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Research Article

Enhancing Motivation Strategies in a Mandatory University Geography Course

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Abstract: This study investigates the effectiveness of innovative teaching strategies designed to enhance student motivation and engagement in a compulsory Physical Geography of the Iberian Peninsula course taught to first-year history students at the University of Seville. The paper outlines the challenges faced in teaching large and diverse groups of students, and the need to develop instructional approaches that accommodate various learning preferences and academic backgrounds. The research evaluates the impact of the implemented strategies on students' perception of the subject matter, with a specific focus on the shift in rankings from the beginning to the end of the academic year. The findings demonstrate a significant improvement in students' appreciation for the subject, as evidenced by a decrease in the percentage of students who ranked the course as their least preferred (from 40.7% to 4.9%) and an increase in the percentage who ranked it as their most preferred (from 0% to 11.1%). The study concludes that the adoption of motivational strategies, including active learning techniques, collaborative tasks, and personalized feedback, can lead to substantial improvements in student engagement and overall learning outcomes in a compulsory university course. The implications for teaching practice and future research are discussed.

Keywords: student motivation, engagement, compulsory university course, Physical Geography, Iberian Peninsula, teaching strategies, active learning, collaborative tasks, personalized feedback, higher education.

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Highlights:

- Motivation challenges in large university courses
- Innovative teaching strategies for Geography
- Improvement in students' perceptions
- Encouraging active student participation and collaboration

1. Introduction

The Bologna Process, initiated in Europe during the early 21st century, brought about substantial changes to higher education. Its primary goal was to create a uniform and comparable European Higher Education Area across member nations. The reform emphasized interdisciplinary approaches and transformed traditional undergraduate programs into more flexible degrees that better cater to the demands of the job market and society. As a result, the teaching of Geography has become increasingly integrated into History degree programs, offering students a broader and more enriching perspective of the social sciences. Studying Geography in this context is essential for History students, as it enables them to understand the interrelationships between historical phenomena and the territories in which they occur, as well as to analyze the impact of geographical factors on the evolution of societies and historical events.

This article focuses on the Physical Geography of the Iberian Peninsula, a subject less frequently taught at the university level in Spain and only offered at some institutions. A solid understanding of Physical Geography is crucial for historians, as the analysis of space and its physical characteristics, such as topography, climate, hydrography, and natural resources, provides a strong foundation for comprehending how these factors influence societal development and the course of history. Moreover, proficiency in Physical Geography allows historians to interpret the role of geographic aspects in cultural, political, and economic interactions over time, which enriches and broadens their analytical approach.

Student motivation in higher education is a critical element for academic success and persistence in studies (Tinto, 2012; Deci & Ryan, 2000; Kuh, 2009). Intrinsic motivation, which involves genuine interest and curiosity in learning, is particularly relevant in this context. However, Physical Geography may not initially appear appealing to History students, as the discipline is often perceived as highly technical and specialized, contrasting with the more traditional humanistic approaches in History. This discrepancy between student expectations and the reality of the subject matter can lead to disinterest and learning difficulties, potentially negatively impacting their performance and satisfaction with the education received.

In this article, three distinct pedagogical strategies will be examined to address challenges and enhance motivation and interest among students with an initial negative predisposition towards a Geography course. The study aims to directly assess changes in their predisposition towards the subject and, indirectly, investigate the impact of these strategies on the learning process.

Student demotivation is identified as one of the primary challenges faced by geography educators, as discussed in studies such as Piróg and Hibszer (2020) and Esteves (2019). Consequently, any strategy aimed at enhancing student motivation is crucial in improving learning outcomes within this discipline. Various strategies have been proposed in the scientific literature to motivate students in higher education. These include the use of active learning techniques (Bonwell & Eison, 1991), collaborative learning (Johnson et al., 1991), incorporating real-world problems and

cases into the curriculum (Savery & Duffy, 1995), designing authentic activities and projects (Herrington & Oliver, 2000), and promoting self-assessment and reflection (Nicol & Macfarlane-Dick, 2006). Furthermore, Self-Determination Theory (Deci & Ryan, 1985) suggests that satisfying students' basic psychological needs for autonomy, competence, and social connection in an educational setting is essential to maintain intrinsic motivation and engagement.

Active learning and collaborative learning approaches, for instance, encourage students to actively participate in the learning process and construct their knowledge through interaction with peers and the educational environment (Bonwell & Eison, 1991; Johnson, Johnson & Smith, 1991). These strategies have proven effective in enhancing motivation, academic performance, and retention in higher education (Prince, 2004; Springer, Stanne & Donovan, 1999). On the other hand, incorporating real-world problems and cases into the curriculum allows students to apply theoretical concepts to practical and relevant situations, increasing their interest and commitment to the subject matter (Savery & Duffy, 1995). Additionally, designing authentic activities and projects provides students with opportunities to develop skills and competencies relevant to their future careers, reinforcing their motivation and perception of the usefulness of learning (Herrington & Oliver, 2000).

Physical Geography, despite students' initial skepticism, offers several opportunities to capture their attention and foster interest throughout the course. Among them, field trips allow students to observe and directly experience geographical concepts in the field, facilitating their understanding and helping them establish connections between theory and reality (Orion & Hofstein, 1994). Moreover, the potential use of visually striking, high-quality territorial images, such as aerial photographs, satellite images, or topographic maps, can contribute to increasing students' interest and curiosity in Geography (Rajovic & Bulatovic, 2017).

Using familiar territorial examples and referencing current geographical events and phenomena can facilitate connecting course content with students' experiences and sociocultural context (Kerski, 2008). Furthermore, incorporating visually potent technologies, such as Google Earth and 3D models, can enrich the teaching and learning of Physical Geography by offering students the possibility to explore and analyze geographic space interactively and dynamically (Klinkenberg, 2007) In this study, all these options and several less common ones are explored with the intention of making the teaching of Physical Geography of the Iberian Peninsula more appealing and increasing student motivation.

The aim of this study is to describe the set of actions implemented to motivate students in the Physical Geography of the Iberian Peninsula course and analyze the results obtained over the past few years during the period 2012-2023. In line with this objective, two interconnected hypotheses are proposed:

Hypothesis A states that students will positively modify their perception of the course when these methods are applied. It is hypothesized that the implementation of daily landscape photography discussions, uploading students' own photos to the Geophotopedia repository, and engaging in open-world video games featuring Iberian landscapes will lead to an improved perception of the subject.

Hypothesis B suggests that the improvement in students' perception of the course is associated with an enhancement in their learning processes. Specifically, it is hypothesized that students who actively participate in these activities will demonstrate improved learning outcomes compared to those who do not engage in them.

