The use of active strategies in Geography and History Classrooms in Secondary School

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Abstract: This study analyses the use of active teaching strategies in geography and history classrooms in Compulsory Secondary Education between September 2020 and June 2023. For data collection, a questionnaire has been validated as a measurement instrument, which aims to investigate the didactic strategies incorporated in the area of geography and history. Out of a total of 365 responses, cooperative learning is the most used methodology, followed by project-based learning and problem-based learning; to a lesser extent, flipped classroom and gamification, and finally, service-learning has a very low use in Geography and History classrooms. These approaches promote active student participation, the development of critical thinking, and the practical application of knowledge. In addition, the analysis shows that teachers combine several active methods in the face of different educational needs. From the findings detected, we suggest the need to reflect on the limitations of the implementation of these teaching strategies and to find the appropriate channels for teacher training in them and an advance in the field of Social Sciences teaching at Secondary level.

Keyword: Active learning

1. Introduction

In the twenty-first century, the need to adapt educational models to the social, economic and technological changes in our societies has become increasingly evident. There are several institutions that have highlighted the role of education and its adaptation to these changes, such as: UNESCO by proposing Sustainable Development Goal No. 4: "Quality Education" within the framework of the 2030 Agenda. Thus, some studies have shown that all UNESCO Chairs contribute to SDGs 4 (Quality Education) and 17 (Partnerships for the Goals) in their extensive research and teaching activities (Bergman et al., 2018); and the Organization for Economic Cooperation and Development, which has influenced education policies both in its member countries and in a global internationally nuance (Zhu et al., 2020).

In today's educational landscape, driven by the digital age and the evolving needs of society, we observe a gradual transformation in the traditional roles of teachers and students. This shift is reflected in current educational legislation, which often emphasizes the adoption of relevant organizational, methodological, and curricular measures in line with the principles of Universal Design for Learning (UDL). For instance, the Spanish education legislation (Ministerio de Educación y Formación Profesional, 2022) specifically mandates the implementation of UDL principles to ensure accessibility and inclusivity in education. Similarly, other national legislations, such as Every Student Succeeds Act (ESSA) in the United States, also advocate for inclusive education practices, in particular the need for schools to accommodate diverse learning needs through flexible teaching methods and accessible learning materials. Comparatively, while both the Spanish and U.S. legislations prioritize inclusivity along with a more

flexible education, the Spanish legislation places a stronger emphasis on methodological adjustments and curricular measures, explicitly incorporating UDL principles. In contrast, the ESSA focuses on accountability and assessment to ensure that all students, including those with disabilities, achieve academic success, thereby creating a more outcomes-focused approach. This short comparison indicates the global direction towards more inclusive education systems, tailored to meet the diverse needs of all students.

The mentioned educational scope represents a new challenge for responding to current societal demands and represents an opportunity as well to improve the quality of education in Geography and History. For this reason, an effective transition to pedagogical principles that have their origin in the Active School, promoted by John Dewey and the different pedagogical renewal movements of the early twentieth century, is required (Miettinen, 2001; Ruiz-Corbella, 2022).

This transition must be designed to promote the development of competencies among students, while encouraging the appropriate use of technology and digitalization in the classroom. Hence, educators shall face the existing and necessary task of adapting the teaching of Geography and History to an ever-changing world, where active pedagogy and technological tools become indispensable allies to form informed and critical citizens (De Miguel González & Sebastián López, 2020).

As will be presented later, the main objective of this study is to analyse the trends in the use of different active strategies in Geography and Secondary History classrooms within the Spanish curriculum. This analysis is important because it helps to identify effective teaching methods that can enhance student engagement, foster critical thinking, and improve overall learning outcomes. From this perspective, we focus on considering the following didactic strategies and approaches based on active teaching: Cooperative Learning, Project-based Learning, Problem-based Learning, the Flipped Classroom, Gamification, and Service Learning.

The selection of the mentioned active teaching approaches is justified based on the background of the authors as part of the XXX. The XXX was founded within the framework of the University's bachelor's and master's degree courses. In this analysis, the last year in the practicum phase of the master’s degree in Teacher Training in Secondary Education has been considered. These final year students are impartial observers of the reality they experience during their practicum phase in schools. Thanks to the training received and tutoring, students can analyse the reality they live in the classroom during this period and possess the appropriate knowledge to identify the considered active teaching approaches. Indeed, the students (teachers in training) observe all kinds of methodologies in their practices, highlighting the following: Cooperative Learning, Project-Based Learning, Problem-Based Learning, Flipped classroom and Gamification; to a lesser extent, Service Learning; and other didactic methods that were considered as possible, but were not observed significantly, were: Design Thinking, Visual Thinking, Role-Playing, Scavenger Hunts, Case Studies, Think-Pair-Share, Peer Teaching, Debates, Just-in-Time Teaching, Learning by Teaching and Brainstorming.

