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Collaborative learning in higher education: a systematic review of current foundations, practices, and challenges (2021–2025)

Aprendizaje colaborativo en la educación superior: una revisión sistemática sobre fundamentos, prácticas y desafíos actuales (2021–2025)

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Abstract
Globally, there is a relentless search for a university teaching method that allows students to acquire the necessary skills to make decisions in the workplace and thus succeed in an increasingly competitive world. Given this reality, cooperative learning emerges as an alternative to traditional education based on encyclopedic knowledge, memorization, and repetition, giving way to the construction of knowledge among students and between students and teachers. As this method has been implemented in higher education, this study aims to analyze collaborative learning in higher education from a recent perspective. In terms of methodology, this research is documentary in nature, focusing on the parameters established in systematic reviews and PRIMA protocols. Among the results, it was found that, although competencies such as communication, respect, and active knowledge construction have been reinforced, there are obstacles such as a lack of equity in group participation. In conclusion, the success of this educational approach does not depend on the grouping of students but on the teacher's pedagogical design.

Keywords: collaborative learning, higher education, teamwork.

Resumen
A nivel mundial existe una incesante búsqueda por encontrar el método de enseñanza universitaria que permita al estudiante adquirir las competencias necesarias para tomar decisiones en el campo de trabajo y así tenga éxito en un mundo cada vez más competitivo. Ante esta realidad, el aprendizaje cooperativo surge como alternativa a la educación tradicional fundamentada en el enciclopedismo, la memorización y repetición, para dar paso a la construcción del conocimiento entre alumnos y alumno–docente. Como este método se ha estado implementando en la educación superior este estudio tiene el objetivo de analizar el aprendizaje colaborativo en la educación superior desde una perspectiva resiente. En cuanto a la metodología, esta investigación es del tipo documental centrada en los parámetros establecidos en las revisiones sistemáticas y los protocolos PRIMA. Entre los resultados se encontró que, aunque se han logrado reforzar competencias como la comunicación, el respecto y la construcción activa del conocimiento existen obstáculos como la falta de equidad en la participación grupal. Como conclusión, el éxito de este enfoque educativo no depende de la agrupación de los estudiantes sino del diseño pedagógico del docente.

Palabras clave: aprendizaje colaborativo, educación superior, trabajo en equipo.

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Introduction

The question of how students learn is hardly new; since the time of Socrates, humanity has sought methods that enable learners to truly appropriate knowledge. Various cognitive theories and educational frameworks, such as constructivism, behaviorism, meaningful learning, among others, have been proposed over time. Although these approaches have reshaped certain aspects of teaching practice, they have not fundamentally transformed the teaching-learning process. Instruction continues to rely heavily on transmission-based, encyclopedic, and memoristic models centered on concept repetition, where procedural mechanization often sidelines analysis and critical thinking. In this regard, Salazar et al. (2024) contend that the instructor's role should extend beyond merely transmitting information; rather, educators ought to manage students' learning processes by offering guidance, tools, and resources that facilitate autonomous knowledge development.

In the current context of rapid global change, education stands at a critical juncture. Digital transformation, globalization, and socioeconomic pressures are driving a fundamental reassessment of conventional teaching methods (Rodríguez, Domínguez & Solórzano, 2024). In light of emerging technologies, there is an urgent need to overhaul existing curricula, some dating back to the previous century, and redesign them to address the new challenges that future professionals will face in a labor market that tests adaptability and innovation. While educational reform partly falls under state policy, universities nevertheless play a decisive role in updating academic programs.

Adding to the issue of outdated curricula are statistics reflecting high course failure rates. Medina et al. (2018) observe that students often fail to recognize their own responsibility for poor academic performance, instead blaming the institution, faculty, or course content. This lack of accountability can generate disengagement, potentially leading to academic failure and rejection of the university experience. Against this backdrop, an instructional approach has emerged that integrates teaching and learning processes while enhancing content comprehension through collaborative learning, a strategy that, according to Reyes and Meneses (2024), offers numerous advantages for developing students' cognitive, metacognitive, and affective competencies.

In essence, García, Hernández and Recamán (2012) explain that this approach builds on student interaction, enabling joint knowledge construction through dialogue and cooperation toward shared goals. Given this context, the present study aims to examine collaborative learning in higher education from a current perspective. The specific focus was selected to investigate the benefits of implementing collaborative learning in the teaching-learning process at the university level. As Ortí, González & Burgueño (p. 4) note, collaborative learning "seeks to weave knowledge networks among organizations, professionals, students, and all stakeholders who have something to contribute." Among its advantages, this teaching approach promotes inclusive education.