To examine these hypotheses, the study will utilize a combination of quantitative and qualitative data, including academic performance measures, student satisfaction surveys, and assessments of the relevance of Physical Geography to students' History studies. The analysis of these data aims to identify effective practices for enhancing student motivation and learning in the Physical Geography of the Iberian Peninsula course, providing valuable insights for future research and educational actions.

2. Course Description and Student Groups

The Physical Geography of the Iberian Peninsula course is taught in the History Degree program at the University of Seville. With the methodology described in this study, the course is taught to two groups of approximately 80 enrolled students each, with a daily attendance rate of around 80%.

Teaching such large groups presents certain difficulties and challenges, especially regarding individualized student monitoring and promoting interaction and active participation in the classroom (Blatchford et al., 2011; Hattie, 2005). Previous research has highlighted the importance of group size on the quality of teaching and learning, suggesting that smaller groups facilitate a better educational environment and allow for more personalized attention to the needs and characteristics of each student (Glass & Smith, 1979; Mosteller, 1995).

The Physical Geography of the Iberian Peninsula course is structured into five main topics: an introductory topic and four others addressing the four major branches of knowledge in Physical Geography, namely, relief, climate, waters, and vegetation. The course adopts a General Geography approach, which emphasizes an explanatory rather than purely descriptive perspective. This approach aims to ensure more effective and comprehensive learning by interpreting the processes occurring in these territories, instead of a rote learning perspective. Considering this context, the goal is to promote understanding of the processes and dynamics underlying geographical phenomena, as well as the interactions between different elements of the physical environment and their relationship with history and human activity. This explanatory approach allows students to acquire a deeper and more critical view of the Physical Geography of the Iberian Peninsula and provides them with conceptual and analytical tools to apply in their History studies and future professional practice.

The structure of the course comprises 3 ECTS credits dedicated to theoretical content, 1.5 ECTS credits for practical sessions, and 1.5 ECTS credits for field trips, leading to a total of 3 classroom hours per week. The theoretical credits involve the explanation of conceptual content, the practical sessions involve the application of real data to develop procedures related to each topic, and the field trips provide firsthand observations of territories and processes covered in the course.

Over the years, the course has adopted an approach in which theoretical content is delivered during the majority of the semester (from January to April), while practical sessions and field trips take place in May. This strategy is employed for several reasons: i) as students initially possess limited background knowledge in the subject matter, the teaching staff believes it is more effective to begin by providing a strong foundation in conceptual knowledge before addressing procedural skills towards the end of the semester, employing holistic approaches; ii) the workload of university students typically increases towards the end of the semester, thus practical sessions offer a more relaxed environment to work collaboratively with peers and instructors; iii) the climate in Seville during May can be extremely hot (with recorded maximum temperatures reaching up to 40°C/104°F), which can lead to discomfort; consequently, it is desirable to cover the core content of the course prior to the onset of such weather conditions.

Another aspect worth noting is the asymmetrical distribution of the course syllabus. Block 2, which focuses on the Iberian relief, accounts for approximately 40% of the theoretical sessions. This is due to the fact that the teaching of geological and geomorphological concepts, which

are often unfamiliar to the students, requires a considerably slower pace in the classroom. This approach ensures that students are given adequate time to grasp these complex concepts, ultimately contributing to a more comprehensive understanding of the subject matter.

Regarding the characteristics of students in the Physical Geography of the Iberian Peninsula course, it is worth noting that, being a subject taught in the early years of the History Degree, most students are around 18 or 19 years old. The frequency of older students decreases as age increases, following a common trend in higher education.

However, this trend is broken by the presence of students of more advanced ages, around 60 years old, who, after retiring, decide to pursue History studies as a leisure activity and complement to their previous academic and life trajectories. In these groups, it is common to find between 2 and 5 students of these advanced ages. This age diversity enriches the educational environment, as these students bring different perspectives and experiences from their younger peers, thus promoting the exchange of ideas and collective construction of knowledge.

This heterogeneity in the student body poses challenges and opportunities in the teaching of Physical Geography, as educators must be able to adapt pedagogical strategies and resources to the characteristics and needs of a diverse group, while ensuring quality and equity in the learning process. Furthermore, the presence of students from different ages and backgrounds can facilitate the creation of support and collaboration networks among students, enhancing motivation and commitment in the study of the subject.

3. Motivation Strategies

Firstly, it is important to mention that having two groups of students with approximately 80 students each necessitates the adoption of a lecture-based methodology, in which the instructor speaks, and the students listen, take notes, and ask questions to clarify any doubts they may have. The large group size in this context contradicts the student-centered approach emphasized by the Bologna Process, hindering personalized teaching and learning. Smaller groups promote critical thinking and problem-solving skills, essential for students' development. The current large group size limits personalized guidance and support, impacting the teaching approach.

To address the issue of relying on a traditional, nineteenth-century teaching methodology in a group of students who may initially be less inclined to engage with a subject they perceive as unrelated to their curriculum needs, three activities have been implemented to enhance their motivation and foster a deeper understanding of the subject matter: 1) daily landscape photography comment, 2) upload of own photo landscapes to a repository and 3) the issue Virtual Iberian Explorers: Landscape Analysis in Open-World Games. All the activities proposed in the article have been implemented by the same teaching team throughout the period 2012-2023.

3.1. Daily landscape photography comment.

Each day, at the beginning of the class, a new photograph taken somewhere within the Iberian Peninsula is shown without disclosing its location (Figure 1), and a collaborative commentary is developed by the entire group of students. This activity often takes up 1/3 of a session. This activity has been shown to statistically enhance the learning processes of students significantly, as evidenced by Fraile-Jurado and Sánchez-Rodríguez (2019). One of the purposes of this article is to examine whether this improvement in the learning processes is associated with a change in students' predisposition towards the subject. The commentary follows a fixed structure proposed by the instructor (Fraile-Jurado et al., 2016) at the beginning of the course, consisting of:

A) Non-geographical description of the photograph. This description serves to establish references that will be mentioned later and to ensure that students do not overlook any elements. It can be organized by planes (foreground, middle ground, and background), grids (from left to right and top to bottom), or hierarchy of elements.

B) Identification of the landscape type based on the dominant use. This includes natural, urban, rural, industrial, and touristic landscapes, as well as coastal, mountainous, or flat landscapes based on their location.

