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ARTICLE

Challenges in Implementation, Contextualization, and Sustainability of Continuing Professional Development for Teachers

Desafíos de Implementación, Contextualización y Sostenibilidad en la Formación Continua Docente

Mercedes Alexandra Yaranga-Rodríguez[1]

[1]Universidad Cesar Vallejo, Trujillo, Peru, email: myarangar@ucvvirtual.edu.pe

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ABSTRACT

Continuous teacher training in basic education faces challenges linked to the decontextualization of programs, the limited sustainability of interventions, and a lack of alignment between teachers' needs and institutional training proposals. The objective was to analyze implementation challenges and contextualization factors related to the effectiveness and sustainability of continuous teacher training programs. The research was conducted within a humanistic-interpretive paradigm, employing a systematic method, a qualitative approach, a retrospective documentary design, a descriptive-bibliographic type, and a cross-sectional scope. The initial documentary population consisted of scientific articles retrieved from Scopus, Web of Science, and ScienceDirect between 2021 and January 2025; the final sample comprised 40 documentary sources selected on the basis of inclusion and exclusion criteria. Methods included a systematic literature review, document analysis, and thematic content analysis, supported by the PRISMA 2020 framework and a systematization matrix. Results identified recurring patterns associated with institutional contextualization, needs assessment, teacher support, communities of practice, and structured reflection. Barriers related to time availability, insufficient resources, resistance to change, and limited institutional support were also identified. It was concluded that the effectiveness and sustainability of continuous training were linked to its integration into school dynamics, collective support, and responsiveness to specific teacher needs. However, the evidence did not allow causal relationships to be established or the superiority of any particular modality to be determined.

KEYWORDS: Continuous teacher training, teacher professional development, educational contextualization, educational sustainability, basic education.

RESUMEN

La formación continua docente en educación básica enfrentó desafíos asociados a la descontextualización de los programas, la escasa sostenibilidad de las intervenciones y la escasa articulación entre las necesidades del profesorado y las propuestas formativas institucionales. El objetivo fue analizar los desafíos de implementación y los factores de contextualización relacionados con la efectividad y la sostenibilidad de los programas de formación continua docente. La investigación se desarrolló bajo el paradigma humanista-interpretativo, método sistemático, enfoque cualitativo, diseño documental-retrospectivo, tipo descriptivo-bibliográfico y corte transversal. La población documental inicial estuvo constituida por artículos científicos recuperados de Scopus, Web of Science y ScienceDirect entre 2021 y enero de 2025; la muestra final comprendió 40 fuentes documentales seleccionadas según criterios de inclusión y exclusión. Se emplearon la revisión sistemática de la literatura, el análisis documental y el análisis de contenido temático, apoyados en PRISMA 2020 y en una matriz de sistematización. Los resultados identificaron patrones recurrentes asociados a la contextualización institucional, el diagnóstico de necesidades, el acompañamiento docente, las comunidades de práctica y la reflexión estructurada. También se identificaron barreras relacionadas con la disponibilidad de tiempo, los recursos insuficientes, la resistencia al cambio y el apoyo institucional limitado. Se concluyó que la efectividad y la sostenibilidad de la formación continua se relacionaron con su integración en las dinámicas escolares, el apoyo colectivo y la respuesta a necesidades docentes específicas, sin que la evidencia permitiera establecer relaciones causales ni determinar la superioridad de una modalidad particular.

PALABRAS CLAVE: Formación continua docente, desarrollo profesional docente, contextualización educativa, sostenibilidad educativa, educación básica.

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Introduction

Continuing professional development for teachers in basic education faces challenges associated with the lack of contextualization of programs, limited sustainability of interventions, and insufficient alignment between teachers' needs and institutional training proposals. Tilga et al. (2021) note that making teacher training programs effective is essential for educational improvement, which is maximized when interventions are grounded in specific strategies and integrated into professional communities of practice. The same authors also emphasize that the success of professional development interventions largely depends on their capacity to address teachers' psychological and motivational needs. Thus, ongoing support and curricular relevance emerge as important conditions associated with continuing professional development.

A critical gap currently persists in education between the provision of continuing professional development programs and the actual needs of educational settings (Haatainen & Aksela, 2021). International organizations such as the OECD (2019) warned of barriers including scheduling conflicts, limited incentives, participation costs, and offerings poorly suited to teachers and their contexts. Recent studies indicate the persistence and intensification of this problem; Tretiak et al. (2024) identify heavy workloads, lack of incentives, and contextual disconnection as factors affecting continuity in teacher training. This disconnection has two principal consequences: first, decontextualization, whereby content is addressed superficially and generically without meaningful adaptation (Haatainen & Aksela, 2021); and second, limited sustainability, as isolated interventions detached from their contexts generate externally driven motivation that ultimately leads to abandoning the practice (Tilga et al., 2021).

In response, programs need to move beyond these limitations, and various studies propose alternative professional development models. Haatainen and Aksela (2021) propose a situated and ongoing program based on an initial assessment, through which specific problems are addressed, collaborative work is encouraged, and flexible adjustments are made to the context. Yan and King (2023) advocate collaborative learning communities as relevant and emerging components of sustainability that enrich teaching practice and enhance teachers' self-efficacy. In addition, recent studies suggest providing scaffolding instead of isolated and disconnected programs; continuous peer support or mentoring is a viable path toward long-term sustainability (Polín, 2023).