Collaborative learning is considered inclusive because it necessarily requires all participants to communicate and interact in order to achieve the objectives outlined in academic programs. Palicio, Deroncele and Goñi (p. 167) reinforce this view, stating that "one emerging category related to collaborative work is empathetic and assertive communication. Findings reveal that learning to coexist by sharing ideas with others and practicing assertive communication and respect in the classroom is essential." Collaborative work thus not only fosters communication but also reinforces values such as respect within group interactions while simultaneously strengthening individual learning (Álvarez et al.). This entails a restructuring of teaching configurations toward more autonomous and reflective learning models in which student-instructor and student-student relationships are transformed.

Although this teaching alternative gained considerable momentum in the educational system following the pandemic, Quic and Iliana (p. 7) note that collaborative learning originates in social constructivist theory yet constitutes a long-standing practice that predates any formal theoretical framework. Its grounding in constructivism is logical: within collaborative work, each individual possesses a unique perspective on the world, yet this perspective can be reconstructed from the individual to the group level under instructor guidance. Fernández (2024, p. 2) emphasizes that "it is crucial to prepare teachers to promote educational inclusion and learning diversity in their classrooms."

Indeed, continuous teacher training and professional development remain essential, as many cognitive theories and educational movements have partially failed because instructors lacked sufficient understanding of their objectives and methodological frameworks, thereby impeding classroom implementation. Given these emerging challenges for educators, the present study poses the following question: How has collaborative learning been addressed in recent higher education research? The aim is to determine whether this educational approach

has been genuinely embraced by instructors and students or whether it remains merely another strategy with limited impact on university teaching and learning processes.

Methodology

The methodology employed centers on documentary research structured as a systematic review following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) protocols, originally published in 2009. According to Page et al. (2021, p. 1), PRISMA "is designed to help systematic review authors transparently document why the review was conducted, what the authors did, and what they found." The following phases were established:

1. Search phase: The search was conducted in Scopus between June and November 2025 using the following equation: (TITLE-ABS-KEY("collaborative learning" OR "cooperative learning" OR "team-based learning" OR "peer learning")) AND (TITLE-ABS-KEY("higher education" OR "university students" OR "tertiary education")) AND (TITLE-ABS-KEY("foundations" OR "practices" OR "challenges" OR "pedagogical strategies")) AND (PUBYEAR > 2020 AND PUBYEAR < 2026). Filters were applied for document type (scientific articles), subject area (Social Sciences), language (Spanish), and time period (2021–2025).

2. PRISMA protocol execution: PRISMA protocols for screening, eligibility, and inclusion were applied. Each record identified in the databases (raw documents) was evaluated, and unique records were assessed in full text, yielding excluded articles by criterion.

3. Analysis phase: The sample was counted and classified according to author, year, objective, method, and findings.

4. Synthesis phase: A narrative synthesis was conducted for all studies included in the final sample:

Results and discussion

During the search phase, all literature in the selected sources was reviewed, yielding an initial population of 1,042 studies. As no duplicates or additional records from other sources were detected, all articles advanced to the screening phase, where titles and abstracts were reviewed to exclude those unrelated to the topic. This process reduced the pool to 112 records. From this result, 82 studies were excluded, leaving a final sample of 30. Reasons for exclusion during full-text evaluation included: non-relevance to higher education, lack of collaborative structure, and insufficient methodological detail. Ultimately, 30 studies meeting all quality and thematic criteria were retained (Table 1).

Table 1. Study selection criteria

Inclusion criteria	Exclusion criteria
Studies explicitly focused on collaborative or cooperative learning in higher education with defined pedagogical structure	Research conducted in basic, secondary, or non-university education settings
Articles published between 2021 and 2025	Publications outside the established timeframe
Empirical research (quantitative, qualitative, mixed), case studies, or systematic reviews	Non-peer-reviewed documents: theses, conference proceedings, essays, institutional reports
Published in peer-reviewed scientific journals	Studies lacking full-text access or with insufficient data for analysis
Population comprising university students and/or instructors (undergraduate or graduate)	Works describing only "group work" without structured collaborative processes

Results addressing interaction, participation, competencies, experiences, challenges, or perceptions of collaboration	Studies not analyzing outcomes linked to collaborative learning
Available in Spanish	Duplicate studies or those with serious methodological deficiencies

Note: Table prepared with data extracted from the selected sample.

Subsequently, all studies were classified in tables by author-year, objective, method, and findings. Each table was further organized according to the following criteria: foundations of collaborative learning, implementation practices and experiences, student perceptions and experiences, and current and emerging trends. The findings revealed that collaborative learning is indeed being implemented in higher education and has successfully strengthened student communication, respect, and active participation in knowledge construction. However, the sample also revealed persistent issues including lack of cohesion, participation inequities, coordination and commitment problems, collaborative participation barriers, gender gaps affecting collaboration, and coordination limitations and obstacles.