C) Relief. This is often the main element that can be discussed in a landscape photograph with first-year students without prior knowledge. First, they are asked to determine whether erosion or deposition processes currently predominate, ultimately assessing the current dynamics of the landscape. Since this is a dichotomous question (although there is actually at least a third option, which is that the landscape remains stable), a debate often arises among the students regarding the dominance of one process or the other, which is usually resolved by the professor. Often, a single photo may show both erosive and depositional sectors. Next, students are asked to indicate whether the relief is young or old. Despite the qualitative nature of the question, the Iberian relief responds well to this categorization, as there are Hercynian or derivative reliefs (old reliefs) and Alpine reliefs (young), as well as abundant plains. Additionally, they are asked to assess the apparent hardness of the materials and whether they are sedimentary or not, based on the presence or absence of strata. If they are sedimentary, students must indicate whether they are pre-orogenic (when there is a dip) or post-orogenic (horizontal sediments), always considering the most likely but not the only options. Finally, they are asked to reconstruct the evolution of the relief, from the formation of the first materials to the present. This evolution, as well as all the answers to the comments, becomes more precise throughout the course as students learn to identify the basic types of rocks and the chronology of the main geological events in the Iberian Peninsula.

D) Climate. Although it is difficult to comment on the climate from a single photograph, which depicts a specific event, it is important for students to understand several issues. One, climate cannot be described based on the meteorological phenomena observed in a photo. And two, vegetation is often a great indicator of climate, as well as the type of urbanization or crops in some cases. In this regard, students are aware from the beginning of the course of some data: Iberian vegetation rarely features trees where precipitation is below 400 mm, and another limiting factor is that the presence of trees requires at least three real summer months, i.e., three months with temperatures above 10°C, which only applies in high mountain areas. Beyond that, little else can be said from a landscape photograph. However, as the course progresses and students learn about Iberian climates, they are often able to indicate, if they suspect where the photo was taken, data such as average temperature, summer temperature, winter temperature, temperature range, annual precipitation, annual rainfall pattern, and annual insolation.

E) Waters. Waters may not be present in photos, or they may be present as river, lake (uncommon in the Iberian Peninsula), or marine waters. In the case of river waters, students are asked to indicate whether they are in a low-water, high-water, or intermediate state, observing the banks of the channels. They should also assess if the rivers appear to have significant flow, relating this to the climatic area where the photo seems to have been taken and the seasonal rainfall patterns, especially from the perspective of ice/melting cycles. If the waters are coastal, students are asked to indicate the wave energy at the time of the photo, the average wave energy (observing the presence of coastal sediments and their size or the presence of cliffs), and whether there should be a wide or narrow continental shelf, as well as the tidal range (mesotidal in Atlantic Iberia, microtidal in the Mediterranean).

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E) Vegetation: By this point in the commentary, the vegetation has been mentioned at least twice, during the initial description of the photo and in the climate section. Students are asked to describe the vegetation in the photo, distinguishing between the three strata (herbaceous, shrubby, and arboreal) and differentiating between natural vegetation and any non-natural vegetative elements such as crops or ornamental plants. Furthermore, they are prompted to identify the adaptations that the vegetation displays to its environment, both in terms of climate and soil and relief, noting whether leaves are flat and soft, small and leathery, needle-like, or spiny, and discussing the environmental implications of each adaptation. Lastly, students are encouraged to speculate which climatic areas of the Iberian Peninsula the vegetation might belong to, distinguishing at least between humid and dry Iberia.

F) The commentary concludes with a general assessment of the landscape, prioritizing the main explanatory factors observed in the photo and venturing a guess as to the location within the Iberian Peninsula where the photo might have been taken.

Figure 1. Examples of photographs discussed in class. A) Fold in Anso, in the Pyrenees; B) Ordesa Valley; C) Dunes in Doñana National Park; and D) Beliches Beach, in Sagres, Portugal. (Source: Geophotopedia. A) Pirineísta, B) Pablo FJ, C) Pablo FJ, D) Marina Romera).

3.2. Upload of own photo landscapes to a repository.

Uploading photos to Geophotopedia: Geophotopedia is a collaborative online platform dedicated to the sharing and discussion of geographically relevant photographs (Palacios Guerrero et al., 2016). Geophotopedia is a public repository of geographic content photographs in which all photos are georeferenced and classified using a tagging system (Figure 2). As of April 2023, it has more than 18,000 images, which have been uploaded under various Creative Commons licenses by over 500 users with knowledge of Geography. Students are encouraged to contribute photos of landscapes, geographical phenomena, or any other subjects related to the study of geography. The platform enables users to engage in discussions, ask questions, and learn from the visual content and the comments provided by their peers and experts in the field. This activity promotes active participation and fosters a sense of community among the students while enhancing their understanding of the subject.

In particular, students are asked to upload between 25 and 50 photos per course, in exchange for a modest reward of a 5% increase in their final grade for the subject. This active participation in Geophotopedia has been shown in the past to not only result in an increase in applied knowledge but also in conceptual understanding. Furthermore, it has been demonstrated that this activity leads to a more pronounced shift toward more environmentally-conscious ideological positions than at the beginning of the course, although this is a common phenomenon, albeit more moderate, among all students.

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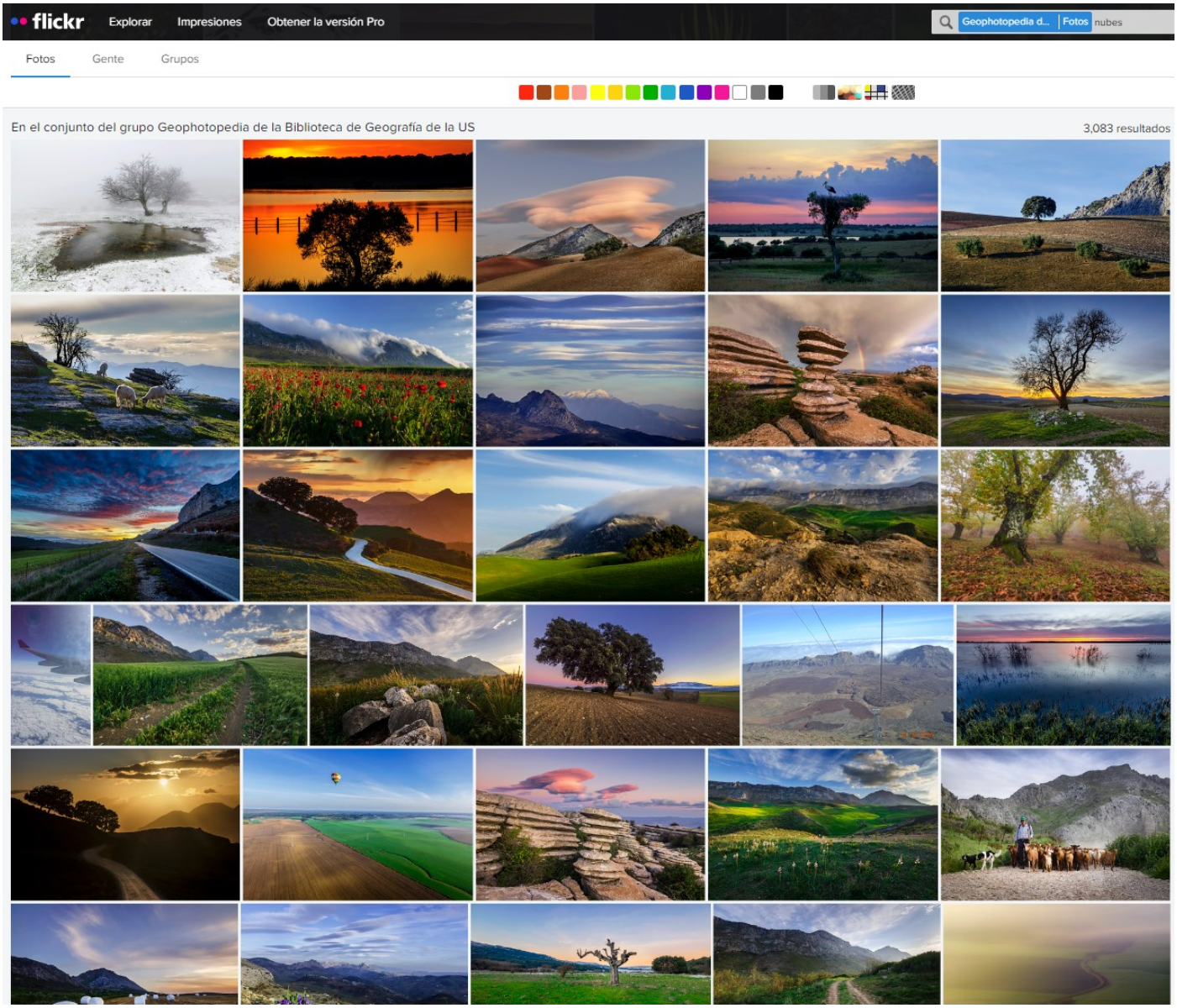

