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A STUDY ON NEUROPEDAGOGICAL FOUNDATIONS AND DIDACTIC APPROACHES FOR DEVELOPING EMOTIONAL COMPETENCE IN PRE-SERVICE TEACHERS

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SUMMARY

The growing awareness of emotional competence as a key professional skill for effective teaching stands in stark contrast to the prevailing priorities of cognitive and disciplinary knowledge acquisition in early teacher training programs. The paper explores the neuropedagogical dimensions of emotional competence and outlines didactic practices compatible with the development of this skill among pre-service educators. Based on twenty articles from peer-reviewed sources dated between 2010 and 2026, the conceptual-analytical approach is used to synthesize the findings derived from affective neuroscience, educational neuroscience training research, and emotional intelligence pedagogy. Three converging principles are identified: neural plasticity and affective-social circuitry constitute the neurobiological foundation for change in emotion regulation behaviors through reflective and experiential learning; practicum, narrative, and mindfulness-based training serve as mutually reinforcing methods of instruction; and misconceptions related to brain functioning are widespread among both active and future educators, restricting the effectiveness of neurologically-informed pedagogy. Theoretical constructs relating neuropedagogical fundamentals, pedagogical methods, and five officially recognized emotional competence domains are outlined, in addition to the thematic and chronological synthesis of the literature analyzed. It is found that the best way to ensure emotional competence is achieved through the

combination of theories related to affective neuroscience with prolonged supervised training instead of workshop-based learning in educational institutions. Recommendations about teacher education programs with respect to the order of neuroscience theories to be taught, practical tasks for reflection, and training modules focused on regulation are made. Limitations related to the diversity of measurement tools and self-reporting prevalence are addressed. The article suggests that neuropedagogical literacy embedded into didactic training is a necessary but not sufficient condition to foster emotional competence of future teachers.

Key words: *neuropedagogy, emotional competence, pre-service teachers, didactic approaches, teacher education.*

INTRODUCTION

While teaching is viewed in terms of knowledge of subject content and pedagogy, the reality of being a teacher involves emotional interactions: the management of frustration associated with behavior issues, affective communication in student participation, and demonstration of calmness in the face of evaluation [1][10]. Current teacher training programs have tended to provide minimal coverage for the development of these skills, even though there is ample evidence showing emotionally competent teachers experience less turnover, enjoy better classroom environments, and achieve greater results from students [17]. As defined in the ability model of emotional intelligence, these skills include four abilities – perception of, use of, understanding of, and management of emotions – which make up an acquired and quantifiable skill set rather than an innate quality [2] [18]. Within the wider context of affective and social neuroscience, these abilities can be attributed to neurobiological systems controlling for threat assessment, reward and pleasure, and social engagement respectively, systems which continue to be malleable even in adulthood [3] [19]. This provides a theoretical basis for the legitimacy of teaching such skills as an educational intervention rather than an incidental one [4].

In spite of all this reasoning, however, the implementation of neuroscientific knowledge into classroom practice remains inconsistent. In surveys conducted among practicing and future teachers, a prevalence of neuromyths, or inaccurate and even falsified representations of neurobiology and brain functioning, including learning styles and their supposed immutability, is still reported, which can undermine the implementation and interpretation of neuroscientific pedagogy [5]. It should be noted, that the perpetuation of such myths creates an assumption that neuropedagogical content, if presented without sufficient epistemic context, may strengthen instead of eliminating any erroneous beliefs about the interaction between emotions and cognition in the classroom. This implies that consideration of emotional competence in pre-service teacher preparation should not be restricted to teaching contents alone. Cross-cultural leadership strategies can help leaders manage cultural differences, improve communication, and foster collaboration in global business environments [21].

The group of pre-service teachers is especially important for this research because professional identity, classroom management skills, and emotion regulation techniques develop significantly during practicum periods, when theoretical learning is combined with the uncertainties of live teaching. Programs that postpone developing emotional competence to in-service periods may not take advantage of an appropriate developmental period when reflective and experiential training is most effective. On the other hand, practical limitations in terms of crowded curriculums, lack of practicum supervision capacity, and absence of local tests make it difficult to incorporate neuro-pedagogical knowledge in initial teacher education programs, especially in those countries where training standards are still being established. Emotional intelligence plays a significant role in managing conflicts, supporting effective negotiation, and improving interpersonal relationships in high-pressure environments.