Despite the contributions of recent systematic reviews and meta-analyses on the characteristics of teacher professional development, such as Sims et al. (2023), previous literature tends to focus on immediate instructional effects and particular educational outcomes. However, a knowledge gap persists regarding the institutional and contextual mechanisms associated with program sustainability and adaptation to school settings. Accordingly, the objective of this research is to analyze implementation challenges and contextualization factors related to the effectiveness and sustainability of continuing professional development programs for basic education teachers. The following research question arises from this objective: What implementation challenges and contextualization factors are related to the effectiveness and sustainability of continuing professional development programs for basic education teachers?

Methodology

Considering the stated objective, the research was framed within a humanistic-interpretive paradigm, a perspective aimed at understanding and interpreting human actions and discourse in their specific contexts (Snyder & Engström, 2021). This approach made it possible to analyze, understand, organize, and interpret available scientific evidence on challenges, facilitators, and sustainability components in teacher professional development programs.

The study therefore employed the systematic method, understood as an explicit, orderly, and replicable procedure designed to identify, critically appraise, and synthesize available empirical evidence while minimizing selection bias (Sims et al., 2023). The research adopted a qualitative approach, allowing for an in-depth examination of trends, conceptual patterns, and narratives within their original documentary context (Snyder &

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Engström, 2021), as well as recognition of shared patterns of contextualization, sustainability, reflective practice, teacher support, and implementation challenges.

The design was documentary-retrospective, descriptive-bibliographic in type, and cross-sectional. It was documentary because the units of analysis were previously published scientific articles; retrospective because it reviewed studies completed between 2021 and January 2025; descriptive-bibliographic because it characterized, organized, and synthesized contributions from the scientific literature on continuing teacher professional development; and cross-sectional because the review covered a defined period, without manipulation of variables or direct intervention involving human participants.

The documentary population comprised scientific articles related to continuing training programs, teacher professional development, pedagogical support, reflective practice, and educational contextualization in basic education. Publications issued between 2021 and January 2025, available in English, Spanish, or Portuguese, and directly related to the review objective were considered. The final sample comprised 40 documentary sources selected using previously established inclusion and exclusion criteria. Duplicate records, documents not directly related to continuing teacher development, restricted-access texts, and publications that did not provide information relevant to the research question were excluded.

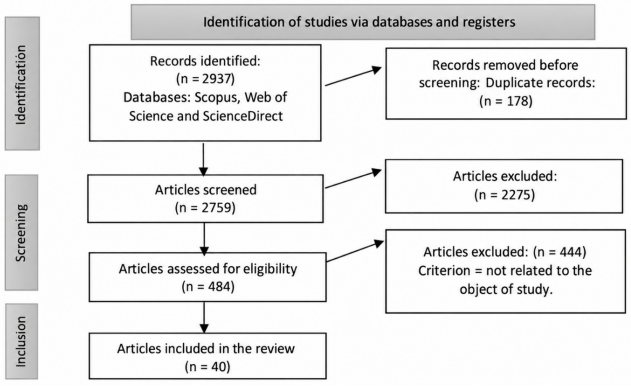
The technique employed was a systematic literature review, a structured data-collection strategy that transparently assesses the impact, design, and mechanisms of interventions reported in previous research (Sims et al., 2023), complemented by document analysis and thematic content analysis of the selected articles. The systematic review followed an orderly process of searching, screening, eligibility assessment, and inclusion; document analysis facilitated the organization of relevant information from each study; and content analysis identified recurring categories related to implementation challenges, contextualization factors, sustainability components, and facilitators of continuing teacher professional development programs.

The research tools consisted of digital platforms, technological environments, and analytical matrices used to index, process, and categorize the retrieved literature (Sims et al., 2023). Initially, the scientific databases Scopus, Web of Science, and ScienceDirect were consulted through the MyLOFT platform; the final sample included articles indexed in Scopus and Web of Science. Zotero was used as the reference manager for managing, organizing, and reviewing retrieved articles.

The PRISMA protocol (Page et al., 2021) was also used (see Figure 1) to provide transparency regarding the identification, selection, exclusion, and inclusion of reviewed studies. Extracted information was organized in a documentary systematization matrix prepared in Excel or Google Sheets, which were considered suitable and valid analytical instruments whose use enables rigorous methodological tracking of the scope of the research (Cisneros-Caicedo et al., 2022). Recorded categories included author, year, country, database, methodological design, subject area, program characteristics, delivery mode, duration, and main findings.

Figure 1

Flow Diagram of Article Identification, Screening, and Inclusion (PRISMA).



Note. Flow diagram adapted from the PRISMA 2020 statement guidelines (Page et al., 2021), authors' own work (2026).

