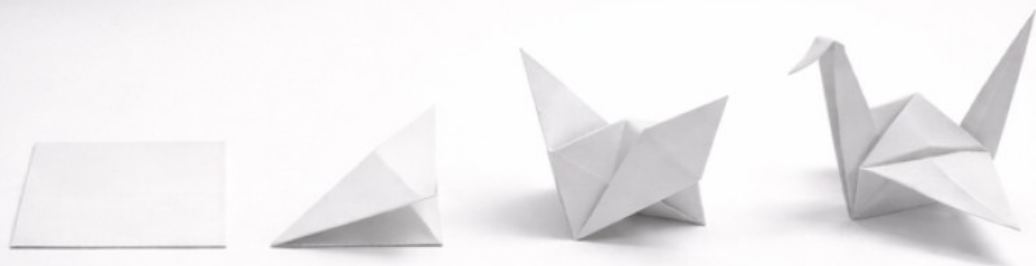




COLECCIÓN CONOCIMIENTO CONTEMPORÁNEO

Pedagogías innovadoras en acción:

modelos, estrategias y prácticas
para la transformación
educativa



Coords.

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Dykinson, S.L.

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PRÁCTICA PARA LA TRANSFORMACIÓN EDUCATIVA**



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2026



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LA TRANSFORMACIÓN EDUCATIVA

Diseño de cubierta y maquetación: Francisco Anaya Benítez

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Madrid 2026

N.º 312 de la colección Conocimiento Contemporáneo

1ª edición, 2026

ISBN: 979-13-7006-947-6

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FROM LEARNERS TO TEACHERS: A FLIPPED CLASSROOM EXPERIENCE TO FOSTER AUTONOMY AND TRANSVERSAL COMPETENCES

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1. INTRODUCTION

Higher education institutions are increasingly challenged to move beyond content transmission and to foster meaningful learning experiences that promote student autonomy, engagement, and the development of transversal competences. In a context marked by rapid social, technological, and professional change, universities are required to prepare students not only to acquire disciplinary knowledge, but also to communicate effectively, collaborate with others, and take responsibility for their own learning processes.

In response to these demands, active learning methodologies have gained prominence as pedagogical approaches capable of placing students at the center of the learning experience. Among these, the flipped classroom has emerged as a particularly relevant model, as it reorganizes traditional teaching dynamics by shifting the transmission of content outside the classroom and reserving in-class time for interaction, application, and reflection. When combined with peer teaching strategies, the flipped classroom further enhances student participation by positioning learners as co-constructors of knowledge rather than passive recipients.

This chapter presents and analyzes a flipped classroom experience implemented in several undergraduate programs at the University of Deusto, in which students assumed the role of teachers by preparing, delivering, and evaluating course content in peer-led sessions. The pedagogical design aimed to foster student autonomy, deepen conceptual understanding, and promote the development of transversal competences such as oral communication, teamwork, organization, and self-confidence. Within this framework, the instructor adopted a facilitative role, providing guidance, structure, and formative feedback throughout the process.

The primary objective of this study is to examine the educational impact of learning by teaching within a flipped classroom model, with particular attention to students' perceptions of motivation, engagement, and competence development. By combining quantitative data from structured satisfaction questionnaires with qualitative feedback gathered at the end of the academic term, the chapter offers an evidence-based account of how this methodology influences learning dynamics in higher education.

The chapter is structured as follows. First, the theoretical foundations of the flipped classroom and peer teaching are reviewed, situating the experience within the broader literature on active and student-centered learning. Second, the methodological design of the study is described, including the context, participants, and instruments used for data collection. Third, the main results are presented and analyzed. Finally, the discussion highlights the pedagogical implications of the findings, identifies limitations, and outlines directions for future research in the field of innovative teaching practices in higher education.

1.1. ACTIVE LEARNING IN HIGHER EDUCATION

Over the last decades, higher education has experienced a gradual but profound transformation in its pedagogical paradigms. Traditional transmission-based models, centered on the lecturer as the primary source of knowledge, have increasingly been questioned for their limited capacity to foster deep learning, critical thinking, and student engagement. In response, active learning approaches have gained prominence as pedagogical strategies that place students at the center of the

learning process, emphasizing participation, autonomy, and responsibility for learning.

