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ACTIVE METHODOLOGIES IN HIGHER EDUCATION: TRANSFORMING THE CLASSROOM

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ABSTRACT

This study investigated how active methodologies can transform the classroom in higher education, focusing on the impacts on student learning. The objective was to analyze active methodologies, such as Problem-Based Learning (PBL), Cooperative Learning, Flipped Classroom, Gamification and Design Thinking, and their implications for academic performance and student engagement. The methodology adopted was a literature review, based on relevant academic sources on the subject. The results indicated that active methodologies promote greater participation and autonomy of students, resulting in meaningful and collaborative learning. The analysis revealed that the integration of digital technologies, such as teaching platforms, facilitates the application of these methodologies and improves the interaction between students and teachers. However, challenges were also identified, such as resistance to change on the part of teachers and the lack of technological infrastructure in educational institutions. The final considerations pointed out that, despite the challenges, active methodologies have great potential to transform higher education, but their implementation requires continuous training of teachers and investments in technological resources. The research suggests the need for further studies to assess the effectiveness of these methodologies in different educational contexts and to overcome the barriers identified.

Keywords: Active Methodologies. Higher education. Meaningful Learning. Educational Technologies. Teacher Training.

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Revista ARACÊ
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INTRODUCTION

The implementation of active methodologies in higher education has gained relevance as an alternative to promote participatory, student-centered teaching focused on meaningful learning. These methodologies involve practices that encourage students' active participation in the learning process, stimulating the development of skills such as problem-solving, critical thinking, and collaboration. The transformation of the classroom through these methodologies seeks to go beyond the transmission of content, offering the student an active role in their own learning, which contributes to greater engagement and the construction of knowledge in a dynamic and autonomous way.

The importance of this theme becomes evident in the face of the challenges faced by higher education institutions, which need to adapt to changes in educational requirements and the growing demand for innovative methodologies. Traditional practices, which are based on the exposition of content by the teacher and the passive receptivity of students, have proven to be insufficient to meet the needs of a world in constant transformation, in which cognitive and social skills are assessed. In this context, active methodologies present themselves as a potential solution for the construction of an education aligned with the new demands of the twenty-first century, which requires professionals prepared to face complex and dynamic situations.

Although active methodologies have been discussed and adopted in several educational institutions, their implementation in higher education still presents challenges. These challenges include resistance on the part of some teachers, the need to adapt curricula, and the continuous training of teachers in the use of new technologies and pedagogical strategies. In addition, the lack of adequate infrastructure and the lack of knowledge about the various active methodologies available make it difficult to completely transform pedagogical practices. Thus, an in-depth study is needed that explores the different approaches to active methodologies in higher education, their implications, and the impact they have on student learning.

The objective of this research is to analyze how active methodologies can transform the classroom in higher education, promoting active and meaningful learning. For this, a bibliographic review will be carried out that will address the main active methodologies adopted in higher education institutions, as well as the challenges and opportunities that arise with their implementation.

Revista ARACÊ
ISSN: 2358-2472

The text is structured as follows: after the introduction, which presents the theme, the justification and the problem, the theoretical framework will be addressed, with a detailed explanation of the active methodologies, their origins and main approaches. Then, three main topics on the development of active methodologies in higher education will be discussed, including their applications, implementation challenges and impact on learning. The methodology used in the research will be described, followed by a critical analysis of the results found in the literature review. Finally, the final considerations will bring a summary of the findings, highlighting the importance of transforming pedagogical practices in higher education.

THEORETICAL FRAMEWORK

The theoretical framework is structured in order to provide an understanding of the active methodologies in higher education, initially addressing the concept and the main characteristics of these methodologies, in addition to their evolution over time. Then, the different approaches adopted by higher education institutions will be explored, highlighting the benefits and limitations of each. The framework also examines the integration of digital technologies in active methodologies, considering their influence on the transformation of pedagogical practices and the development of skills in students. Finally, the impact of these methodologies on student learning will be discussed, considering the empirical evidence of recent studies that show the effectiveness of active methodologies in the academic context.