The applicability of this research is relevant to the situations when countries are in the process of changing their standards for teacher preparation, when the curricula are moving from a disciplinary focus to that of professionalism. In such cases, emotional competence is often referred to as one of the competencies which graduates should have but which are not implemented through any particular didactic strategies or assessment criteria. The explanation of the neuro-pedagogical background of emotional competence development as well as the list of didactic techniques will be helpful for developing methodologically based modules as part of existing courses in pedagogy or psychology.

In this context, the current study seeks to achieve the following three interrelated goals. First, it attempts to highlight the neurobiological and psychological premises supporting the possibility of developing emotional competence through teacher education. Second, it identifies the main didactical tools used in the literature to achieve this goal, which include experiential and simulation-based learning, reflection and narrative pedagogy, as well as mindfulness- or regulation-based training. Third, it offers a holistic framework for integrating the neuropedagogical premises, didactical methods, and the five domains of emotional competence, which are self-awareness, self-regulation, social awareness, relationship skills, and responsible decision-making.

Structure of the Paper: Section 1 provides an overview of the background of the research, the problems, and its aims. Section 2 provides an overview of the literature relevant to neuropedagogical theory, emotional intelligence models, neuroscience literacy, and training strategies. Section 3 provides the conceptual-analytical methodology, sources used for the analysis, and the themes analyzed. Section 4 provides the results, discussing theory-practice consistency, didactic strategies, and the limitations of the research. Section 5 is the conclusion.

LITERATURE REVIEW

Neuropedagogical Foundations of Emotion and Learning

According to affective and social neuroscience, emotions are an integral part of the processes of attention, memory consolidation, and decision-making, rather than some disturbance to rational thinking [3] [20]. The concept of "teaching brain" expands this view to the brain processes of teachers, arguing that the ability of a teacher to perceive and regulate emotions in real time is a distinct neuro-cognitive skill, unrelated to the content of knowledge [8]. Although hyperscanning and brain-to-brain coupling studies are still at their infancy, there are indications that the level of teacher-student interaction may be mirrored by neurobiological coupling, thus confirming the neurobiological dimension of classroom environment [8]. In summary, the results commonly observed from editorial syntheses of the educational neuroscience literature include: the negative effects of stress hormones on learning due to inadequate emotional regulation; the consolidation of emotionally salient information in long-term memory; and the transformation of self-regulatory neural circuits via experience-dependent plasticity due to repeated exposure to emotionally laden experiences [15]. These findings provide the biological basis for the inclusion of emotional competence in pedagogical preparation rather than being an ancillary health activity.

Theoretical Models of Emotional Intelligence and Emotional Competence

Ability theory of EI is one that identifies four skills that are hierarchical, i.e. perception of emotions, utilization of emotions to promote thinking, comprehension of emotions, and management of emotions for personal and interpersonal gain, all of which are considered measurable on performance-based tests rather than self-report tests [2]. Reviews of the larger body of literature indicate that emotional intelligence overlaps with but is different from personality and general cognitive ability, which has practical value in teacher preparation as it indicates that the emotional competence is something that can be acquired as a result of training [22]. In addition, similar to the ability theory tradition, the construct of emotional competence has been assessed using self-report measures such as Profile of Emotional Competence that distinguishes between the processes of identifying, understanding, expressing, regulating, and utilizing emotions [6]. Specifically in relation to the field of teaching, tools for situational judgement have been designed to measure profession-specific knowledge about emotion regulation and relationship management strategies, thus shifting measurement from general self-report to scenario-based judgement and coming closer to reality faced by teachers in classrooms [7]. Coexistence of all these three traditions ability-focused, trait-focused, and profession-specific points to the fact that no tool is able to fully represent the construct, which has an impact on evaluation of didactic interventions.