The search procedure used search strings constructed with English and Spanish terms relating to continuing teacher development, pedagogical support, professional development programs, and secondary education. Initially, 2,937 records were

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identified in the databases consulted. Subsequently, 178 duplicates were removed, leaving 2,759 records for screening. A further 2,275 documents that did not meet thematic, methodological, or accessibility criteria were excluded, leaving 484 articles for eligibility assessment. Finally, after applying specific criteria concerning teacher support, educational programs, training programs, and basic education, 40 scientific articles were selected for the final analysis.

The specific search strings were distributed as follows. For ScienceDirect, the following string was used: (continuing teacher training AND "program secondary") OR (teacher support AND "program Secondary") OR (programa formación continua AND "docente secundaria") OR (programa acompañamiento AND "docente secundaria"). For the other databases, the following string was used: ("continuing" AND "teacher" AND "training" AND "program" AND "secondary") OR ("teacher" AND "support" AND "program" AND "Secondary") OR ("programa" AND "formación" AND "continua" AND "docente" AND "secundaria") OR ("programa" AND "acompañamiento" AND "docente" AND "secundaria").

The Mixed Methods Appraisal Tool (MMAT), designed for critical appraisal of qualitative, quantitative, and mixed-methods studies, was applied to assess the methodological quality of the evidence (Hong et al., 2018). The tool considers design-specific methodological criteria. Identified protocols were distinguished from empirical studies and were not used to support claims about the observed effectiveness of interventions. Methodological appraisal was based on compliance with the tool's criteria and recorded in an assessment matrix. Evidence was subsequently integrated through narrative synthesis and thematic-categorical analysis, supplemented by descriptive frequencies. No meta-analysis or pooled effect-size estimates were undertaken because of the methodological heterogeneity of the corpus.

Information was analyzed through narrative synthesis and thematic-categorical analysis. First, the main data from each included study were extracted; second, findings were grouped into analytical categories; and third, shared trends, recurring features, and differences among the reviewed programs were identified. Descriptive frequencies were also used to represent the presence of categories such as program duration, implementation modalities, support strategies, communities of practice, critical reflection, and favorable institutional factors. No meta-analysis, effect-size calculation, heterogeneity analysis, or fixed- or random-effects models were performed because of the methodological heterogeneity of the studies and the predominance of qualitative-documentary synthesis.

From an ethical standpoint, this research did not require informed consent or institutional ethics committee approval because it was based exclusively on scientific literature published in academic documentary sources, without direct human participation or processing of personally identifiable information. Nevertheless, the principles of academic integrity, source traceability, responsible citation, methodological transparency, and acknowledgment of intellectual authorship of the included studies were respected.

Results

The evidence synthesis identified a recurring pattern whereby institutional contextualization, prior needs assessment, teacher support, professional collaboration, and structured reflection appeared more frequently in programs reporting favorable outcomes. Recurring barriers were also identified in relation to available time, insufficient resources, resistance to change, and limited institutional support. Thematic analysis organized the evidence into seven categories: programs by specialty area; well-being and mental health; active pedagogical strategies and inquiry; technologies and digital competencies; collaborative strategies; formative assessment and pedagogical self-regulation; and design and leadership.

The overall synthesis indicated that structured interventions incorporating collaborative approaches, socioemotional support, and active methodologies were widely valued in relation to self-efficacy and the transformation of pedagogical practice compared with isolated or purely theoretical workshops. Seven fundamental analytical categories emerged from the qualitative and relational analysis of the selected articles, grouped according to program evidence: specialties, well-being and

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mental health, active methodologies, digital competencies, collaborative strategies, design, and leadership.

Programs by Specialty Area

Professional development programs organized by specialty area are presented below. Table 1 synthesizes studies focused on life support, physical education, and vocational inclusion. These studies are characterized by contextualization to the specific needs of each area and collaboration with specialized external stakeholders.

Table 1

Specialty Programs and Clinical-Pedagogical Evidence.

Author/year	Country	Design	Program area	Analytical category	Evidence for the review
Carraro et al. (2022)	Italy	Controlled trial	Physical education	Teacher self-efficacy	Hybrid training with support favored teacher motivation, self-efficacy, and engagement.
Pérez-Bailón et al. (2023)	Spain	Cross-sectional descriptive	Life support	Pedagogical transfer	Structured teacher training resulted in better student performance compared with external models.
Imai (2023)	Japan	Pre-experimental	Vocational inclusion	Practical training	The brief intervention strengthened teachers' knowledge, although follow-up was needed to sustain changes.
Borghouts et al. (2021)	Netherlands	Quasi-experimental	Physical education	Strategy effectiveness	Structured motivational workshops improved teacher behavior; however, adding Lesson Study did not produce further significant improvements.
Louis et al. (2022)	Spain	Implementation study	Life support	Collaborative approach	A phased program with Design Thinking and ongoing virtual support facilitated instructional adaptation to the school context.

Note. Authors' own work based on the studies included in the systematic review (2026).

The five studies included in Table 1 were geographically distributed across two continents: Europe accounted for 80% (Spain, Italy, and the Netherlands), while Asia represented the remaining 20% (Japan). Regarding publication language, 60% of the articles were written in English and 40% in Spanish. The identified methodological pattern showed a greater presence of favorable outcomes in programs oriented toward technical specialties, particularly when using simulators, design methodologies, and iterative virtual support. These strategies served as catalysts that supported teachers' roles, the assimilation of complex content, and context-appropriate transfer by students.

