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Sustainability Education for Trainee Teachers: Landscape and Mirror Classes as Educational Tools

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Abstract: Under the sustainability education paradigm, the landscape has a key role as an identity object of study in the interaction between nature and society. This research is motivated by a practical experience with trainee teachers on the systematized analysis of local degraded landscapes in Spain. This study is based on environmental, sustainability, and global citizenship literacies—the guarantors of sustainability education. A mirror class methodology was implemented with the objective of evaluating the effectiveness of sustainability learning and the influence of students' personal factors. A quasi-experimental methodology was followed through a didactic and statistical analysis of student reports and a validated questionnaire. The findings reveal a 2.9/4 global didactic evaluation, one that is higher in didactic tasks and lower in comparative ones, and a statistically significant learning acquisition of +0.8. The results suggest that the study of local landscapes captures interest and mirror classes bring distant realities closer, thus achieving a successful eco-social education and didactic transfer.

Keywords: education for sustainable development; eco-social education; landscape; social science education; natural science education; didactics of geography

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1. Introduction

1.1. The Beginning: Environmental Education

In recent decades, it has become clear that activism is recognized as a collective action for democratic resolution and can be used as a pedagogical approach to prepare students and teachers for activist initiatives related to socio-environmental problems [1].

The sustainability perspective is a recent outcome of environmental education. According to the definition established in the International Congress on Education and Environment Staff Training (Moscow, 1987) [2] the latter can be conceived as the permanent process in which individuals and communities gain awareness of their environment and acquire knowledge, values, skills, experience, and determination, which are needed to act—individually and collectively—to solve present and future environmental problems [3].

We might be able to find its main antecedent at the I UN Conference on the Human Environment (Stockholm, 1972) [4] where the anthropic origin of environmental conflicts was first recognized [5]. Following the First Intergovernmental Conference on Environmental Education (1977 in Tbilisi), the International Environmental Education Programme (IEEP) emerged. This conference established three fundamental aims, the first being to work on increasing the knowledge of the natural system; the second on how to assess the interrelationship between society and the natural system; and the third on how to bring about attitudinal change [6].

Environmental education, from its beginnings, has worked for the generalization of concepts related to the activity of natural systems, and this is in addition to the evaluation of anthropic activity related to the functioning of the system [7]. Emphasis has been placed

on the transnational dimension of environmental problems, as well as on the need for a generalized, coherent, and coordinated educational effort throughout the world [3]. The transnational nature of environmental problems, together with the need for a coordinated, coherent, and generalized educational policy throughout the planet [3], led the UN to incorporate environmental education into its action planning through the International Environmental Education Programme (UNESCO-UNEP) [4].

This research was contextualized in Spain. In particular, the project will work with students from central and southeastern Spain. In the aforementioned country, the publication of the "White Paper on Environmental Education" [8], with its large mosaic of proposals, was a milestone. However, the concept of environmental education is not static [7]. In view of the current state of the planet, categorized as a climate emergency and a global crisis by international organizations [9], it seems that environmental education has not reached the most ambitious goal of promoting an attitudinal change.

This declaration of the UN recognizes the need to achieve sustainability in the ecological, social, and economic fields through new patterns of production and consumption, as well as to adopt new lifestyles and to create a new ethics in citizenship through lifelong education [10]. This is why we must move forward from environmental education toward education for sustainable development, where ethics and eco-social education are the backbone [11].

In order to achieve this ethical commitment, the UN established the Decade for Sustainable Development (2005–2014), in which an Education for Sustainable Development (ESD) was to be framed. The aim was to contribute to a world where everyone could have the opportunity to receive a quality education and learn the values, behavior, and lifestyles required for a sustainable future and a positive transformation of society [12]. This is a step ahead to move from environmental education to what we could call "education for sustainable development" [13]. There is a focus movement from social and environmental knowledge toward a commitment to social and environmental sustainability. The latest action of the UN, through the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda, reinforces this idea of environmental education with an education approach for sustainable development, which is explicitly indicated in Target 7 of Goal 4 for a quality education [14].

1.2. Landscape in Sustainability Education

In this work, the efficiency of a didactic proposal for teacher training in environmental education is evaluated. This proposal follows an education for sustainable development or an eco-social education approach, and it is based on the analysis of landscapes as an interdisciplinary channel for said education.

The conceptualization of a landscape reached a recognized consensus in the European Landscape Convention in Florence [15]. It was defined as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (p. 2). According to Zoido (2007) [16], the Convention recognized the role of landscapes in the cultural, ecological, environmental, and social fields, as well as an economic resource, not only in outstanding beauty areas, but also in everyday spaces.

