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Technological Platforms for Inclusive Practice at University: A Qualitative Analysis from the Perspective of Spanish Faculty Members

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Abstract: Currently, the development of new virtual environments as a complementary tool to face-to-face teaching and the increased presence of students with disabilities at university classrooms are changing the landscape of university teaching. This article analyses the actions of faculty members who carry out inclusive practices in the context of technological platforms. The research was based on the assumptions of the qualitative paradigm, using individual semi-structured interviews with 119 faculty members from 10 Spanish public universities. The results show the reasons for inclusive learning with technological platforms, the use that faculty members make of these platforms in their inclusive educational practices, and the influence of these on the learning of students, especially students with disabilities. The conclusions give a good account of the conditions that determine the pedagogical use that faculty members make of virtual environments to facilitate the inclusion of students.

Keywords: higher education; inclusive education; disability; technological platforms; faculty members



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1. Introduction

Inclusive education is a challenge for university systems [1]. Among the Sustainable Development Goals (SDGs) of the 2030 Agenda, Goal 4 “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” is promoting a global agenda for the effective recognition of the rights of all people and the construction of a cohesive society that respects the principle of equal opportunities and non-discrimination [2].

Teaching at university today implies assuming that diversity is common, that students learn in different ways, and that their intelligences are multiple. It also involves mastering not only the content of a subject, but also knowing how to teach, adjusting to the needs of students, and making use of different resources, including technological ones [3].

The current educational reality is immersed in a period of adaptation to the digital era [4]. The European Education Area is addressing this challenge by promoting the Digital Education Action Plan [5], which sets out a vision of high-quality, inclusive, and accessible digital education at all levels of education. This new plan includes, among its strategic priorities, the development of a digital education ecosystem by making better use of information and communication technologies to improve the quality of teaching and learning processes. The report “Top IT Issues, 2020. The Drive to Digital Transformation Begins” [6], highlights some of the trends related to the digital transformation of universities. In particular, it focuses on issues related to students and teaching, highlighting the fact that we are moving inexorably toward student-centred systems. In the case of learners with disabilities, many studies confirm that ICTs facilitate their inclusion [7,8].

In universities, this process of digital transformation is accelerating as a consequence of a profound change in the demand for higher education [9]. This movement, characterised in part by the presence of a more plural, diverse, and heterogeneous student profile, is playing a crucial role in technological resources [10]. Thus, one of the areas of university activity where the implications of educational technologies are having the greatest relevance is traditional university teaching [11]. In the report “Situation and challenges of Spanish universities in the face of digital transformation”, published by the Conference of Social Councils and the Network of University-Business Foundations, it is stated that Spanish universities are quite digitised in terms of new teaching methodologies and new learning and working environments [12]. The predominant educational discourse in the scientific literature on technology and disability focuses on the idea that ICTs are resources that generate real situations of access to inclusive education both in virtual scenarios and in face-to-face teaching modalities supported by technological media. Specifically, training modalities such as e-learning and m-learning can overcome barriers and open up opportunities to facilitate inclusive and equitable education [13].

In the last decade, educational opportunities in higher education institutions have been evolving beyond the traditional classroom environment thanks to existing educational technologies [14]. Moreover, the development of new virtual environments as a complementary tool to face-to-face teaching [15] and the increased presence of students with disabilities in university classrooms [16] are changing the landscape of face-to-face teaching. In Spain, the report “UNIVERSITIC 2017: analysis of ICT in Spanish Universities” highlights that the universities’ commitment to technological resources as support for teaching has reached saturation levels, with over 90% of faculty members using institutional platforms for virtual training [17].

The 2017 Horizon Report identified, as a key trend, the combination of traditional face-to-face training with innovative technologies for higher education worldwide [18]. The technology of virtual learning environments, i.e., LMS—Learning Management Systems, is the technological tool that has had the highest rate of acceptance in higher education. In fact, in Spain, all universities have some kind of LMS to support face-to-face training or for the development of blended learning [19]. However, the report “ICT 360°: Digital Transformation in the University” highlights that the challenges and responsibilities that most universities must face are faculty training and the reformulation of content to adapt to digitisation [20].

This article explores the practices of faculty members who carry out inclusive education with technological platforms. The analysis of their discourses allows us to learn more about how virtual environments can contribute to inclusive learning for all students, with or without disabilities.