Well-Being and Mental Health Programs

The studies focused on the human dimension of teaching, where the challenge is to implement programs that not only transmit knowledge but also achieve attitudinal changes and address the emotional aspects of teaching performance. Table 2 groups programs addressing attitude changes and emotional management in teaching performance, highlighting the importance of adaptation and socioemotional support in interventions.

Table 2

Programs Focused on Well-Being, Mental Health, and Socioemotional Development.

Author/year	Country	Design	Program area	Analytical category	Evidence for the review
Brick et al. (2021)	Liberia	Exploratory pilot study	Mental health	Sustainability and structure	Mental health literacy required co-trainers with lived experience, governmental support, and administrative structures.

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Author/year	Country	Design	Program area	Analytical category	Evidence for the review
Van De Sande et al. (2022)	Netherlands	Quasi-experimental	Socioemotional learning	Intercultural competence	Interventions required greater sociocultural sensitivity and investment in awareness and openness to student diversity.
Ratanasiripong et al. (2022)	Thailand	Cross-sectional study	Teacher well-being	Comprehensive strategies	Comprehensive well-being reduced burnout through two components: personal development and collaborative projects with peer mentoring.
Braun et al. (2024)	England	Randomized controlled trial	Mindfulness	Stress adaptation	Extended training with ongoing support was indispensable for teachers working in high-stress contexts.
Darling et al. (2021).	Australia	Quasi-experimental	Child mental health	Communities of practice	Training school staff through modules and communities of practice significantly increased assessed teacher self-efficacy.
Liu et al. (2023)	Singapore	Qualitative study	Autonomy support	Teaching style	Combining training interventions facilitated the transition from a controlling style to a supportive approach that promoted intrinsic motivation.
Mahon et al. (2023).	Ireland	Randomized controlled trial	Body well-being	Cultural adaptation	Providing structured materials and manuals required prior cultural adaptation to ensure contextual feasibility.
Saelid et al. (2022).	Norway	Empirical study	Universal mental health	Implementation barriers	Intensive courses involving role-playing showed no significant effects on students, revealing critical barriers in evaluating generational programs.
Darragh and Petrie (2022).	United States	Qualitative	Trauma education	Training needs	An urgent need was identified for explicit trauma training and development of self-care skills to protect the community.

Note. Based on the 40 articles analyzed, authors' own work (2026).

The nine studies in Table 2 were geographically distributed across five continents: the Americas (United States), Africa (Liberia), and Oceania (Australia) each accounted for 11.1%; Asia for 22.2% (Singapore and Thailand); and Europe for the remaining 44.44% (England, Ireland, Norway, and the Netherlands). All articles were published in English. The analytical pattern indicated limitations in brief or isolated interventions, with reduced impact on outcomes and shortcomings in addressing symptoms of anxiety and depression. Conversely, comprehensive programs involving personal development and structured communities of practice created opportunities to mitigate chronic teacher burnout.

Programs on Active Pedagogical Strategies and Inquiry

Active methodologies and formative assessment require continuous professional development that promotes learning communities and reflective practice focused on improving institutional culture. Table 3 groups studies examining successful factors and major pedagogical challenges in creating learning communities and reflective practice.

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Table 3

Active Pedagogical Strategies and Inquiry.

Author(s)/year	Country	Design	Program area	Analytical categories	Evidence for the review
Li and Gu (2023)	China	Action research	Formative assessment	Reflective practice	A learning model with minimal external intervention enhanced autonomous reflection and the development of curricular competencies.
Mahat and Loh (2024)	Singapore	Mixed-methods case study	Spatial competence	Student-centered strategies	Designing learning spaces through cooperative phases fostered more mindful pedagogical practice in the classroom.
Tretiak et al. (2024)	Ukraine	Quasi-experimental	Collaborative pedagogy	Methodological competence	Joint work among teachers, students, and parents through methodological partnerships significantly improved methodological performance.
Boardman et al. (2024)	United States	Mixed-methods quasi-experimental	Project-based learning	Virtual support	The feasibility of project-based learning depended directly on adaptable teaching materials and ongoing virtual coaching sessions.
Babinčáková et al. (2023)	Slovakia	Multiple-case study	Formative assessment	Flexibility and beliefs	Ongoing monitoring and classroom tutoring transformed teachers' beliefs and increased student participation and motivation.
Polin (2023)	United States	Explanatory sequential mixed-methods	Collaborative planning	Teacher self-efficacy	Critical reflection mediated through online professional communities enhanced perceived self-efficacy through feedback.
Haatainen and Aksela (2021)	Finland	Qualitative	Project-based learning	Role transformation	Project-based learning training needed to be sustained and practical, leveraging learning networks to transition toward a facilitating teacher role.

Note. Based on the studies included in the systematic review, authors' own work (2026).

