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Mitigation of psychosocial risk in second language learning through innovative pedagogies: A systematic review

Mitigación del riesgo psicosocial en el aprendizaje de segundas lenguas mediante pedagogías innovadoras: una revisión sistemática

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SUMMARY

Introduction: *Second language learning has evolved towards a holistic view in which affective and neurophysiological dimensions are critical. Conditions such as stress inhibit cognitive processes, requiring new teaching approaches.*
Objective: *To analyse emerging elements related to innovative pedagogies, the physiology of emotions, and psychological well-being in second language teaching.*
Methods: *A systematic review of thematic analysis was conducted using the PRISMA methodology in the Scopus database, covering the period 2023–2025. Emerging elements were defined and operationalised as the functional interaction between teaching strategies and student health responses. Inclusion criteria were applied to open-access articles from Colombia, yielding a thematic synthesis of 26 publications after screening.*
Results: *Quantitative studies predominated (62 %). Five emerging categories were identified, highlighting 'performance and mental health dissonance' and 'technological mediation and immersive teaching methods. It became evident that academic success often comes at the expense of students' physiological stability.*
Discussion: *Traditional models prioritize linguistic competence over mental health. A shift is needed from global standardization to more contextualized pedagogies.*
Conclusions: *There is an urgent need to implement neuroeducationally sustainable environments that integrate emotional self-regulation and well-being for deep learning.*

Keywords: *Mental health, psychological well-being, neuroeducation, innovative teaching methods, second language.*

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RESUMEN

Introducción: *El aprendizaje de una segunda lengua ha evolucionado hacia una visión holística en la que las dimensiones afectivas y neurofisiológicas resultan críticas. Estados como el estrés inhiben los procesos cognitivos, lo que exige nuevos enfoques didácticos.*
Objetivo: *Analizar los elementos emergentes relacionados con las pedagogías innovadoras, la fisiología de las emociones y el bienestar psicológico en la enseñanza de una segunda lengua.*
Métodos: *Se realizó una revisión sistemática de análisis temático, según la metodología PRISMA, en la base de datos Scopus, cubriendo el periodo 2023-2025. Se definieron y operacionalizaron los "elementos emergentes" como la interacción funcional entre las estrategias didácticas y la respuesta de salud del estudiante. Se aplicaron criterios de inclusión para artículos de acceso abierto en Colombia, lo que, tras el cribado, dio lugar a una síntesis temática de 26 publicaciones.*
Resultados: *Predominaron los estudios de corte cuantitativo (62 %). Se identificaron cinco categorías emergentes, entre las que destacan la "disonancia entre rendimiento y salud mental" y la "mediación tecnológica y didáctica inmersiva". Se hizo evidente que el éxito académico suele ocurrir a expensas de la estabilidad fisiológica del estudiante.*
Discusión: *Los modelos tradicionales priorizan la competencia lingüística por encima de la salud mental. Se requiere pasar de la estandarización global a pedagogías más contextualizadas.*
Conclusiones: *Es urgente implementar entornos neuroeducativos sostenibles que integren la autorregulación emocional y el bienestar para un aprendizaje profundo.*

Palabras clave: *Salud mental, bienestar psicológico, neuroeducación, pedagogías innovadoras, segunda lengua.*

INTRODUCTION

In second language learning and clinical training, the period between 2023 and 2025 has marked a turning point, with the affective and neurophysiological dimensions of second language acquisition (L2) becoming the cornerstones for improvement. The literature indicates that language learning is not merely cognitive or measurable; rather, it is intertwined with students' emotional and physical experiences and functions as a psychosocial stressor that can trigger maladaptive physiological responses (1,2).

It has been shown that states such as linguistic anxiety and academic distress operate as physiological barriers, causing autonomic (dysautonomia) and neuroendocrine dysregulation that inhibit higher cognitive processes, thus blocking the ability to retain and communicate fluently in the language (3). This has prompted a shift from traditional approaches that focus solely on grammatical or communicative competence to a more holistic perspective that prioritises the psychological well-being and emotional health of the student without compromising academic success (4,5). In response to this health issue in the classroom, innovative teaching methods, such as immersive reality and active learning, have emerged and must be evaluated for their effectiveness and their capacity to regulate physiological responses to stress. The integration of technologies aims to create neuroprotective environments that promote emotional regulation through biofeedback mechanisms, thereby reducing cognitive load and inducing positive emotions to facilitate the desired neuroplasticity and physiological adaptation to the cognitive demands of the new language (7).