Neuroscience Literacy and Misconceptions Among Teachers

Surveys of practicing teachers have found that, on average, around half of the respondents hold myths about brain function, with especially high levels of endorsement of commercialized brain claims unsupported by empirical research [5]. Similar findings were obtained in surveys of prospective science teachers, whose neuroscientific literacy tests have revealed persistent misunderstandings of the biological processes underlying learning and memory, as well as beliefs in debunked constructs [9]. Notably, general knowledge about the brain does not prevent people from believing in neuromyths, thus indicating that mere exposure to neuroscience is not a sufficient measure of protection against neuromyths; it may be important how neuroscience content is delivered, whether there is a discussion of neuromyths and source evaluation practices included. For programs aiming at inclusion of neuropedagogical content in the curriculum of prospective teachers, these findings indicate that brain-based marketing myths should be approached critically, and that source-evaluation skills must be developed together with the delivery of the neuroscientific content.

Didactic and Training Approaches for Emotional-Competence Development

There is empirical evidence that indicates that the effectiveness of the training on emotional and social competence is best demonstrated in the context of school-based interventions among children and adolescents. Meta-analytical research on universally conducted, school-based programs revealed improvements in the participants' social-emotional abilities and attitudes and academic results in comparison to those who had no training [1]. Concerning the applicability of this approach to teacher training, there is evidence that demonstrates the positive effect of the training program based on the principles of educational neuroscience on prospective teachers' pedagogical content knowledge and, to some degree, professional self-efficacy, while the impact on the well-being variables was less evident [23]. The evaluation of teacher-training programs developed within the framework of neuroeducation revealed that the students benefited from social, emotional, and empathic competencies training that lasted several years [11]. The meta-analytic findings on emotional intelligence training in general show that there is a moderate impact on the emotional skills of trainees from the structured intervention, with more significant impact achieved by psychoeducational approach coupled with guidance as compared to the lecture-only one [12]. Experimental assessments of emotional development programs aimed at secondary-level teachers find a positive impact on different sub-competencies after semester-long interventions [13]. From the perspective of evidence synthesis, review protocols for universal school-based social and emotional programs indicate the key competency areas - self-awareness, awareness of others, emotion control, and self-care - that have been identified in the international literature and match the teacher competence frameworks quite well [14]. Lastly, approaches focused on the regulation of emotions such as structured mindfulness-based training have proved to be effective in reducing the stress levels and enhancing emotion regulation and self-compassion among teachers in the randomized designs [16]. Together, the three groups of didactic strategies described above fall into the following three major categories: simulation- and experience-based learning, which allows rehearsing difficult emotionally loaded situations without any real danger; reflective or narrative teaching, which involves reflection on the classroom events; and mindfulness- or regulation-based training, which works directly with the neurophysiological base of emotional reactions. These three major categories are placed within the broader neuropsychological framework described above (see figure 1).

