



# Active methodologies in Higher Education: reasons to use them (or not) from the voices of faculty teaching staff

Nahia Idoiaga Mondragon<sup>1</sup> · Nekane Beloki<sup>2</sup> · Ion Yarritu<sup>1</sup> ·  
Idoia Zarrazquin<sup>3</sup> · Karmele Artano<sup>4</sup>

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## Abstract

Teaching based on active methodologies emphasizes the importance of giving students a leading role in the learning process. With the implementation of the European Higher Education Area, universities have undergone a reform that significantly increased student involvement in the teaching–learning process. The University of the Basque Country (UPV/EHU) responded to this change by introducing its own educational model: IKD i<sup>3</sup>. The general objective of this research is to explore the effect of the IKD i<sup>3</sup> strategy on the teaching staff of the UPV/EHU. The study aims to identify the active methodologies adopted by the teaching staff and the reasons behind the use (or not) of these methodologies. A total of 403 teachers participated in the study, and their opinions were gathered freely to accurately represent their viewpoints. The results reveal that teaching staff at the UPV/EHU utilize active methodologies, with the most frequent being problem-based learning, cooperative learning, and the case study method. The reasons for incorporating these methodologies vary and include both benefits for students and advantages related to teaching, while the rationale for not using active methodologies is based on the lack of training, time constraints, and having a large number of students. Interestingly, the teachers who expressed these arguments were primarily those who were not familiar with or actively participating in the IKD i<sup>3</sup> educational model. We believe that while our findings validate the UPV/EHU's IKD i<sup>3</sup> educational model, they also highlight the importance of universities not only having an educational model but also fostering a culture that encourages the active engagement of teaching staff. This commitment is essential to effectively develop and implement such a model.

**Keywords** ESSS · Higher Education · Educational method · Teaching method · Active methodology · Learning

## Introduction

When we speak of methodology in the field of teaching, we are referring to the design of an action plan that defines the objectives to be achieved, the procedures to be undertaken, and the resources to be utilized (De Miguel, 2005). In recent years, the educational community

in Higher Education has been shifting towards a model of educational innovation based on active or action-based methodologies. However, it is important to note that not all faculty members have adopted these methodologies equally. This imbalance has created a gap in the scientific literature, as there is a lack of research into why some teachers choose not to use active methodologies. In other words, research and systematic reviews on the use of active methodologies in Higher Education analyze both, the use of certain methodologies (Hood Cattaneo, 2017; Khalaf & Mohammed Zin, 2018; Martínez Valdivia et al., 2023) and the effect on students (Guo et al., 2020; Schneider & Preckel, 2017; Theobald et al., 2020), including teachers' knowledge of the methodologies themselves (Stentiford & Koutsouris, 2021), but little research has been done on why they decide to use them or not. To address this gap, this paper aims to analyze the use and beliefs about active or action-based methodologies in Higher Education, by giving a voice to the teachers themselves. For this purpose, it takes as a sample the teaching staff of the UPV/EHU, as this university has a pedagogical model that specifies the importance of including active methodologies since 2010 (Fernández & Palomares, 2010). Therefore, although this is a localized research sample, the possibility of extrapolating the results to Higher Education institutions with similar pedagogical models will be discussed.

According to Samwel (2010), there are two distinct types of methodologies in teaching: traditional methods—also known as passive methodologies—and active or action-based methodologies. Traditional methodologies follow a linear teaching strategy, starting with the teacher's explanation and concluding with content evaluation, with a primary focus on achieving specific outcomes. In contrast, active methodologies offer greater flexibility in designing a curriculum tailored to the interests of students and emphasize competence-based learning, which involves the development of social skills (Moreno et al., 2021). Therefore, in teaching based on active methodologies, the focus shifts from what the teacher does to what the student does (Moreno et al., 2021; Paricio et al., 2019).

This approach encompasses several key aspects; firstly, learning is viewed as a constructive process, not limited to the passive reception and accumulation of information (Moreno et al., 2021). Moreover, students are encouraged to self-regulate their learning process, promoting awareness, confidence, and accountability for their decisions. This cultivates greater autonomy in acquiring knowledge (Paricio et al., 2019). In addition, learning spaces and situations are organized to promote interaction among students (Moreno et al., 2021). This includes collaborative activities such as teamwork, discussions, debates, and ongoing evaluation of their learning progress. In this context, usually, teaching is contextualized so that students can face real problems with a level of difficulty and complexity similar to those they will encounter in professional practice (Moreno et al., 2021). Thus, the teacher has to develop an active role as a guide and facilitator of learning, creating flexible spaces—both physical and temporal—which must be compatible with the use of information and communication technologies (Toro & Arguis, 2015). In short, this innovative methodological approach makes it possible to conceive the structure of the programs as a set of joint and guided actions aimed at providing our future professionals with the transversal training and competences they will need once they have entered the world of work (Fernández-Feijoo & Pino-Juste, 2016).