From a conceptual perspective, the "physiology of emotions" in the educational context refers to the biological responses and neural activity that influence the affective experience of learning. Recent research has begun to explore how the recognition of emotions through physiological metrics such as brain activity (EEG) and other biometric markers can be integrated into learning analytics systems to personalise teaching and optimise performance (7). On the other hand, "innovative pedagogies" focused on well-being encompass approaches such as Active Learning Pedagogy (ALP), which transforms the physical and methodological space to reduce student passivity and isolation, factors that correlate with school failure (8). Likewise, the use of digital tools, such as blogging and Information and Communication Technologies (ICT), has been reframed not as ends in themselves but as mediators of the development of emotional intelligence and group cohesion (6).

Thus, the literature found identifies an indissoluble triad between emotions, the body and second language acquisition, where theories such as 'broaden-and-build' suggest that positive emotions (enjoyment, flow, gratitude)

broaden the student's repertoire of thought and action, facilitating neuroplasticity and linguistic resilience in the face of the anxiety traditionally associated with language learning (1).

The need to conduct this systematic review at present responds to the urgency of scientifically validating practices that, although popular, require robust empirical support for their mechanisms of action; simply addressing "motivation" as an abstract concept is insufficient. It is necessary to understand how the satisfaction of basic psychological needs (autonomy, competence, and relatedness) directly influences emotional regulation and, consequently, the consolidation of long-term memory, which leads to second-language learning (9).

Understanding how these mechanisms can be integrated through emerging elements is important for designing educational interventions that enable learning to progress toward more holistic and integrative modes. Furthermore, factors such as linguistic competence are longitudinal predictors of well-being and social engagement, particularly in contexts of high adaptive demand, such as among international students (2). Thus, ignoring the physiological and emotional basis of learning perpetuates models that can be iatrogenic to students' mental health and, therefore, inefficient for second-language acquisition.

Despite the clinical relevance of these factors, there is a gap in the systematisation of evidence linking pedagogical interventions to objectifiable health outcomes. Although there is consensus on the importance of the emotional climate (10), the literature lacks a clear integration of how innovative methodologies influence markers of well-being and student physiology. Ignoring this biological basis means perpetuating educational models that can be iatrogenic for students' mental health.

Similarly, although active methodologies are promoted in public and private institutions, there is a lack of clarity regarding which components of these pedagogies (physical movement, social interaction, or immediate feedback) are directly responsible for the physiological modulation that promotes well-being (4,8). This dispersion prevents the formulation of standardised teaching protocols that guarantee neuroeducationally healthy learning environments.

In view of the above, this study will contribute to the validation of strategies to mitigate psychosocial risk in academic environments, providing a framework for curricular decision-making. Thus, the objective of the study is to analyse, through a systematic review of the literature from 2023 to 2025, the key emerging elements related to innovative pedagogies, emotion physiology, and psychological well-being in the context of second language teaching and learning. The findings of this research provide a framework for implementing interventions that consider mental health and physiological regulation as essential precursors to performance in second language acquisition, guiding the design of learning ecosystems that are cognitively challenging, physiologically regulated, and emotionally sustainable.

Theoretical framework

Innovative pedagogies

Innovative pedagogies are presented as new theoretical and practical approaches that seek to overcome traditional teaching methods and adapt to the needs of contemporary society, working in concert with emerging technologies (11), such as augmented reality and educational games. Thus, the objective is to use technology to enable more interactive, collaborative, and experiential learning. A central aspect of these proposals is 'real-world learning' (12), which aims to combine academic theory with professional practice by exposing students to real-life situations, thereby promoting education that develops skills for work and daily life; in this way, students become active creators of knowledge. Therefore, innovative pedagogies value student autonomy by promoting self-directed and active learning, in which students are aware of their own processes and able to regulate them (13).