Table 3 presents seven studies: Asia accounted for 28.6% (China and Singapore), Europe for 42.9% (Slovakia, Finland, and Ukraine), and the Americas for 28.6% (United States); all were conducted in English. The cross-cutting analysis identified a pattern: programs oriented toward active methodologies related to project-based learning or formative assessment achieved limited outcomes when implemented in isolation. A relevant contribution to pedagogical transfer involved tutorial support, individualized virtual coaching, and iterative peer feedback cycles within professional communities.

Technology and Digital Competence Programs

Technological advances require teachers to master new digital tools. The articles in Table 4 examined programs oriented toward integrating information and communication technologies (ICT), as well as the STEAM approach. They addressed the technological and andragogical challenges faced by teachers across educational contexts.

Table 4

Programs Focused on STEAM, Technologies, and Digital Competencies.

Author(s)/year	Country	Design	Program area	Analytical categories	Evidence for the review
Dalal et al. (2024)	United States	Exploratory qualitative	Engineering teaching	Teacher confidence	Participatory design and joint planning provided by professional organizations positively influenced self-efficacy.

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Author(s)/year	Country	Design	Program area	Analytical categories	Evidence for the review
Ortiz-Laso et al. (2023).	Spain	Qualitative study	STEM/STEAM education	Professional autonomy	Ongoing advice through focus groups enabled teachers to develop confidence to enrich and modify their real projects.
Gorghiu et al. (2024).	United Kingdom	Qualitative study	Curriculum sustainability	Framework-based coaching	Coaching strategies structured around self-awareness and real practice strengthened institutional self-efficacy.
Eidin and Shwartz (2023)	Israel	Educational design	Socioscientific issues	Barrier identification	A short program structured around argumentation and communication increased practical knowledge of pedagogical tools.
Amir (2023)	Israel	Mixed-methods cases	ICT integration	Holistic disciplinary model	A hybrid instructor-guided format combining technological and disciplinary expertise substantially reduced barriers to classroom adoption.
Charania et al. (2024)	India	Quasi-experimental	Meaningful ICT integration	Constructivist approach	Online training adapted to a multicultural context with multilingual assessments facilitated genuine technology appropriation.
Chaipidech et al. (2022)	Thailand	Quantitative pretest/posttest	TPACK model	Artificial intelligence	A personalized AI-based andragogical system providing diagnoses and recommendations significantly optimized technological knowledge.

Note. Based on the 40 articles analyzed, authors' own work (2026).

The studies in Table 4 were distributed across three continents: the Americas accounted for 14.3% (United States), Asia for 57.1% (India and Thailand), and Europe for 28.6% (Spain and the United Kingdom). All articles were published in English. The analysis identified gaps in teachers' acquisition of digital competencies when programs were restricted to developing isolated technical skills. Evidence suggested the feasibility of personalized AI-based andragogical platforms and support from specialized mentors, which may act as catalysts and could mitigate disciplinary obstacles.

Programs with Collaborative Strategies

Activities such as pair work, mentoring, and ongoing feedback are important for enhancing teaching performance. Table 5 presents relevant studies of professional learning communities oriented toward specific needs, emphasizing the involvement of certified trainers and leadership within these communities.

Table 5

Collaborative Strategies.

Author(s)/year	Country	Design	Program area	Analytical category	Evidence for the review
Stuhlman et al. (2022)	United States	Quasi-experimental	Peer coaching	Pedagogical exchange	Teams supported by structured materials optimized time devoted to pedagogical discussion and increased video sharing and student participation.
Djamnezhad et al. (2023)	Sweden	Randomized controlled trial	Behavior management	Implementation fidelity	Systematic phased training with certified trainers ensured a positive school climate through ongoing observation and feedback.
Carli and Pantano (2023)	Italy	Longitudinal case	Laboratory practices	Reciprocal training	Collaborative and microteaching meetings focused on a shared interest became central to professional growth.
Bandeira et al. (2021)	Brazil	Randomized controlled trial	Multicomponent intervention	Impact assessment	Despite a robust structure including brochures and online platforms, no statistically significant intervention effects were observed.

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Author(s)/year	Country	Design	Program area	Analytical category	Evidence for the review
Mavuso et al. (2022)	South Africa	Exploratory qualitative	Climate change education	Practice exchange	Professional learning communities facilitated the acquisition of content knowledge and integration of the geography curriculum.
Sandal (2023)	Norway	Qualitative	Formative assessment	School network groups	Establishing participatory and flexible networks in schools increased teachers' confidence in applying assessment for learning.

Note. Based on the studies included in the systematic review, authors' own work (2026).

The six studies in Table 5 were published in English. The Americas accounted for 33.3% (United States and Brazil), Africa for 16.7% (South Africa), and Europe for 50% (Italy, Norway, and Sweden). The relational analysis identified a challenge: structured design and supporting materials could optimize the time devoted to authentic pedagogical exchange. However, the evidence from the multicomponent study in Latin America suggests that structural complexity, without deep integration into everyday school dynamics, may become an obstacle that delays the program's expected outcomes.

Formative Assessment and Pedagogical Self-Regulation Programs

Reflective practice is a central component of teacher improvement. Table 6 presents studies emphasizing the importance of reflective sessions before and during programs, using reflective journals regularly and in pairs as a strategy for developing performance assessment and professional development.