1.1. Inclusive Education as a Promoter of a More Democratic and Sustainable Society

Inclusive education is based on the need for educational institutions to transform their cultures and practices to ensure the learning of all students, promoting their participation and seeking to eliminate the processes that lead to social exclusion [21]. Inclusion is conceived as a process that involves and commits to the transformation of educational institutions in order to provide a response to all students. Inclusion is fundamental for achieving quality education for all students and for the development of a more democratic and sustainable society [22].

When universities are identified with the principles of inclusion, diversity is valued, recognising that there are different ways of learning and that all students bring things of value to the learning environment. In addition, it removes barriers linked to exclusionary practices and works proactively to respond to the needs of all learners [23]. Inclusive practices can enrich the curriculum and the success of all students. Learning-centred approaches and Universal Design for Learning (UDL) have been shown to be effective in inclusive contexts [24].

Research on inclusive education and higher education often highlights faculty members. The majority of studies carried out to date conclude that faculty members are key to the success and sustainability of an inclusive approach [25,26]. When faculty use technological resources in their teaching, including virtual learning environments, inclusive teacher practices can contribute to the retention and success of students with disabilities [27].

1.2. Overcoming Challenges in the Use of Technological Platforms for Diversity

Currently, most Spanish universities are using LMS as a resource to support face-to-face classes in an effort to provide new scenarios and alternative learning solutions [12], especially favourable for students with disabilities [16]. However, as learning with technological resources in the classroom advances as a complement to traditional face-to-face teaching, universities and faculty are facing the challenge of promoting changes in students [28,29], especially related to acceptance and trust in LMSs [30]. On the other hand, studies suggest that students with disabilities are attracted to LMSs due to the ease of access and use as they can set their own pace and intensity of learning according to their interests [31,32].

Virtual environments are improving their functionalities and the quality of materials, making it easier for students to adapt to these new learning environments; however, some studies have revealed that people with disabilities must overcome previous barriers to ensure the appropriate use of LMSs [33,34]. Thus, for example, many of the challenges faced by students with disabilities using LMSs negatively affect their quality of life in terms of stress levels, self-esteem, personal relationships, and time available for other activities [35]. In line with these findings, Maboe [36] confirmed that the time taken by students with disabilities to complete assignments in LMSs is much longer compared to students without disabilities. These studies established that LMSs must be well adapted to ensure efficient and effective use by students with and without disabilities.

The challenges posed by these changes, together with the poor preparation of faculty in the use of LMS, are currently evident [37]. Universities are finding it difficult to convert these virtual environments into learning environments that increase accessibility for persons with disabilities, which makes it necessary to guide faculty members in this transition [38]. Currently, faculty training programmes in technology-supported instruction focus on accessibility issues rather than on understanding the specific learning needs of students with disabilities [39]. In their study, Greer et al. [40] showed that many of the faculty members who teach with the support of technological resources are poorly aware of the fact that LMSs are promising tools for the individualised education of students with and without disabilities. In addition, most faculty members need training to effectively implement individualised and inclusive teaching in a virtual learning environment [27,41].

In the area of difficulties related to faculty use of LMSs, the reviewed studies identified a number of barriers, including fear of using these learning environments, poor trust in the effectiveness of their use in teaching [11], lack of self-confidence to pedagogically use these environments and, in particular, poor preparation for teaching students with disabilities or no experience working directly with students with disabilities in a face-to-face or virtual environment [42]. These studies give a clear picture of the existing barriers and a general idea of how faculty training should be geared toward the effective use of this technology. Therefore, it is necessary to design specific training programmes that address the professional development of faculty members in order for them to acquire the technical and pedagogical skills required to integrate and use technological resources appropriately with students with disabilities and, more specifically, to know how to adapt virtual environments and digital materials to make them accessible [43].

1.3. Accessibility in Virtual Environments as a Prelude to Digital Education for All

From a practical perspective, research on digital accessibility in higher education is in its early stages [44]. With the rise of blended learning, there is an ongoing concern about accessibility, particularly for students with disabilities [45]. In this regard, in Spain, the

Royal Legislative Decree 1/2013, of 29 November [46], which approves the Revised Text of the General Law on the Rights of Persons with Disabilities and their Social Inclusion, and regulates the right to equal opportunities and non-discrimination of these students, establishes that universities must have the necessary support for the inclusion of students with disabilities and mentions the need to include training plans in universal design or design for all people in the different university degrees.