Physiology of emotions

The physiology of emotions is defined as a system of responses that enables the organism to

adapt to its environment and survive, linking the brain (especially the amygdala), hormones, the nervous system, and neurotransmitters to the rest of the body (14). When processing information, automatic reactions are elicited that prepare the person to act, directly influencing how these emotions manifest.

From a functional perspective, these emotions generate electrical activity in the brain, producing changes in brain waves that indicate moods such as stress or calm (15,16). In turn, this causes the release of chemicals that alter the body's balance, making it visible through muscle tension, facial expressions, and gaze, showing that emotion is both a neurobiological process and a fundamental aesthetic and communicative experience (17); if these reactions are not properly regulated, they can affect physical health and general well-being (14).

Psychological well-being

Psychological well-being is understood as something deeper than the mere absence of problems or momentary happiness; it is defined as optimal functioning oriented toward personal development and the pursuit of a sense of purpose in life (18,19). This well-being is structured around six interconnected areas: self-acceptance, positive relationships with others, autonomy, mastery of one's environment, clear goals, and personal growth (20,21). These elements enable individuals to view their lives positively, thereby directly benefiting their self-esteem and mental health (19).

Maintaining this psychological well-being depends on the balance between a person's internal resources and their environment. At a personal level, tools such as emotion regulation and resilience serve as essential protective mechanisms, enabling the management of negative feelings while maintaining the mental strength to mitigate the impact of highly stressful situations, thereby reducing the likelihood of anxiety or depression (20,22). In the social sphere, perceived support from family and friends plays a decisive role, as it helps cushion risky behaviours, enhances positive aspects such as optimism, and strengthens connections with others. In this way, close relationships not only provide companionship but also strengthen healthy development and emotional stability in the face of life's challenges (23,24).

Second language teaching

Second language teaching is understood as a field that integrates technology with the social and emotional aspects of learning, moving from rigid methods to flexible, collaborative, computer-assisted models that recognise that each student learns differently, whether in person or virtually (25,26). In this century, technology has become a key element in education, as the use of digital platforms and gamification seeks to promote inclusion and equitable access to resources (27-29); however, this change brings with it significant challenges such as inequality in access to the internet and the need for both teachers and students to develop a critical approach to the use of these tools. Thus, language learning is seen as a bridge to other cultures, as it is not only about learning words, but also about understanding and respecting cultural differences (30,31) using playful, digital, and communicative strategies that help students feel more comfortable and motivated, facilitating learning that is truly useful and connected to today's reality (32,33).

METHOD

This systematic review of thematic analysis is conducted using the PRISMA (34,35) (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology, which aims to optimise review quality, standardise the review process, and increase transparency in study selection. The review focuses on studies of innovative pedagogies, the physiology of emotions, psychological well-being, and their contributions to second-language teaching, integrating these theoretical insights through an analysis of emerging elements. To this end, the years 2023 to 2025 were considered, as they represent the most recent research (Figure 1).

Search and data extraction strategies

The systematic search was conducted between 24 September and 29 October 2025 in the Scopus database using the respective filters mentioned in the eligibility criteria. In addition, articles published by Scopus under "Articles in Press" were included. A search for individual terms was designed to maximise sensitivity and specificity. The syntax used was TITLE-ABS-KEY ("innovative pedagogy"); ("physiology of emotions"); ("psychological well-being); ("second language teaching"). Each term was searched for individually, as no literature was found on all four terms together; this research aims to address that thematic gap. Zotero (Version 7.0.27) was used for citation management and to eliminate duplicate records. The geographical restriction was limited to scientific production with a Colombian institutional affiliation. This methodological decision aligns with the analysis of national trends and the characterisation of the Colombian research community's contribution to the global corpus. The aim is to identify how local researchers are adopting and reinterpreting the paradigms of neuroeducation and physiology in language learning in other parts of the world, consolidating a situated state of the art that allows for the evaluation of the maturity and direction of this line of research in the country, giving rise to future research in other countries. This will be addressed in the limitations section.

The inclusion criterion was: access to full text; Open access; Search only for articles published in Colombia; Articles related to university students or secondary education; Articles published in Scopus; Articles between 2023 and 2025; Quantitative, qualitative, mixed-methods, reflection articles, narrative review, or systematic review articles; All languages available; Subject areas that include the terms; Articles in press (available digitally, but not yet assigned a volume).