According to this theoretical framework, landscapes are a perception of the territory in combination with physical and anthropic aspects. Therefore, its study sequentially allows one to move from knowledge of the environment to the evaluation of its reciprocal relationship with society, thus generating a sentimental perception that can lead to a concern of conservation or improvement, which is key in sustainable development. With these considerations in mind, an education in landscape is of great interest within the pedagogical paradigm of sustainability. As Crespo (2021) [17] stated, a holistic perspective of the landscape, understood as a system of natural and cultural relationships, is essential in order to conceive it as an ideal concept for an education with an eco-social focus. This goes in line with an environmental education for sustainable development [18], which Murga-Menoyo (2021) [19] characterizes within eco-social literacy.

Busquets (2011, p. 378) [20] defines landscape education as "the significant transmission of knowledge and the generation of positive attitudes towards the landscape and its values". This education is not intended to create experts, but rather a citizenry capable of thinking about the landscape, and therefore giving it a fair value [19]. The International Geographical Union, in the Lucerne Declaration (2007), proposed the definition of geography as a landscape science, since the territory, which is its object of study, is made up of landscapes. In this way, the principles of the didactics of geography take responsibility for an environmental education with a sustainability approach through the teaching/learning of landscapes. In doing so, there is a promotion of the knowledge of its physical and anthropic elements, as well as their relationships, including an ethical commitment to valuing sustainable development as a balanced relationship between nature and society [21]. By extension, landscapes allow for the structuring of all of the following didactic contents in the social sciences area through an integrated approach [20]: the physical environment, human environment, interaction, and social responsibility. The didactics of natural sciences also has a fundamental role in landscape education, especially through geological study [22]. Crespo (2017) [23] assigned to the study of landscapes a crucial role in unifying the natural and social sciences, and this is taken as a reference for this research.

1.3. Landscape Teaching through the Mirror Class

The didactic use of landscape analysis in environmental education for sustainable development or eco-social education connects with constructivism as a paradigm for teaching and learning. Students create knowledge upon the foundation of previous learning with the guidance of the teacher and through active methodologies so that they can develop a competency-based learning and focus on close study objects that increase the significance of learning and motivation [24]. Consequently, selecting a landscape from the students' environment will contribute to meaningful learning. Its interpretation, guided by methodological guidelines that were previously explained by the teacher, will allow for the construction of new knowledge, starting from existing knowledge, and through personal experience. This knowledge will be interdisciplinary and will have a conceptual, procedural, and attitudinal dimension as the basis for learning competencies [25].

Under this framework, teacher training, based on the acquisition of skills [26], requires the development of didactic innovations through good educational practices [27]. Therefore, this paper examines an innovative teaching practice, in which a mirror class approach, of proven implementation in the Ibero-American sphere [28], is used for classroom instruction. This methodology consists of a videoconference exchange between teachers from different educational institutions of similar background for the teaching of a specific topic [29]. It allows for those involved to experience an exchange without modifying the dynamics of the course and without additional costs [30].

This study analyzes the development and implementation of a didactic proposal based on a mirror class methodology. Students in two Spanish universities took part in videoconference exchanges during lessons in landscape education with an eco-social approach. Our hypothesis was that the didactic analysis of local and foreign landscapes, when facilitated by local experts through mirror classes, improves knowledge of the sustainability field (although possible particularities may arise depending on the personal and territorial circumstances of the students).

1.4. Research Objectives

In relation to the hypothesis, the aim of this research is to evaluate the effectiveness of a didactic proposal on landscape analysis in fostering eco-social learning. In order to do so, a mirror class methodology was utilized for classroom instruction at universities of Madrid and Murcia in Spain. Both the global results and different factors derived from the origin of the students that may influence the learning process were considered. From this, two specific objectives (SO) were defined:

SO1. To determine statistically and didactically the scientific learning acquired in the landscape mirror class, both on a general level and taking into account the affiliation of each group of students.

SO2. To quantify the students' assessment of the didactic and logistical effectiveness of the landscape mirror class, both on a general level and according to specific factors for each group of students (region, university, gender, age, and type of population).

2. Materials and Methods

2.1. Didactic Proposal and Sample

The implementation of this didactic proposal was carried out in the context of university teacher training degrees in Spain, the University of Murcia (UMU), and the Complutense University of Madrid (UCM). The participant sample comprised students enrolled in subjects belonging to study programs in the Social Sciences and in Natural Sciences (Table 1). This was possible since the study of landscapes as a key role in environmental education [23] was followed.

Table 1. Participants in the mirror class.