Universal design can help provide greater accessibility in the virtual learning environment, not only for students with disabilities but for all students [47]. Studies have shown that the improvement of student learning increases significantly when the LMS is adapted [48]. However, studies focusing on accessibility do not seem to have consistently considered the design of learning materials in digital format [49], despite the fact that adapting LMSs improves their accessibility when learning objects are adapted [50].

Providing materials in a way that they are accessible to learners, including those with disabilities, is important in the virtual environment. Some works conclude that the usability of LMSs is significantly enhanced when students with disabilities can access the learning materials offered in these environments [3]. For this reason, LMSs should incorporate materials adapted to the personal needs and preferences of all learners, although studies such as those by Brito and Dias [51] conclude that there is no single solution that can meet all individual needs, even when responding to the same type of disability. However, many of the materials that are shared are not adapted, thus the level of accessibility of information in LMSs is often quite low [48].

Adaptations of LMSs and materials are not sufficient if the syllabi are inadequately designed and create additional barriers to participation [52,53]. There are several considerations when designing a syllabus and presenting content that is accessible to all learners, including those with disabilities [40]. One of these considerations is to use the principles of universal design for learning (UDL), which allows “all people to have an equal opportunity to learn” [54]. Designing a training programme based on UDL principles contributes to making education inclusive, improves accessibility without the need for environmental adaptations, and engages participants in their learning [3,55].

In short, based on the use of LMS, and from the perspective of faculty members who carry out inclusive practices, this article analyses the reasons that lead them to promote inclusive learning in virtual environments, the use they make of these in their educational practices, and how technological platforms influence the learning of students with and without disabilities.

2. Materials and Methods

The design of the present study is framed within the qualitative paradigm. Specifically, in the biographical-narrative research design, focusing in this case on the importance of highlighting the experience of inclusive faculty members. The results of this study are part of a larger research project, funded by the Spanish Ministry of Science and Innovation, entitled “Pedagogía Inclusiva en la Universidad: Narrativas del Profesorado (EDU2016-76587-R)”. This study focuses on what inclusive faculty members do and how and why they do it, exclusively analysing the inclusive actions of these faculty members regarding the technological platforms (Moodle and Blackboard), used as a complement to face-to-face teaching.

2.1. Participants

This study involved 119 faculty members from 10 Spanish public face-to-face universities, belonging to all areas of knowledge. The participants were selected by students with disabilities, through the collaboration of the Disability Support Services of the different universities. The choice of faculty members was based on the following criteria [56], by which they demonstrated that they had carried out inclusive practices: believing in the possibilities of all students; facilitating learning processes; using different methodological teaching strategies; showing concern for their students’ learning; motivating students;

maintaining close relationships; and favouring interactions between students or allowing students to participate in the class and build knowledge together.

Regarding the profile of the participating faculty members, 24 taught Arts and Humanities (20.2%) (faculty members identified with P1 to P24), 14 taught Engineering and Sciences (11.8%) (P25 to P38), 16 taught Health Sciences (13.4%) (P39 to P54), 25 taught Social and Legal Sciences (21%) (P55 to P79), and 40 taught Educational Sciences (33.6%) (P80 to P119). In terms of gender variables, 69 were male (58.3%) and 50 were female (41.7%). Regarding age, 108 faculty members were between 36–60 years old, 7 were under 35 years of age (7.8%), and 4 of them were over 60 years of age (4.4%). Regarding teaching practice, most of the faculty had more than 10 years of teaching experience (68.4%), with six (6.2%) faculty members having less than 5 years of experience and 24 having between 5–10 years (25.4%).

2.2. The Spanish University Context

The report “Data on the Spanish University System, 2019–2020” [57] indicates that the Spanish University System is made up of 82 universities, with 50 public universities (49 face-to-face, 1 non-face-to-face) and 32 private universities (27 face-to-face and 5 non-face-to-face). Currently, online university education is almost exclusively dominated by private universities, while public universities provide face-to-face teaching combined with or supported by technological platforms [58].