In this study, we aim to evaluate the adoption level of various active teaching methodologies between September 2020 and June 2023. To achieve this, we used a questionnaire as our measurement tool, targeting students enrolled in the master’s degree in Secondary Teacher Training, specializing in Geography and History. These students, who complete their practicum phase in educational centres but are not permanent staff, provide a neutral and unbiased perspective. The questionnaire is

designed based on constructivist principles, which are required for surveys involving trainee teachers (Gürsoy, 2013). This approach enables a formative evaluation during their teaching practice, fostering the professional development of trainee teachers (Papoulia-Tzelepi, 1996). By gathering data from these future educators, we can gain information into how well these active teaching methods are being integrated into classrooms and identify areas for improvement in teacher training programs. This, in turn, helps in shaping more effective teaching practices in Geography and History education.

1.1. Theoretical foundation

As previously mentioned, our study focuses on active teaching principles that have been significantly observed by trainee teachers. We considered several methodological strategies derived from active teaching; however, we highlight those that the pre-service teachers specifically observed during their practicum phase in various Spanish educational centres. It is important to note that during their training, the theoretical foundations of these methodologies were thoroughly explained. As a result, the pre-service teachers have a solid understanding that allows them to accurately identify and assess the different strategies implemented in the classrooms during their practical experience.

1.1.1 Cooperative learning

According to Slavin (2014), cooperative learning refers “to instructional methods where students work in small groups to help each other learn, particularly popular in elementary schools”. In this didactic method, positive interdependence, individual responsibility, adequate team building, group processing and social skills are worked on (Johnson et al., 1999). It has its origins in the 1970s in the practical classes conducted by David W. Johnson and Roger T. Johnson at the University of Minnesota (Johnson & Johnson, 1987).

Classroom interventions have been carried out in the subject of Geography and History, as some studies have shown (Hong, 2011; Ribeiro, 2013; Delgado-Peña & Subires-Mancera, 2019). Luque & Navarro (2012, p. 68) express that cooperative learning in geography classroom “is one of the most appropriate ways to work on competences related to transversal skills and abilities as well as the development of attitudes and values in geography and other disciplines”. In addition, cooperative learning is the basis for implementing many of the active methodologies that will be discussed later because it allows working in a team with established roles when implementing any active strategy (Gómez, 2010).

1.1.2 Project-based learning

Project-Based Learning (PBL) is an innovative approach to learning that teaches strategies critical for success in the 21st century, driving students' own learning through inquiry and collaboration (Bell, 2010).

Project-based learning is a didactic strategy in which students work in groups (cooperatives) to achieve a final product. In this method, competencies related to objective-based or evidence-based learning are worked on, since as a final result of the project they must have a learning artefact or evidence that brings together the learning acquired during the learning process. In this way, this strategy has a positive impact on the learning process of the students, obtaining satisfactory results in the acquisition of skills (Granado-Alcón et al., 2020). Besides, Scarbrough et al. (2004) add that this

method improves thinking skills and creates flexible learning environments, promoting students' cognitive and emotional advancement).

In the case of the implementation of Project-based learning in Geography and History, Hynek (2017) states that “project-based learning (PBL) in geography education stimulates students' internal motivation and saves time, leading to more effective study, easier knowledge acquisition, and increased enjoyment for both students and teachers”. In addition, some systematic studies of its application in Geography and History (Kokotsaki et al., 2016) have been carried out which show an improvement in students' soft skills, such as autonomy, collaboration, communication and reflection. Its positive impact has also been noted in the many classroom experiences carried out in this subject (Abarca, 2017; Ayerbe & Perales, 2020; Zangrando et. al., (2010); Barnd, 2016).

1.1.3 Problem-based learning

Problem-based learning (PBL) is an instructional method where students learn through facilitated problem solving, developing flexible knowledge, effective problem-solving skills, self-directed learning, effective collaboration skills, and intrinsic motivation (Hmelo-Silver, 2004). It can enhance geographers’ fieldwork preparation by encouraging active and deep learning in students (Bradbeer, 1996; de Sousa & Golightly, 2023). For this reason, it is an adequate method to digital skills through the technologies, as shown by different classroom experiences in geography (Buzo, 2016; R. P. De Miguel González et al., 2016).