Table 6

Formative Assessment and Pedagogical Self-Regulation.

Author(s)/year	Country	Design	Program area	Analytical category	Evidence for the review
De Vries et al. (2022)	Netherlands	Experimental study	Professional needs	Adaptive diagnosis	Teacher professional development was maximized when specific needs were systematically assessed before and during program implementation.
Hassani et al. (2023)	Austria	Qualitative with pretest/posttest	Classroom interactions	Reflective journals	Weekly reflective journals kept for six weeks promoted critical self-assessment and documented sustained adjustments in the classroom climate.
Gudeta (2022)	Ethiopia	Convergent mixed methods	Technical-pedagogical aspects	Peer observation	The use of standardized school-provided forms encouraged critical self-assessment in lesson planning.

Note. Based on the 40 articles analyzed, authors' own work (2026).

The studies in Table 6 originated from Europe, which accounted for 66.7% of the sample (Austria and the Netherlands), and Africa, which accounted for the remaining 33.3% (Ethiopia); all were published in English. The identified pattern showed a favorable trend in teacher performance assessment when moving from external punitive approaches to guided critical self-assessment. Regular reflective journals and peer-observation forms were reported as recurring components and the most consistent mechanisms for linking formative theory with variations in everyday classroom interactions.

Design and Leadership Programs

Contextualizing the institution's local reality is a relevant factor in achieving pedagogical balance and modifying research. Table 7 contrasts the contributions of a continuing professional development program oriented toward teacher change with those of a study proposing consideration of local realities and needs.

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Table 7

Design and Leadership.

Author(s)/year	Country	Design	Program area	Analytical category	Evidence for the review
Reid et al. (2025)	United States	Longitudinal qualitative	Action research	Change leaders	Designing and implementing autonomous projects in teachers' own classrooms, supported by mentoring, transformed teachers into sustainable leaders.
Barrientos-Moncada et al. (2023)	Colombia	Exploratory qualitative	English language teaching	Regional realities	Isolated workshops that ignored differences among educational levels and specific territorial contexts lacked lasting impact.
Dolfing et al. (2021)	Netherlands	Multiple-case study	Context-based curriculum	Curricular balance	Maintaining a problem-analysis phase and a clear balance between new and conventional curricula facilitated assimilation of scientific content.

Note. Based on the studies included in the systematic review, authors' own work (2026).

The three studies collected in Table 7 were distributed across the Americas, with 66.7% (Colombia and the United States), and Europe, with the remaining 33.3% (the Netherlands), and were published in English. The cross-cutting analysis identified a substantial pattern in the sustainability of continuing professional development: centralized policies that design generic programs without differentiating needs by educational level are insufficient, excessive, and poorly specified relative to their objectives. Conversely, the most frequently identified factors concern longer-term programs based on action research, sensitive to local realities, and extending beyond temporary administrative changes.

Synthesis of Findings

Finally, to consolidate the evidence analyzed in the preceding categories, a relational matrix was structured to synthesize the predominant trends and approaches in the 40 documentary sources included in the review. Data collected on continuing teacher professional development programs indicated that they were not always adapted to regional needs, indicating a gap or disconnection from local reality (Barrientos-Moncada et al., 2023). This issue was exacerbated in vulnerable settings, where working with local trainers who are properly accepted by the community was essential (Brick et al., 2021).

Regarding program design, structure alone was not a determining factor, since other components were more decisive for success or failure, such as attitudinal resistance to change and administrative obstacles surrounding implementation (Bandeira et al., 2021). Consequently, teacher professional development programs must respond to contextual and student characteristics (Carli & Pantano, 2023), while progressively integrating information technology and artificial intelligence systems that personalize teacher training (Chaipidech et al., 2022). Table 8 synthesizes the principal findings, trends, and frequencies of occurrence.

Table 8

Analytical Synthesis of Approaches, Content, and Methodologies in the Included Studies.

ANALYTICAL DIMENSION	IDENTIFIED CATEGORIES	FREQUENCY AND PERCENTAGE
Prevailing theoretical approaches	• Socioconstructivism and active learning • Social cognitive theory and self-efficacy • Self-determination theory • TPACK and technological-pedagogical models • Andragogy and adult learning	n = 6 (15.0%) n = 5 (12.5%) n = 5 (12.5%) n = 3 (7.5%) n = 2 (5.0%)
Program content	• Socioemotional skills and well-being • Technology integration / STEM • Formative assessment and self-regulation • Physical activity and health • Language competencies and language teaching	n = 7 (17.5%) n = 6 (15.0%) n = 4 (10.0%) n = 3 (7.5%) n = 3 (7.5%)
Contextualization	• Adapted to specific contexts (post-conflict, pandemic, rural) • Aligned with professional standards and needs	n = 6 (15.0%) n = 3 (7.5%)