In Spain, all public universities have support offices for students with disabilities, and 21,435 students with disabilities are currently enrolled in undergraduate courses [59], representing 1.5% of the total student body in Spanish universities. The disability offices ensure that these students have the necessary resources for the development of their learning process and advise faculty members on the reasonable adjustments to be made.

2.3. Data Collection Instrument and Procedure

The research was conducted on the basis of individual semi-structured interviews in which three questions were explored: (1) the reasons for inclusive learning with technological platforms; (2) the areas in which faculty members make use of LMSs in their inclusive educational practices; and (3) the influence that LMSs have on the learning of students, especially students with disabilities.

The interviews were conducted by members of the research team, who were previously trained for the task. Most of these interviews were conducted face-to-face (89 faculty members). Where face-to-face interviews were not possible, telematic means were used (videoconference with Skype and telephone calls). The interviews were audio-recorded and lasted approximately 90 min.

2.4. Data Analysis

The information collected from the interviews was transcribed verbatim and processed through qualitative data analysis using an inductive system of categories and codes, which allowed organising and making sense of the information collected [60]. Table 1 below shows the categories and codes used for the development of this study.

2.5. Ethical Issues of the Research

In terms of the ethical issues of this research, we ensured that the information collected in the interviews was confidential and anonymous. In this regard, the participants and the researchers signed a confidentiality document in which the terms regarding the collection, processing, and publication of information were agreed upon. In addition, the participants were informed of their right to withdraw voluntarily at any time during the research, which would mean that their data would be removed from the study. Therefore, this study complied with the ethical requirements approved by the Spanish Ministry of Science and Innovation.

Table 1. System of categories, indicators, and codes used.

Category	Subcategory	Indicators	Codes
Technology platforms (LMS)	Reasons for use	Faculty beliefs	A1
		Faculty attitudes	A2
		Faculty training	A3
	Areas of use	Learning support	B1
		Pedagogical purposes	B2
		Repository	B3
	Influence on inclusive practice	Faculty appraisal	C1
		Student learning	C2
		Accessibility (responding to diversity)	C3
		Faculty practice	C4

3. Results

This section shows the main results that emerged from the faculty members' discourse on the reasons that led them to inclusive learning with technological platforms, the use they made of these in their inclusive educational practices, and, finally, how technological platforms influenced the learning of students with and without disabilities.

3.1. Why Inclusive Learning with LMS?

Faculty members who carried out inclusive educational practices incorporated various technological media, especially LMSs, in their syllabi. In general, the faculty had a good concept of the use of these virtual environments in the educational processes, considering them as resources that facilitate educational inclusion.

I think it's always positive because with these resources you can work online, do a fruitful search. It is a tremendous support. Also, there are resources that help students with disabilities who have a physical limitation (P1).

Regarding the faculty members' view of the students' relationship with these technologies, some of the participants felt that their use was common among students and that the latter were comparatively better prepared and more technically proficient than the faculty.

In general the students have no difficulty in adapting and using it because they are better prepared than me. That seems quite natural, and I have had to learn it. (P116).

Although not all the faculty agreed that the use of these tools was necessary to achieve inclusion, others stated that their interest lied in the potential of these tools to respond to the educational needs of all students.

Everyone can access and download the curriculum that we have seen in class. For students with disabilities I think it's perfect because they need more resources, but for students who don't have problems, I think they could bring something more to the subject (P37).

However, for the above to become a reality and for the potential of these tools to be exploited, many faculty members highlighted the need to show a good predisposition toward the use of LMS. They proposed that there should be an improvement in technopedagogical training, which, in the eyes of the students, would help the faculty to be renewed and closer to the way in which learning takes place today.

I believe that electronic resources should be used for practically everything because students are motivated by them and use them every day. I think that faculty members are the ones who need to modernise a bit (P60).

3.2. Which Areas of LMS Generate Inclusive Educational Practices?

The faculty members considered several areas of application of LMSs to support their face-to-face teaching. In this sense, they used LMSs as an environment to support learning processes, as they allowed: (a) accessing this environment free of charge and making direct, easy, and useful use of it; (b) consulting digital study materials and materials of various types that could be shared and distributed in a permanent and organised way, enabling students to follow the lesson in case of being absent from class; (c) submitting assignments for evaluation; (d) consulting the planning and management of the subject (for example, knowing when to propose and submit activities or an exam test, have materials or resources of the lecturer's oral subject available, publishing the notes developed for each subject, etc.); and (e) contacting and communicating directly with classmates and faculty.