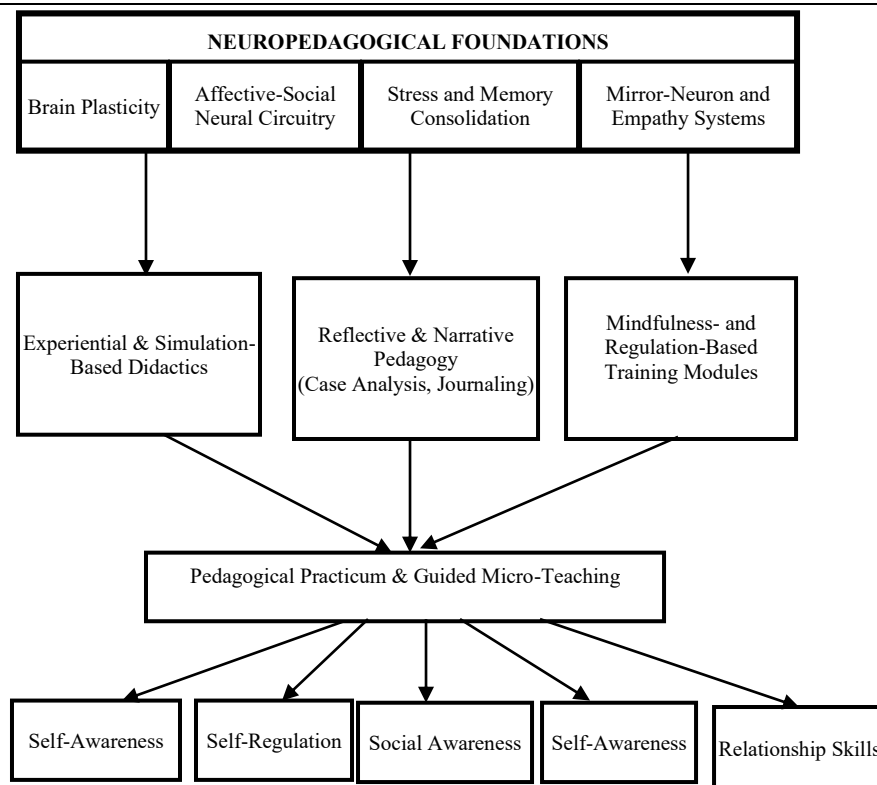


Figure 1. Conceptual framework linking neuropedagogical foundations, didactic approaches, and the five emotional-competence domains addressed in pre-service teacher education

METHODOLOGY

Conceptual-Analytical Design

The investigation adopts a conceptual and analytical framework that is suitable for conducting a synthesis of literature in a developing discipline where methodological and population differences are too many to enable meta-analysis. Unlike the experimental papers that present primary data, this study builds on an explanatory framework in which converging findings from neuroscience, psychology of education, and teacher education literature are sorted according to their function in pre-service teacher education, either as theoretical base, test, training or outcome.

Source Identification and Eligibility

The candidate sources were found via systematic search in the indexed databases employing the keywords on neuroeducation, emotional intelligence, emotional competence, teacher education, and pre-service teachers. The sources to be included had to meet such criteria as the peer-review status, publishing period between 2010 and 2025, type of source (an article, editorial or systematic review protocol), and subject matter (emotional competence from neurobiological or didactic perspectives). The sources focusing solely on clinical, occupational, or non-educational settings were not included. The sources published before 2010 or without Digital Object Identifier were also excluded. Figure 2 and the associated PRISMA metrics provide an overview of the seven steps involved, including initial yield (48 citations), de-duplication (12 citations), full text screening, and inclusion of 20 citations.