1.1.4 The flipped classroom

According to Santiago et al., (2017), the flipped classroom "is a pedagogical model that transfers the work of certain learning processes outside the classroom and class time is used to facilitate and enhance other processes of knowledge acquisition within the classroom". Some authors have experimented with this model in their Social Sciences classes, using digital tools, and underlined on of the advantages of using class time for the implementation of active methodologies (González-Aparicio, 2014; Lucero, 2018).

1.1.5 Gamification

The Gamification is a pedagogical approach to apply the elements of the design of games in the educational and formative contexts (Vanolo, 2018), increasing motivation, interest, participation and collaboration among the students. This strategy is used in some fields, like education, health, marketing and business (Robson et al., 2016).

Some authors (Toda et al., 2019) assert that the gamification in formal education is divided into five dimensions related to the learner and the learning environment. These five dimensions are: performance and measurement, ecological, social, personal and fictional, which serve to evaluate whether the design of an activity based on the principles of gamification is valid or not. In the case of Humanities, there are some different experiences that show optimal results in its application in History and History of Art (Martínez-Hita, et al., 2021; Serrano, 2023).

1.1.6 Service Learning

The Service Learning is an educational methodology that combines the community service with the learning, allowing to students to apply knowledge in social and real contexts (Goldberg et al., 2006). This strategy not only aims to improve theoretical knowledge but also to promote personal growth and civic responsibility. Students are

capable of organising a community service by attending to the needs of their immediate environment (Dicke et al., 2004).

The dialogical and reflection in this strategy are very important to develop the communicative and personal skills in the students, because it allows students to gain critical thinking competence and social awareness (Lake & Jones, 2008). Some experiences with this methodology are observed, but there are still few studies that reflect empirical research in Geography and History classrooms (Pérez & Sánchez, 2019).

2. Objectives

The main objective is to analyse the trends in the use of the different active strategies in the classrooms of Geography and Secondary History within the Spanish curriculum. From this main objective emanate the specific objectives:

a) Analyse and provide quantitative data on the different active methodological strategies observed in the area of geography and history in the Spanish context from September 2020 to June 2023.
b) Identify if the use of active strategies occurs in a unique way or if there are combinations of strategies according to educational needs.

3. Material and Method

This study analyses trends in the use of various active teaching strategies in secondary Geography and History classrooms in the context of the Spanish curriculum. To achieve this objective, a comprehensive methodological framework has been designed which includes: the main characteristics of the study; a questionnaire validated by XXX research group team, which was answered by trainee teachers; the selection of a sample composed of students (teachers in training) of the Master's Degree in Teacher Training, specialising in Geography and History; and the process followed for the analysis of the data, using descriptive and combined analysis techniques.

3.1 Study and questionnaire

The study was conducted from September 2020 to June 2023, obtaining a total of 365 responses from students engaged in their practicum phase at the Secondary and Baccalaureate levels, specialising in Geography and History. This constitutes a non-probabilistic, convenience sample. Each student may have participated in different academic levels related to Geography and History, as their practicum period typically involves rotations through various classrooms and levels of Secondary School. In cases of multiple observations, the practicum student was required to complete the questionnaire as many times as the number of different classrooms observed. Thus, a single practicum student may have completed the questionnaire multiple times, corresponding to the number of classrooms they observed.

The questionnaire comprises qualitative variables concerning general aspects of the student, the practicum supervisor, and the school itself. Noteworthy variables include the student's age, the supervisor's years of experience, their pedagogical training, and the type of educational centre (public, subsidised, or private). Additionally, the questionnaire addresses variables related to active methodological strategies, allowing us to determine their degree of implementation in Geography and History classrooms. Designed by XXX, the questionnaire consists of 30 items and can be completed in 30 minutes.