University	Subject	N. Participants
Complutense University of Madrid (UCM)	Fundaments and Didactics of Geography	29
University of Murcia (UMU)	Teaching and Learning of Natural Environment I	36
Total	Teaching training degrees	65

This research is built on the idea that the study of the local imbalanced landscape—it being understood as a holistic focus of sustainability knowledge and complementing it also with the local perspectives on another foreign landscape—can maintain students' engagement, widen their perspectives, and increase the possibilities of sustainability literacy. Moreover, the best way of conducting it is adopting a mirror class methodology for classroom instruction. In this way, our research (Figure 1) constitutes a demonstration that the didactic analysis of landscapes, facilitated by experts through a mirror class approach, in actuality promotes sustainability knowledge based on a triple literacy (environmental, sustainability, and global citizenship) acquirement.

The didactic proposal consists of 4 consecutive stages for the comparative study of the landscape, with theoretical and practical lectures, as well as mirror classes. This learning dynamic had a total duration of 5 h, with a free distribution of time among the sessions. The first stage consisted of the completion of CEAVAP in the classroom by the students to ensure that there was no interference or external consultation of the information required. The second stage consisted of a theoretical session in which the different theoretical contents necessary for the students to be able to develop the necessary aspects of the didactic activity were addressed. Also, in this stage, the landscapes to be analyzed by the students were presented. The third stage focused on the elaboration, by the students, of the analysis of the proposed landscape (Portman, Spain), as well as the didactic proposal for a primary school class. And, finally, the fourth stage was the sharing of the work produced by the students with the rest of their classmates. It should be noted that the mirror class, in this work, consisted of replicating the same sessions with two classes of students (one per participating university), but without the participating students interacting with each other.

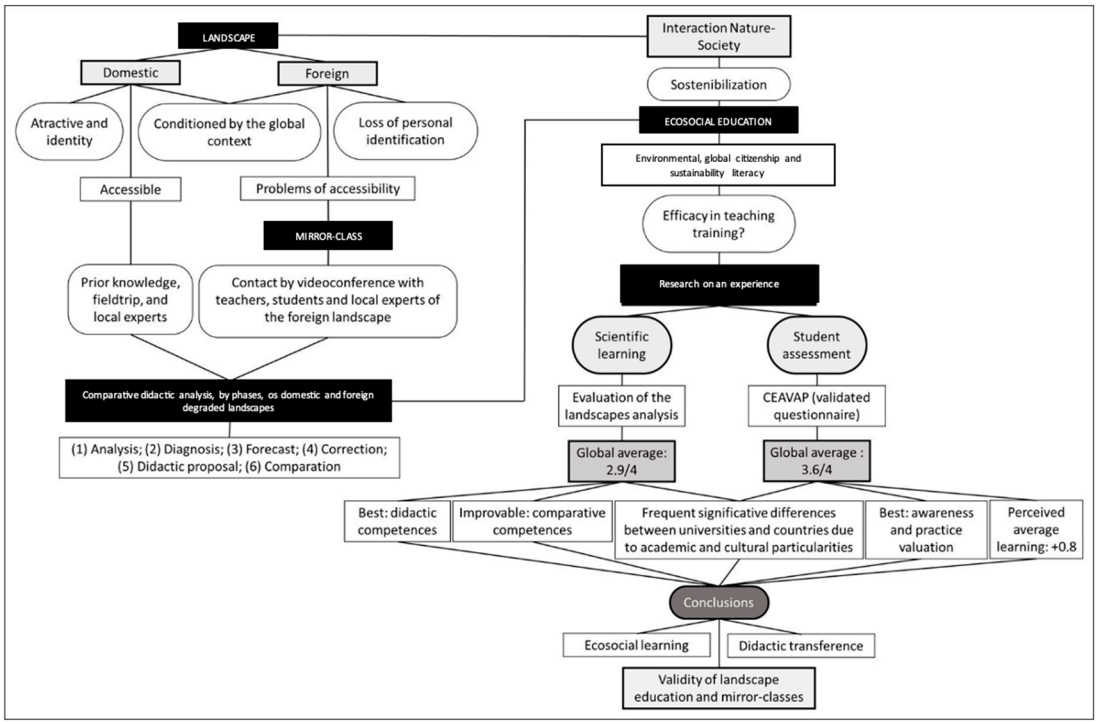

Figure 1. Conceptual diagram of the research approach and development.

2.2. Data Collection Tools and Research Variables

For SO1, the elaboration of a scientific didactic report was used as a practical activity carried out by the students in groups. A total of 24 reports (14 from UCM and 10 from UMU) were analyzed following a pre-designed ad hoc evaluation rubric. A Likert scale of 4 ascending values was used to assess the level of achievement in each landscape study phase based on eco-social education.

