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Didactic strategies to foster active participation in virtual environments through learning landscapes

Estrategias didácticas para fomentar la participación activa en entornos virtuales mediante paisajes de aprendizaje

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Abstract

This article explores the impact of learning landscapes as a teaching strategy to promote active student participation in the Pedagogical Praxis module of a graduate program. The study highlights how learning landscapes can address educational diversity by integrating multimedia resources, interactive activities, and a reflective approach that promotes collaboration and active participation. The exploratory, qualitative research was conducted

in four stages: design of the learning landscape, implementation in a virtual environment, data collection through pre- and post-implementation surveys, and analysis of interactions on digital platforms. Nine students from the module participated, and the data were analyzed qualitatively to understand the students' perceptions and experiences. The results showed that learning landscapes significantly improved active participation, increased motivation and interest in the content, and facilitated self-regulation. Additionally, the importance of integrating innovative strategies to personalize learning and foster collaborative interaction in digital environments was emphasized. This study concludes that learning landscapes are an effective tool for transforming educational dynamics in graduate virtual environments.

Keywords: Strategies; Participation; Virtual learning; Higher education.

Resumen

El presente artículo explora el impacto de los paisajes de aprendizaje como estrategia didáctica para fomentar la participación activa del estudiantado en el módulo de Praxis Pedagógica de un programa de posgrado. El estudio destaca cómo los paisajes de aprendizaje pueden atender la diversidad educativa al integrar recursos multimedia, actividades interactivas y un enfoque reflexivo que promueva la colaboración y la participación activa. La investigación, de carácter exploratorio y con un enfoque cualitativo, se desarrolló en cuatro etapas: diseño del paisaje de aprendizaje, implementación en un entorno virtual, recopilación de datos a través de cuestionarios pre y post implementación, así como el análisis de las interacciones en plataformas digitales. Participaron nueve estudiantes del módulo, y los datos fueron analizados de manera cualitativa para comprender las percepciones y experiencias del estudiantado. Los resultados mostraron que los paisajes de aprendizaje mejoraron significativamente la participación activa, incrementaron la motivación y el interés por los contenidos, y facilitaron la autorregulación. Además, se destacó la importancia de integrar estrategias innovadoras que personalicen el aprendizaje y fomenten la interacción colaborativa en entornos digitales. Este estudio concluye que los paisajes de aprendizaje representan una herramienta eficaz para transformar las dinámicas educativas en entornos virtuales de posgrado.

Palabras clave: Estrategias; Participación; Aprendizaje virtual; Enseñanza superior.

INTRODUCTION

In the contemporary educational context, virtual environments have gained significant relevance, particularly in postgraduate programs. Higher Education Institutions (HEIs) worldwide play a fundamental role in bridging the development gap. One way to achieve this is by increasing the transfer of knowledge across borders. By collaborating to find joint solutions, universities can foster the circulation of professionals and contribute to global progress. In this way, virtual modalities at the postgraduate level emerge as an innovative response. This new vision and educational model expands the scope of higher education, facilitating a learning process adapted to the demands of a constantly changing society (Román, 2019).

Additionally, with the evolution of digital technologies, universities have adopted online platforms to offer more flexible and accessible education. For instance, distance learning combines in-person and virtual sessions in varying percentages, depending on the institution, allowing students to manage their time, space, and availability, as well as the pace of learning, without the need for a constant internet connection or technological devices. It is generally based on physical materials and delayed communication. In contrast, online education takes place entirely in digital environments, where teachers and students interact through technological platforms in synchronous sessions, requiring an internet connection and a time zone for real-time participation. On the other hand, virtual education is characterized by its asynchronous operation, meaning that teachers and students do not need to coincide at specific times. This model, based exclusively on technological resources such as computers, tablets, and multimedia platforms, shares similarities with distance education but relies entirely on digital tools for accessing materials and engaging in academic activities (Ibáñez, 2020).

Given this landscape of educational modalities, Virtual Learning Environments (VLEs) emerge as an integrative solution that combines elements of distance, online, and virtual education, optimizing teaching through interactive digital platforms. VLEs not only facilitate content management and communication between teachers and students but also offer spaces designed to foster autonomous learning, collaboration, and active participation. Their flexibility allows for the combination of multiple tools to offer both synchronous and asynchronous learning experiences tailored to student needs (Ortega-Sánchez, 2024), providing access to educational resources in various formats and promoting innovative teaching strategies. In this context, their relevance lies in their ability to personalize learning and improve the training experience in digital environments, making them a key tool for higher education and other academic offerings.

However, VLEs present significant challenges in terms of ensuring and maintaining active student engagement. The transition from face-to-face to virtual education does not always ensure the same level of engagement and participation, which can negatively affect the learning process. Flores-Fernández and Durán-Riquelme (2022) emphasize active participation and student agency in an online environment as essential elements for achieving positive learning outcomes. However, the authors note that various virtual classroom experiences at the higher education level have often shown that there is little interaction

between students and teachers, among students themselves, and even between the content and resources available.