These findings suggest that the implementation of collaborative learning still has considerable ground to cover in educational contexts. Instructor intervention often remains limited or poorly designed, possibly because some educators assume collaboration is a natural process that students can execute independently. Yet when group activities are assigned without adequate coordination, inequities arise and persist, particularly when instructors adopt a passive stance, failing to monitor interaction dynamics or ensure a safe space where all students can participate actively on equal terms. Instructors are therefore essential for articulating the methodological framework and facilitating student inclusion in the teaching-learning process, as students alone encounter barriers to integrating fully into this educational approach.

Table 2. Foundations of collaborative learning

No.	Author – Year	Objective	Method	Findings
1	Prieto Andreu (2025)	Analyze collaborative learning foundations in VR/AR/MR	Systematic review	Immersion enhances interactions and joint construction
2	Hernández-Sellés et al. (2024)	Explore digital collaborative learning bases	Empirical	Interaction and roles are key to sustaining collaboration
3	Caubet et al. (2024)	Analyze formative evaluation as foundation for critical thinking	Qualitative	Collaboration reinforces reflective processes
4	de Jesús Molina Gutiérrez et al. (2023)	Examine libraries' role in collaborative innovation	Documental	Library spaces facilitate collaborative dynamics
5	Hernández-Sellés et al. (2023)	Identify teacher roles in virtual collaboration	Qualitative	Teacher roles structure collaborative experience
6	Saiz-Linares (2023)	Review reflective practice theory in teacher training	Documental review	Reflection underpins collaborative work
7	Hernández et al. (2021)	Identify strategies for research competencies	Descriptive	Collaboration strengthens research skills

Note: Table prepared with data extracted from the selected sample.

Table 3. Implementation practices and experiences

No.	Author – Year	Objective	Method	Findings
1	Roy Sadradín et al. (2025)	Examine relationship between digital competencies and innovation	Quantitative	Curricular innovation is enhanced through collaboration
2	Muñoz-Carril et al. (2024)	Identify success factors in online collaborative work	Quantitative	Role, communication, and leadership determine effectiveness
3	Reyes & Meneses (2024)	Evaluate collaborative implementation in online university	Case study	Limited inclusion in collaborative dynamics
4	Navas Romero (2024)	Evaluate educational breakouts	Applied	Breakouts increase collaborative motivation
5	Pacheco-García et al. (2024)	Review innovations in training profiles	Descriptive	Digital collaboration is a cross-cutting axis
6	Díaz et al. (2024)	Analyze training virtualization	Documental	Digital collaboration emerges as key practice
7	Gil-Juárez et al. (2024)	Evaluate CBL in teacher training	Quantitative	Collaborative competencies strengthened
8	Cerveró-Carrascosa et al. (2024)	Evaluate Padlet for collaborative learning	Quantitative	Padlet facilitates collaborative written interaction
9	Galindo-Domínguez et al. (2024)	Describe group conflicts	Qualitative	Identifies problems and collaborative solutions
10	Ortí-Martínez et al. (2023)	Post-COVID collaborative experiences	Case study	Collaboration energizes open training
11	Segundo et al. (2023)	Explore visual resources for cooperation	Critical	Promotes reflection through image interaction
12	Hervás-Torres et al. (2022)	Analyze mentoring and service-learning	Quasi-experimental	Improves collaborative academic engagement
13	Medina et al. (2022)	Evaluate peer observation	Quantitative	Improves technical learning
14	Martos-García et al. (2022)	Evaluate motor story cooperative	Qualitative	Increases empathy and group cohesion
15	González & Roldán (2021)	Evaluate cooperative eco-stories	Qualitative	Fosters artistic cooperation

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16	Aparicio-Herguedas et al. (2021)	Analyze teamwork	Quantitative	Structures initial professional development

Note: Table prepared with data extracted from the selected sample.

Table 4. Student perceptions and experiences

No.	Author – Year	Objective	Method	Findings
1	Reyes & Meneses (2024)	Evaluate inclusion in collaborative environments	Case study	Lack of cohesion and participation inequities
2	Galindo-Domínguez et al. (2024)	Describe frequent conflicts in group work	Qualitative	Coordination and commitment problems
3	Martínez-Sanz (2022)	Analyze effects of teaching innovation	Quantitative	Barriers in collaborative participation
4	Gutiérrez et al. (2022)	Study emotional differences in cooperative learning	Quantitative	Gender gaps affect collaboration
5	Hernández-Sellés (2021)	Evaluate virtual interaction during pandemic	Qualitative	Interaction limitations hinder collaboration
6	Parra & Checa (2021)	Analyze interventions against gender violence	Qualitative	Obstacles in collaborative coordination

Note: Table prepared with data extracted from the selected sample.