Figure 2. Geophotopedia website after searching for the term "clouds."

3.3. Issue Virtual Iberian Explorers: Landscape Analysis in Open-World Games.

The third additional activity proposed for the students involves identifying landscapes within open-world video games that could potentially be found on the Iberian Peninsula (Figure 3), encouraging them to apply their newfound knowledge in a creative and engaging context. To participate, students must find and document five diverse landscapes within the game that could plausibly exist on the Iberian Peninsula, and provide a detailed commentary on these landscapes following the same structure used for in-class photo analysis (Fraile-Jurado, 2023). Offering a 5% reward on the final grade, this activity incentivizes participation. Interestingly, some students choose to enhance their submissions by inventing a narrative surrounding the identified landscapes, such as a story of a traveler writing to their king, describing the unknown lands, landscapes, and resources encountered, showcasing their geographical knowledge and fostering a deeper appreciation for the interplay between environment and human experiences. Typically, the games that students play are AAA titles such as the Assassin's Creed, Far Cry, Elder Scrolls, and Grand Theft Auto franchises. As these students are of legal age, it is unnecessary to impose stringent restrictions based on the potential violence associated with each game. They are given the freedom to choose the games they want to work with, allowing for a diverse range of options.

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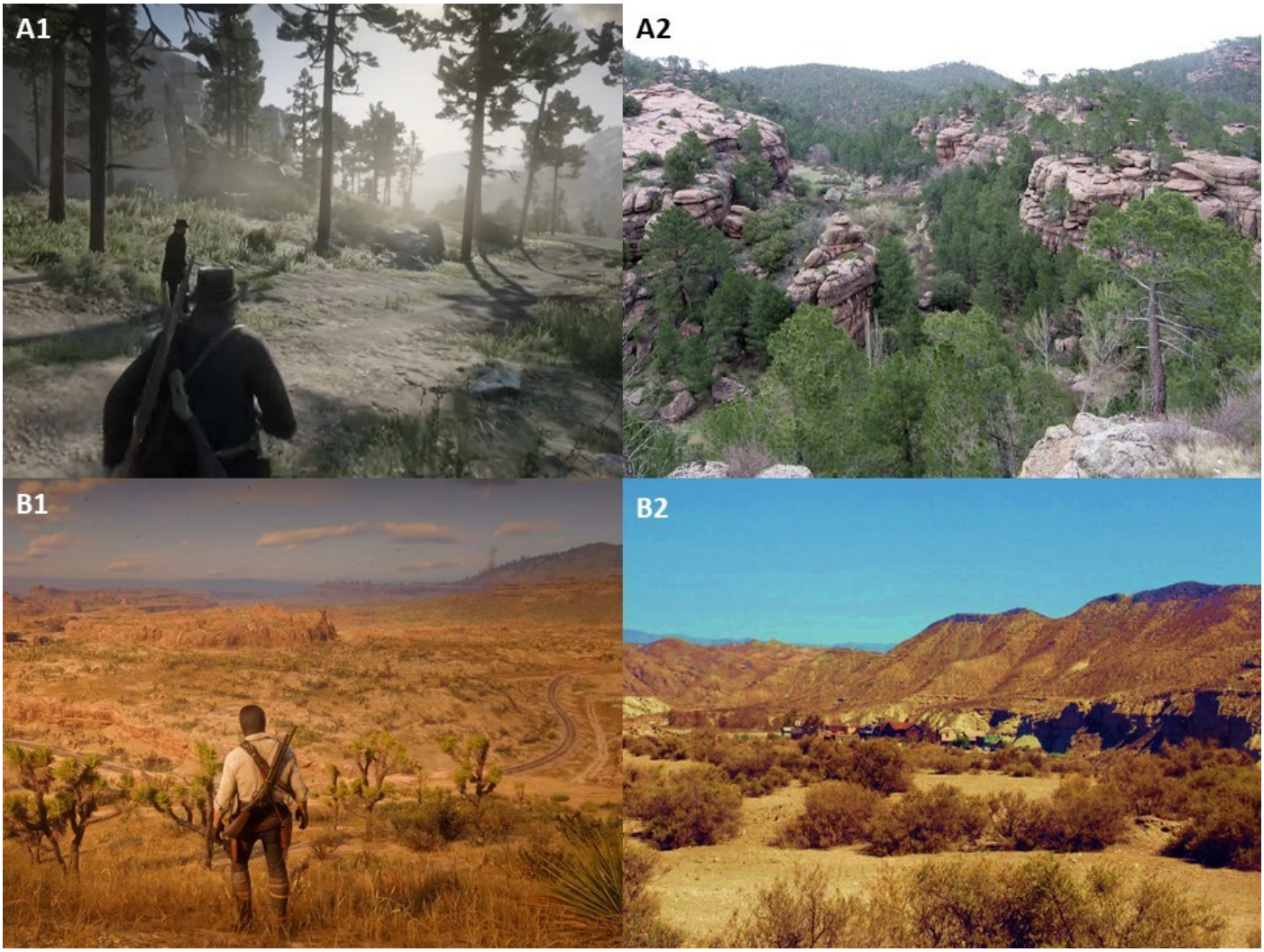

Figure 3. Example of video game landscapes (right side of the photograph) that could be located on the Iberian Peninsula. The images on the left are from the video game Red Dead Redemption 2, commonly used by students, while those on the right were taken in Teruel (Spain) and Tabernas (Spain). (Source: Geophotopedia. A2) Zoraida Jaime González, B2) Jepeto).

