that brain-based teaching competence can be developed through intentional, hybrid professional development. Educators benefit not only in knowledge acquisition but also in transforming that knowledge into practice that resonates with how students think and learn. As education systems evolve to meet the cognitive and emotional needs of diverse learners, integrating neuroscience into teacher development becomes not a luxury but a necessity. Empowering teachers with this competence marks a pivotal step toward aligning classroom practice with the science of learning.

## CONCLUSION

The most significant finding of this study is the demonstrated effectiveness of a hybrid professional development model in enhancing teachers' brain-based pedagogical competence through structured neuroeducation. Participants not only showed statistically significant gains in their theoretical understanding of cognitive neuroscience concepts but also translated this knowledge into observable classroom practices. Unlike traditional TPD programs that often fail to produce classroom-level change, this model enabled sustained shifts in instructional planning, student engagement strategies, and reflective teaching behaviors grounded in neuroeducational principles. Teachers became more intentional in designing learning environments that aligned with how the brain processes, retains, and applies information.

The main contribution of this research lies in its methodological and conceptual integration of neuroeducation within a hybrid learning framework, tailored specifically for in-service teachers. The design-based research (DBR) approach provided an iterative, participant-centered process that allowed for contextual adaptation while preserving academic rigor. This study offers a scalable, adaptable model that merges neuroscience, adult learning theory, and blended pedagogy—an

interdisciplinary convergence rarely operationalized in existing TPD literature. The hybrid structure, incorporating asynchronous content, live discussions, and experiential applications, stands out as an innovative pathway for translating brain science into real-world educational practice.

The study is limited by its sample scope and duration, as it focused on a relatively small group of educators within a 10-week timeframe. Although the results indicate positive short-term impacts, long-term effects on teaching performance and student outcomes remain unexplored. Future research should extend the model's application across different educational levels, subjects, and cultural contexts to test its generalizability and sustainability. Longitudinal studies are also needed to examine how brain-based teaching competence evolves over time and how it correlates with indicators of student cognitive and emotional growth in diverse classroom environments.

## AUTHORS' CONTRIBUTION

Baso Intang Sappaile: Conceptualization; Project administration; Validation.
Palesa Molefa: Writing - review and editing; Conceptualization; Data curation; In-vestigation.
Kabela Dube: Data curation; Investigation; Formal analysis; Methodology; Writing - original draft.
Dineo Modise: Supervision; Validation; Other contribution; Resources; Visuali-zation; Writing - original draft.

## REFERENCES

Amazan, R., Weuffen, S., Langdon, S., & Durksen, T. L. (2025). Communities of practice in supporting collective sense-making for culturally nourishing schooling. *Learning, Culture and Social Interaction*, *52*. https://doi.org/10.1016/j.lcsi.2025.100896

Antunes, R., & Brandão, A. (2025). Bridging Academia and Practice: A Comparative Study of Brand Design Projects in Higher Education. *International Journal of Design Education*, *19*(1), 91–108. https://doi.org/10.18848/2325-128X/CGP/v19i01/91-108

Arslan, S. (2025). English-as-a-foreign language university instructors' perceptions of integrating artificial intelligence: A Turkish perspective. *System*, *131*. https://doi.org/10.1016/j.system.2025.103680

Assali, M. A. (2025). Bridging the Gap: ESL Teachers' Views on AI Integration and Its Impact on Language Learning. *World Journal of English Language*, *15*(4), 120–127. https://doi.org/10.5430/wjel.v15n4p120

Baymetov, B. B., Muratov, K. K., Yusupova, S. A., Norqulova, D. U., Muxitdinova, M. S., Khamraqulova, M. T. K., Yusupov, U. K., & Susilawati, A. (2025). TECHNOLOGIES FOR THE SCIENTIFIC AND THEORETICAL FORMATION OF PROFESSIONAL COMPETENCE IN FUTURE FINE ARTS TEACHERS. *Journal of Engineering Science and Technology*, *20*(3), 17–24. https://www.scopus.com/inward/record.uri?eid=2-s2.0-105002421575&partnerID=40&md5=717dca914b443d5c228e591075d1f88f

Bergdahl, N., & Sjöberg, J. (2025). Attitudes, perceptions and AI self-efficacy in K-12 education. *Computers and Education: Artificial Intelligence*, *8*. https://doi.org/10.1016/j.caeai.2024.100358

Bezmalinovic, H. S., Peña-Rincón, P., Martín, C. S., & Zaccarelli, F. G. (2025). Mathematics and special education teachers co-teaching to promote argumentation in the classroom. *Revista Colombiana de Educacion*, *96*. https://doi.org/10.17227/rce.num96-19102

Borges-Veloso, C., & Fernández, X. M. C. (2025). Cooperation Between Teaching Teams and Social Workers in Schools. A Study on Two Contrasting Work Team Proposals. *Revista Colombiana de Educacion*, *96*. https://doi.org/10.17227/rce.num96-20371