The exclusion criteria were conference articles, book chapters, books, conference reviews, editorial letters, notes, retractions, brief reviews, grey literature, secondary sources, articles published in countries other than Colombia, and articles related to teachers, excluding those addressing the student population.

Data coding and analysis

A matrix was designed to systematise the information once it had been filtered according to the inclusion criteria. After extracting the information using the "Export" function in the Scopus database for each of the four search strategies used, downloaded in "RIS" format, the following was taken from each one: Citation information: "Author(s)", "Document title", "Year", "EID", "Source title", "Number of citations", "Source and document type", "DOI".

Abstract & keywords: "Abstract", "Author keywords", "Indexed keywords."

These are then uploaded to Zotero, where duplicates are removed, and a CSV file is created. The information is then organised to focus on the title and abstract, addressing higher or secondary education. This process helps to organise internal consistency and cultural relevance. The process was carried out in two phases: the first involved coding and analyzing the characteristics of the articles, such as type and year of publication, and the second involved analyzing the emerging elements of the selected articles with respect to the topics covered and the conclusions reached.

Assessment of methodological quality and risk of bias

To ensure the robustness of the conclusions, the risk of bias of the included studies was assessed using the CASP (Critical Appraisal Skills Programme) checklist for systematic reviews, as appropriate to each primary article's design. Studies that demonstrated rigour in data collection were prioritised; those with insufficient methodological reporting, which prevented traceability of the evidence, were excluded. Four additional articles, more focused on theoretical reflection, were found in the results.

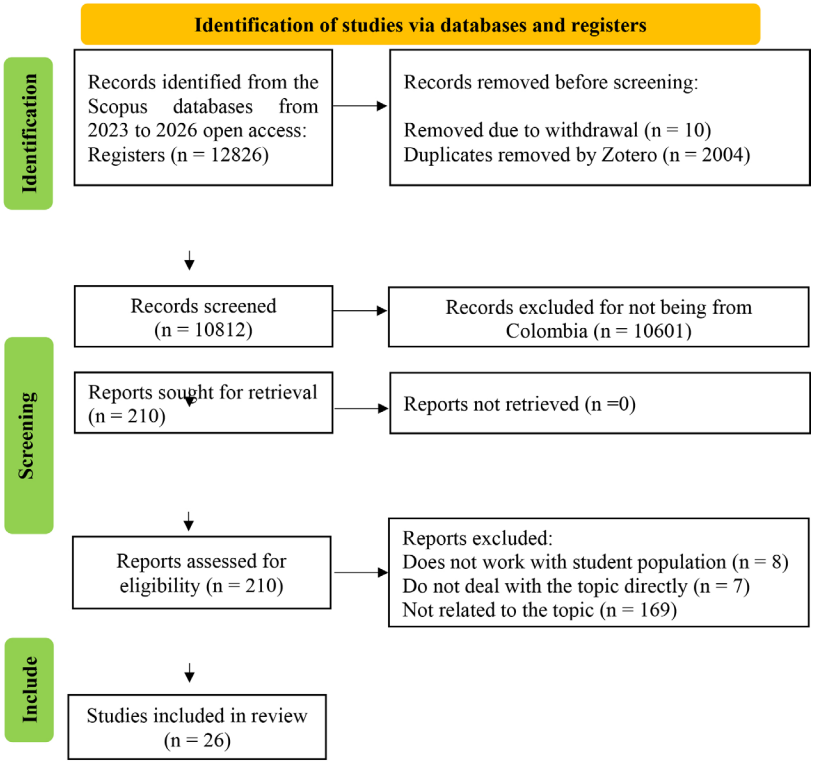


Figure 1. PRISMA flow diagram.

RESULTS

Twenty-seven records were identified using all the criteria outlined in the method (Figure 1 and Table 1), yielding the following results.

Figure 2 shows that the year with the highest number of publications was 2025, with 52 % (14), followed by 2024 with 37 % (10), and finally 2023 with 11 % (3), which had the lowest output.