Moreover, using active methodologies promotes the integration of knowledge and the internalization of competences (Sanhueza & Otondo, 2020). Thus, they allow students to accumulate knowledge and apply it in a comprehensive manner in different areas of life. In fact, active learning favors the acquisition and consolidation of long-term and in-depth knowledge (Paricio et al., 2019). Furthermore, it enhances the acquisition of fundamental qualities and skills such as critical thinking, coherence, constructive dialogue,

communication, and willingness to cooperate and learn, as well as a reflective, critical, and constructive analysis of the real-world (Fernández-Feijoo & Pino-Juste, 2016). Additionally, active methodologies also foster interdisciplinarity and research (Crisol-Moya et al., 2020) and promote the development of learning tools, as well as group work and learning among students (Aljawarneh, 2020). Likewise, they improve student interest, motivation, engagement, and participation in the learning process while promoting a learning spirit (Moreno et al., 2021) and increase attendance and, therefore, student interest in the subject (Buckley & Doyle, 2016; Tan et al., 2019), improving also students' academic performance (Bhutto et al., 2017).

These empirical studies also highlight the main difficulties or obstacles to be overcome when implementing active methodologies. Some of these obstacles are related to organizational issues such as the high number of students per classroom or the existence of courses of varying lengths (García-Peñalvo, 2021). Other challenges are more closely related to the teaching staff themselves. One prominent concern is the ambiguity perceived by teachers, their insufficient training, and the lack of internal coordination within the educational institution (Hannache-Heurteloup & Moustaghfir, 2020).

## Active methodologies in Higher Education

The entry of the European university systems into the European Higher Education Area (EHEA) brought about significant transformations in the way students' education is conceived, managed, and implemented (Fernández & Madinabeitia, 2020). The Yerevan Communiqué, signed in 2015, clearly advocated for student-centered learning, which should be supported by clear descriptions of learning outcomes and workload, as well as flexible learning pathways and appropriate teaching and assessment methods. Similarly, it also highlighted the need to promote a stronger link between teaching, learning, and research at all levels of study and to provide incentives for institutions, teachers, and students to intensify activities that develop creativity, innovation, and entrepreneurship (European Commission/EACEA/Eurydice, 2018).

However, this transition is not proving to be easy, as it implies a major cultural shift for the university as an educational institution. This challenge is evidenced by the last three Bologna Process Implementation Reports (European Commission/EACEA/Eurydice, 2018), which clearly state that while there has been substantial growth in student-centered learning (as well as the promotion of the use of learning outcomes in curriculum development); it still remains inadequately developed in many parts of Europe. The latest 2020 report specifically calls upon European University Partnerships, supported by the Erasmus+ and Horizon Europe programs, to act as models for introducing more flexible and modular forms of learning. At the national level, some studies (Jiménez et al., 2020; Martínez-Clares & González-Morga, 2018) have also revealed a high prevalence of traditional methodologies, such as master classes, whereas more innovative and student-focused methodologies that align with the goals of the EHEA are often relegated to the background.

In addition, recent studies in the field have highlighted the significance of active learning as an instructional approach that can include various forms of activation (Hartikainen et al., 2019). Regardless of the specific form of this approach, the key to successful active learning lies in empowering students and encouraging them to work collaboratively with faculty as pedagogical co-creators and co-designers (Bovill & Felten, 2016; Felten et al., 2019). The recent literature has emphasized the effectiveness of active methodologies in promoting learning and practical skill development among Higher Education students.

These methodologies help foster collaboration (Meijer et al., 2020), critical thinking (Morancho & Rodríguez-Mantilla, 2020), problem solving (Guo et al., 2020), and improve student motivation and engagement (Ferrer et al., 2020). Additionally, it is essential to promote curricular reforms that recognize the complex dynamics between culture and curriculum to promote meaningful educational innovation (Yang & Li, 2019). In this context, certain institutional circumstances should be considered, such as the allocation of increased economic and infrastructure resources. Moreover, fostering collaborative and shared tutoring sessions among teachers and planning interdisciplinary activities that integrate knowledge and assessments shared across subjects are also important steps (García-Morales et al., 2021). More recently, emphasis has been placed on recognizing that the successful transformation of Higher Education hinges on the specific training and development of teachers (Marinoni et al., 2020). There is a unanimous belief that teacher training in active methodologies and strategies, together with research on the subject, is key to achieving this transition required by the EHEA (Jiménez et al., 2021; Martínez-Clares & González-Morga, 2018; Odalen et al., 2019). This implies a strong commitment on the part of the teacher, which is essential for achieving the proposed shift in the educational paradigm (Hargreaves & Fullan, 2014).

### Active methodologies at the University of the Basque Country (UPV/EHU)

The education system in Spain has undergone several reforms in recent decades, especially in non-university education. The lack of a state pact on education has particularly affected this level. University education, on the other hand, has not undergone so many ups and downs over the last 40 years. Four laws are worth mentioning in this respect: the University Reform Law (LRU, 1983), the Organic Law on Universities (LOU, 2001), the Organic Law for the Modification of the Organic Law on Universities (LOMLOU, 2007), and the “Organic Law on the University System” (LOSU, 2023). By means of the LOU, Spain also committed itself to adopting the necessary measures for the full integration of its education system into the EHEA, and Article 87 of the LOU establishes that the Government, the Autonomous Communities and the Universities “shall adopt the necessary measures to complete the full integration of the Spanish system into the European Higher Education Area” (Art. 87, Organic Law 6/2001). In 2007, this law was modified with the LOMLOU, due to the political agreements related to the construction of the EHEA. The LOMLOU assumes the need for a profound reform in the structure and organization of education in order to harmonize it with the Higher Education systems within the framework of the European area. At regional level, in the Basque Country, Law 3/2004, on the Basque University System, was passed with the aim of regulating the university system in the territory, and develops the competence recognized in Article 16 of the Statute of Autonomy of the Basque Country.