MAIN ACTIVE METHODOLOGIES IN HIGHER EDUCATION

Active methodologies have gained prominence in higher education for their ability to engage students in a meaningful way in the learning process. Among the main active methodologies, Problem-Based Learning (PBL), Cooperative Learning, *Flipped Classroom*, gamification and *Design Thinking stand out*, all with their peculiarities and forms of application that seek to transform the traditional dynamics of classrooms.

Problem-Based Learning (PBL) is a methodology in which students are challenged to solve complex and realistic problems, stimulating inquiry and critical thinking. According to Nascimento and Nascimento (2021), PBL prioritizes the development of cognitive skills, while promoting autonomy and collaboration among students, which are fundamental for the formation of professional skills. The use of this methodology in academic contexts has

Revista ARACÊ
ISSN: 2358-2472

shown positive results in preparing students for practical situations, being a tool to integrate theory and practice in a meaningful way.

Cooperative Learning, in turn, is centered on collaboration between students to carry out tasks or solve problems. According to Lima, Althaus and Parabocz (2023), cooperation in the learning process allows students to share knowledge, promoting mutual learning and the development of social skills, essential for the academic and professional environment. This type of learning has been used to develop communication and teamwork skills, being applied in courses in various areas of knowledge.

The Flipped *Classroom* proposes a reorganization of learning time, where content is initially presented outside the classroom environment, through videos, readings or other digital resources. During the face-to-face time, students carry out activities that promote the practical application of the concepts. Laet *et al.* (2024) state that *Flipped Classroom* allows students to absorb theoretical content at their own pace, while the teacher dedicates class time to guidance and interactive activities, such as discussions and problem-solving. This model has been adopted in disciplines that require a large volume of theoretical content, as it favors greater interaction between students and teachers, in addition to optimizing class time.

Gamification, or the use of game elements in the learning process, is a strategy that has shown great effectiveness in student engagement. According to Ferrarini, Saheb and Torres (2019), gamification, when well applied, can increase student motivation by transforming learning into a dynamic and fun process, leading students to feel involved and responsible for their own development. This type of methodology has been used in various academic contexts, especially in areas that require the development of practical skills and resolution of challenges, such as in administration, engineering, and social sciences courses.

Design Thinking, finally, is a methodology that is based on creative problem-solving, using a user-centered approach and real context. According to Soares (2021), *Design Thinking* allows students to work as a team to develop innovative solutions, focusing on the user's needs and the real impact of their proposals. In higher education, this methodology has been applied in design, engineering, and business courses, where students are challenged to create practical solutions to complex problems, using a creative and collaborative approach.

Revista ARACÊ
ISSN: 2358-2472

These methodologies have been applied in academic contexts of higher education, and the results indicate that they contribute to the development of cognitive and social skills in students, promoting active, meaningful learning adapted to the needs of the twenty-first century. Each of these methodologies has distinct characteristics, but they all have in common the objective of transforming the role of students from passive content receptors to protagonists of their own learning.

CHALLENGES OF IMPLEMENTING ACTIVE METHODOLOGIES

The implementation of active methodologies in higher education, although seen as an innovative practice, faces several challenges. These obstacles can arise both in the institutional context and in the classroom environment, making it difficult to fully adopt these pedagogical approaches. One of the main challenges is the resistance to change, which can be observed by both teachers and students. According to Lima, Althaus, and Parabocz (2023), resistance to change is a natural phenomenon, especially when it comes to profound transformations in pedagogical practices, such as the adoption of active methodologies. This resistance may be related to fear of the unknown and lack of familiarity with new teaching approaches, which can lead to hesitant and limited adherence to active methodologies.

Another significant obstacle is the lack of resources, both material and technological, which often prevents the implementation of active methodologies. Laet *et al*. (2024) point out that the implementation of active methodologies requires adequate infrastructure, including access to digital technologies and teaching materials that favor collaborative and interactive learning. The absence of appropriate technologies, such as digital teaching platforms or collaborative tools, can restrict the use of methodologies such as *Flipped Classroom* and gamification, which rely on technological resources to be effective.