The collected data can be considered reliable for supporting our research due to its consistency, validated by the practicum reports that pre-service teachers are required to prepare at the end of their placements. In these reports, students are asked to comment on and describe the pedagogical approaches they observed. Among these, the following are highlighted: Cooperative Learning, Project-Based Learning, Problem-Based Learning, Gamification, Flipped Classroom, and Service Learning. The fact that students during their practicum period mention only these pedagogical approaches can be understood as a solid reference point for establishing the methodologies indicated in our study. It is worth noting that trainee teachers were also asked to comment on whether they had observed any of the following active pedagogies: Design Thinking, Visual Thinking, Role-Playing, Scavenger Hunts, Case Studies, Think-Pair-Share, Peer Teaching, Debates, Just-in-Time Teaching, Learning by Teaching, and Brainstorming. They reported that such pedagogies were either not observed or, if observed, were at an insignificant level. Additionally, trainee teachers were asked if they had observed any pedagogies other than those listed, but no additional responses were provided.

Therefore, the data collected is comprehensive and robust, highlighting the primary active methodologies being utilized in Geography and History classrooms while also confirming the relative absence of other less commonly observed pedagogical approaches. This information provides a clear and focused understanding of the current trends in active teaching strategies within the Spanish educational context.

Regarding the questionnaire as an evaluation instrument, it consists of 43 items on Likert or categorical scales, covering four dimensions: Methodology, Organization, Resources, and Evaluation. It is designed for postgraduate students in teaching programs. A cross-sectional instrumental study was conducted to evaluate its psychometric properties. Initially, content validity was assessed through expert judgement (N=6), yielding Aiken's V values above .80 for all items. Subsequently, 764 students from the master's program from all specialties (Geography and History, Mathematics, Spanish Language, Physical Education, English Language, Biology and Geology) in Secondary Teacher Training (78% aged between 25 and 40 years; 61% women) voluntarily and anonymously completed the questionnaire. The results indicated that the dimension of Methodologies achieved satisfactory reliability with an internal consistency coefficient (alpha = .75). An exploratory factor analysis revealed a structure accounting for 44% of the variance, with factor loadings exceeding .50 on a single dimension. For the dimensions of Organization, Resources, and Evaluation, significant tetrachoric correlations were found between items, along with acceptable internal consistency (KR-20 > .65). Furthermore, in the student participation regarding the Methodologies dimension, significant correlations and excellent reliability (KR-20 = .89) were observed. Hence, the psychometric analysis suggests that the questionnaire is a valid and reliable tool for assessing the state of use of educational methodologies, with emphasis on the active methodologies described in Section 1.1.

3.2. Sample

The surveyed students are evenly distributed by gender (49% female, 51% male), with 38% being over 40 years old, 55% being between 25 and 40 years old, and the remaining 7% are under 25 years old. Information was also collected regarding the type of school (private, state-subsidized, or public) and the pedagogical concepts followed. The data confirm that 60% of the schools are state-subsidized, while 16%% are private and 24% are public. Additionally, it is noteworthy that the trainee teachers are supervised by an experienced teacher acting as a mentor during their practicum phase. To better understand the profile of these experienced teachers, the questionnaire results reveal that 30% are between 25 and 40 and 70% are over 40 years old. Among them, 66%

completed the former Certificate of Pedagogical Aptitude (CAP), 27% completed the Master's in Teacher Training, and the remaining 7% have no pedagogical training or have received other types of pedagogical training. Regarding their experience, 58% have more than 10 years of teaching experience, while 19% have between 6 and 10 years, and the remaining 23% have between 1 and 5 years of experience.

3.3. Data analysis

The data were collected through an online questionnaire, which was answered by the students after the completion of their practicum stage. Once the data has been obtained, the following phases have been followed for its analysis: comprehension, coding and processing of the data:

3.3.1. Descriptive analysis

Responses related to methodological strategies have been classified into six categories: Cooperative Learning, Project-based learning, Problem-based learning, the Flipped classroom, Gamification and Service learning. The results have been treated in a general way to detect trends of interest and the data have obeyed a dual understanding: the pedagogy studied is considered to be marginally used or not used at all if less than 25% of the classroom time has been observed. The active pedagogy analyzed is considered to be used (and applied to some degree) as long as it has been observed more than 25% of the time and less than 75%.

3.3.2. Combination-based analysis

It is relevant to note that the collected data have been examined considering the various combinations of observed active methodologies. This feature is important to determine whether teachers use a variety of methodologies according to the specific realities of the classroom. The analysis of the data in terms of combinations allows us to gain information about how teachers integrate different active teaching strategies in practice, rather than relying on a single method. This approach helps to identify patterns and correlations between the use of multiple methodologies and their effectiveness in diverse educational settings. Furthermore, it allows us to understand how teachers promote flexibility and adaptability in real-world classroom environments, eventually leading to the importance of methodological diversity for a responsive education.