In this context, the people responsible for designing and managing innovation, quality policies, and teaching development at the UPV/EHU, at the time the Bologna Treaty was signed, understood that “this reform should be an opportunity for the university to emerge stronger, reorient its institutional sense and make a new, more effective one emerge from the point of view of learning and its public, social, and territorial vocation” (Fernández & Alkorta, 2014, p.14).

To achieve this goal, the university set out to design a unique educational model that would align with the proposed changes within the EHEA framework. Based on this analysis, the IKD model (Cooperative and Dynamic Learning, “Ikaskuntza Kooperatibo

eta Dinamikoa” in basque) emerged in 2010, which has been regarded, to a certain extent, as a local version of the student-based learning model (Fernández & Palomares, 2010), serving as a concrete framework from which to think and act. It is a dynamic, plural, and cooperative teaching–learning model in which the students are central to the curricular development of teaching at the UPV/EHU. In order to ensure comprehensive curricular development, the IKD model has to consider the professional development of its workers, the territorial and social development of the context in which it is located, institutional development, and the development of active education (Fernández & Palomares, 2010).

Subsequently, in 2016, it was deemed necessary to revise the IKD model to bring it in line with modern pedagogical trends, that is, the renewed European Union Agenda for Higher Education and the 2030 Agenda. The result was IKD  $i^3$  (“i to the power of three”: learning [“ikaskuntza” in Basque] × research [“ikerkuntza” in Basque] × sustainability [“iraunkortasuna” in Basque]), which means multiplying learning by research and sustainability, implying the exponential growth of each of these terms, paving the way for hitherto unknown processes and outcomes (Sáez de Cámara et al., 2021).

## The present research

This research arose from the desire to analyze the effect of the IKD  $i^3$  strategy on the teaching faculty of the UPV/EHU. Specifically, the main objective was to analyze the way in which UPV/EHU teachers have incorporated and internalized the learning area proposed in the latest revision of this strategy. To this end, we set out the following specific objectives: (1) to establish which active methodologies are used by UPV/EHU teaching staff in their teaching practice and (2) to explore the reasons why UPV/EHU teaching staff use (or do not use) active methodologies in their teaching practice.

## Method

### Sample

A total of 403 study participants were recruited from the entire teaching faculty of the University of the Basque Country (UPV/EHU), which comprises 4314 teachers. Considering this population size and assuming a confidence level of 95%, a sample of 403 participants ensures that the results can be extrapolated to the population with a margin of error of less than 5% (4.65%).

The sample consisted of 230 women (57.1%), 168 men (41.7%), and 5 non-binary individuals (1.2%). In addition, 0.5% were under 30 years old, 17.9% were between 31 and 40 years old, 35.2% were between 41 and 50 years old, 36.7% were between 51 and 60 years old, and 9.7% were over 60 years old. From an employment perspective, 66.7% were permanent lecturers, 29.0% were non-permanent lecturers, and 4.2% were associate lecturers. Likewise, 20.8% had been working at the UPV/EHU for less than 10 years, 35.5% for between 10 and 20 years, 25.1% for between 21 and 30 years, and 18.6% for more than 30 years.

Concerning the area of teaching expertise, 34.0% worked in social and legal sciences, 24.6% in engineering or architecture, 15.1% in experimental sciences, 14.6% in health

sciences, and 11.7% in arts and humanities. Finally, 60.21% were aware of the IKD i<sup>3</sup> strategy, 62.7% had participated in an educational innovation or sustainability project,<sup>1</sup> and 73.2% have the Docentiaz<sup>2</sup> accreditation.

## Procedure

Once the project was approved by the Ethics Committee (Ref.: M10/2022/107), the recruitment of participants began. For this purpose, the university's notification systems were used to distribute information about the project and the survey link among all the teachers at the university. The following were used: (1) mail distribution lists of the faculties and departments, (2) university bulletin board, and (3) university institutional website.

The questionnaire could be completed in both Basque and Spanish. In addition, individuals were informed that participation was voluntary and anonymous and that the survey could be completed in 15 min.

The exercises were designed to collect the opinions and thoughts of the teaching staff as openly as possible. For this purpose, participants were asked to respond to three questions. The first of the questions was worded as "I use active methodologies in my teaching activity." This question was asked to respond using a 7-point Likert scale (from 1 = totally disagree to 7 = totally agree). A score from one to four was taken to indicate low usage while a score from five to seven denotes high usage. The purpose of this question was only to dichotomize the teachers between those who used active methodologies little or not at all and those who used them more regularly or a lot in order to create an independent variable for lexical analysis. This division was made on the basis of previous research with 7-point liker scales (see Baird et al., 2007; Kennedy-Hendricks et al., 2016). The second and the third question wording were "What active methodologies do you use in your teaching activity?" and "Please give four reasons to explain why you use active methodologies or why you do not use them." Both questions asked for a free response and teachers were asked to elaborate on this response as much as they wished, with no restrictions.