In this scenario, it is crucial to explore and evaluate new teaching strategies that can foster more active and meaningful participation among participants within online modalities. Rivera-Tejada et al. (2023) highlight the importance of university teaching that employs effective strategies in virtual environments, particularly techniques that efficiently streamline the teaching and learning process. This process involves teachers, students, course content, the learning context, and effective teaching strategies.

Likewise, the implementation of didactic strategies based on Active Learning (AL) emphasizes the importance of active student participation and their individual and group contributions, promoting rapport with classmates, which is often lacking in virtual environments, through technological tools that facilitate this connection. To this end, encouraging the activity of each participant is crucial in virtual environments, as it involves accepting responsibilities, self-regulation in their own learning, and mutual collaboration, serving as incentives to maintain motivation in activities specific to the dynamic (Boada & Mayorca, 2019).

For Mendoza-Zambrano et al. (2023), the principal objective of AL is to provide the conditions, tasks, and stimuli necessary for developing skills in information search, analysis, synthesis, problem-solving, discussion, and expression. To achieve this objective, it is crucial that students reflect on what they learn and apply it effectively. The primary purpose of this methodology is to enable participants to connect with the learning objectives, topics, and study materials, and to participate in the classroom and collaborate with one another actively. Consequently, the strategies applied to expand their knowledge and understanding must be clearly defined. Although these may vary in form and content, they all encourage students to reflect on the task and its purpose, thus promoting higher-level critical thinking.

Regarding teaching strategies applied to virtual environments, it is important to keep in mind that, as in face-to-face education, teaching and learning experiences must be carefully planned and designed. In virtual environments, these spaces must be organized by incorporating teaching materials that present knowledge in various formats, such as texts, images, videos, and forums, becoming spaces for communication and interaction between students and teachers. In this way, participants not only receive content but also perform various tasks and activities. Teachers, for their part, must motivate, guide, and evaluate both the social participation and intellectual production of each student (Rivera-Tejada et al., 2023).

It is therefore the responsibility of teachers to facilitate and co-create educational scenarios to ensure not only meaningful but also active learning. Given the constant flow of knowledge, teachers must act as facilitators and mediators of learning to ensure both the depth and durability of learning. In the context of AL, the teacher's primary role is to create a safe learning environment that stimulates interest and encourages participation (Chaunay-Guanca et al., 2023).

The use of digital technologies expands opportunities through personalized learning, participation, accessibility, and collaboration. Thus, students can generate self-di-

rected and flexible proposals, situated in context and based on projects or experiences of their own interest. According to Macías-Arias et al. (2020), these technologies also allow students to access not only static content but also active and interactive learning experiences, achieving true interaction between participants in the various learning sessions.

One of the emerging strategies in the field of education, supported by the use of digital technologies, is the use of learning landscapes. According to Mosquera-Gende (2019), learning landscapes are visual representations of a subject or a part of it, depending on the desired scope. They are websites that are predominantly graphic in nature and include links to other pages, resources, or mini-landscapes. These landscapes enable the creation of personalized scenarios in symbolic worlds, fostering each student's autonomy, motivation, and imagination, while addressing diversity and individual learning pace.

Additionally, learning landscapes play a fundamental role in supporting the learning process, as they allow for the design of a more personalized and interactive educational experience (Saborío-Taylor, 2025). These environments provide a structured yet flexible platform where students can access a wide range of resources and activities tailored to their individual needs, thereby promoting not only meaningful and autonomous learning but also offering spaces for collaborative interaction and knowledge construction through a dynamic and contextualized approach.

Thus, in a learning landscape, teachers design experiences that outline the objectives to be achieved, the assessment tools, and the outcomes of each activity (Hernando-Calvo, 2015). This approach allows the teaching process to be structured flexibly and adapted to the needs of students, promoting active participation in their own learning.

A learning landscape can be viewed as a world or a route composed of different spaces or paths that students must navigate, either in a specific order or freely. In this journey, content and activities are strategically integrated, allowing learning to occur in a progressive and interconnected way. Each space within the landscape represents an opportunity to interact with different types of resources, develop skills, and apply knowledge in diverse contexts. In this way, the learning landscape design not only organizes access to information but also motivates students to take an active role, promoting autonomy, critical reflection, and decision-making in their training process.

In a learning landscape, content is designed to encompass as many learning styles as possible, allowing students to utilize their diverse abilities and acquire knowledge. Furthermore, activities are planned according to the individual's different cognitive states: remembering, understanding, applying, analyzing, evaluating, and creating. It is worth noting that while other traditional methodologies focus on the first three levels, the design of learning landscapes prioritizes higher-order skills: creating, analyzing, and evaluating, with a special emphasis on creativity. In this way, meaningful learning is achieved, as it involves not only the user accumulating knowledge but also actively and collaboratively applying it (Zomeño, 2019).