From a constructivist and socio-cognitive perspective, learning is understood as an active process in which students construct knowledge through interaction, reflection, and experience. Within this framework, active learning methodologies aim to promote higher-order cognitive processes by engaging students in tasks that require analysis, synthesis, and application rather than passive reception of information. Empirical research in higher education consistently indicates that active learning environments are associated with improved academic performance, greater motivation, and enhanced engagement when compared to traditional lecture-based instruction (Bredow et al., 2021; Strelan et al., 2020).

However, the literature also highlights that active learning is not inherently effective by design alone. Its impact depends largely on the quality of instructional planning, the coherence between learning objectives and activities, and students' capacity for self-regulation and engagement. Studies emphasize that poorly structured active methodologies may generate confusion, resistance, or cognitive overload, particularly among students accustomed to more directive teaching models (Baig & Yadegaridehkordi, 2023; Sointu et al., 2022). Consequently, the shift toward active learning in higher education requires not only methodological innovation but also careful pedagogical design and sustained instructional support.

1.2. THE FLIPPED CLASSROOM IN HIGHER EDUCATION

Within the broader landscape of active learning methodologies, the flipped classroom has emerged as one of the most widely adopted and researched models in higher education. Its defining characteristic lies in the inversion of traditional instructional sequences: students engage with core theoretical content prior to class—typically through videos, readings, or digital resources—while in-class time is devoted to interactive, collaborative, and application-oriented activities (O'Flaherty & Phillips, 2015).

Extensive evidence from meta-analyses and systematic reviews in higher education indicates that flipped classroom models tend to produce small to moderate positive effects on academic achievement and learning outcomes when compared to traditional lecture-based instruction (Bredow et al., 2021; Cheng et al., 2018; Strelan et al., 2020; Van Alten et al., 2019). These effects are particularly pronounced when flipped designs incorporate active in-class tasks, formative assessment, and opportunities for immediate feedback (Hew & Lo, 2018; Låg & Sæle, 2019).

Student satisfaction with flipped classrooms is generally positive, although findings suggest that satisfaction is not uniformly higher than in traditional formats. Research indicates that students' perceptions are strongly influenced by the quality of pre-class materials, clarity of expectations, and alignment between pre-class preparation and in-class activities (Al-Samarraie et al., 2019). When these elements are poorly coordinated, students may perceive the flipped classroom as increasing workload without proportional learning benefits.

Importantly, the flipped classroom should not be understood merely as a technological innovation or a simple reorganization of teaching time. Rather, it represents a pedagogical shift that redefines the roles of both students and instructors. Instructors move toward a facilitative role, focusing on guiding learning processes, monitoring progress, and providing formative feedback, while students are expected to engage more actively and autonomously with learning materials (Rotellar & Cain, 2016).

1.3. LEARNING BY TEACHING AND PEER TEACHING IN UNIVERSITY CONTEXTS

Learning by teaching is based on the premise that the act of teaching others enhances one's own learning by requiring deeper cognitive processing, organization of knowledge, and metacognitive monitoring. When students prepare to teach, they must structure content coherently, anticipate questions, and evaluate their own understanding, thereby engaging in processes that go beyond surface learning.

In higher education, peer teaching has been increasingly recognized as an effective strategy for promoting active and collaborative learning.

Research indicates that peer teaching can enhance conceptual understanding, communication skills, and students' sense of responsibility for learning, particularly when supported by clear guidance and assessment criteria (Zainuddin & Perera, 2017). Moreover, peer teaching contributes to the development of a more participatory classroom culture, in which knowledge is constructed collectively rather than transmitted unidirectionally.

When integrated into a flipped classroom model, learning by teaching amplifies the benefits of both approaches. Pre-class preparation becomes more meaningful, as students engage with content not only to understand it themselves but also to explain it to others. In-class activities, in turn, are transformed into spaces of dialogue, clarification, and shared inquiry. Studies in higher education suggest that such combinations foster higher levels of engagement, autonomy, and reflective learning, especially when instructors provide pedagogical scaffolding and formative feedback (Divjak et al., 2022; Sointu et al., 2022).

Nevertheless, literature also points to potential challenges. Peer teaching may generate anxiety among students who feel unprepared or uncomfortable assuming an instructional role, particularly in contexts where traditional teacher-centered norms are deeply ingrained. These findings underscore the importance of creating supportive learning environments and progressively introducing students to teaching responsibilities.