Table 5. Current and emerging trends

No.	Author – Year	Objective	Method	Findings
1	Prieto Andreu (2025)	Explore collaboration in immersive environments	Systematic review	VR/AR redefines collaborative interaction
2	Roy Sadradín et al. (2025)	Relationship between digital competencies and innovation	Quantitative	Collaboration drives contemporary innovation
3	Muñoz-Carril et al. (2024)	Key factors in online collaborative work	Quantitative	Online learning dominates current trends
4	Navas Romero (2024)	Design educational breakouts	Applied	Considered an ascending pedagogical trend
5	Gil-Juárez et al. (2024)	Determine CBL in university settings	Quantitative	Emerging collaborative methodology
6	Cerveró-Carrascosa et al. (2024)	Digital collaborative writing	Quantitative	Consolidates as emerging tool

7	Saiz-Linares (2023)	Review of reflective practice	Documental review	Reflection integrates into new collaborative models
8	Palacios-Núñez et al. (2022)	Effectiveness of online collaborative learning	Qualitative	Defines emerging factors for digital collaboration
9	de Ves et al. (2022)	Collaborative body percussion	Quantitative	Artistic interventions emerge as trend
10	Aparicio-Herguedas et al. (2021)	Collaborative work in initial training	Quantitative	Post-pandemic reconfiguration of collaborative work
11	Albarello et al. (2021)	Smartphone use for collaboration	Quantitative	Smartphone emerges as key collaborative tool

Note: Table prepared with data extracted from the selected sample.

The findings of this systematic review, based on a final sample of 30 studies, offer critical insight into the current state of collaborative learning in higher education. On one hand, the analysis confirms its widespread implementation and potential for developing essential cognitive competencies such as communication, respect, and active participation in knowledge construction. On the other hand, the results consistently reveal a significant gap between theoretical potential and practical experience, evidenced by recurring obstacles including lack of cohesion, participation inequities, coordination problems, unequal commitment, and gender-based disparities.

This duality is not coincidental but rather points directly to the core of implementation: the instructor's role. The findings suggest that many of the problems reported by students are essentially symptoms of insufficient or poorly structured facilitation. As observed in Tables 3 and 4, when instructor intervention is limited to assigning group tasks without a pedagogical framework that includes clear definition of interdependent roles, establishment of common goals, implementation of mixed assessment systems (individual and group), and active monitoring of group dynamics, a void emerges where dis-coordination and perceptions of unfairness take root. The passive instructor stance identified in the results not only permits these negative dynamics to persist but may also perpetuate them, as in the case of gender gaps, by failing to intervene in ways that ensure equitable and safe participation for all.

This interpretation finds support in the theoretical foundations analyzed (Table 2). Studies by Hernández-Sellés et al. (2023, 2024) and Prieto Andreu (2025) emphasize that effective collaboration is not spontaneous but rather requires intentional design that promotes positive interdependence and individual accountability. Failure to translate these principles into practice explains the discrepancy between what collaborative learning should achieve and what students actually experience. The challenges identified do not invalidate the model; rather, they underscore that its success depends on a transformation of the instructor's role, as educators ultimately bear responsibility for designing activities that foster enriching student experiences. Consequently, the discussion leads to an important conclusion: overcoming the identified obstacles requires moving beyond mere student grouping.

Conclusions

The systematic review demonstrates that collaborative learning in higher education has become a consolidated pedagogical approach capable of responding to contemporary training demands by integrating meaningful interaction, shared knowledge construction, and student participation. The studies analyzed coincide that collaboration promotes the development of cognitive, socioemotional, and digital competencies, particularly when clear instructional design, sustained teacher guidance, and appropriate use of technologies facilitating communication and joint work are present. Nevertheless, the findings also reveal persistent challenges, including unequal distribution of responsibilities, tensions arising from group dynamics, and gaps in access to or mastery of group techniques.

Concurrently, emerging trends are expanding the possibilities of collaborative learning, including the use of immersive environments, challenge-based methodologies, creative resources, and interactive digital platforms.

Taken together, the evidence supports the assertion that collaborative learning not only contributes to improving the quality of university education but also positions itself as a key element for driving pedagogical innovations and strengthening the educational experience across hybrid, face-to-face, and virtual contexts.

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DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE

The author declares that generative artificial intelligence tools were employed during the writing process solely as support for linguistic tasks, such as improving style, syntactic organization, and grammatical correction. These technologies were in no case used to generate original scientific content, interpret results, or substitute the academic and ethical judgment of the authors. Full responsibility for the integrity, validity, and originality of the manuscript rests exclusively with the author, in accordance with good editorial practices and internationally recognized ethical principles of scientific publication.

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