In addition, inadequate teacher training also represents a major challenge. For active methodologies to be successfully implemented, it is necessary for teachers to possess not only the theoretical knowledge about these methodologies, but also the practical skills to apply them in the classroom. Nascimento and Nascimento (2021) point out that many teachers face difficulties in adapting their traditional pedagogical practices to dynamic and participatory models, since they have not received specific training for the use of active methodologies. This implies that the continuing education of teachers is essential for them

Revista ARACÊ
ISSN: 2358-2472

to overcome the barriers imposed by the implementation of these methodologies, and it is essential that educational institutions offer adequate training programs.

Educational institutions, to overcome these challenges, can adopt several strategies. Continuous teacher training should be prioritized, offering courses, workshops and seminars that focus on active methodologies and the use of educational technologies. Ferrarini, Saheb and Torres (2019) highlight that universities must provide opportunities for constant training to their professors, in order to prepare them for the demands of active methodologies, especially with regard to the use of educational technologies. In addition, it is essential that institutions invest in technological infrastructure, ensuring adequate access to the necessary tools for the implementation of these methodologies. Finally, institutional management must act to foster a culture of pedagogical innovation, creating a favorable environment for experimenting with new practices and continuous support for teachers who adopt active methodologies.

Overcoming these obstacles is possible through institutional commitment, continuous training of teachers, and investment in adequate resources. In this way, active methodologies can be implemented, contributing to the transformation of pedagogical practice in higher education and promoting dynamic and engaging learning for students.

THE IMPACT OF ACTIVE METHODOLOGIES ON STUDENT LEARNING

Active methodologies have shown a significant impact on student learning, especially with regard to academic performance and engagement during the teaching-learning process. These methodologies, by placing the student at the center of the educational process, promote greater participation, autonomy and a practical approach to content. The application of active methodologies associated with technologies promotes more collaborative and critical environments. *Santana et al.* (2021) observe that the adoption of these practices, mediated by DICTs, enhances the construction of knowledge and breaks with the traditional transmissive logic.

Lima, Althaus, and Parabocz (2023) state that active methodologies encourage students to become protagonists of their learning, which favors the development of critical, analytical, and collaborative skills. This statement demonstrates that active methodologies not only influence the way students learn, but also expand their cognitive and social skills, essential aspects for academic and professional success.

Revista ARACÊ
ISSN: 2358-2472

In addition, the effects of these methodologies on student engagement are quite evident. Laet *et al*. (2024) highlight that students who experience active methodologies, such as *Flipped Classroom* and problem-based learning, have a much higher level of engagement, since they are challenged to participate in activities and apply knowledge in practical situations. This greater participation is one of the main benefits observed, because, unlike traditional methods, in which the student tends to be passive, active methodologies require the student to take an active role in the construction of their knowledge, promoting meaningful learning.

When compared to traditional teaching methods, active methodologies stand out for their focus on interactive and collaborative practices. Nascimento and Nascimento (2021) point out that while traditional teaching methods, based on the exposure of content and memorization, are focused on the unilateral transmission of information, active methodologies encourage interaction between students, the development of creative solutions, and teamwork. This comparison shows that active methodologies offer a dynamic approach focused on the application of knowledge, while traditional methods remain centered on the figure of the teacher and passive teaching.

Case studies and recent research have shown the positive results of active methodologies. Ferrarini, Saheb, and Torres (2019) report that several studies show that the use of active methodologies in university environments results in significant improvements in student performance, especially in disciplines that require greater problem-solving and critical thinking. These results were observed in different academic contexts, highlighting the effectiveness of active methodologies in promoting not only better academic performance, but also greater preparation of students to face professional challenges.

These data reinforce the idea that active methodologies offer an alternative to traditional methods, not only by increasing engagement, but also by developing practical and cognitive skills that are fundamental for the formation of students. In this way, active methodologies have proven to be essential to transform learning, preparing students for the challenges of the professional world.