4. Methods

In order to evaluate the impact of three motivational activities, namely daily landscape photography discussions in the classroom, uploading students' own photos to the Geophotopedia repository, and engaging in open-world video games featuring Iberian landscapes, on the acquisition of theoretical and practical knowledge in the course, this study employs a combination of quantitative methods and surveys. The quantitative methods aim to assess the students' learning processes, while the surveys focus on exploring students' perceptions of the course and the evolution of their opinions throughout the implementation of the motivational program. Through these approaches, the study aims to identify two key aspects: A) whether students' perception of the course improves when these methods are applied, and B) whether the implementation of these methods leads to an enhanced learning process. Different evaluation methods were employed to assess the impact of the diverse teaching approaches implemented in the course. Two types of assessments were conducted. Quantitative measures were utilized to evaluate students' learning processes, while qualitative measures were employed to capture students' perception of the course itself.

To evaluate the influence of uploading their own photos to the Geophotopedia repository on the acquisition of theoretical and practical knowledge in the course, the study analyzed the average final grades in the theoretical knowledge component for the period of 2012-2022, involving a total of 1243 students, as well as the practical component for the period of 2017-2022, with a total of 628 students. Within the initial group of 1243 students, 781 students did not contribute their own photographs to Geophotopedia (Group A), while 462 students did. Among the 628 students (all included in the previous group of 1243 students), 426 students did not upload their photos to Geophotopedia (Group A'), while 202 students did (Group B') (Figure 5).

Similarly, to assess the effectiveness of the teaching approach regarding students who uploaded their field photographs to Geophotopedia, the average scores of students who engaged in the open-world video game activity were calculated for both theoretical and practical components. However, it should be noted that this activity was introduced relatively recently (in 2018), resulting in a smaller sample size compared to the previous groups (with only 38 students since 2018, Group D, while the rest, Group C, are 512) (Figure 5). Nonetheless, this activity has gained popularity among students in recent years, reflecting their growing interest and engagement.

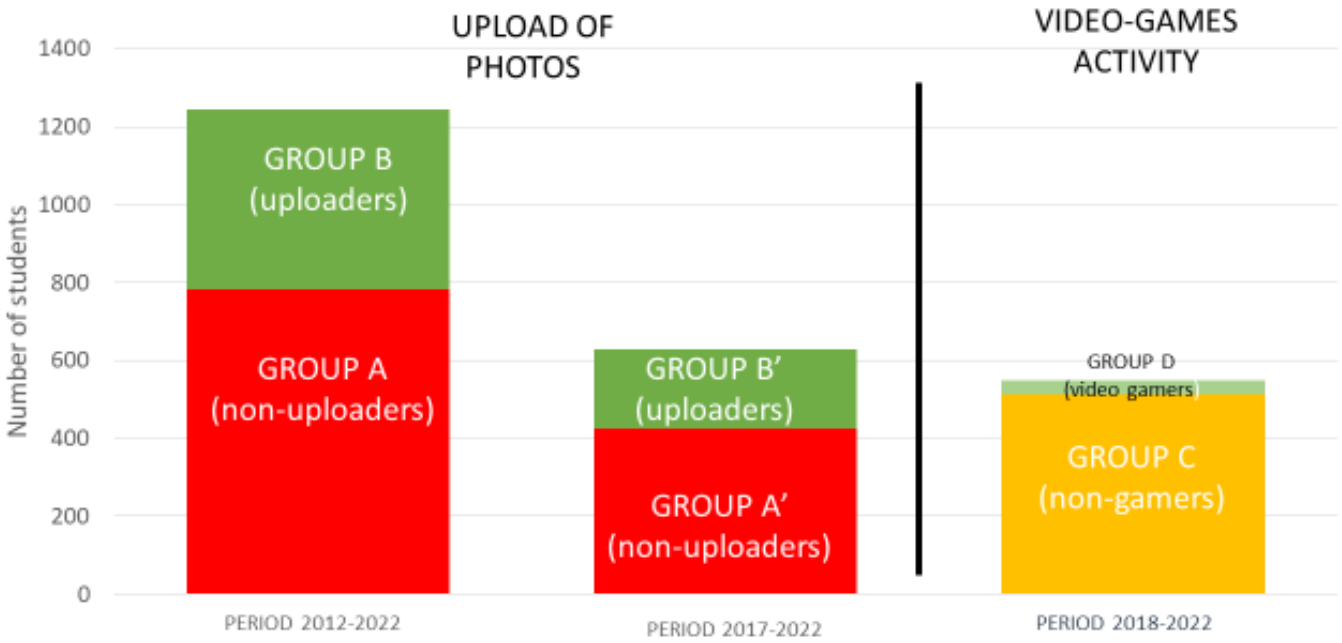

Figure 5. Diagram illustrating the composition of the study groups A, B, A', B', C, and D.

Additionally, the study employed three assessment methods that aimed to capture students' perception of the course and provide indirect information about the motivational teaching strategies discussed in this article, which were developed in 2022 and 2023:

A. The first method involved analyzing student evaluations collected through the University of Seville's course evaluation surveys, which are conducted at the end of each semester. These evaluations served as a proxy for understanding students' perception of the course and provided a basis for comparison with average evaluations at the departmental, faculty, and university levels. It is important to note that only the overall results of these surveys were available to the instructor, with specific details such as standard deviations remaining unpublished.

B. The second method consisted of conducting an in-class survey, where students were asked to rank the course in relation to other compulsory courses they took during the second semester of their first year in History. This survey provided valuable insights into students' preferences and how the teaching strategies influenced their perception of the course.

C. Lastly, a Likert scale evaluation was utilized to measure students' motivation levels toward the course at the beginning and end of the semester. This self-assessment approach allowed for the measurement of any changes in motivation that could be attributed to the motivational teaching approaches implemented throughout the course. The evaluation utilized a Likert scale questionnaire to assess students' motivation levels towards the course. Students were asked to rate their expectations regarding the course on a scale from 1 to 5, with 1 indicating very low expectations and 5 representing extremely high expectations. The concept of expectations was deliberately left open-ended to encompass various aspects such as academic achievement, learning outcomes, and engagement. This approach allowed for a comprehensive understanding of students' perspectives and experiences, making the evaluation method replicable in future studies.