We have the WebCT platform. It is a great invention. I love it, as it is a way of communicating directly with all students and distributing materials (P70).

A second area of LMSs used by the participants was for pedagogical purposes that facilitated their work, for example: (a) promoting participation in class, using different resources that adapted to different learning styles; (b) facilitating access to certain materials, such as digital books, to work from places other than the classroom; (c) combining and enriching these educational environments with other programmes or applications, in addition to other digital resources that did not exist before; (d) providing guidelines for a critical and selective attitude toward the type of digital sources consulted, necessary for the quality of the expected results; (e) familiarising with the digital resource aimed at students who belonged to a generation that was also digital, making them feel more attracted and motivated by this medium; and (f) creating ecological awareness by reducing the use of printed documents, although some faculty members did not renounce the use of the reprographic service to share materials or take written exams.

I use the virtual classroom a lot. It's a fundamental tool, as it contains the whole course (ppt, videos, even the notes). Apart from the teaching development, the students have the planning of each subject, the contents, what they have to do at each moment, where and when they have to hand in the practical assignments, what exercise they have to do each day... etc. Thus, the virtual classroom is fundamental and is one of the keys to the work in the preparation of the subject, without any doubt (P15).

The use of the LMS was also focused, as a repository, on the dissemination of essential materials for the development of the subject, with several purposes: (a) to publish documents, texts, notes and presentations for the follow-up of the lessons; (b) to present the syllabus and the teaching project (providing information on the syllabus, assessment calendar, exam regulations, basic and complementary bibliography, etc.); (c) to publish digital files of the course, with the aim of providing information on the subject (e.g., the course content, the assessment calendar, the exam regulations, the basic and complementary bibliography, etc.); (d) to publish the course content and the teaching project; (e) to publish large digital files for downloading and consultation; (f) to link digital resources of interest that complement the information seen in class or even those parts of the syllabus that were not covered in class; and (g) to display documents with the solutions to the problems seen in class. However, some faculty members also used it for other purposes: (a) to create announcements on the board for notices related to the development of the subject; (b) to use social applications such as the blog, forum or wiki to generate group work spaces; (c) to carry out evaluations or self-evaluations of different types (e.g., open-ended, multiple-choice).

My lessons are based on PowerPoint files, which I then convert to PDF and publish on the platform. Then, the contents of each topic are also published on the platform. If there are interesting videos, we watch them in class and I upload the link to the platform, and I also publish links that we don't have time to watch, but are interesting. These are the resources I need (P28).

3.3. How do LMSs Influence the Learning of Students with and without Disabilities?

The valuation that faculty members made of the impact of LMSs on the learning process was generally positive. However, they believed that the impact of LMSs did not depend on whether the student had a disability or not, but rather on whether these media were fundamentally focused on a good didactic use and adjusted to the educational needs of the students. To this end, the faculty alluded to the need of changing traditional teaching methodologies for strategies that integrate these new environments, as well as to the planned use of these virtual spaces in such a way as to produce greater interest in the students.

More than the platform itself, it is the use of the platform that has an influence, because if you don't use it properly, it has no influence. It is wonderful for any student. I don't know if any technological device would adapt to any specific disability, I suppose it would, but it hasn't been the case. Generally speaking, technological advances have been a revolution. Today we are live and we connect, the Prado Museum, such and such an artist... (P31).

The faculty members also conferred a distinctive character on the LMSs, by which virtual educational environments had implicit advantages over the training provided in face-to-face learning. Thus, for example, they commented that LMSs facilitated accessibility to reliable information, in an immediate way, thanks to the fact that the media and materials were in digital format. This is why these environments were used to democratise opportunities for participation and give students equal access to a particular subject.

The fact that there is this tool where you enter and have everything you can think of about the subject, makes the class freer too, doesn't it? The opportunity we have to be together in a space, to dedicate it to other things, to work in groups, to debate... (P20).

The participants believed that the use of LMSs could influence several areas related to the development of students' learning. Thus, these environments were characterised by: (a) providing workspaces adapted to sharing and building; (b) facilitating the submission of assignments in digital format for supervision and evaluation; (c) providing security by making study materials and support resources available in advance; (d) enabling access to online tutoring sessions for consultation and resolution of academic doubts; (e) promoting didactic interaction with the materials, among the students themselves and between the faculty and the student, allowing open and continuous communication; and (f) favouring the ubiquity of learning in more appropriate contexts and situations.