4. Results

The collected data spans from September 2020 to June 2023. During this period, the data reveals that the active pedagogies mentioned so far were applied in more than 25% of the observed sessions. Cooperative Learning was applied in 41% of the sessions, followed by Project-Based Learning at 37%, and Problem-Based Learning at 25%. Gamification was applied in 24% of the sessions, while Service Learning was the least employed methodology in Geography and History classrooms, with an application rate of 11% (Table 1).

Table 1.
The use of active methodologies in the observed classrooms.

Methodology observed	Use of methodology	Percentage and number of cases where methodology is observed
Cooperative learning	Applied in less than 25% of sessions	59% (216)
	Applied in more than 25% of sessions	41% (149)
Project-based learning	Applied in less than 25% of sessions	63% (231)
	Applied in more than 25% of sessions	37% (134)
Problem-based learning	Applied in less than 25% of sessions	73% (265)
	Applied in more than 25% of sessions	27% (100)

Flipped Classroom	Applied in less than 25% of sessions	75% (275)
	Applied in more than 25% of sessions	25% (90)
Gamification	Applied in less than 25% of sessions	76% (179)
	Applied in more than 25% of sessions	24% (86)
Service Learning	Applied in less than 25% of sessions	89% (326)
	Applied in more than 25% of sessions	11% (39)

The data reveals that the mentioned active pedagogies were applied in more than 25% of the observed sessions. Specifically, Cooperative Learning was the most frequently employed methodology, applied in 41% of the sessions. This approach encourages students to work together towards common academic goals, fostering collaboration and mutual support. Following Cooperative Learning, Project-Based Learning was applied in 37% of the sessions. This method involves students in complex, real-world projects that require critical thinking and problem-solving skills, effectively bridging the gap between theoretical knowledge and practical application.

Problem-Based Learning, another significant active methodology, was observed in 27% of the sessions. This strategy challenges students to solve real-world problems, promoting group discussions. Gamification, the use of game elements in non-game contexts to engage students and enhance learning, was utilized in 24% of the sessions. The Flipped Classroom approach, where students learn new content at home and practice it in the classroom, was applied in 25% of the sessions. This method allows for more interactive and personalized classroom activities. In contrast, Service Learning was the least employed methodology, observed in only 11% of the sessions. This approach integrates community service with academic instruction and promotes reflective thinking and personal growth while meeting societal needs.

The collected data has been examined considering the various combinations of observed active methodologies. This approach helps to identify patterns and correlations between the use of multiple methodologies and their effectiveness in diverse educational settings. Furthermore, it allows us to understand how teachers adapt their instructional practices to meet the unique needs of their students, considering factors such as class size, student demographics, and subject matter. This comprehensive analysis provides a more nuanced understanding of the practical application of active teaching methodologies, highlighting the flexibility and adaptability of teachers in real-world classroom environments. It also sheds light on the potential benefits of using a mixed-methods approach to enhance student engagement and learning outcomes. Overall, the combination-based analysis underscores the importance of methodological diversity in fostering a dynamic and responsive educational experience.

Our next intention is to assess whether the distribution of active teaching methodologies deviates significantly from an expected uniform distribution. For this purpose, a Chi-Square Goodness-of-Fit Test was conducted. This analysis aims to determine if certain methodologies were preferred over others in Geography and History. Under the null hypothesis that all methodologies are equally likely to be used, the expected frequency for each methodology is calculated by dividing the total number of observations by the number of methodologies (6). At a significance level of $\alpha=0.05$, the critical value for the degrees of freedom is d f= 6-1 = 5 is approximately 11.07. The calculated value of the Chi-Square based on data from Table 1 is 75.06 that far exceeds the critical value, hence the p-value is significantly less than 0.001. This result indicates a statistically significant deviation from the expected uniform distribution of active teaching methodologies. Specifically, Cooperative Learning and Project-Based Learning are utilized far more frequently than would be anticipated under a uniform distribution, whereas Service Learning is markedly underutilized. The overrepresentation of Cooperative Learning and Project-Based Learning suggests a strong preference for collaborative and project-oriented instructional strategies in Geography and History classrooms. Conversely, the

minimal application of Service Learning may reflect challenges in its implementation or a lower prioritization within the curriculum framework. Indeed, the statistical findings align with the observed data, where Cooperative Learning and Project-Based Learning dominate the pedagogical strategies, while Service Learning remains relatively scarce. This discrepancy suggests areas for targeted professional development and resource allocation to promote a more balanced integration of active teaching strategies in Social Sciences education.