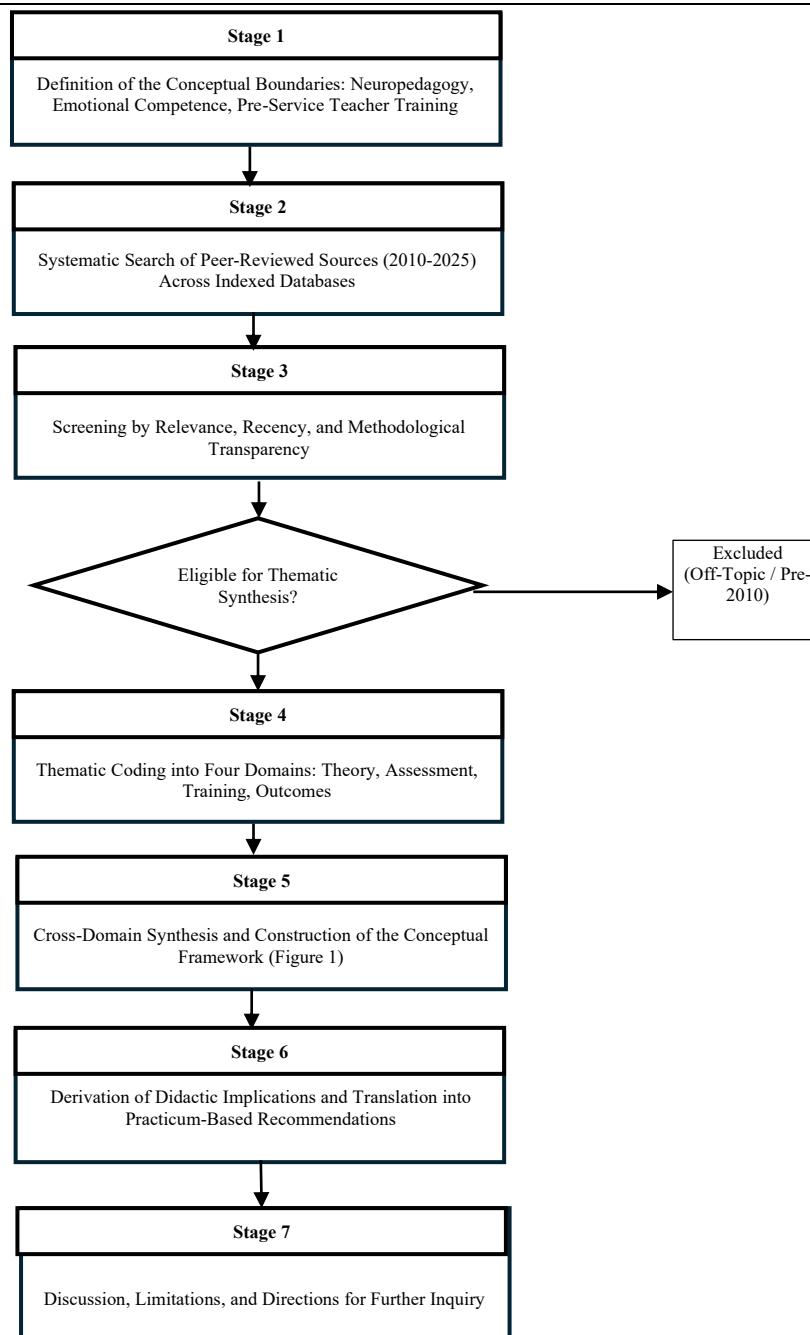


Figure 2. Seven-stage methodological flow for source identification, screening, thematic coding, and synthesis

Thematic Coding and Corpus Characteristics

Thematic categories for coding eligible sources according to their main contribution included neuropsychology theories, neuroscience literacy, neuro-myths about the brain, neuroscience teacher training, models of emotional intelligence, tests measuring emotional competence, effectiveness of emotion/emotion-intelligence training, and social-emotional learning programs in schools. The distribution of the themes according to the new corpus that consists of 20 sources analyzed is presented in figure 3 below. The first point is the domination of neuropedagogical theories among all the others.

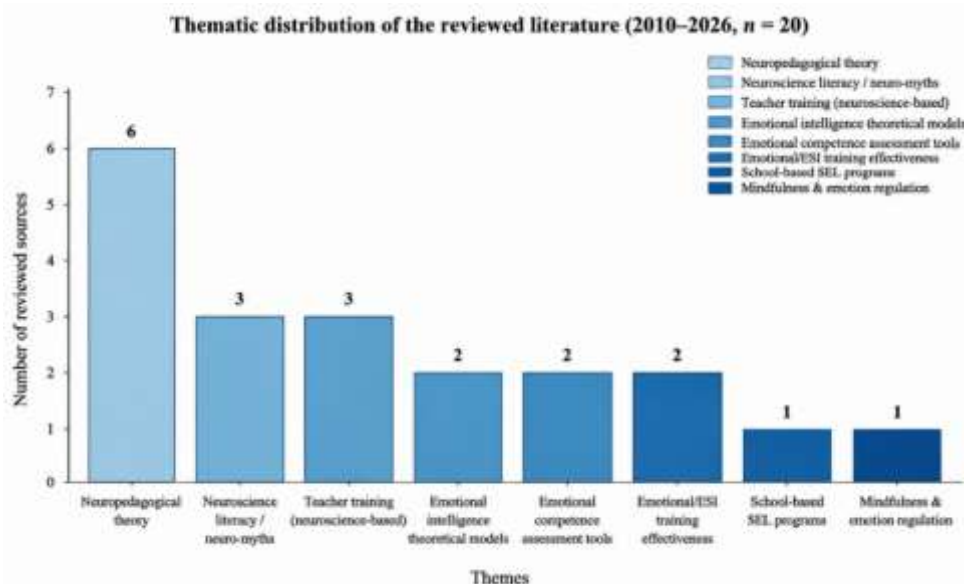


Figure 3. Thematic distribution of the reviewed literature (n = 20)

In figure 4, the chronological distribution of the corpus is shown; a clear trend in the increase in the number of publications on the topic since 2016 is evident, which is in line with the overall growth of educational neuroscience studies observed over the past decade. The chronological distribution influenced the choice to use mostly recent references in the didactic guidelines provided in the next part.