The Profuturo Observatory Team (2022) proposes a series of advantages highlighted from the implementation of learning landscapes and the various didactic strategies that they allow to develop:

- They facilitate individualized attention to students by responding to their needs and providing them with an intuitive, functional audiovisual environment that captures their attention, making content more attractive, achieving greater concept retention, and enhancing their digital competence.
- They increase learning motivation by providing an environment that combines playful elements with appropriate instructional design and activities that are both challenging and motivating for students.
- They allow students to take independent ownership of their learning by providing opportunities to learn by doing, with guidance from teachers who accompany them on their journey of exploration and discovery. The flexibility of learning landscapes allows each student to utilize the content and solve challenges based on their learning style. Thus, they go from being a passive subject into an active agent in their learning process.
- They develop the digital competence of teachers and students through critical thinking and safe and ethical behavior in the digital environment.

In this way, learning landscapes are viewed as dynamic and multifaceted educational environments that integrate diverse learning resources and activities, designed to promote exploration, collaboration, and critical reflection. It is essential to emphasize that their role is not only to transmit knowledge but also to actively engage students in their own learning process, facilitating the construction of knowledge in a meaningful and contextualized manner.

As a result, due to the effectiveness of the teaching strategies that can be exploited from the implementation of learning landscapes in virtual environments, it is necessary to develop an in-depth exploration, particularly in the context of higher education. Because of this, the primary objective of this research is to investigate the impact of learning landscapes as a teaching strategy on student participation in virtual environments, particularly in the Pedagogical Praxis Module of the Master's Degree in Education with an Emphasis on English Language Learning. To achieve this objective, three specific objectives are proposed: to identify the contradictions and challenges that exist in students' active participation in virtual environments, to design a learning landscape that promotes a participatory and reflective approach, and to evaluate the impact of this landscape on student participation. Through a dialectical-critical approach, this study aims not only to provide an in-depth understanding of the dynamics of participation in virtual environments but also to contribute to the transformation of educational practices in these contexts.

METHODOLOGY

The research was conducted using an exploratory approach and a qualitative methodology. With an exploratory scope, the research process is applied to phenomena that have not been previously studied, and their characteristics are examined (Ramos-Galarza, 2020). Given that the concept of learning landscapes is relatively novel in the selected context, the exploratory approach enabled flexible and open research, allowing for adaptation

to emerging discoveries throughout the research process. The implementation of qualitative methods led to data triangulation, which strengthened the validity and reliability of the results, offering a different yet complementary perspective on the phenomenon under study.

This methodology provided a comprehensive view of the impact of learning landscapes on active student participation in virtual environments, specifically in the Pedagogical Praxis module of the Master's in Education with an Emphasis on English Language Learning. It also led to a comprehensive understanding of the impact of learning landscapes, providing a solid foundation for future research and improvements in the instructional and graphic design of virtual environments.

Participants

Nine students enrolled in the Pedagogical Praxis module of the Master's in Education with an Emphasis on English Language Learning participated in this research. The participants represented a diverse range of ages, which allowed for a variety of perspectives and experiences on the impact of learning landscapes in virtual environments. This age diversity was a significant factor, as it allowed an analysis of how different age groups interacted with the proposed teaching tools and strategies. Each participant contributed their unique perspective, thus enriching the research results and conclusions.

Instruments

Different techniques and instruments were used to measure changes in students' perceptions and levels of active participation, as well as to evaluate the impact of the learning landscape on this participation. Table 1 lists the techniques and instruments used, along with their descriptions, as well as the specific research objective to which each one aligns.

Tabla 1

Research techniques and instruments

Instrument or Technique	Description	Specific Objective
Pre-implementation questionnaire	Evaluate the perception and level of active student participation in previous virtual courses or modules	Identify existing challenges in the active participation of students in virtual learning environments.
Post-implementation questionnaire	Measure changes in perception and level of active participation after the implementation of the learning landscape.	Evaluate the impact of the learning landscape on active student participation in a virtual environment.
Case study: Content analysis of interactions on virtual platforms	Evaluate the type and quality of interactions, frequency of participation, and collaboration among participants.	Evaluate the impact of the learning landscape on active student participation in a virtual environment.

.Thus, two questionnaires were designed and administered, one before and one after the implementation of the learning landscape. The initial instrument focused on assessing students' perceptions and level of active participation in previous virtual courses or mo-

dules. It combined closed-ended questions with Likert-type and dichotomous (yes/no) scales to measure active participation, motivation, and perceptions of learning landscapes in virtual environments. Given the sample size (nine students), the results have a qualitative approach, allowing for a deep understanding of their experiences and perceptions rather than establishing statistical generalizations. The questionnaire was completed by the nine participants in the module, providing an initial overview of the context and the active participation of students in previous virtual courses. This instrument established a baseline of student participation, identifying their attitudes and previous experiences in virtual environments.

The final questionnaire, administered at the end of the module, focused on measuring changes in perception and level of active participation following the implementation of the learning landscape. The instrument was designed with a structured approach to assess students' active participation in the virtual environment and their experience with learning landscapes in the Pedagogical Praxis module. Closed-ended questions were used.