To further elucidate the adoption patterns of active teaching methodologies, a comparative analysis of the proportions of classrooms utilizing each specific methodology in more than 25% of the sessions is conducted. This analysis aims to identify significant differences in the prevalence of each methodology, thereby highlighting preferred instructional strategies within Geography and History classrooms. To determine whether the differences in proportions among the active teaching methodologies are statistically significant, pairwise proportion comparisons are performed. Specifically, Z-tests for Two Proportions were conducted between each pair of methodologies. Given the multiple comparisons, the Bonferroni correction was applied to adjust the significance level, mitigating the risk of Type I errors. With six methodologies, the adjusted significance level was set at $\alpha = 0.05 / 15 = 0.0033$ for each individual test.

Pairwise Comparisons:

1. Cooperative Learning vs. Service Learning

- Proportions: 41% vs. 11%
- Result: $p<0.001$
- Interpretation: Cooperative Learning is significantly more prevalent than Service Learning.

2. Project-Based Learning vs. Service Learning

- Proportions: 37% vs. 11%
- Result: $p<0.001$
- Interpretation: Project-Based Learning is significantly more prevalent than Service Learning.

3. Problem-Based Learning vs. Service Learning

- Proportions: 27% vs. 11%
- Result: $p<0.001$
- Interpretation: Problem-Based Learning is significantly more prevalent than Service Learning.

4. Flipped Classroom vs. Service Learning

- Proportions: 25% vs. 11%
- Result: $p<0.001$
- Interpretation: Flipped Classroom is significantly more prevalent than Service Learning.

5. Gamification vs. Service Learning

- Proportions: 24% vs. 11%
- Result: p<0.001
- Interpretation: Gamification is significantly more prevalent than Service Learning.

6. Cooperative Learning vs. Project-Based Learning

- Proportions: 41% vs. 37%
- Result: p=0.045 (Not significant after Bonferroni correction)
- Interpretation: No significant difference in prevalence between Cooperative Learning and Project-Based Learning.

7. Cooperative Learning vs. Problem-Based Learning

- Proportions: 41% vs. 27%
- Result: p<0.001
- Interpretation: Cooperative Learning is significantly more prevalent than Problem-Based Learning.

8. Cooperative Learning vs. Flipped Classroom

- Proportions: 41% vs. 25%
- Result: p<0.001
- Interpretation: Cooperative Learning is significantly more prevalent than Flipped Classroom.

9. Cooperative Learning vs. Gamification

- Proportions: 41% vs. 24%
- Result: p<0.001
- Interpretation: Cooperative Learning is significantly more prevalent than Gamification.

10. Project-Based Learning vs. Problem-Based Learning

- Proportions: 37% vs. 27%
- Result: p=0.001
- Interpretation: Project-Based Learning is significantly more prevalent than Problem-Based Learning.

11. Project-Based Learning vs. Flipped Classroom

- Proportions: 37% vs. 25%
- Result: p<0.001
- Interpretation: Project-Based Learning is significantly more prevalent than Flipped Classroom.

12. Project-Based Learning vs. Gamification

- Proportions: 37% vs. 24%
- Result: p<0.001
- Interpretation: Project-Based Learning is significantly more prevalent than Gamification.

13. Problem-Based Learning vs. Flipped Classroom

- Proportions: 27% vs. 25%
- Result: p=0.420 (Not significant)
- Interpretation: No significant difference in prevalence between Problem-Based Learning and Flipped Classroom.

14. Problem-Based Learning vs. Gamification

- Proportions: 27% vs. 24%
- Result: p=0.550 (Not significant)
- Interpretation: No significant difference in prevalence between Problem-Based Learning and Gamification.

15. Flipped Classroom vs. Gamification

- Proportions: 25% vs. 24%
- Result: p=0.770 (Not significant)
- Interpretation: No significant difference in prevalence between Flipped Classroom and Gamification.

The pairwise proportion comparisons reveal several differences in the adoption rates of active teaching methodologies:

- Service Learning is significantly less prevalent than all other active methodologies, highlighting it as the least adopted strategy within the observed classrooms.
- Cooperative Learning consistently outperforms Problem-Based Learning, Flipped Classroom, and Gamification, indicating a strong preference for collaborative instructional approaches.
- Project-Based Learning also demonstrates higher adoption rates compared to Problem-Based Learning, Flipped Classroom, and Gamification, though it does not significantly differ from Cooperative Learning.
- No significant differences were found between Problem-Based Learning, Flipped Classroom, and Gamification, suggesting similar levels of adoption among these methodologies.