By utilizing these three evaluation methods, the study aimed to comprehensively examine the effectiveness of the implemented teaching strategies on students' learning experience and overall satisfaction with the course, providing valuable second-hand information about the proposed motivational interventions discussed in this article.

5. Results

The first part of the following section presents the results obtained from assessing students' perception of the course, starting with the outcomes of the teacher evaluation conducted by the students.

Over the nine years in which evaluations have been conducted since this teaching methodology was implemented, the course on Physical Geography of the Iberian Peninsula consistently achieves higher scores than the average scores of the Department to which its faculty belongs, the Faculty in which it is taught, and the overall University of Seville in each of the nine years (Figure 6). The observed differences range between +0.9 and +0.4 on a 5-point Likert scale. In at least three academic years, the course rating has exceeded a level of 4.7 out of 5, which is an exceptionally high score. The average score observed over the nine years is 4.55, compared to 3.91 for its Department, 4.01 for its Faculty, and 3.99 for the University of Seville. These results demonstrate the effectiveness of the implemented teaching methodology, which has led to a significant improvement in students' engagement and overall satisfaction with the course.

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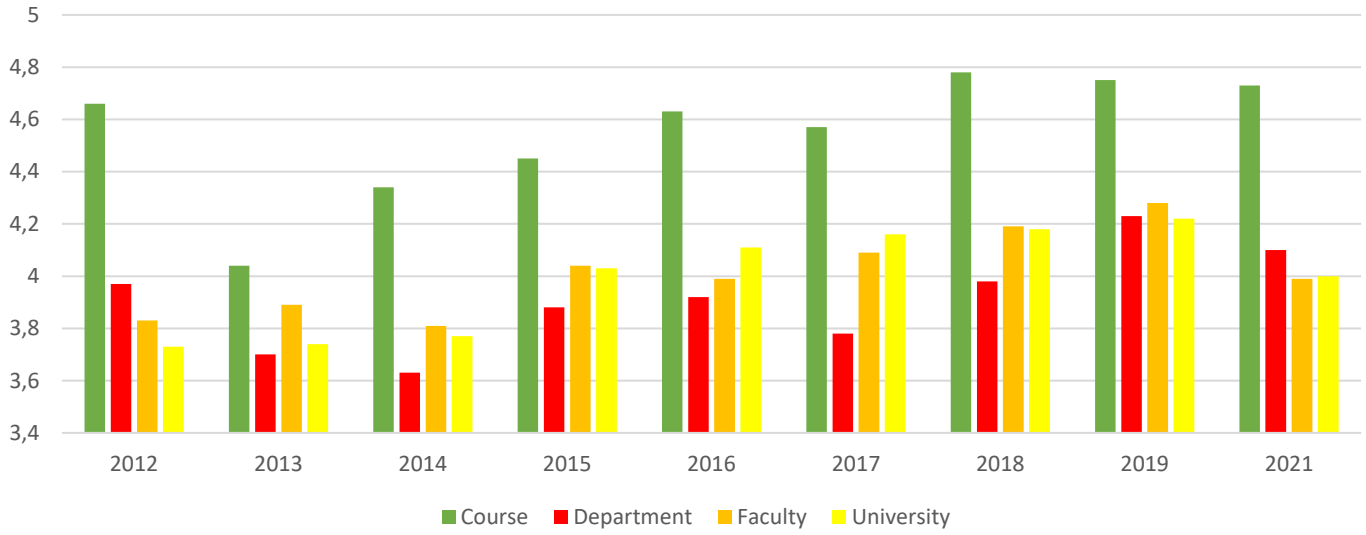

Figure 6. Results obtained in the teaching evaluations for the course under study, at the Department of Physical Geography and AGR, at the Faculty of Geography and History, and at the University of Seville in the period 2011-2019. Note: In 2020, due to the pandemic, surveys were not conducted, while those for the 2022 academic year have not yet been published.

Within the first phase of the results, specifically focusing on demonstrating Hypothesis 1, the findings from the survey regarding students' subject preferences at the beginning and end of the course will be presented. This survey aimed to explore any shifts or changes in students' rankings and attitudes towards the Physical Geography of the Iberian Peninsula course compared to other mandatory subjects.

In terms of the course ranking among the five compulsory subjects, the Physical Geography of the Iberian Peninsula course sees its average ranking shift from 4.01 at the beginning of the term to 2.74 by the end (Figure 7). Examining the frequencies, it is evident that over 40% of the students initially chose this course as their least preferred, with nearly 30% ranking it as their second least preferred, totaling 70% of the students with low predisposition towards the subject. However, by the end of the term, the situation reverses, with only 4.7% of students choosing it as their least preferred course, and fewer than 20% ranking it as their fourth choice among the five compulsory subjects, amounting to less than 25% of students with low predisposition. Additionally, up to 11% of students choose it as their favorite course. To properly assess the quantitative improvement of the course, it is essential to consider that it is a non-vocational subject taught alongside other History subjects. The significant shift in students' preferences demonstrates the effectiveness of the implemented teaching methodology in engaging students and enhancing their interest in the subject, even in a non-vocational context.

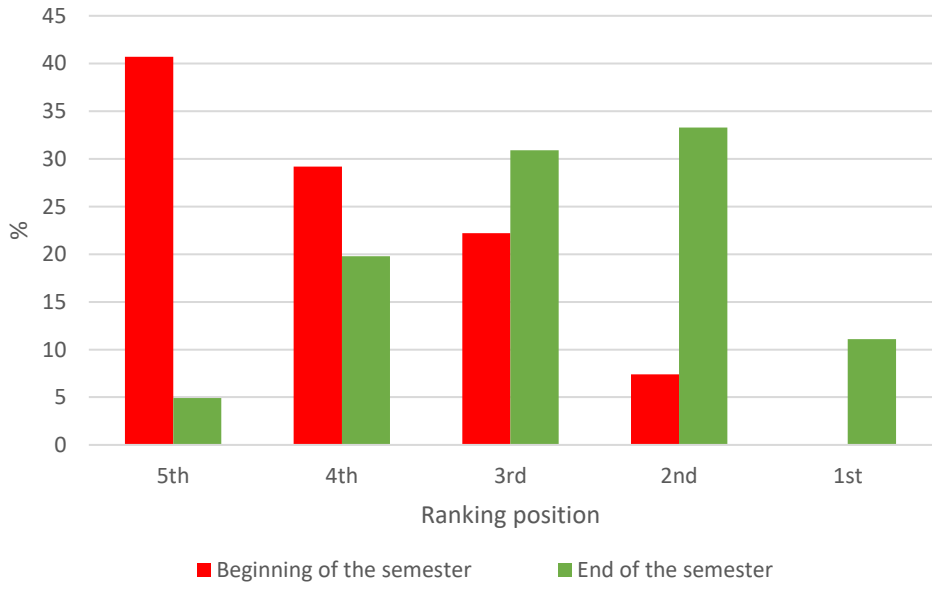

Figure 7. Results obtained from surveys conducted at the beginning and end of the semester regarding the ranking in which each student places the course among the five mandatory first-year History courses they are required to take.