Likert-type scales were used to measure the frequency of interaction in forums and collaborative activities, the level of motivation, and the perceived usefulness of the learning landscape resources. An open-ended question was also included to gather additional comments on the student experience, allowing for a more in-depth analysis of their perceptions. Although 7 of the nine participants completed the form, the sample remains representative and provides valuable information on the impact of the learning landscape. Unlike the initial questionnaire, which was administered during a synchronous session and obtained a complete response, the subsequent questionnaire was administered asynchronously, which may have influenced the lower response rate by not guaranteeing immediate student participation. The results obtained from both questionnaires were compared to evaluate the impact of the learning landscape on active student participation.

An instrumental case study was also conducted, focusing on the analysis of student interactions on the virtual platform Padlet throughout the 12 weeks of the Pedagogical Praxis module. This type of study is not limited to describing a particular case, but rather seeks to generate broader knowledge through the analysis of specific situations. In this sense, the case of Padlet serves as a valuable resource for delving deeper into the understanding of active participation in virtual environments, thereby contributing to the refinement of teaching strategies and the optimization of the learning landscape. As Jiménez-Chaves (2022) points out, instrumental case studies enable the in-depth examination of a phenomenon, allowing for the derivation of broader statements about the object of study. The case serves as a means to understand patterns and trends that can be replicated in other educational contexts.

This exploration in the instrumental case study focused on assessing the type and quality of interactions, frequency of participation, and collaboration among participants. Through content analysis, the contributions made in each Micro landscape were evaluated. This analysis allowed for an objective observation of the behavior and dynamics of each participant's active participation, providing qualitative data on the impact of the learning landscape on their virtual interactions.

It should be noted that the entire research was conducted in accordance with strict ethical considerations: both questionnaires were completely anonymous, and participation was voluntary, thereby guaranteeing the freedom of choice for those involved. Furthermore, it was ensured that the data obtained would be used exclusively for research purposes, respecting the confidentiality and integrity of the participants.

Procedure

The research procedure was structured in four clearly defined stages, with the aim of ensuring an organized and systematic process. The first stage involved planning and designing the learning landscape, during which specific teaching materials and activities for the Pedagogical Praxis module were developed. The second stage involved implementing the learning landscape in the course's virtual environment, ensuring its accessibility and functionality for all students. In the third stage, pre- and post-implementation questionnaires were administered, and an instrumental case study was conducted. The fourth and final stage focused on data analysis, evaluating both questionnaire responses and interactions to determine the impact of the learning landscape on active student participation. Establishing these stages allowed for a methodical approach, facilitating the collection and analysis of data in an orderly and efficient manner.

Stage 1: Planning and designing the learning landscape

The instructional planning and design process for the learning landscape for the Pedagogical Praxis module was carefully organized to ensure a rich and coherent educational experience. The contents were structured into micro-landscapes, each addressing key themes of the module: a) dialogical reflection on teaching, b) pedagogical mediation in the diversity of educational contexts, and c) systematization of teaching practice. These themes were distributed throughout the 12 weeks of the course, with each week represented by a specific micro-landscape. Figure 1 illustrates the distribution of the learning landscape, encompassing the 12 weeks and other weeks associated with each of the module's themes.

The learning landscape consisted of 12 weekly routes, each following the principles of instructional design to ensure that users became familiar with and identified with the landscape's dynamics from the outset. Each Micro landscape incorporated various multimedia elements, such as audio, text, and video, as well as spaces for communication and self-reflection, such as forums and collaborative whiteboards, providing tools and opportunities to encourage active student participation. Figure 2 illustrates various sections of different Micro landscapes, supported by multimedia elements, which in turn lead to collaborative whiteboards.