From this report, 7 quantitative variables were created (with a 1:4 rank and the levels of achievement in each phase of the landscape study and in the overall sequence). A qualitative analysis of these reports was also carried out, thereby registering the curricular, academic, scientific, and cultural particularities for each university, which could contribute to a better contextualization of the quantitative results.

For SO_2, an analysis was carried out with the data obtained from an assessment questionnaire, and this was completed individually by the students at the end of this dynamic (total n = 65; 29 from UCM, and 36 from UMU). For this purpose, the Questionnaire on Environmental Education Assessed through Landscape Analysis (or CEAVAP, for its acronym is Spanish) was made available to participants (it is hosted on Google Forms: https://forms.gle/uxdNXjL4efrSv33J7, accessed on 31 August 2023). This questionnaire is scientifically validated in Martínez-Hernández and Robles-Moral (2021) [28] through an inter-judge reliability assessment (adequacy = 93.3%; relevance = 97.5%; Cronbach's alpha = 0.8), as well as through the testing of a pilot test (100% presence of 100% of the relevance indicators and a Cronbach's alpha of 0.9). The questionnaire consists of 5 blocks of items, and these allowed for the configuration of different research variables (Table 2).

Table 2. Use of CEAVAP information for research.

Block	Items Information	Variables
1. Anonymized personal information	Categorization of the students	Region University Gender Age Type of settlement
2. Didactic value	Perception of the level of learning of key concepts of eco-social education	Concept of landscape Characteristics of sustainable development Applicability of environmental or eco-social education Landscape analysis methodology Didactic treatment of the landscape Comparison between landscapes Importance of valuing and caring for the landscape Interest in own landscapes Interest in foreign landscapes The SDGs of the UN 2030 Agenda
3. Logistic assessment	Perception of the adequacy of logistical aspects	Theoretical explanation Practical proposal Duration Difficulty adequacy
4. Learning	Perception of the level of the global learning	Prior knowledge Post-implementation knowledge
5. Open comments	Open impression responses	Improvements Success

The variables in Block 1 were qualitative and allowed for the sample to be categorized (Figure 2) based on factors that were believed to have the potential to influence eco-social education: region (different environmental legislation, educational trajectory, and cultural context), university (particularities of the teaching staff), gender (influence of social roles), age (different time and the intensity of exposure to the paradigm of sustainable development), and type of population (different life experiences in the territory).

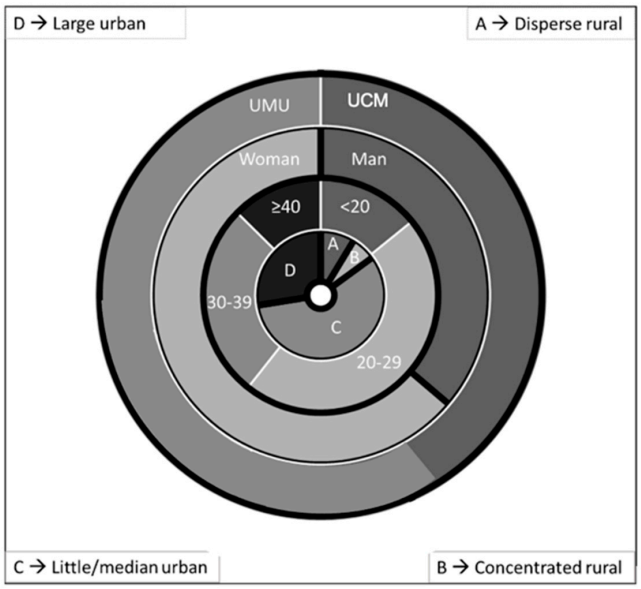

Figure 2. Characterization of the sample based, from the outer to the inner rings, on the classification variables: region, university, gender, age, and settlement.

The variables in Blocks 2, 3, and 4 are quantitative (with a 1:4 range and based on an increasing level of assessment). A variable was added to each block for the global result (the average in the first two cases, and the difference, in terms of learning gain, in the third one). The variables in Block 5 came from a later qualitative reclassification of the free text responses provided.

2.3. Statistical Analysis

To ensure normality in the analysis process, the total number of research variables, both those derived from student reports (n = 24) and the ones obtained from the CEAVAP questionnaire (n = 65), were subjected to the Kolmogorov–Smirnov test (with the significance correction of Lilliefors). The results showed the rejection of the null hypothesis of normality with a *p*-value of 0.0 for all variables, except for the level of global achievement in the student reports. Descriptive and inferential statistics were performed using Microsoft Excel 365 and SPSS v.27. Parametric tests were used for the level of global achievement and non-parametric tests for the rest of the variables using the categorization data of the sample as classification variables.