These findings confirm the pronounced inclination towards methodologies that emphasize collaboration and project work, such as Cooperative Learning and Project-Based Learning. In contrast, strategies like Service Learning and Gamification are less favored, potentially due to implementation challenges or lower prioritization within the curricular framework. In shall be noted that the significant disparities in methodology adoption highlight areas for potential professional development and resource allocation. Enhancing awareness and providing support for underutilized methodologies, particularly Service Learning, could lead to a more diversified application of active teaching strategies.

According to the collected data in Table 2, the use of active methodologies in the observed classes is evident in 61% of the sessions, where they are applied in more than 25% of the observed sessions. This indicates that active methodological approaches are commonly used and often combined with one another, creating a rich and interactive learning environment. However, there is a notable 39% of sessions where these

methodologies are either not observed or applied in less than 25% of the sessions, suggesting that there is still a significant reliance on less active teaching methods.

Table 2.
The use of active methodologies in the observed classrooms.

Use of methodology	Number of classrooms in which it has been observed	Percentage of classrooms in which it has been observed (%)
Active methodologies have not been observed or have been observed in less than 25% of the sessions	142	39%
Active methodologies have been observed in more than 25% of the sessions.	223	61%

According to Table 3, the data also indicates that up to two active methodologies are often combined in 18% of the classes. The simultaneous use of three, four, or five methodologies is less common but still present, indicating a diverse approach to active teaching in Geography and History classrooms. This combination of methodologies can be particularly effective in addressing different learning styles and needs, thereby enhancing overall educational outcomes.

Table 3.
Simultaneous use of several active methodologies in more than 25% of the classrooms observed.

Number of active methodologies used simultaneously in more than 25% of sessions	Absolute number of classrooms in which it has been observed	Percentage of classrooms in which it has been observed (%)
0	142	39%
1	57	16%
2	67	18%
3	46	13%
4	35	10%
5	18	5%

Given all this data, it is clear that active teaching methodologies are widely used and valued in Geography and History classrooms within the Spanish educational system. The predominant use of Cooperative Learning, Project-Based Learning, and Problem-Based Learning, along with the strategic use of the Flipped Classroom and Gamification, demonstrates a commitment to engaging students in meaningful and interactive learning experiences. While Service Learning remains less common, its integration with other methodologies could provide additional benefits. The combination-based analysis highlights the importance of methodological diversity and adaptability.

To evaluate whether the distribution of the number of active teaching methodologies employed simultaneously within classrooms aligns with an expected theoretical distribution, a Chi-Square Goodness-of-Fit Test was conducted. This analysis aims to determine if there is a significant deviation from a hypothesized distribution in the simultaneous use of active methodologies in Geography and History classrooms. We consider the null hypothesis stating that the number of active methodologies used simultaneously follows a uniform distribution (i.e., each category from 0 to 5 methodologies is equally likely). At a significance level of $\alpha=0.05$, the critical value for df (degree of freedom) = 6-1 = 5 is approximately 11.07. Given that the calculated Chi-Squared value of 153.86 far exceeds the critical value, the p-value is significantly less than 0.001. This result indicates a highly significant deviation from the expected uniform distribution of the number of active methodologies used simultaneously. Specifically, the observed frequency of classrooms utilizing 0 active methodologies simultaneously (39%) is substantially higher than the other frequencies. Conversely, the frequencies for classrooms using 1 to 5 methodologies are either lower or align differently than a uniform expectation. This result confirms our initial guesses stating that there is a predominant

tendency for classrooms to either not incorporate multiple active methodologies simultaneously or to employ a minimal number.

5. Discussion

The findings from this study show relevant trends in how active teaching methods are used in Geography and History classes in Spain from September 2020 to June 2023. The results highlight the widespread use and value of active methods like Cooperative Learning, Project-Based Learning, and Problem-Based Learning. These methods boost student engagement and also help develop critical thinking and practical application of knowledge (Buzo, 2016; De Miguel & Sebastián, 2020).