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In terms of the individual motivation assessment completed by each student at the beginning and end of the semester, the results are similar to those previously presented. At the beginning of the semester, students rated their motivation towards the course with an average score of 2.93 on a Likert scale of 1 to 5, while by the end of the term, the rating increased to 3.81. Figure 8 shows a peak in motivation rated with a 2 at the beginning of the semester, which shifts to a value of 4 by the end of the term.

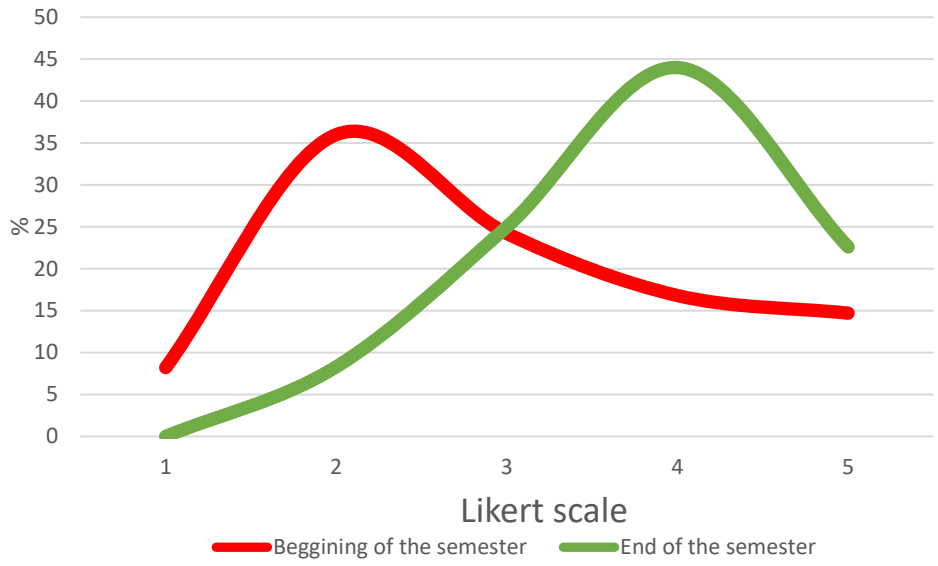

Figure 8. Results obtained in the assessment of personal motivation towards the course at the beginning and end of the semester using a Likert-type scale with values ranging from 1 to 5.

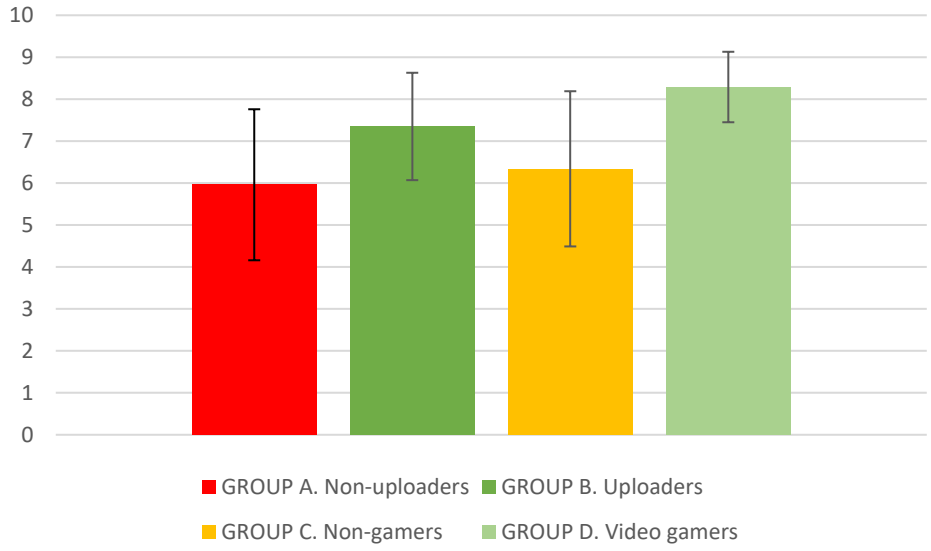

Figure 9. Mean Scores in the Theoretical Component of the Course for Groups A, B, C, and D.

Moving to the second phase of the results, the focus shifts to Hypothesis 2, which suggests that an increase in motivation is associated with improved academic performance. This phase aims to investigate the correlation between heightened student motivation and their grades and overall achievements in the Physical Geography of the Iberian Peninsula course.

The average score in the theoretical component of the course for students in Group A was 5.96 (with a standard deviation of 1.71) out of 10 points, whereas students in Group B achieved an average score of 7.35 out of 10 (with a standard deviation of 1.51). The differences between the two groups were slightly smaller in the practical activities, with Group A receiving an average score of 6.68 and Group B achieving a score of 7.49. In the case of the open-world video game activity, students who did not participate obtained an average score of 6.34 out of 10 in the theoretical exam, while those who actively engaged in the activity achieved a higher average score of 8.12. The differences were much smaller in the practical activities of the course, with Group C obtaining an average score of 7.12 and Group D achieving a score of 7.28 (Figure 9).

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6. Discussion

As stated previously, the course is taught to two groups of approximately 80 enrolled students each. Teaching such large groups presents certain difficulties and challenges, especially regarding individualized student monitoring and promoting interaction and active participation in the classroom (Blatchford, Bassett & Brown, 2011; Hattie, 2005). Previous research has highlighted the importance of group size on the quality of teaching and learning, suggesting that smaller groups facilitate a better educational environment and allow for more personalized attention to the needs and characteristics of each student (Glass & Smith, 1979; Mosteller, 1995). These conditions differ from the principles of the Bologna Process.

The obtained results provide support for hypothesis 1, indicating that the applied methodology has generated a positive perception among students. This is evident not only in improved evaluations of the subject by students but also in the observed evolution of their opinions throughout the courses, which advocates for a more student-centered approach and closer, personalized monitoring of the learning process.