Of course, I use the technological platform. Not only to post the material, but also for the submission and evaluation of the activities, and I have sometimes used forum and chat tools to discuss in class some activities that have not been clear. I often use the email to communicate with the students. I also post links to the videos so that they can watch them at home (P91).

While the faculty felt that LMSs could bring important opportunities and improvements to the learning process for all students, they also highlighted the particular benefits for students with disabilities. For example, some faculty members pointed to the accessibility of these environments as one of the main benefits for students with disabilities who may not be able to attend classes or who simply need more time to understand the material.

What I see, from the use I make of it, is the possibility for students with disabilities to have the material in their laptops... to have it readily accessible at any time, which does not have to be on paper [...], and they can see it from home, they don't have to travel (P109).

Another positive aspect deriving from the accessibility of the learning environment from anywhere was related to the possibility of adjusting the learning pace to the available time. This enabled the learner to demonstrate greater creativity and productivity by being able to repeatedly refer to the material, achieve a better understanding of it, and thus reduce their insecurity.

[...] for people who have a disability in their hand, a pencil and a tablet provide a much better chance of coming to understand and do something that a paintbrush doesn't allow them to do, where they know that going back is complicated if they make a mistake... So the fear issue disappears and creativity flourishes (P17).

One way in which faculty members facilitated the students' ability to adapt their learning rhythms consisted in videotaping their lessons and sharing them within the LMS. In this way, each student, with or without a disability, and according to their way of learning, was supported by one or another type of study material. Having alternative routes for learning was possible thanks to the diversification of the provided materials (editable Word or PDF files, videos) or the available channels (virtual platform, mobile phone, social networks). This adjustment to the interests, needs, and abilities of each student significantly linked inclusive practices to personalised learning.

In addition to the fact that I believe it is fundamental to achieve the motivation of students with or without disabilities, I understand that providing the instruments from different perspectives helps all students to feel that at a given moment they are given the instrument that is most appropriate for them to obtain the information (P39).

However, the participants indicated that, in many cases, these materials did not meet the specific needs of certain disabilities, such as visual impairment, due to the students' own perceptual characteristics, except in the case of one faculty member, who stated that he designed the teaching project with the contents adapted for visually impaired pupils, in a way that they could be seen by any pupil, with or without special educational needs.

Well, always, when designing the project, when I am already thinking about the contents I am going to develop, in the references, I try, for example, to include books that are accessible to a visually impaired person (P44).

4. Discussion and Conclusions

In universities, inclusive education is one of the most complex challenges that faculty members are facing nowadays. In line with the present investigation, other studies have highlighted the importance of the faculty member and, more specifically, their pedagogical practice in the classroom as one of the key elements in the processes of educational inclusion [16,28]. In recent years, national and international reports on the process of digital transformation of education indicate that universities, and specifically Spanish universities, are making significant progress in the field of teaching methodology, by gradually incorporating technological resources that are promoting the transition from traditional teaching to digital, inclusive, and accessible teaching [5,12]. This study has taken good account of this emerging reality by delving, from the perspective of faculty, into the conditions that determine the pedagogical use that faculty members make of virtual environments to facilitate the inclusion of students.

In university classrooms, the presence of technological media, and more specifically the use of virtual environments, is shaping many of the teaching practices that are being considered inclusive. In fact, as is demonstrated in this investigation, numerous studies conclude that LMSs are one of the essential tools in teaching, thanks in part to the fact that their use has practical applications in various areas of learning for students with and without disabilities [48,61]. Along these lines, the main findings of this study emphasise the interest that faculty recognise they have in the possibilities offered by LMSs when used to support face-to-face university teaching in order to develop inclusive practices.

A first conclusion drawn from the obtained results is related to the idea shared by the faculty that the integration of technological resources in their syllabi is a consolidated reality. In this sense, and as is stated in the report on the situation of educational technologies in universities [19], it is worth remembering that all the universities participating in this study had their own LMS for online training, generally Moodle and Blackboard, which they made available to faculty for use as support for face-to-face teaching. From a faculty member's perspective, one of the reasons why this technology has become a key element

in educational practices is due to the consideration that its use facilitates the development of inclusive practices, although it is not the only means to achieve this [61].