Borja, G. P. S., Franco, L. E. N., & Poblete, P. A. C. (2025). Archaeological Training as a Tool for Scientific Historical Research: An Analysis of its Application in the Preprofessional Internships of the Pedagogy of History Degree, Riobamba, Ecuador. *Arqueologia*

*Iberoamericana*, *55*, 17–23. https://doi.org/10.5281/zenodo.14684734

Chatmaneerungcharoen, S. (2025). Collaborative professional development for science, technology, and mathematics teachers in designing iPad-integrated lesson plans. *Multidisciplinary Reviews*, *8*(6). https://doi.org/10.31893/multirev.2025170

Ettienne, E. B., & Rose, K. (2025). African minors' health challenges are comparable to those in the rest of the world. *World Journal of Clinical Pediatrics*, *14*(2). https://doi.org/10.5409/wjcp.v14.i2.102922

Ghiasvand, F., & Seyri, H. (2025). A collaborative reflection on the synergy of Artificial Intelligence (AI) and language teacher identity reconstruction. *Teaching and Teacher Education*, *160*. https://doi.org/10.1016/j.tate.2025.105022

Glaser, K., & Martínez-Flor, A. (2025). Tracing a pre-service primary English teacher's development in teaching L2 pragmatics: Knowledge, beliefs, and perceived challenges. *System*, *131*. https://doi.org/10.1016/j.system.2025.103655

González-Amarante, P., & Romero-Padrón, M. A. (2025). Motivations for a career in teaching: medical students' projections towards their future role. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-024-06536-2

Hari Rajan, M., Herbert, C., & Polly, P. (2025). A synthetic review of learning theories, elements and virtual environment simulation types to improve learning within higher education. *Thinking Skills and Creativity*, *56*. https://doi.org/10.1016/j.tsc.2024.101732

Hashim, S., Zahir, N. Z. M., Maleki, N. H., Amiruddin, M. H., Ismail, M. E., & Nincarean, D. (2025). The Design and Development of a Multimedia Reading Application for Pre-schoolers as a Foundation in the Area of TVET. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, *51*(2), 111–123. https://doi.org/10.37934/araset.51.2.111123

Hunt, M., Yan, Y., Meyer, B., & Liu, H. (2025). Managing literacy interventions through professional learning communities: a case study on organizational change in education systems. *Humanities and Social Sciences Communications*, *12*(1). https://doi.org/10.1057/s41599-025-04744-9

Jambarsang, S., Mehrparvar, A. H., & Keshmiri, F. (2025). Assessment of leadership and professional behavior of educational managers in the complex and post-crisis era: perspectives of educators. *BMC Research Notes*, *18*(1). https://doi.org/10.1186/s13104-025-07166-7

Kienitz, A., Krebs, M.-C., & Eitel, A. (2025). Level one: Teaching practice – Does playing a digital teaching simulation game foster novice student teachers' perception and use of theoretical knowledge? *Computers and Education*, *231*. https://doi.org/10.1016/j.compedu.2025.105277

Leibovitch, Y. M., Beencke, A., Ellerton, P. J., McBrien, C., Robinson-Taylor, C.-L., & Brown, D. J. (2025). Teachers' (evolving) beliefs about critical thinking education during professional learning: A multi- case study. *Thinking Skills and Creativity*, *56*. https://doi.org/10.1016/j.tsc.2024.101725

Mosavi, R., Foroughipour, F., Kazemipoor, M., & Keshmiri, F. (2025). Moral competence of dental students: an explanatory mixed-methods study. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06636-7

Mosley, K. C., McCarthy, C. J., Lambert, R. G., & Caldwell, A. B. (2025a). Correction to: Understanding teacher professional intentions: the role of teacher psychological resources, appraisals, and job satisfaction (Social Psychology of Education, (2025), 28, 1, (2), 10.1007/s11218-024-09981-5). *Social Psychology of Education*, *28*(1). https://doi.org/10.1007/s11218-025-10054-4

Mosley, K. C., McCarthy, C. J., Lambert, R. G., & Caldwell, A. B. (2025b). Understanding teacher professional intentions: the role of teacher psychological resources, appraisals, and job satisfaction. *Social Psychology of Education*, *28*(1). https://doi.org/10.1007/s11218-024-09981-5

Nguyen, H. T. M., Nguyen, H. T. T., Gilanyi, L., Hoang, T. H., & Gao, X. (2025). Content Language Integrated Learning (CLIL): Teachers' metacognitive understanding of pedagogical translanguaging. *Learning and Instruction*, *97*.