In the case of non-parametric tests, for the variables of 2 independent groups (region and gender), the Mann–Whitney U test was carried out. In contrast, for the variables of 2 or more independent groups (university and types of population), the Kruskal–Wallis test was performed together with the one-way ANOVA post hoc test. For the global result variables of didactic value and logistical assessment, according to the independent ordinal variable of age, a correlation study was carried out by means of Spearman's Rho statistic. Finally, a longitudinal study was conducted to find out about the learning construct by applying the Wilcoxon signed ranks test between the variables of post-implementation knowledge and prior knowledge.

With regard to the parametric testing of the student reports data, Student's *t*-test was used to compare the variables of two independent groups (region), and the one-way ANOVA test was conducted for a variable of two independent groups (university). As a post hoc test, Tukey's test was added after assessing the homogeneity of variance.

The level of significance sought in all these tests corresponded to a *p*-value of 0.05. The results collected were deposited with the authors, while, in the text of this work, only the most significant ones for the achievement of the research objectives are highlighted.

3. Results

3.1. Scientific Learning Derived from the Mirror Class

The scientific-didactic landscape analysis report carried out in groups by the students showed a global average learning level of 2.9 in a 1:4 range (Figure 3). The median was 3. Therefore, it can be highlighted that a remarkable learning about the concept of landscape as the axis of eco-social education had taken place, especially in students at UCM, who displayed a significantly higher level of proficiency.

The most successful phase of the landscape analysis process was the design of didactic activities (3.5 on average, without significant differences between universities), while the comparison of landscapes had not worked as well (2.3 on average, with a wide dispersion of results and with significant differences between UMU students and UCM students). In the rest of the phases, the average score ranged between 2.7 and 3.1, with students at UCM achieving significantly higher results than the rest.

Taking the above into account, qualitative particularities were observed in landscape analysis depending on the university of the student, which are recorded in Table 3.

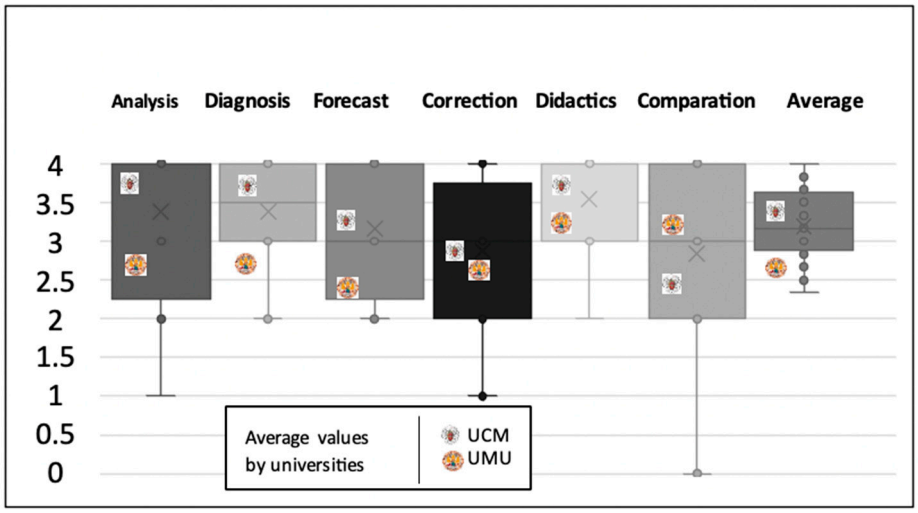

Figure 3. Evaluation of the scientific-didactic reports of landscape analysis (range 1:4).

Table 3. Record of the qualitative particularities in the evaluation of landscape reports.

Observations	UCM	UMU
Curricular	Good curricular foundations, although sometimes there is confusion between Social and Natural Sciences	
Academic	Little original text, although well selected and ordered	Good research style: references to justify the prognosis
Scientific/Didactic	Exclusive coverage of the SDGs without measures	
		Predisposition for didactic designs with older students: 2nd section of Primary Education (4th, 5th, and 6th year)
		Rigorous descriptions of landscape elements

3.2. Student Evaluation of the Didactic Proposal

Students rated the didactic effectiveness of the activity as outstanding, with a global average of 3.6 points out of 4, and with little dispersion (Figure 4). In terms of content, the average values ranged between 3.46 for the 2030 Agenda, and 3.9 for sustainability awareness. UCM students, however, selected intermediate values, presenting significant differences with UMU in only three of the contents (landscape, landscape analysis, and didactic methodology in the first case, and landscape, environmental education, and comparison of landscapes in the second).