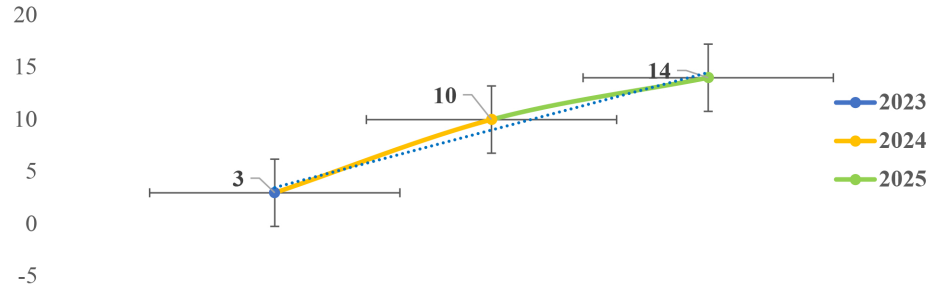


Figure 2. Publication by year.

Table 1

Study characteristics

Coding and citation	Type of study	Year
C (01)(36)	Quantitative	2023
C (02) (37)	Quantitative	2025
C (03) (38)	Quantitative	2025
C (04) (39)	Quantitative	2025
C (05) (40)	Quantitative	2024
C (06) (41)	Quantitative	2024
C (07) (42)	Quantitative	2024
C (08) (43)	Systematic Review	2023
C (09) (44)	Quantitative	2023
C (010) (45)	Quantitative	2025
C (011) (46)	Quantitative	2025
C (012) (47)	Quantitative	2025
C (013) (48)	Quantitative	2025
C (014) (49)	Qualitative/Reflection	2024
C (015) (50)	Mixed	2025
C (016) (51)	Literature review	2025
C (017) (52)	Systematic review/Reflection	2025
C (018) (53)	Systematic Review	2024
C (019) (54)	Quantitative	2025
C (020) (55)	Quantitative	2025
C (021) (56)	Narrative/Qualitative Review	2024
C (022) (57)	Mixed	2024
C (023) (58)	Mixed	2024
C (024) (59)	Quantitative	2024
C (025) (60)	Systematic Review	2025
C (026) (61)	Narrative review/Qualitative	2025

Source: Own elaboration.

Figure 3 shows the types of articles, with quantitative studies predominating at 62 %, followed by systematic reviews at 19 %, mixed-methods studies at 11 %, and narrative reviews at 7 %.

Analysis of emerging elements

First, the category "t performance and mental health," in which we observe a phenomenon in which academic success coexists with the deterioration of mental and physical health (stress, anxiety, autonomic dysfunction), challenging the linear notion of well-being as a predictor of performance. This category comprises 11 articles. The second category is "Technological Mediation and Immersive Teaching Methods," where the transformation of teaching occurs through the integration of advanced tools (artificial intelligence, Metaverse, apps) that change the role of teachers and students, moving from the passive transmission of knowledge to context-based experience, automated feedback, and reduced cognitive load. This category has a frequency of 7. On the other hand, the third category is "Metacognition and self-regulation as axes of learning", in which learning is conceptualised as a cyclical and individual process where critical thinking, planning, and metacognitive monitoring are essential precursors to both academic performance and empathy and psychological well-being. This category has a frequency of 6.

The fourth category is "Conflict between global standardisation and local contextualisation," which criticises the lack of contextualisation of educational models (such as the CEFR and global citizenship policies) and defends situated pedagogies that recognise critical interculturality, local socio-economic realities (poverty, conflict) and "alternative citizenships." The fourth category has a frequency of 5. The fifth category is "Differential psychosocial variables (gender