## Data analysis

IBM SPSS Statistics for Windows, Version 26.0 was used to analyze the sociodemographic data and quantitative variables. To analyze the corpus of free responses, the Iramuteq software was used for lexical analysis. Two types of analysis were carried out with this software. The first was based on lexical similarity analysis and the second on the Reinert method.

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<sup>1</sup> The UPV/EHU is currently presenting an annual competitive call for Innovation Projects called IKD i<sup>3</sup> Laborategia (formerly known as the PIE program). Likewise, the university's sustainability department has also presented another annual competitive call for Innovation Projects in Sustainability, known as CBL.

<sup>2</sup> Program for the evaluation of the teaching activity of the teaching staff of the UPV/EHU and is certified by ANECA and UNIBASQ. DOCENTIAZ complies with the requirements established by the DOCENTIA program of the ANECA, as recognized in the verification carried out by the Agency itself. This program, which evaluates the teaching activity for five years and is voluntary in origin, currently has repercussions for the reduction of teaching, the assignment and consolidation of additional PDI salary complements assigned by the Social Council of the UPV/EHU, accreditations of Degrees and Master's degrees and teaching staff accreditations.

## Similarity analysis

First, to analyze the responses obtained in the first item of the questionnaire, a lexical similarity analysis was conducted using the Iramuteq software. This type of analysis examines the corpus as a whole, regardless of whether the responses are from different participants (subjects). This approach also has the advantage of effectively revealing the organizational structure of the meaningful elements by presenting the different types of links between them (with varying strengths) in graph format (Galli & Fasanelli, 2020).

## Reinert method

For responses to the second item, the Reinert method (Reinert, 1983) was employed using the Iramuteq software. This method has frequently been used for the study of open-ended questions (Legorburu et al., 2022; Souza et al., 2018), confirming that the results obtained eliminate the problems of reliability and validity in text analysis.

Using this method, which follows a top-down hierarchical cluster analysis format, the analyst obtains a series of classes and statistical clues in the form of typical words and text segments (Idoiaga & Belasko, 2019). Specifically, the software identifies the words and text segments with the highest Chi-square values, that is, those words and text segments that best identify each class (i.e., idea or “lexical universes”) that participants have repeatedly mentioned.

Consistent with previous research using the Reinert method (Camargo & Bousfield, 2009), the raw data were entered into Iramuteq software, and the most significant vocabulary items (words) in each class were selected based on three criteria: (1) an expected value of the word greater than three, (2) evidence of an association based on the chi-square statistic, tested against the class ( $\chi^2 \geq 3.89$  [ $p=0.05$ ];  $df=1$ ), and (3) the word appearing primarily in that class with a frequency of 50% or more. The Iramuteq software also determined which text segments were associated with each class or group of words and ranked them according to their chi-square value, and the text segments with the most significant chi-squares in each class were collected.

Once these “lexical universes” were identified, they were associated with “passive” variables (independent variables). In the present case, the passive variables were whether or not active methodologies were used, the area of teaching expertise, professional category, participation in educational innovation projects, knowledge of the UPV/EHU’s IKD i<sup>3</sup> strategy, having Docentiaz accreditation, number of years worked, and gender.

The Reinert method produces statistical, transparent, and reproducible data until the final point of interpretation, where the analyst assigns a label. Finally, researchers will give a title to the set of words and text segments grouped by the software (Idoiaga & Belasko, 2019).

When comparing the Reinert method with classical content analysis (Allum, 1998), it has been concluded that both methods can provide similar level of contract validity. For although Reinert achieves results that are potentially replicable, it in no way removes the role of the researcher. This software shifts the interpretative process to a later stage of the statistical analysis, whereas classical content analysis does it before, when constructing the coding frames (Allum, 1998). Therefore, although there may be differences in the interpretations of the results (as in all quantitative methods), the Reinert method avoids problems of reliability and validity attributed to other qualitative methods (Klein & Licata, 2003; Reinert, 1998). Finally, it should be mentioned that it is a particularly useful method for

analyzing large amounts of text, as it easily identifies patterns that would otherwise be impossible to recognize in very long texts (Eiguren et al., 2021).

## Results

Of the teachers who responded to the questionnaire, it was found that 22.39% reported low usage of active methodologies in their teaching practices. On a scale of 1 to 7, these respondents ranked their usage levels between 1 and 4 (specifically, 3.48% answered 1; 1.49% answered 2; 5.23% answered 3; and 12.19% answered 4). In contrast, 77.61% of the respondents reported using active methodologies moderately or highly (21.39% answered 5; 23.38% answered 6, and 32.84% answered 7). On average, the entire group appeared to report moderately high use of active methodologies, with an overall mean score of  $M=5.48$  ( $SD=1.53$ ).

### Which active methodologies do UPV/EHU university lecturers use?

The total word corpus of the first exercise consisted of 2540 words, 614 of which were unique. A lexical similarity analysis was conducted to generate an overview of the co-occurrences between all the words in the corpus beyond their division into classes. The idea was to analyze how the words in the corpus were interconnected on a common plane. For this purpose, the lexical similarity analysis was carried out only on words with a frequency higher than 5, the results of which are displayed in Fig. 1.