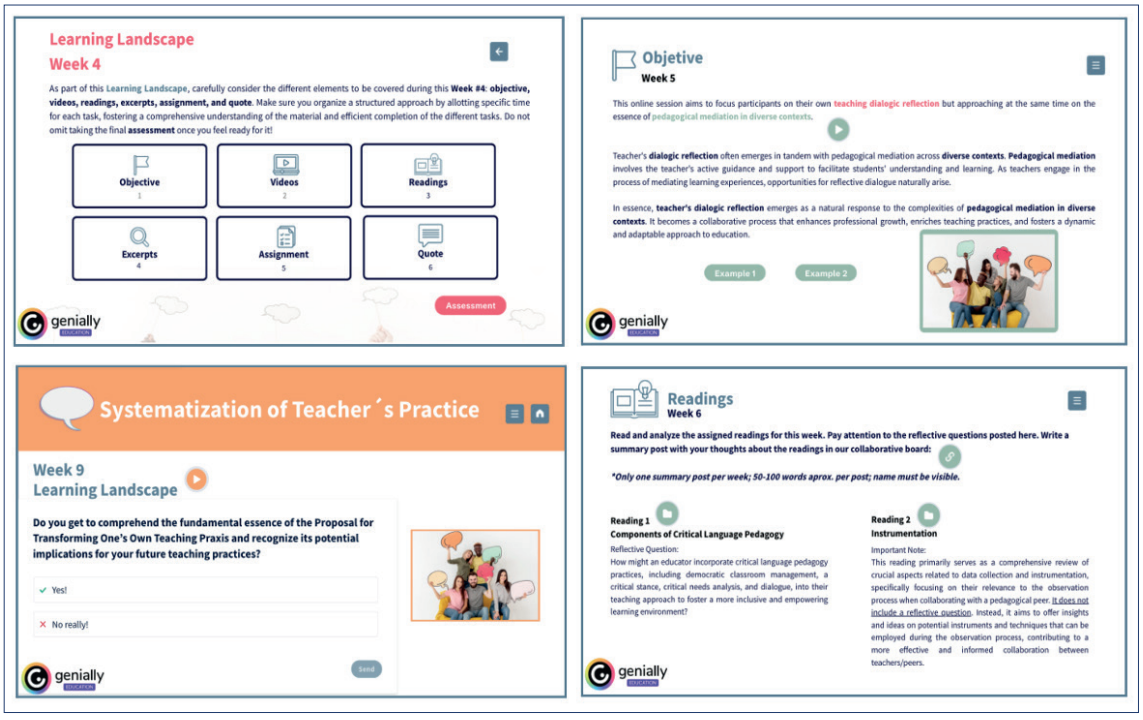
FigurE 1

Distribution of the learning landscape and other weeks according to the module topics.

Source: Authors

Figure 2

Micro landscape sections.

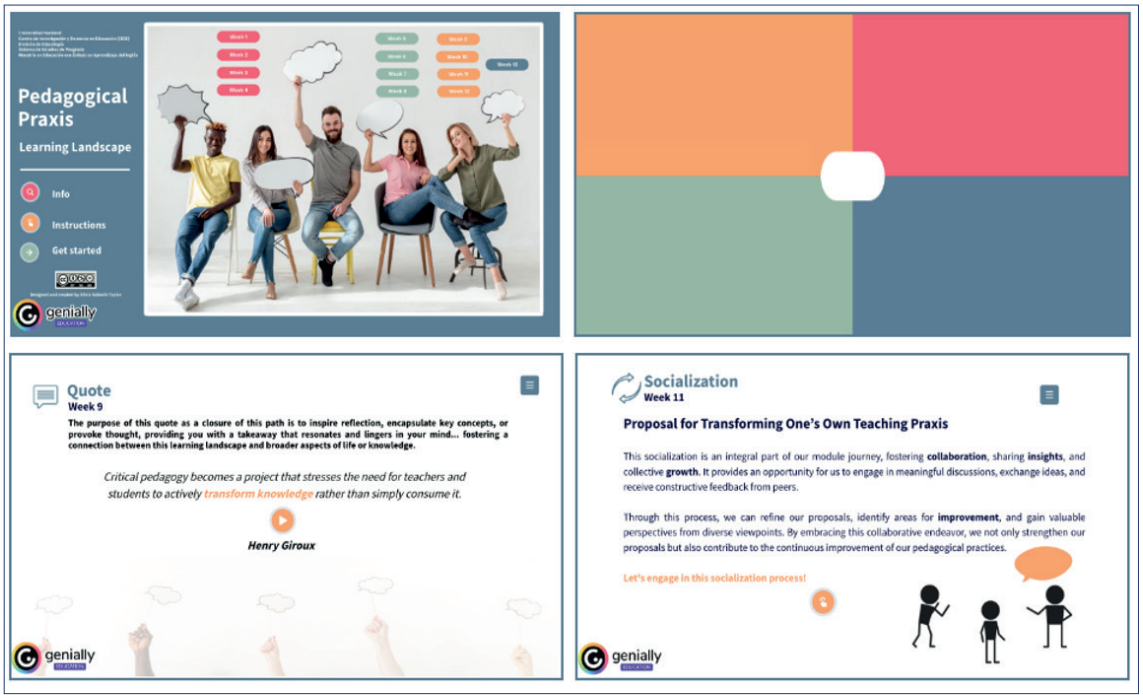


Source: Authors

Furthermore, the graphic design of the learning landscape was carefully adapted to the essence of the module, using a palette of four base colors that remained constant throughout all the Micro landscapes. Each color represented a specific content, achieving a comprehensive graphic unity. The pedagogical metaphor chosen to represent the reflective dialogic processes on educational praxis consisted of speech bubbles, distributed throughout the learning landscape. These bubbles symbolized the reflective and interactive processes, creating a coherent and meaningful visual representation of the module's educational approach. Figure 3 illustrates the harmonization of the graphic design of the learning landscape, taking into account the color palette used and the pedagogical metaphor in accordance with the main theme of the module.

Figure 3

Harmonization of graphic design according to the module theme.