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ANALYTICAL DIMENSION	IDENTIFIED CATEGORIES	FREQUENCY AND PERCENTAGE
Delivery modality	• Face-to-face • Hybrid / mixed • Online • Not specified	n = 18 (45.0%) n = 9 (22.5%) n = 6 (15.0%) n = 7 (17.5%)
Program duration	• Long duration (1 to 5 years) • Medium duration (1 to 6 months) • Short duration (1 day to 2 weeks)	n = 12 (30.0%) n = 14 (35.0%) n = 8 (20.0%)
Reflection strategies	• Promotion of reflective practice, group discussion, self-assessment, observation, and journals.	n = 32 (80.0%)
Methodology	• Mixed (surveys, interviews, observations, and tests) • Quantitative (scales and questionnaires) • Qualitative (interviews and focus groups)	n = 14 (35.0%) n = 12 (30.0%) n = 10 (25.0%)
Outcome trends	• Increased pedagogical knowledge and competencies • Positive changes in classroom practices • Favorable perception of teacher self-efficacy • Mixed or neutral effects on mental health	n = 15 (37.5%) n = 10 (25.0%) n = 9 (22.5%) n = 3 (7.5%)

Note. N = 40 documentary sources for the descriptive and structural characteristics of the corpus. Categories corresponding to intervention outcomes were calculated only from empirical studies reporting outcomes (n = [indicate]). The dimensions of approach, content, contextualization, and reflectivity allowed multiple coding; therefore, their frequencies were not mutually exclusive categories. Authors' own work (2026).

Table 8 summarizes the studies included in this systematic review, published in scientific journals indexed in Scopus (42.5%) and Web of Science (57.5%). Research on continuing teacher development prioritized mixed-methods designs and medium-duration face-to-face modalities aimed at strengthening pedagogical competencies and mental health. The data showed that, although reflection and feedback were incorporated in most theoretical proposals, impacts were limited or neutral when continuous support was absent. Regarding the perceived effectiveness of programs, no uniform pattern was observed that was associated exclusively with accumulated instructional hours; instead, the pattern concerned the holistic articulation of disciplinary content, an andragogical self-efficacy approach, and a design grounded in teachers' reflective practice.

Discussion

The review findings answer the research question by showing that the main challenges in implementing teacher professional development programs are related to institutional constraints, resource availability, resistance to change, weak support, and limited adaptation of interventions to teachers' needs. Across the studies, the evidence suggests that program effectiveness and sustainability do not depend solely on duration or formal structure, but rather on the interaction among institutional contextualization, ongoing support, reflective practice, professional collaboration, and organizational backing. Accordingly, isolated or standardized interventions yield less consistent results than those integrated into school dynamics and aligned with specific teacher needs. This interpretation must be understood in light of the qualitative-documentary nature of the review and the methodological heterogeneity of the included studies; the identified relationships represent recurring patterns in the literature rather than pooled causal estimates.

The implementation challenges identified show that structural constraints and teachers' professional conditions are relevant to understanding observed differences among programs. This interpretation is consistent with the OECD (2019) and Tretiak et al. (2024), who note that participation in professional development activities may be limited by available time, costs, incentives, and the relevance of the training offered. The findings are also consistent with Van De Sande et al. (2022), who show the importance of considering participants' sociocultural characteristics when implementing educational interventions, while Amir (2023) emphasizes that innovation requires linking disciplinary, technological, and pedagogical components. From another perspective, Gudeta (2022) highlights the value of professional reflection in reviewing teaching practices, whereas Saelid et al. (2022) report that structured school interventions do not necessarily produce the expected effects for every outcome assessed. Taken together, these findings support avoiding linear interpretations of continuing professional development and

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considering the institutional and professional conditions that mediate implementation.

Regarding contextualization, the findings indicate that adapting programs to sociocultural, territorial, and professional characteristics is a recurring element in the experiences reviewed. Darragh and Petrie (2022) emphasize that training needs associated with complex situations, such as trauma and educational vulnerability, require specific contextualized responses, while Brick et al. (2021) highlight the relevance of involving community-based stakeholders and institutional support structures in training processes. This perspective is consistent with Barrientos-Moncada et al. (2023), who document differences in professional development needs according to teachers' territorial and educational realities. At the relational level, Yan and King (2023) show that certain assessment and self-efficacy practices may spread through interactions among teachers, reinforcing the value of collaborative professional settings. In addition, Porsanger (2023) indicates that professional knowledge demands may vary according to disciplinary characteristics and the concrete conditions of practice. Thus, contextualization does not merely mean changing content; it entails connecting training design with the institutional, disciplinary, and sociocultural characteristics of teaching activity.

Sustainability is another cross-cutting dimension of the findings. Reviewed studies repeatedly include support, feedback, and shared reflection as components of programs reporting favorable variations in professional practice. This interpretation is consistent with Braun et al. (2024), who emphasize the importance of implementation conditions and teacher support in programs addressing stress. Stuhlman et al. (2022) show that incorporating structured support practices into teaching teams can encourage professional collaboration, while Gorghiu et al. (2024) highlight the potential of coaching support to strengthen self-efficacy. Likewise, Kim et al. (2021) and De Vries et al. (2022) provide evidence concerning the importance of reviewing, adapting, and assessing professional practices through systematic reflection and formative assessment. These findings are consistent with the trend observed in the review, in which reflection and feedback appeared in a considerable proportion of analyzed studies. Nevertheless, the available evidence does not permit identifying a universal duration threshold at which a program becomes sustainable; duration must be interpreted alongside intensity, continuity, support, and implementation conditions.