It is evident that the assessment changes significantly from the beginning to the end of the course. The results obtained are consistent with each other, both in the two surveys conducted specifically with the students about the progress of the course and in the high evaluation obtained by the course in the surveys on teaching quality conducted by the University itself. The results shown in Figures 6 and 7 do not seem to contradict each other. Although the course appears to be the least favorite among the students, as indicated by Figure 6, it can be inferred that the students' predisposition is generally good since there is not a majority of students who have scored their initial predisposition towards the course with a 1 at the beginning of the semester. The progress of the course, taking into account this generally non-negative predisposition, leads to an optimal benefit from the course and, consequently, a change in the students' perception.

The results obtained from the analysis of students' grades provide support for hypothesis 2, as it is evident that the groups that engaged in these activities achieved higher grades compared to those who did not participate. This finding establishes a clear relationship between increased motivation and academic performance.

The results obtained from the analysis of grades indicate that the different motivational activities seem to have a direct or indirect influence on students' learning processes. However, these results should be interpreted with caution. While groups B and D are mutually exclusive (students have to choose between landscape work in video games or uploading their own photos to Geophotopedia), groups A and C may include students from groups D (in the case of A) or B (in the case of C).

The findings of this study are consistent with preliminary studies examining the impact of daily work with photographs in the classroom (Fraile-Jurado et al., 2019). This study, employing a control group, demonstrated that intensive use of photography throughout the course enhances learning processes. Fraile-Jurado et al. (2019) conducted a study demonstrating that the use of Geophotopedia in geography education led to significant improvements in students' knowledge retention and application. The authors attributed these results to the platform's ability to provide real-world examples, which facilitated an experiential learning environment that enabled students to better grasp complex concepts. Indeed, it could be argued that an appropriate selection of video games and photographs could not only guide students towards a heightened environmental awareness but also towards other perspectives, as pointed out by García-Álvarez and Arias García (2022). However, caution must be exercised with such approaches, as it is essential to maintain a balanced and objective perspective when introducing these resources into the classroom.

Additionally, it is important to consider the presence of bias in this type of study: students who choose to engage in voluntary activities with a moderate academic reward (only 5% of the final grade) may likely be more concerned about their grades and, ultimately, have a higher overall level than those who do not participate in extra tasks. Therefore, the obtained results should be interpreted with utmost caution, taking into account this potential bias. One key reflection is that educational research often encounters the challenge of assuming biases due to the inherent limitations of the educational process, which often hinders extensive experimentation with different groups once a methodology has shown favorable outcomes (Berliner, 2002).

However, the use of grades as a source of information to measure the impact of different teaching activities has been employed by numerous studies, while also being criticized for the potential lack of population homogeneity it may entail, particularly in higher education where student conditions vary significantly (Carini et al., 2006). It is worth noting that relying solely on grades as an indicator of learning outcomes may overlook other important factors that contribute to students' educational experiences, such as motivation, engagement, and deeper conceptual understanding (Biggs, & Tang, 2011). Therefore, while grades can provide valuable insights, it is essential to consider them within the broader context of the learning environment and to supplement them with additional qualitative and quantitative measures (Sax et al., 2003). Moreover, the variability in student populations within higher education institutions, including diverse backgrounds, prior knowledge, and learning styles, adds complexity to the interpretation of grade-based studies (Black & Wiliam, 1998). Consequently, caution must be exercised when generalizing findings and considering the transferability of results across different educational contexts.

Although it is common for textbooks to include practical activities centered on the analysis of photographs, active engagement through the commentary and manipulation of self-sourced or external landscape photographs has not yet been incorporated into textbooks across various academic levels (Trahorsch et al., 2022; Varjas, 2022; Hintermann et al., 2021). Research such as this article, as well as studies by Yasar & Seremet (2007), Rose (2008), and Sidaway (2002), suggest that the integration of such activities should be more regularly implemented throughout the course, rather than being utilized solely as an occasional resource. By incorporating these activities into regular coursework, students can gain a deeper understanding of geographic concepts and develop critical thinking skills related to landscape analysis.

The heterogeneity in the student body poses challenges and opportunities in the teaching of Physical Geography, as educators must be able to adapt pedagogical strategies and resources to the characteristics and needs of a diverse group, while ensuring quality and equity in the learning process. Furthermore, the presence of students from different ages and backgrounds can facilitate the creation of support and collaboration networks among students, enhancing motivation and commitment in the study of the subject.

Although the number of students who participated in the video game activity (Group D) is moderate compared to Groups A, B, and C, the importance of gamification in the classroom cannot be overstated. While this study does not specifically identify which of the three motivational strategies is responsible for the success of the teaching proposal (or if it is the combination of all three), as well as other immeasurable factors such as the human relationship between students and teachers, it is clear that gamification strategies generally yield positive educational outcomes (Mojca, 2020). This is particularly true for the specific strategy of incorporating video games into the learning process. By engaging students in a familiar and enjoyable context, gamification fosters a more active and enthusiastic approach to learning, ultimately enhancing the overall educational experience and potentially leading to better academic performance. It is true that students are increasingly mobile (Litmeyer et al.,

2023); however, it is still not feasible for them to frequently and easily access distant territories, whether they are remote biomes or diverse regions within their own country, due to economic and time constraints. Video games offer a unique opportunity for students to virtually "travel" to many of these areas, providing an immersive experience that other media, such as photographs, texts, and videos, may not be able to deliver. This virtual exploration allows students to engage more deeply with the subject matter, fostering a greater understanding and appreciation for the diverse landscapes and environments they encounter.

In conclusion, the teaching methods employed in this study, including the use of Geophotopedia and intensive in-class landscape photography analysis, are supported by the findings of Fraile-Jurado et al. (2019). These approaches contribute to the enhanced learning outcomes observed in the course, as well as the positive shifts in students' environmental ideologies.

7. Conclusions

The results obtained suggest that the implementation of innovative teaching methods, including daily landscape photography analysis, Geophotopedia contributions, and open-world video game landscape identification, has the potential to enhance the learning experience for geography students. These methods have shown promising indications of fostering a deeper understanding of geographical concepts and potentially contributing to a shift in students' environmental ideologies towards a more environmentally-conscious mindset.

The positive outcomes of these teaching strategies highlight the benefits of using Geophotopedia and intensive in-class landscape photography analysis in geography education. By engaging students in experiential learning activities, these approaches have been shown to promote knowledge retention, critical thinking, and environmental awareness.

Finally, the high overall evaluation of the course by the students, as well as the improvement in their motivation and ranking of the subject, serves as evidence of the success of these teaching methods. It is recommended that further research be conducted to explore the potential long-term effects of these approaches on students' academic performance and career choices, as well as their impact on fostering a broader culture of environmental stewardship.

Conflicts of Interest: The author declares no conflict of interest.

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