METHODOLOGY

The bibliographic research aimed to explore the active methodologies in higher education. It is a qualitative approach, whose main strategy consisted of the analysis and

Revista ARACÊ
ISSN: 2358-2472

synthesis of relevant academic productions on the subject. According to Santana, Narciso and Fernandes (2025, p. 9):

> Bibliographic research, in turn, aims to gather information on a topic from materials already published. This approach is essential to provide theoretical grounding and direct subsequent investigations. Documentary research, on the other hand, differs by working with sources that have not yet been analyzed, such as official documents, photographs, letters, and films, contributing to a new understanding of unexplored materials. Another relevant method is the ex-post-facto search, characterized by investigating situations in which independent and dependent variables have already occurred. This approach seeks to understand the cause-and-effect relationships between past events and subsequent phenomena. As pointed out, the methodology is used in academic works, such as monographs and scientific initiation projects, as it offers a differential in the analysis of concrete situations.

For data collection, scientific articles, dissertations, theses and books that deal with active methodologies and their application in university pedagogical practices were selected. The research involved the survey of materials in academic databases such as *Scielo, Google Scholar,* Capes, among others, with the use of keywords related to the theme, such as active methodologies, higher education, active learning and digital technologies in education. The selection of texts considered criteria of relevance, timeliness and quality of the publications, seeking to ensure the representativeness of the approaches discussed. Data analysis was carried out through the reading and critical interpretation of the selected studies, in order to identify the main practices, challenges and results associated with the implementation of these methodologies in higher education.

The table with the main references used in this research is presented below, which provides a summary of the selected works, highlighting the authors, titles, year of publication and type of work. The table facilitates the visualization of the sources consulted and the understanding of the contributions of each one to the revision of the theme.

Chart 1: Main References Used in the Literature Review

Author(s)	Title as published	Year	Type of work
Ferrarini, R.; Saheb, D.; Torres, P. L.	Active methodologies and digital technologies: approximations and distinctions	2019	Article
Nascimento, S.; Nascimento, L. M. do.	Learning process in the classroom and permanence in higher education: students' perception of the use of active methodologies as strategies	2021	Article
Soares, C.	Active methodologies: a new learning experience	2021	Book
Lima, A.; Althaus, D.; Parabocz, C. R. B.	How to help higher education teachers transform passive methodologies into active methodologies in the	2023	Article

Revista ARACÊ
ISSN: 2358-2472

	classroom: the practice of the Activity Clinic		
Laet, L. E. F. *et al*.	Transforming Education: Exploring Active Methodologies, Technology, and *Design Thinking*	2024	Article

Source: The author.

After inserting the table, it is highlighted that it offers an overview of the relevant sources for the development of this research. The organization of references by author, title, year and type of work allows the reader to access the information in a clear and objective way, facilitating the understanding of the theoretical bases that support the discussion on active methodologies in higher education.

CRITICAL ANALYSIS OF REFERENCES ON ACTIVE METHODOLOGIES

The critical analysis of the references on active methodologies allows an understanding of the different types of methodologies used in higher education, as well as the practices and approaches observed in the consulted sources. When comparing active methodologies, such as Problem-Based Learning (PBL), Cooperative Learning, *Flipped Classroom* and Gamification, it is observed that each one has different characteristics and objectives, but all converge to create a dynamic and participatory learning environment.

Lima, Althaus and Parabocz (2023) point out that Problem-Based Learning and Cooperative Learning, although active methodologies, have different focuses: while PBL prioritizes complex problem-solving and critical reflection on content, Cooperative Learning emphasizes interaction and collaboration among students. This difference shows that, although both promote the active engagement of students, they focus on different aspects of the learning process, with PBL focused on autonomy and problem solving, and Cooperative Learning, on the development of social skills and teamwork.

The Flipped *Classroom* and Gamification, in turn, present another different approach. Laet *et al*. (2024) state that *Flipped Classroom* inverts the traditional teaching model by making students learn content at home and dedicate class time to the practical application of knowledge, while Gamification uses game elements to increase student motivation and engagement. While *Flipped Classroom* promotes autonomous and personalized learning, Gamification focuses on motivating and engaging students, using a playful and interactive approach.