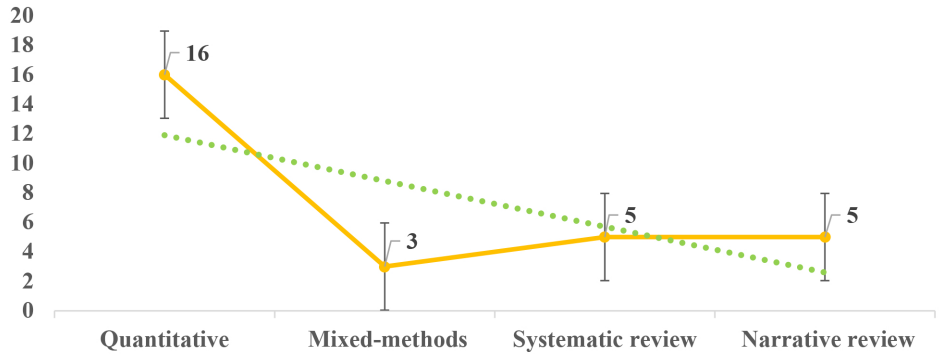
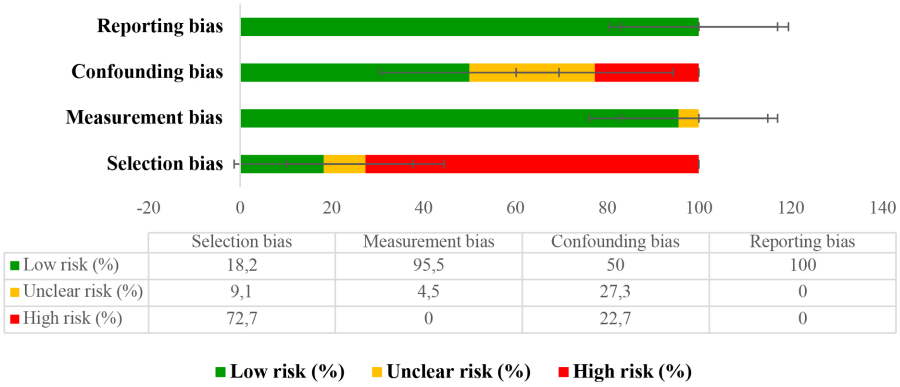


Figure 3. Type of article.

and age)", which includes a cross-cutting finding that educational and mental health experiences are not homogeneous, with variations according to gender (greater vulnerability or different adaptive response in women) and age/maturity. This category has a frequency of 6.

Methodological quality assessment

A comprehensive risk-of-bias assessment was performed for the 26 articles included in the review, using an adapted version of the Critical Appraisal Skills Programme (CASP) criteria based on the methodological design. Of the entire sample, 22 studies underwent quantitative bias assessment (empirical and systematic reviews), while 4 articles (C14, C17, C21, C26) were classified as theoretical or narrative reflections, contributing to the qualitative analysis but excluded from the statistical bias metrics, yielding the following results: Risk of bias assessment (n = 22 studies)



	Selection bias	Measurement bias	Confounding bias	Reporting bias
Low risk (%)	18,2	95,5	50	100
Unclear risk (%)	9,1	4,5	27,3	0
High risk (%)	72,7	0	22,7	0

Figure 4. Risk assessment.

Figure 4 indicates that the risk assessment identified selection bias as the primary threat to external validity in the corpus, classified as "High Risk" in 72.7 % of the studies evaluated. Research such as that in (C01, C06, C11) employed non-probability sampling limited to specific university institutions, which limits the generalisability of the findings to the global student population. However, there are exceptions of high methodological quality, such as the systematic reviews in C08, C18, C25, and the cross-cultural study (C20), which implemented rigorous selection protocols and multicentre sampling (in different institutions), placing them at the "Low Risk" level.

Secondly, measurement bias is the domain with the greatest methodological strength, achieving a "Low Risk" rating in 95.5 % of articles. Studies such as (C02) and (C16) used validated instruments with adequate reports of internal consistency (Cronbach's Alpha > 0.70). On the other hand, the inclusion of objective physiological measures, such as heart rate variability in (C19), reinforces validity in the face of the subjectivity of self-reporting. Only descriptive studies, such as (C23), presented an unclear risk due to the lack of details on the validation of their ad hoc collection instruments (specific instruments).

Furthermore, confounding bias showed a polarised distribution; studies that used multivariate models or Structural Equation Modelling (SEM), such as those in (C03, C07, C12), effectively addressed this bias, resulting in a 50 % "Low Risk" rating. In contrast to the above purely descriptive or simple correlational studies, such as those in (C22, C24), which presented a "High Risk" of 22.7 % due to not adjusting their

analyses for sociodemographic variables, which could inflate the observed associations between pedagogical strategies and perceived well-being.