1.4. DEVELOPMENT OF TRANSVERSAL COMPETENCES IN HIGHER EDUCATION

Beyond disciplinary knowledge, contemporary higher education increasingly emphasizes the development of transversal competences that are essential for professional, social, and personal contexts. Competences such as oral communication, teamwork, organization, autonomy, and self-confidence are widely recognized as key learning outcomes aligned with employability and lifelong learning.

Flipped classroom and peer-based methodologies have been identified as particularly suitable for competence-oriented education, as they require students to actively manage their learning processes, collaborate

with peers, and apply knowledge in authentic and socially situated contexts (Sointu et al., 2022; Zainuddin & Perera, 2017). Research in higher education indicates that these methodologies contribute positively to students' perceived autonomy, engagement, and confidence, especially when learning environments emphasize interaction and formative assessment (Nouri, 2016).

At the same time, studies highlight persistent challenges associated with competence development through active methodologies. Increased initial workload, uneven levels of student preparedness, and the need for instructor training are frequently cited as barriers to effective implementation (Baig & Yadegaridehkordi, 2023; Rotellar & Cain, 2016). These challenges suggest that the development of transversal competences requires not only innovative methodologies but also institutional support and pedagogical coherence.

Within this framework, learning by teaching can be understood as a human-centered pedagogical strategy that aligns flipped classroom principles with the holistic development of university students. By positioning learners as active contributors and co-creators of knowledge, this approach supports both cognitive learning and the cultivation of transversal competences essential for higher education in contemporary societies.

2. OBJECTIVE

The primary objective of this chapter is to examine the educational impact of a flipped classroom experience based on learning by teaching in higher education. Specifically, the study aims to analyze how assuming the role of teacher within a peer-led instructional framework influences students' autonomy, engagement, and development of transversal competences.

In addition, the chapter seeks to:

- a. Explore students' perceptions of motivation, participation, and responsibility for learning.
- b. Assess the contribution of peer teaching to conceptual understanding and communicative competence.

- c. identify strengths and areas for improvement in the implementation of this pedagogical approach across different undergraduate programs.

Through this objective, the chapter intends to provide empirical evidence on the potential of flipped classroom models combined with peer teaching to foster active, reflective, and competence-oriented learning in higher education.

3. METHODOLOGY

3.1. PROCEDURE

The teaching experience was implemented over the course of one academic semester within a flipped classroom framework combined with a learning-by-teaching approach. The procedure followed a structured four-phase sequence designed to ensure coherence, student autonomy, and continuous formative support.

Phase 1. Preparation

At the beginning of the semester, the instructor introduced the pedagogical approach, objectives, and assessment criteria to the students. Learning materials, including academic readings, instructional videos, conceptual outlines, and guidelines for class delivery, were made available through the institutional virtual learning platform. Students were then organized into small working groups and assigned specific course topics for which they would assume responsibility as peer teachers.

Phase 2. Design

Each group autonomously designed a teaching session related to its assigned topic. This process involved selecting and organizing key theoretical concepts, preparing visual support materials, and planning interactive or practical activities aimed at fostering participation and understanding. Groups were encouraged to incorporate active learning strategies such as discussions, debates, simulations, or short exercises aligned with the learning outcomes of the course. During this phase, the

instructor provided guidance when required, ensuring pedagogical alignment and feasibility.

Phase 3. Implementation

The student-designed sessions were delivered during scheduled class time. Groups assumed the role of instructors, leading the class, facilitating activities, and managing interaction with their peers. The instructor adopted an observational and facilitative role, intervening only when necessary to clarify concepts, maintain the flow of the session, or reinforce key ideas. This phase emphasized shared responsibility for learning and the creation of a collaborative classroom environment.

Phase 4. Evaluation and Feedback

A system of continuous and formative assessment was applied throughout the experience. This included self-assessment and peer assessment to promote reflection on learning processes and performance, as well as a mid-term evaluation conducted by the instructor. At the end of the semester, students completed a structured satisfaction questionnaire and provided qualitative feedback on motivation, communication, group dynamics, and perceived learning outcomes. This final phase aimed to consolidate learning and gather data to evaluate the educational impact of the methodology.

3.2. PARTICIPANTS

The participants in this study were 49 undergraduate students enrolled in three degree programs at the University of Deusto during one academic semester. The sample comprised students from the Bachelor's Degree in Primary Education (second year, $n = 24$), the Bachelor's Degree in Physical Activity and Sport Sciences (CAFyD) (fourth year, $n = 11$), and a course in Body Expression ($n = 14$).