Figure 4. Publication-year trend and cumulative growth of the reviewed literature, 2010–2025

FINDINGS AND DISCUSSION

Convergence Between Neuropedagogical Theory and Didactic Practice

The reviewed body of literature reaches consensus on the claim that emotional competence is not an inherent feature nor an accident, but is rather a learnable skill dependent on the observable plasticity of the brain [3]. Such convergence leads to one clear didactic inference: those learning modules that teach future educators the neurobiological underpinnings of emotions without giving them the chance to practice this knowledge will not result in behavioral changes, as such changes require repeated activation of plasticity mechanisms, which happen when an activity is emotionally charged [15]. It was found that learning modules consisting of neuroscience content as well as task completion showed higher results

than those which provided only information through lectures, which is consistent with research on emotional intelligence training, showing that modules combining psychoeducation with experiential tasks were more effective than the informational modules. The consistency of the theoretical framework with didactic conclusions allows us to infer the appropriateness of the sequence shown in figure 1.

Comparative Alignment of Didactic Approaches with Emotional-Competence Domains

Comparing the three didactic families to the five areas of emotional competence, one sees that there is differentiation in terms of applicability and not homogeneity. Reflective and narrative teaching methodology, which is based on reflective consideration of classroom events, is ideologically closer to self-awareness and responsible decision-making, as these areas imply the need for reflective analysis of one's own emotions and thoughts. On the other hand, experiential and simulation teaching approaches provide a more practical experience of interpersonal skills and thus are more suitable for social awareness and relationship skills, as these areas require real-time analysis and actions, and not reflective ones. Mindfulness and regulation-based training occupy another niche – self-regulation, where the aim is the physiological basis of emotional reactions, as they have been shown to diminish teachers' stress and enhance their emotional regulation [16]. Figure 5 demonstrates this idea of differentiated alignment through its depiction of how each didactic family is not equally strong in covering the five domains. Hence, a program on emotional competence training would benefit much more by combining the three methods rather than choosing among them. This observation is consistent with findings showing that longer periods of training, involving a number of modalities, are more successful than shorter periods.

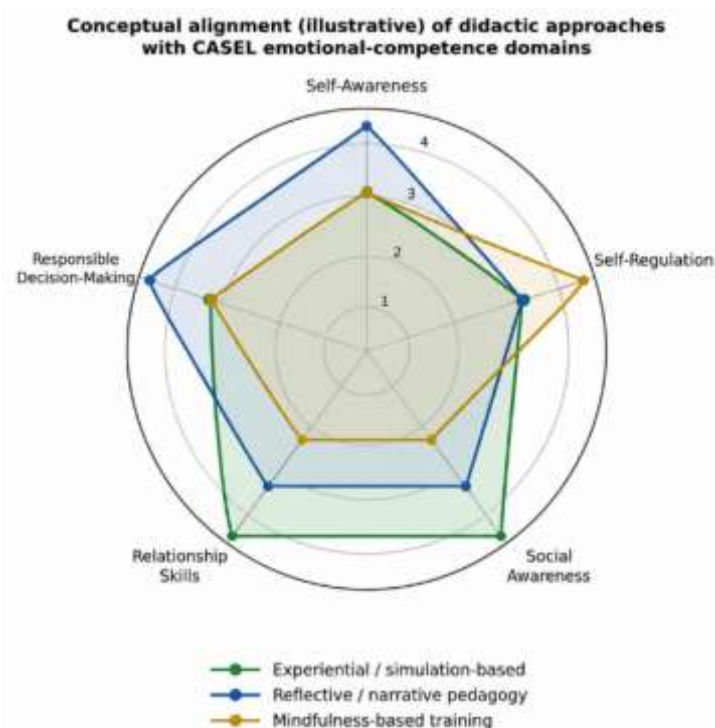


Figure 5. Conceptual, illustrative alignment of the three didactic families with the five CASEL-aligned emotional-competence domains

Constraints and Unresolved Tensions

There are several factors that limit the validity of these findings. The first is that the instruments employed for the evaluation of emotional competence in the literature review are quite different in their theoretical assumptions. Thus, it includes not only ability-performance tests but also trait self-reports and profession-specific situational judgment tests. The second limitation stems from the widespread presence of neuromyths among both teachers-in-training and teachers, suggesting that neuropedagogical materials could be reinforcing the misconceptions about how the brain works without critical appraisal.