The main core of the representational figure is learning (in blue) ( $f=184$ ), and from this, various techniques, methods, or methodologies used for this purpose emerge. In the upper branch of the figure in red color, problem-based learning (PBL) methodologies ( $f=104$ ), problem-based learning ( $f=146$ ), and project-based learning ( $f=39$ ), together with cooperative learning ( $f=43$ ), are shown in green and strongly linked to work ( $f=57$ ) that can be carried out by students in groups ( $f=29$ ) or teams ( $f=6$ ). These problem–solution ( $f=5$ ) exercises ( $f=7$ ) and active ( $f=18$ ) methodologies are also linked to gamification ( $f=13$ ) and tools such as the Socrative program ( $f=5$ ) or the Aronson puzzle ( $f=6$ ) all of which are shown in orange.

In the central part of the figure, and especially close to learning (in blue), purple color denotes the projects ( $f=48$ ), problems ( $f=29$ ), and even the puzzle technique ( $f=29$ ), to be used in workshops ( $f=5$ ), lectures ( $f=17$ ), class ( $f=12$ ), or questionnaires ( $f=14$ ). Learning, in blue, is defined as a challenge ( $f=9$ ) which should be practical ( $f=17$ ) and collaborative ( $f=13$ ). Other tools mentioned, in pink, are the case study method ( $f=53$ ), service learning ( $f=6$ ), discussion groups ( $f=5$ ), or programs such as kahoot ( $f=5$ ). Finally, in the lower part of the figure, marked in brown, the methodology ( $f=15$ ) of the flipped classroom ( $f=71$ ) is notable ( $f=8$ ), which is linked to debate ( $f=24$ ) or discussion ( $f=5$ ) held jointly with the students in class or laboratory ( $f=8$ ) and research ( $f=9$ ).

### Reasons for using (or not) using active methodologies

To explore the main reasons given by the participants to use (or not use) active methodologies, the corpus of the free responses was analyzed using the Reinert method with the Iramuteq software. The complete corpus contained 14,587 words, of which 1849 were unique.



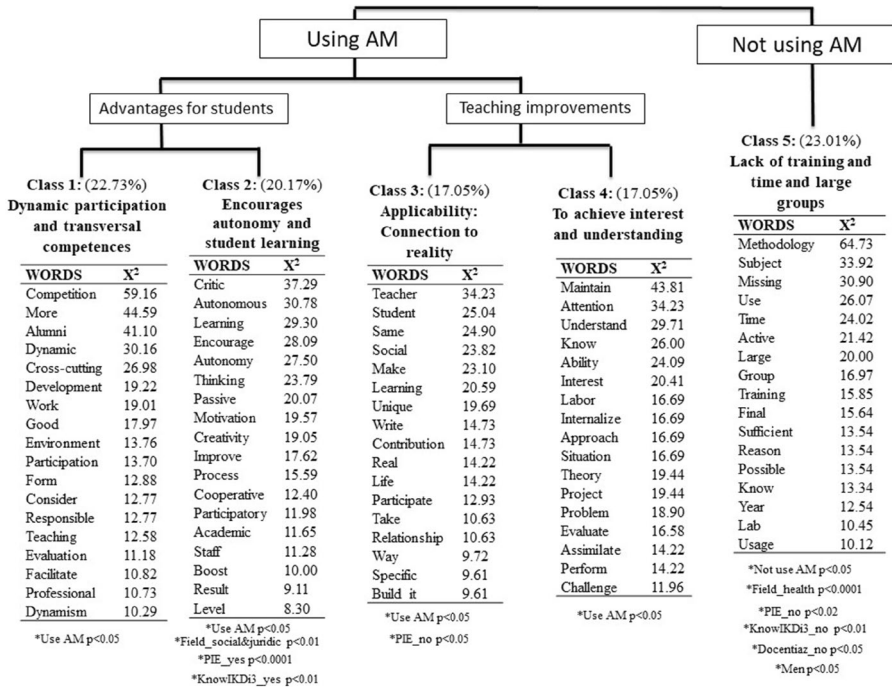


Fig. 1 Results of the lexical similarity analysis with words with a frequency of more than 5

The top-down hierarchical analysis of the Reinert method divided the corpus into 422 segments and five classes. The results of this analysis can be seen in Fig. 2.

The analysis identified the main reasons given by participants for using (or not) active methodologies. Each reason or idea is represented by a set of typical words and text segments, known as a class. The results revealed five different classes, four of which give reasons why university teachers use these methodologies. Specifically, the first two classes, which explain the advantages for students, were labeled “Class 1: Dynamic participation and transversal competences” and “Class 2: Promotes autonomy and student learning”. The next two classes, which explain the reasons why teachers use active methodologies, focus more on the improvements brought to teaching itself and were labeled “Class 3: Applicability: Connecting with reality” and “Class 4: Gaining interest and understanding”. Finally, the fifth class, concerning the reasons why teachers do not use active methodologies, was labeled “Class 5: Lack of training and time and large groups”. In the following section we will separately describe each of these classes and their characteristics.