Source: Authors

The tool used to design the learning landscape was Genially, due to its versatility and ease of creating an interactive environment. Genially allowed for efficient multimedia integration and the development of an engaging and dynamic learning environment, facilitating the creation of micro-landscapes that were not only visually stimulating but also functional and accessible to all students. The ability of Genially to combine different types of content and its ease of use were crucial for the successful implementation of this innovative learning landscape.

Stage 2: Implementation of the learning landscape

The learning landscape implementation process for the Pedagogical Praxis module was conducted with the nine enrolled students over the course of 12 weeks. This imple-

mentation combined synchronous and asynchronous sessions to maximize learning flexibility and effectiveness.

During the 12-week period, three synchronous sessions were held, strategically scheduled at the beginning, middle, and end of the module. The first synchronous session was used to introduce the learning landscape, explain its structure and objectives, and familiarize students with the available tools and resources. The second synchronous session, held midway through the course, allowed students to share their experiences up to that point, discuss challenges, and receive real-time feedback, among other topics. The final synchronous session served to reflect on the entire learning process, evaluate achievements, and discuss the results of the activities.

The remaining nine sessions were asynchronous, designed to encourage self-regulation and active participation by each student. Each week, participants accessed a new thematic Micro landscape that included interactive activities, multimedia resources (audio, text, and video), and spaces for communication and reflection (forums and collaborative whiteboards). These asynchronous sessions allowed them to manage their time autonomously, complete tasks at their own pace, and participate in online discussions.

Throughout the weeks, the learning landscape promoted student self-regulation, encouraging students to set their own learning goals, monitor their progress, and reflect on their performance. Furthermore, active participation was encouraged through activities designed to involve collaborative learning, problem-solving, and the practical application of learned concepts. It is noteworthy that this combination of synchronous and asynchronous sessions, along with the interactive and engaging design of the learning landscape, created a dynamic and participatory learning environment, allowing students to develop self-regulation skills and actively participate in their educational process.

Stage 3: Questionnaire application and content analysis

Data collection was conducted by administering questionnaires before and after the implementation of the learning landscape to measure changes in students' perceptions and levels of active participation. Additionally, a content analysis of the interactions on the virtual platforms used during the module was conducted by evaluating contributions on collaborative whiteboards to determine the impact of the learning landscape on active student participation.

Stage 4. Data analysis

Data analysis was conducted using a qualitative approach. Data obtained from the pre- and post-implementation questionnaires were analyzed using descriptive statistics to identify changes in student perceptions and active participation. Data from the instrumental case study on the content analysis of interactions on virtual platforms were coded and categorized to identify patterns, recurring themes, and the depth of active participation. This combination of methods allowed for a comprehensive understanding of the impact of the learning landscape on the Pedagogical Praxis module.

RESULTS AND DISCUSSION

The results obtained provide a detailed view of the impact of learning landscapes on active student engagement in the Pedagogical Praxis module. These results offer a comprehensive understanding of how the design and implementation of learning landscapes can foster a more interactive and effective educational environment.

Pre-implementation questionnaire

Regarding the pre-implementation questionnaire, the results presented in Table 2 reveal that, in previous virtual courses, 33.3% of students always actively participated in discussion forums and interacted with peers through collaborative tools such as chats, forums, collaborative whiteboards, or work groups. However, only 50% reported a moderate level of engagement with the assigned activities and tasks. Regarding motivation, 66.7% reported moderate motivation, with their participation fluctuating depending on their interest in the topics covered. Furthermore, 50% expressed satisfaction with their own level of participation in previous virtual courses. Notably, 100% indicated that they had not used learning landscapes in previous courses or modules, which highlights the novelty and potential impact of this methodology on their educational experience.

Table 2

Questionnaire on Active Participation and Experience with Learning Landscapes in Virtual Environments

Frequency	Descriptor
33% Always	Active participation in discussion forums in previous virtual courses.
33% Always	Interaction with peers through collaborative tools (such as chats, forums, collaborative whiteboards, or work groups) in previous virtual courses.
50% Moderate	Level of commitment to the activities and tasks assigned in previous virtual courses.
66.7% Moderately motivated	Participation based on interest in the topics covered in previous virtual courses.
50% Satisfied	Level of satisfaction with your own level of participation in previous virtual courses.
100% No	Using learning landscapes (integrated learning environments with multiple resources and interactive activities) in previous courses or modules.

Based on the initial survey, it is noted that less than 50% of the frequency of active student participation in the various dynamics of previous virtual courses is achieved, where students had not previously interacted with learning landscapes. This entails searching for didactic strategies that can enhance active student participation in virtual environments. In this sense, Ortiz-Aguilar et al. (2020) highlight that virtual teaching and learning environments require didactic strategies that foster knowledge construction, coope-

ration, and interaction among participants, emphasizing the need for competent teachers to mediate pedagogical activity. Therefore, these strategies represent a key opportunity to transform the dynamics of the educational process and promote more meaningful learning systems in digital spaces.