Third, the vast majority of the studies analyzed provide information on short- to medium-term results and hence raise a question about the sustainability of gains in emotional competence after formal training is over and practice in the classroom is independent. Fourth, the literature on systematic reviews at the level of school-based programs, which is very comprehensive in regard to students, is less abundant in terms of pre-service teachers, thus preventing generalization of findings from student-oriented meta-analysis for adult professional learners. These limitations do not negate the fact of agreement but mean that the framework proposed is a synthesis of the existing knowledge rather than a fully empirically validated instructional approach.

CONCLUSION

The present study has provided a critical overview of the neurobiological and psychological basis for viewing emotional competence as a skill that can be developed as a result of pre-service teacher training and has summarized the main didactic methodologies associated with this skill development. There are three main conclusions drawn from the analysis presented in this study that allow formulating the proposed framework. First, emotional competence is based on specific neural circuits that retain sensitivity to structured experience even in adulthood, thus providing a good biological justification for including this skill in the curriculum for teacher preparation rather than regarding it as just an individual characteristic. Second, didactic methodologies can be classified into three major groups: experiential and simulation-based, reflective and narrative, and mindfulness-based – each of which is more suitable for developing a certain aspect of emotional competence than others. Misconceptions regarding brain function held by both teaching professionals and those who hope to become teachers represent an ongoing limitation that makes the case for the need to integrate critical appraisal skills along with knowledge of neuroscience. As for programs of teacher education that are currently updating their professional competencies criteria, the study implies certain recommendations, such as the order of presentation of neuroscientific material before practical exercises, provision of adequate training time for emotional competencies modules (rather than one-session courses), and selection of relevant testing procedures for the particular skill domain. Further research could profitably be done in the form of longitudinal studies able to follow the progress of emotional competencies development from training period to early career experience, in terms of cross-cultural validation of the training effects in other parts of the world different from those covered by the current review corpus, and in terms of the interaction between neuroscience literacy training and the existing practicum supervision system of teacher education programs.

REFERENCES

- [1] Durlak JA, Weissberg RP, Dymnicki AB, Taylor RD, Schellinger KB. The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child development*. 2011 Jan;82(1):405-32. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>
- [2] Mayer JD, Caruso DR, Salovey P. The ability model of emotional intelligence: Principles and updates. *Emotion review*. 2016 Oct;8(4):290-300. <https://doi.org/10.1177/1754073916639667>
- [3] Immordino-Yang MH, Gotlieb R. Embodied brains, social minds, cultural meaning: Integrating neuroscientific and educational research on social-affective development. *American Educational Research Journal*. 2017 Apr;54(1_suppl):344S-67S. <https://doi.org/10.3102/0002831216669780>
- [4] García J, Fernández L. AI-Driven Educational Transformation Framework for Enhancing Learning Equity and Accessibility. *International Academic Journal of Social Sciences*. 2026;13(3):30-44.
- [5] Dekker S, Lee NC, Howard-Jones P, Jolles J. Neuromyths in education: Prevalence and predictors of misconceptions among teachers. *Frontiers in psychology*. 2012 Oct 18;3:429. <https://doi.org/10.3389/fpsyg.2012.00429>
- [6] Brasseur S, Grégoire J, Bourdu R, Mikolajczak M. The profile of emotional competence (PEC): Development and validation of a self-reported measure that fits dimensions of emotional competence theory. *PloS one*. 2013 May 6;8(5):e62635. <https://doi.org/10.1371/journal.pone.0062635>
- [7] Aldrup K, Carstensen B, Köller MM, Klusmann U. Measuring teachers' social-emotional competence: development and validation of a situational judgment test. *Frontiers in psychology*. 2020 May 29;11:892. <https://doi.org/10.3389/fpsyg.2020.00892>
- [8] Gola G, Angioletti L, Cassioli F, Balconi M. The teaching brain: Beyond the science of teaching and educational neuroscience. *Frontiers in psychology*. 2022 Mar 8;13:823832. <https://doi.org/10.3389/fpsyg.2022.823832>