The participants were selected through convenience sampling, as the intervention was integrated into regular course activities. All students enrolled in the selected courses took part in the experience as part of their academic program. Participation in the data collection process was

voluntary, and students were informed of the educational and research purposes of the study.

Across the three degree programs, more than 70% of the students reported having no prior experience with flipped classroom or peer-teaching methodologies. This contextual factor is particularly relevant for interpreting the results, as the intervention required students to engage with an active learning approach that was largely unfamiliar to them.

The inclusion of students from different programs and academic years allowed for the exploration of the flipped classroom and peer teaching methodology across diverse disciplinary contexts within higher education. This heterogeneity contributed to a broader understanding of students' perceptions regarding autonomy, engagement, and competence development in learning-by-teaching environments.

3.3. INSTRUMENTS

Data were collected using a structured student satisfaction questionnaire administered at the end of the academic semester. The instrument was designed to capture students' perceptions of the flipped classroom experience based on learning by teaching, with particular attention to motivation, engagement, autonomy, and the development of transversal competences.

The questionnaire consisted of two main sections. The first section included closed-ended items measured on a Likert-type scale, aimed at assessing students' levels of satisfaction with the methodology, perceived improvement in conceptual understanding, participation, communicative competence, teamwork, and self-confidence. The second section comprised open-ended questions that allowed students to provide qualitative feedback on their learning experience, classroom dynamics, and perceived strengths and areas for improvement of the pedagogical approach.

The use of both quantitative and qualitative items enabled a more comprehensive understanding of students' perceptions, combining measurable trends with reflective insights. This mixed approach was considered appropriate to explore the educational impact of the flipped classroom and peer teaching methodology in higher education contexts.

3.4. DATA ANALYSIS

Data analysis followed a descriptive and exploratory approach consistent with the objectives of the study and the nature of the research design. Quantitative data obtained from the closed-ended questionnaire items were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations, in order to summarize students' overall perceptions of the flipped classroom experience.

Qualitative data derived from open-ended questionnaire responses were analyzed through a thematic content analysis. Students' comments were reviewed, coded, and grouped into emerging categories related to motivation, autonomy, communication, group dynamics, and perceived learning outcomes. This process allowed for the identification of recurring patterns and illustrative examples that complemented the quantitative findings.

The integration of quantitative and qualitative analyses enabled a more nuanced interpretation of the results, providing both an overview of general trends and deeper insights into students' subjective experiences. This mixed analytical strategy was considered appropriate for capturing the educational impact of learning by teaching within a flipped classroom framework in higher education.

4. RESULTS

The results of the study reveal a consistently positive evaluation of the flipped classroom experience grounded in learning by teaching across the three undergraduate programs involved. Quantitative data from the satisfaction questionnaire indicate high levels of student agreement regarding the contribution of the methodology to active participation, engagement, and responsibility for learning.

4.1. MOTIVATION AND ENGAGEMENT

In terms of motivation and engagement, students reported a clear increase in their involvement with course content when compared to more traditional instructional approaches. A substantial proportion of participants

indicated that the requirement to teach peers encouraged them to prepare more thoroughly and to engage more deeply with theoretical materials prior to class. This heightened level of preparation was frequently associated with greater attentiveness during peer-led sessions and a more proactive attitude toward participation in discussions and activities.

More than 80% of participants agreed or strongly agreed that they felt more motivated, and over 85% reported higher levels of active participation compared to traditional lecture-based classes.

Students' qualitative comments suggest that motivation was not only linked to novelty, but also to the sense of purpose derived from having an active role in the learning process. Knowing that they would be responsible for explaining content to classmates appeared to foster a stronger commitment to learning and a more sustained effort throughout the semester. Several students emphasized that this responsibility helped them remain focused and involved beyond the minimum requirements of the course.

4.2. CONCEPTUAL UNDERSTANDING AND LEARNING PROCESSES

Regarding conceptual understanding, students consistently perceived that teaching others strengthened their mastery of course content. More than 80% of respondents agreed that explaining concepts to peers helped them clarify ideas, organize knowledge more coherently, and identify gaps in their own understanding. This perception was common across all participating programs, regardless of academic year or disciplinary context.

Qualitative feedback revealed that the process of preparing explanations and anticipating questions played a central role in reinforcing learning. Students reported that they became more aware of the internal logic of concepts and the relationships between theoretical elements. Additionally, responding to peers' questions during class sessions prompted real-time reflection and adaptation, which students identified as particularly valuable for consolidating learning.