Logistical aspects were also highly valued, with a global average of 3.4 and little dispersion (Figure 5). Practical tasks within the activity were rated the highest (3.6 on average), followed by theoretical ones (3.5). The adequacy of the timing (3.3) and the level of difficulty (3.1) were rated the lowest, although they also showed high values. For this last item, there was a statistical consensus among the students from each university. Between UCM and UMU, there were only significant differences in the theory evaluation—one point lower for UMU students.

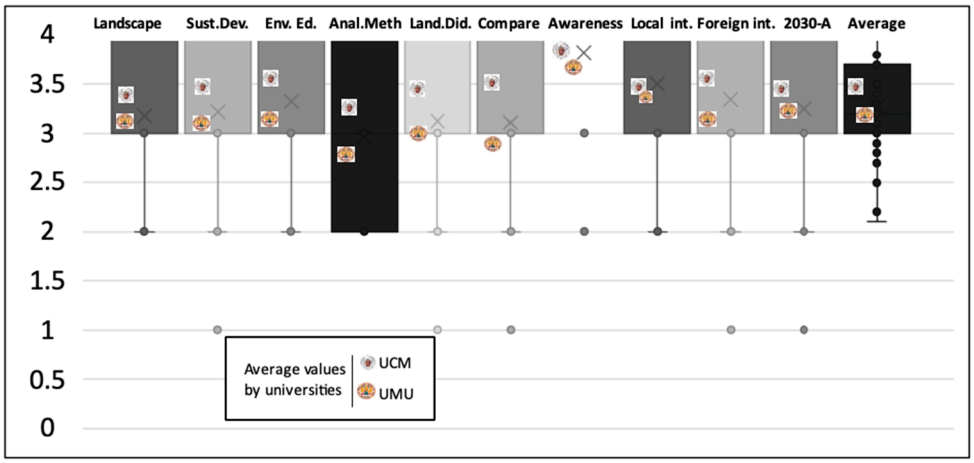

Figure 4. Student perception (range 1:4) of the didactic value of the activity (see Table 2).

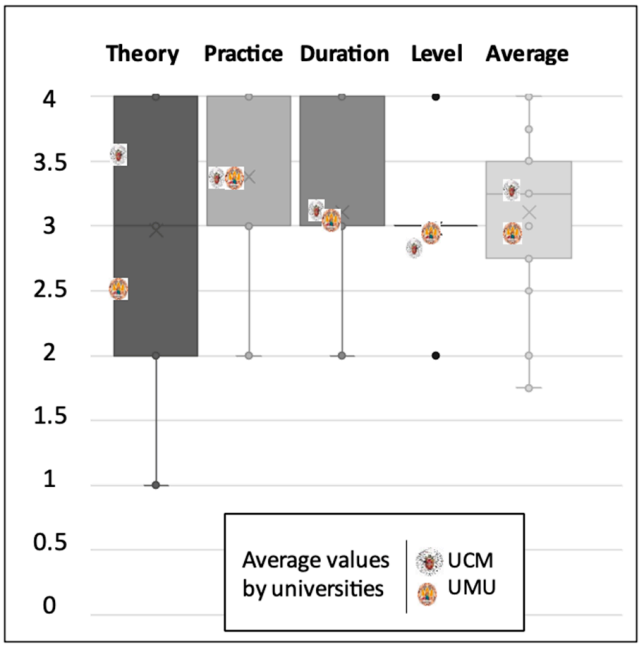

Figure 5. Student perception (range 1:4) of the level of logistical adequacy.

The results about the didactic and logistical effectiveness of the activity did not show statistically significant differences when classified according to other factors, such as the gender of the students and the type of population. However, a significant positive correlation appeared between the global values of didactic perception and logistic aspects, as well as with the age groups of the students, for 36% and 30% of the cases, respectively.

The students' responses to the closed-item evaluation were complemented by their open opinions. These results suggest that there was a certain consensus when claiming that some improvements needed to be made, but also when highlighting success in several areas (Figure 6).

As a last result, the students assessed the global level of knowledge on landscape education that they had before and after the implementation of the activity (Figure 7). What can be seen from these data was that the initial level reported by the students stood at a discreet value (an average of 2.8 points out of 4), but this was enhanced post-implementation with an average knowledge gain of 0.8 points, thus reaching a striking value of 3.6. This increase was statistically significant, but there were not any significant differences between the groups of students or any other factors considered in the study.