Among the classes that detail arguments in favor of using active methodologies in terms of the advantages for students, the first of these is “Class 1: Dynamic participation and transversal competences,” with a weight of 22.73%. Within this class, teachers state that through these methodologies they can work in a more dynamic and participative



**Fig. 2** Hierarchical clustering dendrogram of the corpus extracted from the responses, showing the words with the highest association for each class  $\chi^2(1)$ ,  $p < 0.001$  extracted by the Reinert method

way and that this approach favors the development of the transversal competences promoted by the university. This class was significantly more frequently mentioned by teachers who used active methodologies ( $p < 0.05$ ). In order to contextualize the words in Fig. 2, they need to be viewed in conjunction with the characteristic text segments associated with this class. Therefore, the most significant quotes, that is, the quotes with the highest chi-square from this class, are presented below:

- “Improves student participation and engagement. Learning is more dynamic and active, more collaborative and assessment is more formative. With all this, other transversal competences are better developed and the teaching and learning process is more focused and adapted to the students” ( $\chi^2 = 292.40$ ; engineering and architecture, female, 21 to 30 years of age).
- “It is a tool to motivate students and because it helps me to work on certain transversal competences that I would find difficult to work on with the traditional master class alone” ( $\chi^2 = 274.95$ ; experimental sciences, female, less than 10 years of employment).
- “Students become responsible for their own learning and develop subject competences and the cross-cutting competences of the UPV/EHU. It is the right way for interdisciplinarity, I think they are the most effective and efficient way to develop teaching and learning processes in Higher Education” ( $\chi^2 = 235.47$ ; social and legal sciences, female, between 10 and 20 years of employment).

Second, and also concerning the reasons for using active methodologies with a focus on the students, “Class 2: Encourages student autonomy and learning” emerged with a weight of 20.17%. In this class, the respondents describe how these methodologies encourage autonomy, critical thinking, motivation, creativity and better academic outcomes. This class was significantly more frequently mentioned by teachers who use active methodologies ( $p < 0.05$ ), those from the field of social sciences and law ( $p < 0.01$ ), participants in PIEs ( $p < 0.0001$ ), and those familiar with the UPV/EHU’s IKD i<sup>3</sup> strategy ( $p < 0.01$ ). Some of the most significant quotes from this class include the following:

- “Because in this educational paradigm, learning is student-centered, and I believe that this is the way to encourage their autonomy, creativity, and critical thinking. Furthermore, these methodologies seem to me to be suitable for achieving constructive and meaningful learning and for motivating students” ( $\chi^2 = 184.44$ ; social and legal sciences, female, 10–20 years of age).
- “They involve a cooperative work approach, encouraging creativity, critical thinking and motivation. They stimulate students by giving them the opportunity to construct their own learning” ( $\chi^2 = 146.53$ ; health sciences, male, less than 10 years of employment).
- “We rely on the process of fostering students’ autonomy and critical opinion for excellent learning that goes beyond rote learning” ( $\chi^2 = 140.01$ ; arts and humanities, male, less than 10 years of employment).

Further reasons given by the teaching staff for using active methodologies came from a more teaching-based perspective. This third class emerged with a weight of 17.05% and was called “Class 3: Applicability: Connection with reality.” This class refers to the social contribution of these methodologies, and particularly how this approach allows for focusing teaching on real-life problems and even making contributions to society. This class was significantly more frequently mentioned by teachers who use active methodologies ( $p < 0.05$ ) but who had not participated in PIEs ( $p < 0.005$ ). The most significant text segments of this class include the following:

- “Yes, I use them because they give me more possibilities to connect with reality, because through them we can make contributions at a social level and because I myself feel more motivated as a teacher” ( $\chi^2 = 136.50$ ; social and legal sciences, female, 10 to 20 years of employment).
- “For example, through service learning we manage to work together with organizations to improve society and this is key to providing quality teaching” ( $\chi^2 = 129.48$ ; social and legal sciences, female, 10 to 20 years of employment).
- “I think that by doing you learn more than by seeing, that you learn more among colleagues than alone and that you learn more by making PBL decisions. That’s why I set up real projects with an open solution” ( $\chi^2 = 109.34$ ; arts and humanities, male, 10–20 years of employment).

The final class that refers to using active methodologies with an emphasis on the benefits for teaching was labeled “Class 4: To achieve interest and understanding,” with a weight of 17.05%. In this class, the teachers expressed the view that these methodologies play a crucial role in sustaining students’ attention and interest during their explanations, leading to better comprehension and internalization of the content. This class was significantly more

frequently mentioned by teachers who utilize these methodologies ( $p < 0.05$ ). The most significant reasons described within this class were as follows:

- “I believe that it involves greater reflection on the content, allowing the teacher to work with all students regardless of their abilities. In addition, it helps to achieve and maintain the attention, interest, and motivation of the students and, as they are more practical methodologies, it helps teaching to get closer to reality” ( $\chi^2 = 149.84$ ; social and legal sciences, female, less than 10 years of employment).
- “They allow the intensity of interest and involvement to be maintained constant throughout the teaching period, increasing the degree of depth and real understanding of the subject matter learned. In addition, it increases the ability to work in a group in a coordinated and efficient way” ( $\chi^2 = 130.25$ ; health sciences, male, over 30 years of employment).
- “It allows me to know if the student has understood, allows me to know if I explain correctly, to monitor attendance, and maintain the student’s interest” ( $\chi^2 = 109.34$ ; experimental sciences, female, between 21 and 30 years of employment).