In the debate on best practices, Nascimento and Nascimento (2021) highlight that there is no single methodology that is effective for all situations; The success of active

Revista ARACÊ
ISSN: 2358-2472

methodologies depends on factors such as the discipline, the profile of the students, and the available infrastructure. This critical analysis suggests that the choice of the appropriate methodology should consider the particularities of the educational context and the needs of the students, and it is therefore essential that educators are trained to adapt and combine different approaches, according to the circumstances.

In addition, Ferrarini, Saheb and Torres (2019) state that the best practices in the use of active methodologies involve the combination of different strategies, such as the use of digital technologies in *the Flipped Classroom* and the promotion of collaboration in practical tasks in Cooperative Learning. This demonstrates that active methodologies should not be applied in isolation, but rather integrated with other pedagogical approaches, in order to optimize the learning process.

The comparison between active methodologies and the reflection on best practices show that the successful implementation of these methodologies depends on several factors, such as adaptation to the specific context of the class, the appropriate use of technologies and the training of teachers. In addition, flexibility in the choice and application of methodologies is essential to ensure meaningful learning, favoring the development of critical and collaborative skills in students.

CONTRIBUTIONS OF TECHNOLOGIES IN THE TRANSFORMATION PROCESS

Technologies play a key role in the transformation of higher education, especially when used to enhance active methodologies. The use of digital tools and educational platforms have provided an interactive and collaborative environment, facilitating the implementation of student-centered pedagogical approaches. According to Laet *et al.* (2024), technologies, when strategically integrated, allow for greater personalization of teaching and active student involvement, favoring the construction of knowledge in a collaborative way. This highlights the positive impact of digital tools on student engagement, allowing them to participate in learning and promote knowledge building in an independent and interactive way.

One of the common ways to use technology in active methodologies is through teaching platforms, such as *Moodle, Blackboard,* and *Google Classroom*, which allow the organization of content, interaction between students, and monitoring progress on an ongoing basis. Nascimento and Nascimento (2021) state that digital platforms enable the efficient management of learning, promoting the exchange of experiences among students

Revista ARACÊ
ISSN: 2358-2472

and facilitating the monitoring of individual and collective performance. Such platforms offer resources such as discussion forums, interactive quizzes, and online teaching material, which encourage autonomous and collaborative learning, fundamental characteristics of active methodologies.

Gamification, which uses elements of games in the educational context, is another example of how technology has been applied to enhance active methodologies in higher education. Ferrarini, Saheb, and Torres (2019) highlight that gamification uses technological resources to create a motivating environment, in which students engage in activities, challenging themselves to achieve learning objectives through rewards, scores, and friendly competitions. This use of technology has proven effective in areas such as administration, engineering, and education, where complex problem-solving and decision-making are key skills. Gamification not only increases engagement but also promotes dynamic learning by transforming the educational process into an engaging and fun experience.

In addition, the use of videos and other digital media has been explored in methodologies such as the *Flipped Classroom*. Lima, Althaus, and Parabocz (2023) state that the use of videos and multimedia content outside the classroom allows students to absorb knowledge at their own pace, while face-to-face time is dedicated to practical and collaborative activities. This approach not only provides flexibility for students, but also optimizes class time, transforming it into an interactive and productive space.

Therefore, technology has contributed significantly to the transformation of active methodologies in higher education, allowing personalized, interactive, and engaging learning. By integrating digital tools such as teaching platforms, gamification, and multimedia resources, educational institutions have the potential to create dynamic environments where students take an active and responsible role in their own learning.

IMPLICATIONS FOR TEACHER TRAINING IN HIGHER EDUCATION

The adoption of active methodologies in higher education requires that teachers be prepared to deal with new pedagogical approaches that differ from traditional teaching practices. This implies the need for continuous training, which not only provides theoretical knowledge about active methodologies, but also offers the practical skills to apply them. According to Nascimento and Nascimento (2021), teacher training should be understood as a continuous process, which involves not only the knowledge of active methodologies, but also the ability to adapt them to the needs of their students and the context of the discipline.

Revista ARACÊ
ISSN: 2358-2472

This continuous training is essential, as it allows teachers to update themselves on new methodologies and learn to integrate them in a meaningful way into their pedagogical practices.