Post-implementation questionnaire

Table 3 shows how the results reflect a positive assessment of the learning landscape in the Pedagogical Praxis module. Thus, 57.1% of participants indicated constant active participation in discussion forums and collaborative tools, while the same percentage rated their engagement with assigned activities as moderate. The usefulness of the learning landscape resources was highlighted, with 85.7% of responses indicating that these were extremely helpful for understanding the module topics. Furthermore, 71.4% reported high motivation to participate in interactive activities, increasing their interest in the module content. The diversity of resources was rated as excellent by 71.4% of participants, and 42.9% considered that the landscape greatly facilitated their active participation, demonstrating the positive impact of this teaching strategy.

Table 3

Questionnaire on active participation and experience with learning landscapes in the Pedagogical Praxis module

Frequency	Descriptor
57.1% Always	Active participation in the discussion forums in the Pedagogical Praxis module
57.1% Always	Interaction with peers through collaboration tools (such as chats, forums, collaborative whiteboards, or work groups) in the Pedagogical Praxis module
57.1% Moderate	Level of commitment to the activities and tasks assigned in the Pedagogical Praxis module
85.7% Extremely useful	Usefulness of learning landscape resources to understand the topics of the Pedagogical Praxis module
71.4% Always	Participation in the interactive activities of the learning landscape of the Pedagogical Praxis module
71.4% Very motivated	Motivation to participate in the learning landscape activities of the Pedagogical Praxis module
71.4% A lot	Increased interest in module topics based on the learning landscape
71.4% Excellent	Rating the diversity of resources and forms of representation in the learning landscape
42.9% - 42% To a large extent - A lot	Level of facilitation of active participation in the module through the learning landscape.

Overall, the results show that the learning landscape implemented in the Pedagogical Praxis module had a positive impact on the student learning experience. Active participation in collaborative activities and forums showed substantial improvement compared to previous dynamics, indicating that the interactive and reflective nature of the landscape contributed to greater engagement. This finding aligns with other studies that highlight the effectiveness of dynamic strategies for increasing motivation and interaction in virtual environments. In this regard, Castro-Benavides et al. (2023) note that interactive activities can enhance student learning, motivation, and engagement across various educational levels and cultural contexts.

The high rating given to the usefulness and diversity of the resources highlights their effectiveness in addressing different learning styles and fostering interest in the module's topics. Along these lines, Freire-Mora et al. (2024) note that the design of interactive content plays a crucial role in capturing student attention and promoting active learning. These materials include resources such as videos, simulations, educational games, and activities that encourage active student participation. This approach, by integrating diverse forms of interaction, favors a more enriching and dynamic learning experience.

Likewise, the motivation and increased interest suggest that the participatory design of the landscape effectively connected with the needs and interests of students, fostering a more immersive and enriching experience in the virtual environment. According to Tafur-Méndez et al. (2022), motivation plays a crucial role in the teaching and learning process. Therefore, the attitude of teachers is important, but even more so is the appropriate use of available digital tools. These tools enable teachers to create resources that are not only relevant to the subject being taught but also effective in maintaining student interest and participation, thereby enhancing the learning process in digital environments.

The post-implementation questionnaire included an open-ended question about active participation and interaction with the learning landscape in the Pedagogical Praxis module. Table 4 presents four broad categories based on the variety of student experiences and perceptions based on the question.

As a result, the retrospective analysis of the learning landscape implementation reveals that, in general, students positively value its structure and dynamism, highlighting how it facilitates more interactive and organized learning. For Tafur-Méndez et al. (2022), the use of technology for teaching purposes is a reality that must be fully exploited, so it is crucial to analyze the different learning contexts and topics to choose the most appropriate tools, and, above all, to keep our teaching tools continuously updated in the face of rapid technological advances.

Despite the overall positive perceptions and experiences regarding active participation and experience with the learning landscape in the Pedagogical Praxis Module, it is imperative to consider the tool overload and the amount of information that could be presented regarding the management of so many resources. This suggests the need to adjust the number of digital tools and the amount of information in a way that is not overwhelming for students. According to UNESCO (2024), the digital revolution has great potential, but its use in education must focus on enhancing the learning and well-being of

students and teachers, always prioritizing student needs and supporting effective teaching. Therefore, it is crucial to properly select and manage digital tools, ensuring that they complement the teaching and learning process by enriching and meaningful spaces, and that they do not lead to cognitive saturation.