Finally, in the fifth class, with a weight of 23.01%, the teachers stated the reasons why they did not use active methodologies. This class was labeled “Class 5: Lack of training, lack of time, and large groups” as it details precisely these three reasons for not incorporating these methodologies into teaching practice. This class was significantly more frequently mentioned by teachers who did not use active methodologies ( $p < 0.05$ ), those from the field of health sciences ( $p < 0.01$ ), participants in PIEs ( $p < 0.02$ ), and those with an awareness of the UPV/EHU’s IKD i<sup>3</sup> strategy ( $p < 0.01$ ), teachers without the Docentiaz accreditation ( $p < 0.05$ ), and men ( $p < 0.05$ ). The most significant responses within this class were as follows:

- “The reasons for not using active methodologies is that the subjects I teach have mathematical content, the groups are large, the students are not very motivated, and there is not enough time” ( $\chi^2 = 220.39$ ; engineering and architecture, male, between 10 and 20 years of employment).
- “The non-use of active methodologies has to do with the difficulty of adapting to the type of subject and the knowledge, mastery and experience with them. I don’t use them because I think we lack training and resources in this field” ( $\chi^2 = 206.00$ ; health sciences, female, 21 to 30 years of employment).
- “I think it is difficult to develop active projects due to time constraints, both the length of the course and the time available for students in laboratories. Also, the evaluation and monitoring of students is complicated, and I do not have the training to adapt it to my field” ( $\chi^2 = 189.33$ ; engineering and architecture, male, less than 10 years of employment).

## Discussion and conclusions

This study provides valuable insights into understanding the impact of the IKD i<sup>3</sup> strategy in terms of how teachers approach their teaching and teaching–learning processes by directly gathering the voices of the teaching staff in an open and unrestricted manner.

First, regarding the methodologies currently used by teachers in their teaching activities, the most used ones are problem-based learning (PBL), cooperative learning, and case studies. These methodologies were originally adopted by the IKD model a decade ago. Additionally, there is an emerging methodology known as flipped learning (Karabulut-Ilgü et al., 2018). However, there is a notable lack of inquiry-based learning and research-based learning, incorporated in the latest revision of the IKD  $i^3$  strategy (Sáez de Cámara et al., 2021). It is worth noting that these more complex and innovative methodologies focus on guiding students in discovering new causal relationships. This involves formulating hypotheses and testing them by conducting experiments or observations, requiring the application of problem-solving techniques (Pedaste et al., 2019). The incorporation of these methodologies into teaching practices is crucial for enhancing research and the transfer of knowledge, particularly on bachelor's and master's degree programs. The IKD  $i^3$  strategy recognizes that strengthening complex competences involves integrating research and innovation skills as fundamental and desirable competences for all students (Sáez de Cámara et al., 2021).

Second, this work highlights a significant preference for using active methodologies over not using them, as evident in the arguments put forward by the teachers. However, it is important to note that despite this preference, active methodologies might not be used to their full potential. Nonetheless, it appears that a considerable percentage of teaching staff has internalized the reasons for employing dynamic and active forms of teaching, as proposed by the IKD model (Fernández & Palomares, 2010).

When examining the reasons why our participants choose active methodologies, and in line with other contemporary research (Colomer et al., 2020; Crisol-Moya et al., 2020; Higuera-Rodríguez et al., 2020), it is observed that these methodologies enable students to participate dynamically, develop transversal competences, and learn autonomously. Consequently, it is concluded that active methodologies play a pivotal role in shaping learning in Higher Education as a constructive—rather than receptive—process.

Another noteworthy advantage of using active teaching methodologies in Higher Education is their association with self-directed learning, which reinforces autonomy and fosters the development of metacognitive skills while further enhancing opportunities for improved learning outcomes (Karatas & Arpacı, 2021; Loyens et al., 2008). In self-directed learning environments, students work in teams, engage in discussions, debate, and continuously evaluate their learning progress, and active methodologies effectively employ strategies to support and facilitate this self-directed learning process (Bohaty et al., 2016). It is also worth noting that this reflection on the importance of self-directed learning and learner autonomy was mostly mentioned by teachers in the field of social sciences and law. If we take into account that within this field are all specializations in pedagogy, education, and psychology, it may be that it is the teachers' own training that allows them to appreciate this effect. It would therefore be interesting to extend the training on self-directed learning and learner autonomy also to the rest of the teaching staff so that they can become aware of the impact on learning processes (Gharti, 2019).

Moreover, according to our research, active methodologies in teaching lead to several improvements, such as enhancing applicability by connecting concepts to real-world situations. This approach also generates greater interest and understanding among students. Therefore, active teaching methodologies will be key to creating a teaching context that mirrors real-world problems or professional practices in Higher Education (Camacho & Legare, 2015; Casanovas et al., 2021). Therefore, when implementing active teaching methodologies, it is important to present situations that closely resemble the professional context that students will encounter in their future careers (Higuera-Rodríguez

et al., 2020). In fact, it has been widely demonstrated that the contextualization of teaching promotes a positive attitude and motivation among students, which is essential for meaningful learning (Leite et al., 2018). Additionally, this allows students to tackle real problems with a level of difficulty and complexity similar to what they will encounter in professional practice (Litchfield et al., 2010). In short, it is important to recognize that while teachers can impart information, true knowledge is not transferable as it is an internal and personal entity.