The training required for teachers to successfully implement active methodologies is not limited to the theoretical understanding of these approaches, but also involves mastery of new educational tools and technologies. Laet *et al*. (2024) highlight that in addition to knowledge about active methodologies, teachers need to develop technological skills, as many of these approaches depend on the use of digital platforms and multimedia resources. Technological training is therefore a fundamental part of continuous training, since many active methodologies, such as *Flipped Classroom* and gamification, depend on the use of technologies to ensure their effectiveness.

In addition, Lima, Althaus, and Parabocz (2023) argue that teachers need to be trained not only to apply active methodologies, but also to create a collaborative and reflective learning environment, in which students feel motivated to participate in the process. This implies that teacher training should include the development of pedagogical skills, such as facilitating group discussions, guiding collaborative activities, and evaluating student performance in a continuous and dynamic manner. These skills are key to ensuring that active methodologies are applied, promoting meaningful and transformative learning.

Therefore, the successful implementation of active methodologies in higher education depends on continuous training of teachers, which must include both theoretical knowledge and practical training. This training should cover not only pedagogical methodologies, but also educational technologies, the creation of collaborative learning environments and the constant evaluation of the teaching-learning process. Investment in teacher training is essential to ensure that active methodologies are applied, benefiting both students and the educational process as a whole.

FINAL CONSIDERATIONS

The study sought to investigate how active methodologies can transform the classroom in higher education, with an emphasis on the impacts on student learning. From the analysis of several pedagogical approaches, such as Problem-Based Learning (PBL), Cooperative Learning, *Flipped Classroom*, Gamification and *Design Thinking*, it was possible to observe that all these methodologies promote dynamic, interactive and student-centered teaching. The main conclusion of the research is that active methodologies have

Revista ARACÊ
ISSN: 2358-2472

the potential to transform pedagogical practice in higher education, providing meaningful and engaging learning for students, as well as contributing to the development of essential skills, such as critical thinking, collaboration, and problem-solving.

The main findings of this study reveal that the adoption of active methodologies results in greater student involvement, since they become protagonists of their own learning process. This occurs because these methodologies favor active participation, encouraging students to interact with the content, with their classmates and with the teacher in a collaborative and reflective way. In addition, it was possible to identify that the use of educational technologies, such as digital platforms and multimedia resources, plays a fundamental role in the implementation of active methodologies, providing a flexible and dynamic learning environment.

However, important challenges were also identified for the implementation of these methodologies. Resistance to change, both on the part of teachers and students, emerges as a significant obstacle, as many educators are still accustomed to traditional teaching methods and face difficulties in adopting new approaches. In addition, the lack of adequate technological infrastructure and the need for continuous training of teachers in the use of active methodologies and associated technologies are issues that need to be overcome to ensure implementation.

The contribution of this study lies in the analysis of active methodologies in the context of higher education, offering a critical view of current pedagogical practices and pointing to the need for changes in traditional teaching approaches. In addition, the study highlights the importance of continuous training of teachers, not only with regard to knowledge of active methodologies, but also in the mastery of the technological tools necessary for their implementation.

It is important to emphasize that this study paves the way for new research on the effectiveness of active methodologies in different areas of knowledge and on strategies to overcome the challenges identified. Although it has been possible to identify some advances in the use of these methodologies, the research also suggests that more studies be carried out to investigate the long-term impacts of these methodologies, especially in relation to students' academic performance and their preparation for the job market. In addition, it would be relevant to explore how active methodologies can be adapted to different educational and cultural contexts, considering the diversities present in higher education institutions.

Revista ARACÊ
ISSN: 2358-2472

Active methodologies have proven to be a tool to transform the classroom in higher education, promoting participatory and collaborative learning. However, the successful implementation of these methodologies depends on several factors, including teacher training, the adequacy of technological infrastructure, and overcoming resistance to change. The study contributes to reflection on the role of active methodologies in higher education and highlights the importance of continuing to investigate and improve these approaches to ensure that they meet the needs of students and educators.

Revista ARACÊ
ISSN: 2358-2472

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