- [9] Grospietsch F, Mayer J. Pre-service science teachers' neuroscience literacy: Neuromyths and a professional understanding of learning and memory. *Frontiers in human neuroscience*. 2019 Feb 14;13:20. <https://doi.org/10.3389/fnhum.2019.00020>
- [10] Khan R, Sujatha S. Emotional Contagion and Its Role in Shaping Group Norms and Decision-Making in Workplaces. *International Academic Journal of Organizational Behavior and Human Resource Management*. 2025;12(2):1-6. <https://doi.org/10.71086/IAJOBHRM/V12I2/IAJOBHRM1202>
- [11] Caballero M, Llorent VJ. The effects of a teacher training program on neuroeducation in improving reading, mathematical, social, emotional and moral competencies of secondary school students. A two-year quasi-experimental study. *Revista de Psicodidáctica (English Ed.)*. 2022 Jul 1;27(2):158-67. <https://doi.org/10.1016/j.psicoe.2022.04.002>
- [12] Hodzic S, Scharfen J, Ripoll P, Holling H, Zenasni F. How efficient are emotional intelligence trainings: A meta-analysis. *Emotion Review*. 2018 Apr;10(2):138-48. <https://doi.org/10.1177/1754073917708613>
- [13] Fincias PT, Sánchez EM, Conde MJ. Experimental evaluation of emotional development programmes for teachers in Secondary Education. *Anales de psicología*. 2018;34(1):68-76. <https://doi.org/10.6018/analesps.34.1.273451>
- [14] Connolly P, Miller S, Hanratty J, Roberts J, Sloan S. Universal school-based programmes for improving social and emotional outcomes in children aged 3-11 years a systematic review and meta-analysis (protocol). *Campbell Systematic Reviews*. 2018 May 10;14(1):1-39. <https://doi.org/10.1002/CL2.210>
- [15] Uden L, Ching GS. Enhanced learning and teaching via neuroscience. *Frontiers in Psychology*. 2023 Oct 31;14:1305618. <https://doi.org/10.3389/fpsyg.2023.1305618>
- [16] Lensen JH, Stoltz SE, Kleinjan M, Kraiss JT, Scholte RH, Speckens AE. Mindfulness-based stress reduction for elementary school teachers: a randomized controlled trial. In *Frontiers in Education* 2024 Apr 9 (Vol. 9, p. 1385375). Frontiers Media SA. <https://doi.org/10.3389/educ.2024.1385375>
- [17] Vettriselvan R, Rajesh D, Subhashini S, Gajalakshmi K, Sakthivel R. Developing and applying PCK in diverse subjects: Best practices for mathematics, science, social sciences, and language arts. In *Current trends and best practices of pedagogical content knowledge (PCK) 2025* (pp. 1-30). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3693-0655-0.ch001>
- [18] Gavilán-Martín D, Merma-Molina G, Urrea-Solano M. The impact of neuroeducation on teacher training programs: Reimagining gender in education. *International Journal of Instruction*. 2026 Jan 1;19(1):41-64. <https://doi.org/10.29333/iji.2026.1913a>
- [19] Alam, A. (2026). Bridging Brain Science and Neural Pathways to Pedagogical Possibilities and Classroom Practice: Neuropedagogical Strategies for Effective Learning. In *Cutting-Edge Strategies and Applications of Neuropedagogy* (pp. 371-408). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-3581-0.ch013>
- [20] Tsybulsky D, Gatenio-Kalush M, Abu Ganem M, Grobgeld E. Experiences of preservice teachers exposed to project-based learning. *European Journal of Teacher Education*. 2020 May 26;43(3):368-83. <https://doi.org/10.1080/02619768.2019.1711052>
- [21] Ashour M, Abdullah MM. Strategic Approaches to Managing Cross-Cultural Leadership in Global Business Environments. *Global Perspectives in Management*. 2026 Mar 30;4(1):63-74. <https://doi.org/10.66027/GPIM/V4I1/GPM26106>
- [22] Fernández-Berrocal P, Checa P. Emotional intelligence and cognitive abilities. *Frontiers in psychology*. 2016 Jun 23;7:955. <https://doi.org/10.3389/fpsyg.2016.00955>
- [23] Cui Y, Zhang H. Educational neuroscience training for teachers' technological pedagogical content knowledge construction. *Frontiers in psychology*. 2021 Dec 24;12:792723. <https://doi.org/10.3389/fpsyg.2021.792723>