Regarding theoretical contributions and reporting bias, the latter remained low across the entire empirical sample. For their part, the theoretical articles excluded from the quantitative evaluation (C14, C17, C21, C26) provided necessary conceptual frameworks for "pedagogical humanisation" and "intercultural competence," although their reflective nature entails an inherent subjectivity that was triangulated with empirical evidence from the other studies.

DISCUSSION

From the first part, we can conclude that 2025 and quantitative studies are the most frequently published, indicating a recent surge of interest in these topics.

To begin the analysis, we note that students seek to optimise performance at the expense of well-being (46), revealing this reality in a starker manner: students achieve academic success at the expense of their mental health, which calls into question the sustainability of current high-pressure educational models.

Secondly, technology is presented in two ways: on the one hand, it is a tool that reduces cognitive load (facilitating translations, offering immediate feedback with artificial intelligence, simulating realities through the metaverse) and, on the other hand, there are warnings about dependence and the need to maintain teacher mediation to avoid the loss of critical thinking, as observed in C16, C18, and C21. Thirdly, there is a strong political and pedagogical call (50, 59, 61) to reject global educational standardisation, advocating for contextualised pedagogies that validate local knowledge, whether in language teaching or citizenship training.

And fourthly, when contrasting methodological quality, the finding of high selection bias (68.2 %) reinforces the discussion between standardisation and contextualisation, where the effectiveness of innovative pedagogies seems to be strongly linked to the specific characteristics of the university samples studied, suggesting that, as theorised about the need for situated pedagogies, the results should not be automatically extrapolated to all populations without considering the differential variables that showed a very marked position in the control of confounding biases.

CONCLUSIONS

The findings of this systematic review indicate an evolution in second-language teaching, confirming the existence of a triad among emotion physiology, psychological well-being, and innovative pedagogies. Therefore, it is concluded that success in second language acquisition cannot continue to be measured under traditional parameters for the following reasons:

Firstly, it was identified that, in traditional high-pressure models, the attainment of linguistic competencies often comes at the expense of students' physiological and emotional stability. This highlights the urgency of implementing pedagogical strategies that promote cognitive well-being and protective factors against stress and anxiety, thereby validating emotional self-regulation and metacognition for deep learning.

Secondly, technological mediation and immersive teaching methods have proven effective in reducing cognitive load and facilitating learning, although there is a risk of technological dependence that can undermine students' critical thinking. For this reason, technology must be integrated as a teaching mediation and as a tool for positive emotional experience.

Thirdly, the evidence reviewed has high internal validity, thereby legitimising the use of neuroeducation and physiological measurement as established fields that require further study to examine all variables. However, the prevalence of selection bias in primary studies suggests that innovative pedagogies are not automatic, universal solutions; their implementation must be cautious and adapted to the context, given that the reported effectiveness is often conditioned on highly closed university contexts and may vary in other populations without proper control of variables.

On the other hand, the data support the conclusion that there is empirical rejection of global standardisation of teaching, as they indicate the need to adopt contextualised approaches that recognise differential psychosocial variables (gender, age, and socio-economic realities). In addition, language teaching must move toward the design of neuroeducationally sustainable learning environments, in which communicative competence is a natural consequence of the learner's overall well-being rather than its antithesis.

Considering the findings, it is recommended that future research adopt experimental designs that integrate objective physiological measurements and biometric data to enable more accurate correlations between subjective perceptions of well-being and neurobiological responses during second-language learning.

Study limitations

It is important to recognise the methodological limitations inherent in this review. The geographical restriction exclusively to academic publications in Scopus with the Colombia filter, but several studies are located outside the country, despite this, such as (36,38,39), added to a time window from 2023 to 2025, allows for an updated and relevant review of the local context, but limits the generalisation of the findings at a global level. Likewise, the search restricted to the Scopus database may have excluded relevant literature indexed in regional repositories (such as SciELO or Redalyc) or grey literature.

Conflict of interest

The authors declare that there are no conflicts of interest related to the content of this review.

Use of AI

The authors note that the preparation of this review did not involve the total or partial use of artificial intelligence tools.

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