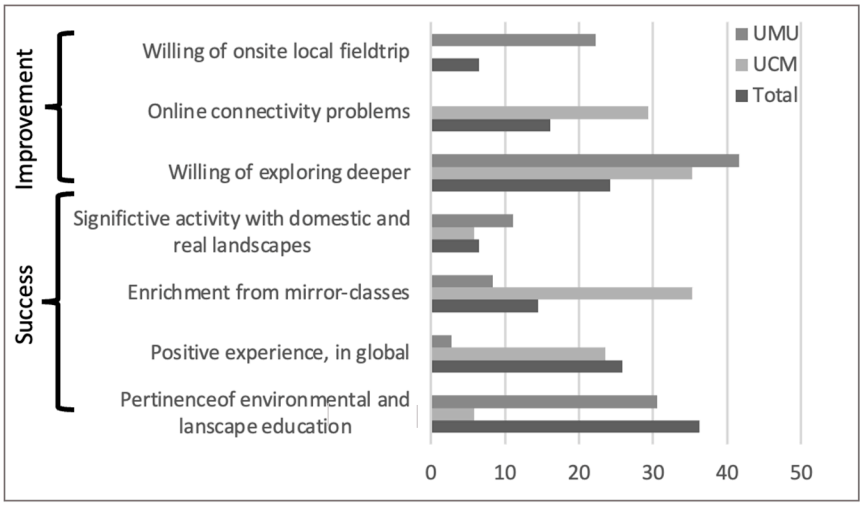

Figure 6. Frequency of correct answers and improvements according to the students' open opinions.

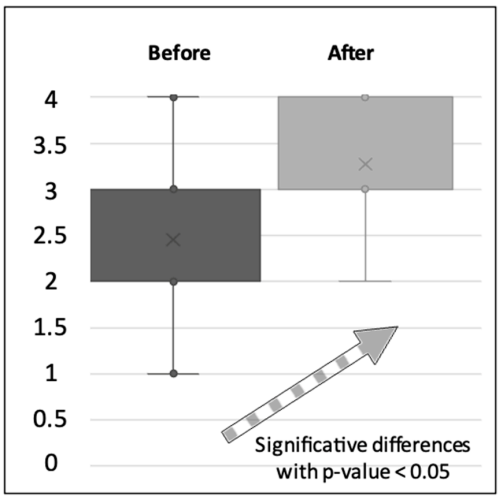

Figure 7. Student perception of the level of knowledge before and after the activity (range 1:4).

In the case of the variables of region, gender, university age, and types of population, the level of significance sought did not yield a significant relevance. Thus, it was not necessary to point out that there were significant differences between these different variables. Therefore, the variable that made a significant difference was sustainability literacy before and after the didactic intervention described in this paper.

4. Discussion and Conclusions

Overall, these results verify that participants in the didactic proposal for the study of landscapes had managed to develop a remarkable sustainability knowledge, and that they responded appropriately to the different designed phases of analysis (as shown in Figure 3). As Murga-Menoyo (2021) [19] states, moral and competence content must be incorporated into scientific knowledge, thereby leading to the involvement of the students as active citizens in achieving sustainable development. This becomes possible if the knowledge and appreciation of the natural system and social adaptation is fostered, thus achieving eco-social literacy in ESD, as stated by the UN (2015) [12] and other academic works [31].

According to Liceras (2017) [32], the concept of the landscape allows for the channeling of this idea of student ethical involvement due to its weight in the configuration of citizen territorial identity. They sentimentally and civically appropriate their environment, especially in places with deep local roots [33], and assume the importance of valuing and caring for it. There is no decline in scientific rigor when learning about the natural and

human environment thanks to the holistic nature of this process and to the convergence between anthropic and physical elements.

In order to understand a landscape, it is essential to apply a landscape analysis methodology [23] in order to develop systematized guidelines that make its study attainable. In this work, the creation of a didactic activity phase obtained the best results. The participants are students in the educational field, and they are capable of integrating new scientific knowledge with pedagogical practice. Educational transfer is key in eco-social education because it ensures that citizens can access their right to enjoy the landscape value [34]. In this way, it is important to make educational curricula sustainable [35] and to guide teacher training toward ESD [18]. In rural communities, schools can also become another actor for sustainable development at a local level, thereby taking part in solutions for environmental problems. Positive experiences in this regard can be found in the Latin American sphere [36].

However, the phase of landscape comparison has been more difficult to tackle. This demonstrates the educational need to transcend localisms when studying a territory in order to learn how to contextualize it globally [20] and to understand the eco-social challenges of humanity with a better perspective. In this sense, the SDGs of the UN 2030 Agenda are of utmost importance as they set global sustainability goals of unequal importance depending on the geographical area. Furthermore, they also establish themselves as a reference framework when assessing the sustainability of the environment [37].

Taken together, our results suggest that not resorting to a mirror class approach would make the comparative analysis of the landscape even more challenging, thus compromising, in turn, the success of sustainability education. Prior studies that have noted the importance of a mirror class methodology, such as Yangali et al. (2022) [28] or Franco y Giraldo (2021) [30], have also shown that it allows for the development of investigative and collaborative skills. This methodology is essential for critical learning and fosters an academic cultural exchange, which facilitates the internationalization of learning. In addition, having local teachers participate contributes to increasing interest in distant territories as they are presented from a personal and close perspective.