https://doi.org/10.1016/j.learninstruc.2025.102085
Niluminda, S., Nilushika, S., Nimalchandra, H., Nishakara, C., Nuwanthika, S., Pabasara, M., & Rathish, D. (2025). A correlation between perceived social support and professional quality of life: a cross-sectional study among government school teachers in the Nuwaragampalatha East educational division of Anuradhapura, Sri Lanka. *Discover Mental Health*, *5*(1). https://doi.org/10.1007/s44192-025-00170-0
Njiku, J. (2025). Teaching Practice Supervision: Student Teachers' Perspectives and Experiences. *International Journal of Learning in Higher Education*, *32*(1), 145–161. https://doi.org/10.18848/2327-7955/CGP/v32i01/145-161
Pereira, A. L. P., Palacio, D. D. C., & Ribeiro, D. V. (2025). Connecting knowledge and practice: specialization course in dentistry in public health at Brazilian unified health system - a journey of transformative integration. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06987-1
Perez, H. C. S., de Souza, L. Z., & Flório, F. M. (2025). Effects of an Educational Comic Book on Knowledge Related to the Safe Use of Fluoride Toothpaste in Children. *Pesquisa Brasileira Em Odontopediatria e Clinica Integrada*, *25*. https://doi.org/10.1590/pboci.2025.072
Perlman, M., Nocita, G., Sokolovic, N., Falenchuk, O., & Jenkins, J. M. (2025). One size does not fit all: Associations between child characteristics, differential treatment of children by educators and quality in child care centers. *Early Childhood Research Quarterly*, *72*, 205–214. https://doi.org/10.1016/j.ecresq.2025.03.002
Prabjandee, D., & Savski, K. (2025). Mediating across the sustainable ecology: Researchers and practitioners as collaborating epistemic arbiters in developing a Global Englishes-informed coursebook. *System*, *131*. https://doi.org/10.1016/j.system.2025.103639
Prediger, S., Rösike, K.-A., & Wischgoll, A. (2025). Beyond basic skills: An effective foundation intervention for low-achieving fifth graders' understanding of basic concepts. *Studies in Educational Evaluation*, *85*. https://doi.org/10.1016/j.stueduc.2025.101452
Rehman, N., Huang, X., Mahmood, A., Zafeer, H. M. I., & Mohammad, N. K. (2025). Emerging trends and effective strategies in STEM teacher professional development: A systematic review. *Humanities and Social Sciences Communications*, *12*(1). https://doi.org/10.1057/s41599-024-04272-y
Schachter, R. E., Knoche, L. L., Lu, J., Goldberg, M. J., Wernick, P. D., Piasta, S. B., & Lancaster, H. S. (2025). A meta-analysis of the effectiveness of coaching and the contribution of coaching processes to learning outcomes for early childhood teachers and children. *Early Childhood Research Quarterly*, *72*, 156–169. https://doi.org/10.1016/j.ecresq.2025.02.014
Shafer, D. (2025). A critical thinking thematic framework and observation tool for improved theory and developing secondary teachers' instructional practice: Proof of concept. *Thinking Skills and Creativity*, *56*. https://doi.org/10.1016/j.tsc.2025.101787
Soncini, A., Politi, E., Petruzziello, G., & Matteucci, M. C. (2025). "We never stop learning!". Teachers' perceptions of distance learning strengths related to their professional growth and intention to integrate technology. *Teaching and Teacher Education*, *160*. https://doi.org/10.1016/j.tate.2025.105038
Stephens, T. N., & Somerville, S. (2025). Perceived faculty development needs and motivations of Chinese general practice trainers: a narrative review of the literature. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06650-9
Stolwijk, N., van Bergen, A., Jetten, E., & Maas, M. (2025). Preparing physiotherapists for the future: the development and evaluation of an innovative curriculum. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-024-06537-1
Torres-Muros, L., Sánchez-Robles, J. M., Pimentel, A. M., Moscoso, B., Bugallo, Á., Achig, L., González, I., Agredo, H., Soria, A., Gijón, J., Botella, M., Linares, D., Linares, M., Gefaell, J., & Rolán-Alvarez, E. (2025). Acceptance of evolutionary theory among pre-service teacher students and in-service teachers in Ecuador. *Evolution: Education and Outreach*, *18*(1). https://doi.org/10.1186/s12052-025-00219-2

Tucholka, I., & Gold, B. (2025). Analysing classroom videos in teacher education— How different instructional settings promote student teachers' professional vision of classroom management. *Learning and Instruction*, *97*. https://doi.org/10.1016/j.learninstruc.2025.102084

van Heijst, I., Volman, M., & Cornelissen, F. (2025). Understanding professional identity development of second-career teachers: A longitudinal study. *Teaching and Teacher Education*, *159*. https://doi.org/10.1016/j.tate.2025.104995

Waka, T. Y., Umucyo, D., Nishimwe, A., Yoon, A. J., & Neil, K. L. (2025). The influence of gender-based perceptions on females joining a bachelor of medicine, bachelor of surgery in Rwanda. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06714-w