Table 4

Open question about active participation and experience with learning landscapes in the Pedagogical Praxis module

Category	Experiences and perceptions
Positive Evaluation of the learning landscape	The clarity, organized structure, and dynamic nature of the learning landscape are highlighted. The appreciation for the "clear and precise information" and the "organized and dynamic tool" reflects a positive reception of the design and organization of the virtual environment, suggesting that this type of digital space facilitates active learning.
Appreciation for the dynamism of the virtual platform	The attractiveness of the platform used (Genially) is recognized, as it is compared favorably with traditional synchronous classes. This highlights the effectiveness of digital tools in capturing students' attention and interest, thereby facilitating a more interactive and engaging learning environment.
Positive impact on the organization and inclusion	One comment stands out from a specific individual with attention deficit disorder, who expressed that the learning landscape helped them stay organized and on top of their tasks. This suggests that the structured and organized design of the learning landscape can be an effective tool for students with specific needs, helping them better manage their participation and learning.
Challenges related to information overload	A comment highlights that the amount of information and multiple tools (such as the virtual classroom and the learning landscape) can be overwhelming. While acknowledging the organization of the environment, a challenge is highlighted regarding managing so many platforms, which could lead to cognitive overload for some participants.

Instrumental case study: Content analysis of interactions

The instrumental case study for the content analysis of interactions on virtual platforms was based on the weekly contributions of students to the collaborative whiteboard on Padlet, structured into 12 themes corresponding to the content of each Micro landscape. This technique enabled the researcher to maintain a detailed record of each student's level of participation and interaction, documenting both the frequency and quality of their interventions.

Throughout the 12 weeks, sustained engagement was observed regarding the topics addressed in each micro-landscape. Most participants actively interacted, both in their individual contributions and in their responses to their peers' posts, fostering collaborative and reflective exchange. This finding is consistent with Reyna-Díaz (2020), who asserts that the implementation of virtual environments in education improves learning efficiency, as it equips students with a range of skills and competencies necessary for professional development.

However, over the last three weeks of the module, a slight decrease in participation was observed, attributed to the course closure and the associated academic workload rela-

ted to the final project submission. In this sense, Loyola-Illescas (2021) reaffirms that factors such as academic load and time management have a significant influence on student mood and participation in virtual environments. However, despite this slight decrease, the student response was notable, as the majority voluntarily requested an extension of time after the formal closure of the module to complete their participation and interactions on the collaborative whiteboard. This behavior reflects not only the student's commitment to the dynamics of the learning landscape but also the positive impact of this strategy in fostering self-regulation and active and collaborative learning.

CONCLUSIONS

The implementation of the learning landscape in the Pedagogical Praxis module reinforces the need to foster more enriching, meaningful, and proactive virtual learning environments, particularly in graduate programs. Throughout the research, contradictions and challenges in active student participation in previous virtual environments were identified, highlighting that, while these spaces offer flexibility and access to multiple resources, interaction and engagement are not always constant. Among the main challenges identified are the lack of teaching strategies that encourage collaboration, information overload, and limited communication between students and teachers.

To address these challenges, a learning landscape was designed with a participatory and reflective approach, integrating multiple interactive resources, self-regulation strategies, and collaborative activities that promoted a greater connection between students and the content. It is essential to note that the adoption of an online resource for teaching and learning largely depends on how its content architecture is structured. A well-planned content architecture facilitates the adaptation and reuse of its elements to meet the diverse needs of students (Quesada-Pacheco, 2018). Thus, the novelty of this research lies in the design and implementation of an educational resource focused on learning personalization, which integrates graphic, multimedia, and collaborative elements. This allowed students to develop a deeper connection with the VLE and the module, while also assuming an active role in their learning process.

The evaluation of the learning landscape's impact revealed improvements in active participation, motivation, and interest in the content, suggesting that its implementation can be an effective strategy for strengthening interaction in virtual environments. According to Pérez-Benavides (2022), these environments not only enhance specific skills but also foster reflective participation and critical thinking. This finding is consistent with the present study's results, which highlight the positive impact of the landscape on motivation, interaction, and interest in the module content.

However, the research also identified limitations, such as the need to optimize the amount of information presented to avoid cognitive overload and to improve the management of digital resources, ensuring a more balanced learning experience. This reinforces the recommendation to select and optimize the digital tools used in learning landscapes, prioritizing their functionality and accessibility, as suggested by UNESCO (2024).

Finally, it is recognized that learning landscapes represent an innovative teaching strategy with considerable potential for transforming participation dynamics in virtual environments. However, future research could expand the study to a more diverse sample or analyze the effectiveness of learning landscapes in different disciplines and educational levels. It is also suggested that we explore how teacher training in the design and implementation of these environments influences their effectiveness, ensuring that their application continues to evolve and respond to the demands of the digital educational context.

In conclusion, in VLEs, teachers must organize the essential means, resources, and activities to share, generate, and construct knowledge. This requires establishing a dynamic of interaction and intervention between teachers and students that fosters communication and the exchange of experiences, perspectives, and reflections (Flores-González et al., 2022). Along these lines, learning landscapes represent a promising strategy for transforming the dynamics of participation in this type of environment, contributing to a more meaningful, active, and collaborative education that meets the demands of today's society.

CONTRIBUTION OF THE AUTHORS

Silvia Saborío-Taylor: Project administration; Formal analysis; Conceptualization; Data curation; Writing - original draft; Writing - review and editing; Research; Methodology; Resources; Software; Supervision; Validation; Visualization; Funding acquisition.

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