4.3. Development of Transversal Competences

The development of transversal competences emerged as one of the most salient outcomes of the experience. Students reported significant perceived improvement in oral communication skills, particularly in relation to public speaking, clarity of explanations, and the ability to manage interaction with peers. Between 70% and 90% of students reported increased confidence in oral communication and public speaking, highlighting improvements in structuring presentations, managing nervousness, and addressing an audience. Although some participants initially expressed discomfort or anxiety about presenting in front of the class, many later described increased confidence and a sense of personal achievement as the experience progressed.

Teamwork and organizational skills were also highly valued. Students highlighted the need to coordinate tasks, distribute responsibilities, manage time effectively, and reach consensus within their groups. These demands were perceived as challenging but beneficial, as they mirrored collaborative dynamics commonly encountered in professional contexts. Several students noted that working closely with peers enhanced mutual trust and facilitated more effective communication within the group.

4.4. CLASSROOM CLIMATE AND LEARNING ENVIRONMENT

Qualitative data further highlighted the impact of the methodology on classroom climate and group cohesion. Students frequently described the learning environment as more dynamic, collaborative, and inclusive than in conventional lecture-based settings. Peer-led sessions were perceived as fostering closer relationships among classmates and reducing hierarchical distance, which contributed to a more relaxed and participatory atmosphere.

Students also reported feeling more comfortable asking questions and expressing doubts during peer-led sessions, as the perceived social distance between students was lower than in traditional teacher-centered contexts. This climate of trust and shared responsibility was repeatedly mentioned as a factor that facilitated learning and encouraged participation.

4.5. PERCEIVED LIMITATIONS AND AREAS FOR IMPROVEMENT

Despite the overall positive evaluation, students identified several areas for improvement. Some participants suggested that brief introductory contextualizations by the instructor at the beginning of each topic could help align expectations and provide a clearer conceptual framework before peer-led sessions. Others recommended increasing the diversity of in-class activities or offering additional guidance during the initial stages of the experience, particularly for students less familiar with active learning methodologies.

These comments indicate that, while students valued autonomy and responsibility, they also recognized the importance of instructional structure and scaffolding. The balance between student-led teaching and instructor guidance emerged as a key consideration for optimizing the effectiveness of the methodology.

4.6. SUMMARY OF RESULTS

Overall, the results indicate that the integration of flipped classroom principles with learning by teaching is associated with high levels of student motivation, engagement, perceived learning, and development of transversal competences. At the same time, the findings underscore the importance of careful instructional design and ongoing formative support to maximize the educational potential of this approach in higher education.

5. DISCUSSION

The findings of this study provide robust empirical support for the pedagogical value of flipped classroom models that integrate learning by teaching in higher education. Overall, the results are consistent with a substantial body of literature indicating that flipped classrooms can enhance student engagement, motivation, and learning outcomes when they are carefully designed and pedagogically aligned (Bredow et al., 2021; Strelan et al., 2020; Van Alten et al., 2019). However, the present study extends existing research by highlighting the added value of positioning students explicitly as peer teachers within the flipped classroom framework.

The reported increase in student motivation and engagement aligns with previous studies emphasizing that active learning environments foster greater involvement and responsibility for learning compared to traditional lecture-based approaches (Divjak et al., 2022; Sointu et al., 2022). In this experience, the requirement for students to assume the role of teacher appears to have intensified these effects. Preparing to teach peers demanded higher levels of commitment, deeper engagement with course content, and a more sustained cognitive effort. This finding reinforces the notion that flipped classrooms are particularly effective when students are not only active participants but also co-creators of the learning process.

From a cognitive perspective, the results related to conceptual understanding support theoretical and empirical work suggesting that teaching others promotes deeper processing and metacognitive regulation (Zainuddin & Perera, 2017). Students' perceptions that explaining content to peers strengthened their understanding resonate with studies showing that peer teaching within flipped classrooms enhances knowledge consolidation and facilitates the identification of misconceptions (Sointu et al., 2022). In this sense, learning by teaching functions as a mechanism that transforms pre-class preparation into a meaningful cognitive activity rather than a purely procedural task.