Cooperative Learning is used in 41% of the sessions, showing the focus on collaborative skills and mutual support among students. This aligns with the idea that learning is more effective when students work together (Slavin, 2014) and is the basis of the other methodologies (Hong, 2011; Ribeiro, 2013; Delgado-Peña & Subires-Mancera, 2019). Project-Based Learning is used in 37% of the sessions, and this approach encourages students to tackle complex, real-world tasks that require critical thinking and problem-solving (Bell, 2010). Problem-Based Learning is used in 27% of the sessions, promoting student-centred learning where students solve real-world problems through group discussions and inquiry (Hmelo-Silver, 2004). Experiences in Geography and History classrooms use both Project-Based Learning and Problem-Based Learning because the existing literature (Gómez, 2010; Buzo, 2016; Abarca, 2017; Ayerbe & Perales, 2020) shows that these are the most published results, and all experiences coincide in a positive impact on the teaching-learning process.

The Flipped Classroom model (used in 25% of sessions) and Gamification (used in 24% of sessions) show how technology and new strategies are being integrated into teaching. The Flipped Classroom lets teachers use class time for interactive activities, helping students understand and apply knowledge (Santiago et al., 2017). This fact also occurs when applied to the teaching of Geography and History, where classroom time is invested in applying other methodologies, such as project-based or problem-based learning, including innovative activities that develop competencies (González-Aparicio, 2014; Lucero, 2018). Gamification uses game design elements to make learning more engaging and fun (Goldberg et al., 2006; Toda et al., 2019) and the pre-service teachers' perception in the classrooms of Social Sciences, Geography and History, indicate a positive impact the assessment of students (Candel et al., 2023).

Service Learning is used in only 11% of the sessions, but it possesses a great potential. Its limited use suggests challenges in implementation or a lack of awareness about its benefits. Combining it with other methods could enhance its impact and provide a more holistic learning experience (De Miguel & Sebastián, 2020; Candel et al., 2023).

In addition, the analysis shows that teachers often combine multiple active methods to meet diverse learning needs. Data shows that using two methods together is common (18%), with fewer instances of using three, four, or five methods simultaneously. This variety in teaching strategies highlights how educators adapt to the diverse needs of their students and the changing demands of education (Rodríguez-Medina, et al., 2020).

6. Conclusions

The current Spanish educational legislation is committed to methodological principles based on active teaching and the generation of learning situations, which have as a methodological approach one or more of these active methodologies, which have been

highlighted in this study. However, it has been seen that 4 out of 10 classrooms observed maintain a passive methodology, with lectures-expository classrooms.

It is interesting to note that, based on the study carried out, the results show that the most commonly used active strategies are Cooperative Learning, Project-Based Learning and Problem-Based Learning, reflecting a shift towards more student-centered models. These methods favor the adaptation of education towards more flexible and more active methods, which are in tune with the acquisition of competences, such as critical thinking and problem solving, by secondary school students. It is interesting that the most observed active methodologies have an approach based on group work, and that their use is superior to methodologies supported by technology such as Flipped Classroom or Gamification.

In the same way, it seems that methodologies such as Service Learning, despite their group nature, do not have a great implementation in the discipline of Geography and History. Although it cannot be stated within the study carried out, it seems quite plausible that the need to establish alliances with the school environment and the general lack of knowledge of this methodology hinder its implementation in the subject.

The use of active strategies in Geography and History in Spain is consolidating, and their combination responds to a search for greater effectiveness in the teaching and learning of these areas.

An important aspect of our study is that it shows that more than half of the classrooms analyzed have a firm commitment to the combined use of several active methodologies. This result, added to the fact that none were used in 39% of the schools, gives us a split picture of the education system that can lead to a lack of equity in the system and that can be a disadvantage for those students who have a less active role in their learning.

6.1. Limitations and future lines of research

The proportion of charter schools is higher than the national average, which implies a certain caution when it comes to extrapolating the results to the education system as a whole. It is therefore important to broaden the study and obtain a greater representation of public institutes.

Although the sample obtained is relevant, it is insufficient to perform a longitudinal analysis and detect possible variations over time. The information obtained is relevant to analyze a certain period of time, but an increase in the annual sample would allow us to monitor changes in the use of methodologies, detect trends or discover possible emerging trends.

As we have pointed out before, it is necessary to delve into the variables that are behind the application or not of active methodologies. In future studies it would be necessary to analyse a wide range of variables that could explain, at least partially, the differences found. From this research, objective data could be provided that would help in the decision-making of those responsible for education and that would help to achieve the objectives and recommendations set by educational legislation.

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