Institutional barriers and enabling factors also help explain some of the variation observed across interventions. Eidin and Shwartz (2023) show that incorporating training proposals requires aligning new content with actual implementation conditions, while Lotter et al. (2024) identify challenges and support factors related to retaining secondary science and mathematics teachers. In parallel, Liu et al. (2023) emphasize the influence of personal factors on teachers' motivational styles, showing that professional changes do not depend exclusively on program structure. Regarding technology, Chaipidech et al. (2022) show that personalized systems can support teachers' technological-pedagogical knowledge development, although this finding does not warrant generalizing the superiority of technology-mediated training over other modalities. Finally, Dolfing et al. (2021) stress the importance of linking professional development to curricular processes and meaning-making in practice. Collectively, these studies suggest that technological, material, and organizational resources act as facilitators when integrated into contextualized pedagogical strategies but are unlikely to compensate on their own for shortcomings in support, relevance, or institutional backing.

The limitations of this review must be considered when interpreting these findings. First, the search focused on scientific literature retrieved through Scopus, Web of Science, and ScienceDirect, potentially excluding studies available in other databases and experiences reported in gray literature. Second, the included studies showed some heterogeneity in design, duration, modality, instruments, and effectiveness measures, precluding meta-analysis and limiting comparisons among interventions. Moreover, the descriptive frequencies identify occurrence trends but do not allow estimates of effect magnitude or causal relationships between program components and outcomes. Another limitation concerns the diversity of indicators used to represent effectiveness, ranging from teacher

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knowledge and self-efficacy to classroom practice and student outcomes. Conclusions should therefore be interpreted as a synthesis of recurring patterns rather than definitive evidence of the superiority of any specific professional development modality, duration, or strategy.

Future research should progress toward longitudinal designs capable of assessing the persistence of changes in teaching after interventions end and establishing clearer links among professional development, modifications in classroom practice, and student learning outcomes. It would also be useful to compare programs with different levels of contextualization, support, and institutional integration using shared indicators that make their effectiveness and sustainability estimable. Regarding technology, controlled studies will be necessary to examine the specific contribution of personalized systems and generative artificial intelligence tools, distinguishing their effects from those arising from pedagogical support and professional collaboration. Finally, research should expand into disciplinary areas underrepresented in the corpus, including arts education and critical thinking development, as well as rural, vulnerable, and socioculturally diverse contexts, to establish the conditions under which continuing professional development programs can be transferred and sustained effectively.

Conclusions

The importance of this study lies in integrating available evidence on implementation challenges, contextualization factors, and components associated with the effectiveness and sustainability of continuing professional development programs for basic education teachers. The findings suggest that teacher professional development is a situated process that goes beyond merely accumulating training hours or implementing standardized interventions. Specifically, institutional contextualization, ongoing support, reflective practice, professional collaboration, and organizational backing emerge as recurring components in programs reporting favorable outcomes. This contribution helps explain why continuing professional development requires coherent alignment among teachers' needs, school conditions, and implementation strategies, although the heterogeneity of the reviewed studies prevents establishing the absolute superiority of any particular modality, duration, or training model.

Regarding the research objectives, the synthesized evidence suggests that sociocultural relevance, prior identification of professional needs, and integration of programs into institutional dynamics may promote greater continuity of acquired practices and better transfer to the classroom. The findings also suggest that restrictive factors related to available time, resources, resistance to change, and institutional support may limit expected effects when overlooked in program design and implementation. Consequently, continuing professional development should evolve toward more flexible, contextualized, and collaborative models in which digital technologies and personalized systems complement pedagogical support rather than replace professional interaction, critical reflection, or institutional backing.

Future research should assess the persistence of changes in teaching after program completion through longitudinal designs and establish more precise relationships among professional development, classroom practice, student learning outcomes, and student well-being. It will also be necessary to compare interventions with different levels of contextualization, duration, support, and institutional backing using common assessment criteria to estimate effectiveness and sustainability more precisely. Furthermore, the evidence base should be expanded in disciplinary areas insufficiently represented in the review, including arts education and critical thinking development, and further examined in rural, vulnerable, and socioculturally diverse contexts. Finally, the specific potential of artificial intelligence and other personalized technological systems in continuing professional development programs should be investigated, distinguishing their contribution from the effects associated with mentoring, peer collaboration, and institutional integration.

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Declaration of Conflicts of Interest

The author declares that there are no conflicts of interest related to the conduct of this study or the interpretation of its results. She further states that she has no personal, academic, or financial relationships that could influence the development or findings of the research.

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Ethics Statement

This research did not require institutional ethics committee approval or informed consent because it was conducted as a documentary systematic review of scientific articles published in academic databases, without direct involvement of human participants or processing of personally identifiable data. Nevertheless, the principles of academic integrity, methodological transparency, source traceability, and recognition of the intellectual authorship of the included studies were upheld. The literature search, selection, analysis, and synthesis were also conducted according to criteria of scientific rigor, responsible citation, and ethical use of documentary information.

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