To conclude, it is noteworthy that teaching staff across all fields, regardless of their familiarity with the IKD  $i^3$  strategy or prior involvement in educational innovation projects (PIE) or Docentiaz accreditation, have put forward almost identical arguments for adopting active methodologies. This finding is promising, as it suggests that active methodologies have become deeply ingrained in the culture and praxis of university teaching and embraced by all, regardless of the area of teaching expertise. The only exception to this pattern was the argument of fostering student autonomy, which was mentioned most frequently by those who had participated in educational innovation projects and were familiar with the IKD  $i^3$  strategy.

On the other hand, the reasons cited for not using active methodologies included the lack of training or time and the challenge of implementing such methodologies with large student groups. Interestingly, this triad of obstacles aligns with findings reported in the previous literature (Edwards et al., 2007; Graffam, 2007), and various proposals have been suggested to address these challenges (Ponsa et al., 2009). However, a noteworthy observation from our results is that those who most frequently mentioned these reasons were individuals who were unfamiliar with the IKD  $i^3$  strategy, had never participated in an educational innovation project, and did not have the Docentiaz accreditation or regardless of their teaching experience. This idea is particularly noticeable among teachers in the health field, which may be due to the fact that these teachers are often associate professors and combine their work in the academy with their professional health practice, so that their time for training in the field may be more limited. In addition, it is common for teaching teams to be made up of several professors, which can also make the process more difficult. For all these reasons, it would be interesting to create specific training for teachers in this area.

Concerning the implications for practice, this research further legitimizes the UPV/EHU's educational model, specifically through the implementation of the IKD  $i^3$  strategy (Fernández & Palomares, 2010; Sáez de Cámara et al., 2021). Notably, our findings provide support for the notion that increased awareness and active participation in the IKD  $i^3$  strategy (through teaching innovation, sustainability projects, or Docentiaz accreditation) results in stronger commitment of the teaching staff to the learning concepts set out in this educational model. Furthermore, in terms of the study's contributions beyond the institution itself, we believe that these results can be applicable to other educational institutions. That is, if we really want Higher Education institutions to promote active and student-centered methodologies, it will be key to incorporate them into their own pedagogical model and promote appropriate training. In addition, strategies to increase the awareness and active participation of the teaching staff in the educational model of each Higher Education institutions will be key to achieve a greater commitment to incorporate active methodologies in their teaching.

The methodology itself also makes a contribution to the field as it proposes a systematized way of collecting the voices of the teachers in this case, but it could also be the voices of the students (Legorburu et al., 2022). In other words, it provides the

possibility of using participatory methodologies in research, even when analyzing large samples (Souza et al., 2018).

The main limitation of this study is that the sample, while representative, includes only a portion of the teaching staff at UPV/EHU. Although this sample appears to be diverse, in studies of this nature, it is quite common for the majority of respondents to be those who find the subject matter relevant. However, it is worth noting that even among the collected responses, a critical perspective has emerged, demonstrating the plurality of opinions expressed. Moreover, the use of a free-response research methodology places few restrictions on the responses, enabling the teachers to provide honest and insightful answers.

Additionally, as a potential line of future research, it would be interesting to conduct a similar type of study among students to explore how the teachers' efforts may have affected them. Specifically, it would be worthwhile to analyze whether active methodologies in Higher Education genuinely promote skills such as collaboration, critical thinking, or problem solving, and enhance the motivation and engagement of Higher Education students.

In conclusion, this research suggests that universities must go beyond merely adopting an educational model; they should also invest considerable effort in disseminating the model and providing training opportunities for teaching staff to implement it effectively. By doing so, teachers can develop a genuine and meaningful commitment to the model. This approach is essential for achieving a tangible commitment from teachers and, in turn, for fostering the desired skills and abilities in students.

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## Declarations

**Conflict of interest** The authors declare no competing interests.

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## Authors and Affiliations

Nahia Idoiaga Mondragon<sup>1</sup>  · Nekane Beloki<sup>2</sup>  · Ion Yarritu<sup>1</sup>  ·  
Idoia Zarrazquin<sup>3</sup>  · Karmele Artano<sup>4</sup> 

✉ Ion Yarritu  
ion.yarritu@ehu.es

Nahia Idoiaga Mondragon  
nahia.idoiaga@ehu.es

Nekane Beloki  
nekane.beloki@ehu.eus

Idoia Zarrazquin  
idoia.zarrazquin@ehu.es

Karmele Artano  
karmele.artano@ehu.eus

<sup>1</sup> Department of Evolutionary and Educational Psychology, University of the Basque Country UPV/EHU, Leioa, Spain

<sup>2</sup> Department Sociology and Social Work, University of the Basque Country (UPV/EHU)University of the Basque Country UPV/EHU, Leioa, Spain

<sup>3</sup> Department of Nursing, University of the Basque Country UPV/EHU, Leioa, Spain

<sup>4</sup> Department of Mining and Metallurgical Engineering and Materials Science, University of the Basque Country UPV/EHU, Leioa, Spain