One of the most significant contributions of this study concerns the development of transversal competences, which are increasingly central to higher education curricula. The findings indicate that flipped classroom experiences grounded in peer teaching are particularly effective in fostering oral communication, teamwork, organizational skills, and self-confidence. These outcomes are consistent with previous research highlighting the potential of flipped learning to promote autonomy and communicative competence (Nouri, 2016; Zainuddin & Perera, 2017). Importantly, students' narratives suggest that initial discomfort or anxiety associated with public speaking evolved into increased confidence and perceived personal growth. This progression underscores the formative potential of learning-by-teaching approaches when students are supported within a structured and psychologically safe environment.

Beyond individual learning outcomes, the results also shed light on the social and relational dimensions of learning in higher education. Students' positive perceptions of classroom climate and group cohesion echo findings from prior research indicating that collaborative learning environments contribute to a stronger sense of belonging and reduced hierarchical distance between students (Sointu et al., 2022). The peer-led nature of the sessions appeared to foster a more horizontal and participatory learning space, in which knowledge was constructed collectively rather than transmitted unidirectionally. This shift has important implications for student engagement and the development of learning communities within university settings.

At the same time, the areas for improvement identified by students highlight challenges that are widely documented in the flipped classroom literature. The need for instructional scaffolding, clear guidance, and strong alignment between pre-class and in-class activities remains a critical factor for successful implementation (Baig & Yadegaridehkordi, 2023; Rotellar & Cain, 2016). Students' suggestions for brief instructor-led contextualizations at the beginning of each topic point to the importance of maintaining a balance between student autonomy and pedagogical structure. Autonomy, in this sense, should be understood not as the absence of guidance but as a gradual process supported by clear expectations and formative feedback.

From a broader perspective, the findings of this study contribute to ongoing debates about the role of active methodologies in higher education. The flipped classroom, particularly when combined with learning by teaching, should not be viewed as a mere instructional technique, but rather as a pedagogical approach that implies a cultural shift in teaching and learning practices. This shift requires instructors to reconceptualize their role, moving from content delivery to learning facilitation, and institutions to support faculty development and innovation in teaching.

Taken together, the results suggest that the flipped classroom integrated with peer teaching represents a pedagogically robust and human-centered approach to higher education. Its effectiveness, however, depends on thoughtful instructional design, sustained formative support, and sensitivity to students' prior experiences and expectations. These

considerations are essential for ensuring that active learning methodologies contribute meaningfully to both academic learning and the holistic development of university students.

6. CONCLUSIONS

This chapter has examined a flipped classroom experience grounded in learning by teaching and implemented across several undergraduate programs in higher education. The findings suggest that positioning students as active contributors and peer teachers within a structured instructional framework can positively influence motivation, engagement, conceptual understanding, and the development of transversal competences.

The results indicate that assuming the role of teacher fosters greater responsibility for learning and encourages deeper cognitive processing. Students' perceptions reveal that explaining content to peers strengthens conceptual understanding and promotes metacognitive reflection, confirming the pedagogical value of learning by teaching within flipped classroom models. Moreover, the experience contributed notably to the development of key transversal competences, particularly oral communication, teamwork, organizational skills, and self-confidence, which are increasingly emphasized in higher education curricula.

Beyond individual learning outcomes, the experience also contributed to the creation of a more collaborative and participatory classroom climate. Peer-led sessions were perceived as reducing hierarchical distance and enhancing group cohesion, reinforcing students' sense of belonging to a shared learning community. These findings support the view that human-centered and participatory methodologies can enrich not only academic learning but also the social and relational dimensions of higher education.

At the same time, the study highlights the importance of instructional design and pedagogical scaffolding. Students' suggestions regarding the need for initial contextualization by the instructor and greater guidance during early stages underscore that autonomy must be carefully balanced with structure to ensure methodological coherence and inclusivity. These considerations are particularly relevant when

implementing flipped and peer-based approaches with students who may have limited prior experience with active learning methodologies.

Several limitations should be acknowledged. The study relied on self-reported data and was conducted within a single institutional context with a relatively small sample size. Future research could incorporate longitudinal designs, comparative analyses with traditional teaching formats, and objective measures of learning outcomes to further examine the impact of learning by teaching in higher education.

In conclusion, the flipped classroom combined with learning by teaching emerges as a pedagogically effective and versatile approach that aligns academic learning with the development of transversal competences. When thoughtfully designed and supported, this methodology has the potential to transform students from passive recipients of knowledge into active, confident, and engaged co-creators of learning in higher education contexts.

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