In fact, interest in their own landscapes is one of the best valued indicators by students, while interest in foreign landscapes is not far behind (Figure 5). This achievement must be attributed to the mechanics of mirror classes, for the reasons stated above. Moving on now to the highest rated indicator by all of the students: the awareness of sustainable development. Analyzing landscapes bridges the gap between the challenges of global sustainability by focusing on the study of certain geographical spaces, which, by definition, combine the natural and anthropic elements that interact with sustainability implications [38]. Thus, students are aware, in an active, direct, and involved way, of the importance of caring for the environment, as well as in adapting to the circumstances of each place on the planet in the contexts of greater or lesser development. Therefore, educating in both European and Latin American landscapes enables the integration of global ethical tasks into scientific knowledge, thus leading to an eco-social learning from a landscape education, as demanded by Crespo (2021) [17].

In detail, our results show that, on the one hand, UCM students have acquired a better sustainability education. A possible explanation for this might be that the project for the didactic proposal was conceived at this university and demanded greater involvement. Regardless, with the greatest differences appearing between students at the two universities, the circumstance that seemed to most influence the development of sustainability literacy was the region of origin (Table 3).

The differences between universities also arose in student assessment. UMU students tended to be significantly more critical, which is likely related to the fact that they feel responsible for the landscape as part of their national and even regional identity. They might feel the expectation of being offered scientifically detailed information, while this expectation may become weakened when compared to other landscapes.

In the closed-item evaluation, the students' responses were complemented by their open opinions. These open comments supported the aforementioned ideas (Figure 6). All of the students demanded a greater depth of explanation with regard to the landscape, and even a small number of participants at the University of Murcia asked for local visits. As Benejam (2003) [39] explained, the closer and more personal a territory is perceived to be, the more interest is expressed in its knowledge and defense. Failed connectivity in virtual learning environments is also pointed out in other studies on mirror classes [29]. In addition, these previous studies highlighted a sense of gratitude for the learning opportunities created by this pedagogical strategy, which was also reflected in our results. It is not surprising, therefore, that a large part of the participants in this study highlighted the fact that mirror classes are a great tool for sustainability education, since this approach has been proven to promote landscape education. This, in turn, demonstrates that students are aware of their learning.

The post-implementation knowledge that students declare having is significantly greater than their prior knowledge in the matter (Figure 6), and thus the evaluation of their landscape analysis reports shows a good development of sustainability literacy (SO1). There seemed to be a coherence in the overall positive assessment (SO2) in which the theoretical and practical treatment of the activity stood out (Figure 4), and this was again unattainable without the mirror class as an instructional tool. In fact, the assessment of the practical part was the most highly valued in terms of logistics. With regard to the teaching of environmental content—whether belonging to the field of Natural Sciences, Social Sciences, or interdisciplinary efforts—an excess load on theory has been detected compared to practical activities [25]. This has been highly criticized in the constructivist paradigm of learning based on active methodologies [24].

No significant differences regarding gender and population are evident in this study, contrary to what was initially believed in the research approach stage. This is a rather surprising outcome as there are studies that place a gender perspective on the role of the individual in geographic spaces. For instance, from the pioneering, although now classic, works of Massey (1994) [40], to many others that show how rural communities have a more developed natural culture [41].

The only other factor that, apart from region and university, has influenced the results of this study has been the participants' age. It is possible to hypothesize that the youngest would be the most proactive participants, as other studies have shown [42]. However, it is usually the case that the older the group is, the more engaged they are. These findings may be somewhat related to the recent evaluations of the badly conceived environmental awareness that is sometimes imposed on newer generations [43]. It is based on a quasi-legal and laborious imperative that is devoid of critical argumentation, thus showing indolence. It constitutes an important wake-up call for sustainability education, which should move toward being a critical ethical need [10] rather than a theoretical duty memorized in the educational system.

Sustainability education ensures knowledge of the natural environment and its interaction with society. Derived from this knowledge, a personal bond, which directs the autonomous will to care for the environment and contribute to sustainable socioeconomic development, is achieved, from both an ethical and professional point of view [44]. One way to accomplish this outcome is providing landscape education from a sustainability approach, but empirical experiences in the matter and the literature on this topic have remained sparse [45,46]. In the case that we could find any reference or study, they failed to transcend purely scientific learning to reach the need for action. The literature on this issue also suggests that nearby landscapes are more attractive; therefore, it is useful to resort to them didactically, but there is a risk of losing a global perspective in which any landscape is integrated.

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