With regard to the competence area, several studies have highlighted the difficulties related to the use of LMSs by faculty members [27,41,42,62,63], suggesting the promotion of specific technopedagogical training programmes in addition to improving the predisposition toward the use of these environments, which are aspects that have been widely studied and have been related to the potential of these media to respond to the educational needs of students [37,38]. In a precursor to this work, and despite the fact that universities offer a wide range of courses for training in the use of LMS, Author et al. [43] already pointed out the advisability of attending to professional development with training programmes that enable the use of these technological resources with students with disabilities.

One of the most relevant findings presented in this study relates to the areas in which faculty use LMSs to support their face-to-face teaching. Three areas can be distinguished that facilitate the work of faculty members who carry out inclusive practices and who define the environment for a specific pedagogical purpose. The first area defines the environment as an accessible space that contains the material and tools that support students with and without disabilities, allowing them to regulate the pace and intensity of their learning according to their interests [31,32]. The second area contemplates the environment as an inclusive space for the differentiated performance of face-to-face teaching activities, which facilitates the development of digital educational processes [48,50]. Lastly, the third area considers the environment as an adapted space that is used to store and provide adapted materials, with which learners improve significantly in their studies by being able to interact with learning objects [3].

Numerous studies have reported the challenges that students have had to overcome in order to use LMS as learning environments [30,33,34]. In this study, however, the faculty revealed the wide acceptance and use of these technologies by students, as they provide them with a better preparation and an adequate level of digital competence. This is a favourable situation that does not exempt universities from the difficulties they are facing in making these new learning environments more accessible to people with disabilities [44]. In this regard, overcoming these drawbacks has largely been the responsibility of faculty members, who have highlighted the benefits implicit in the accessibility of environments and materials due to the opportunities and improvements implied in the learning process for students, which lead them to adjust their learning pace and demonstrate greater productivity and creativity.

Finally, regarding the impact of LMS on students' learning, the faculty members valued it positively, highlighting that such impact does not depend on whether the student has a disability or not, but on the didactic approach with which the technology is used to adjust to the educational needs of students [39]. Another opinion is that matching the interests, needs, and abilities of individual students significantly linked inclusive practices to personalised learning. Thus, the faculty members felt that the effectiveness of the technology that mediates teaching depends on the type of disability to which it is able to respond. In this sense, LMSs are not always infallible and it is necessary to use resources adapted to the specific needs of each student with disabilities and their level of technological competence. Therefore, the usefulness of these technological means ultimately depends on the environment [48], its materials [40], and teaching [52,53] being adapted to the students' circumstances in order to optimise their learning conditions. This is only possible if educational policies in universities continue their commitment to offering programmes that ensure faculty training focused on the design of syllabi that are designed from the UDL and contribute to inclusive education being present in virtual environments.

5. Implications for Academic Community

This study contributes to filling a gap in the scientific literature in light of the ambitious challenge of promoting accessible virtual learning environments. Some practical implications for an inclusive use of LMSs in higher education are presented in this section.

The use of LMS in the classroom has changed the landscape of university education, with important consequences for teaching practice and students' learning experiences. In order for the use of technology to improve the quality of learning and educational opportunities for students with and without disabilities, it is necessary for universities to offer continuous training programmes that allow faculty members to create new scenarios and alternative learning solutions.

In order to effectively implement individualised and inclusive teaching in a virtual learning environment, the environment and material must be adapted to the specific needs of students and their level of digital competence. This requires reflection, dedication and training for faculty members in technopedagogical skills and in the design of specific training programmes based on the principles of universal design for learning that contribute to inclusive education.

6. Limitations and Future Research

In this study, we identified some limitations related to the methodological design, such as considering the faculty members' discourse from a global perspective, without paying attention to their specific field of knowledge. This means that their view of certain aspects that could be exclusive and defining of the different branches of knowledge analysed was diluted in a discourse without nuances. Likewise, the students' disability could have been taken into account as a second criterion for classifying the faculty members' discourse, which would have helped to identify specific forms of action in their practices according to this variable. Therefore, as a prospective of the study, these limitations should be overcome in order to continue evaluating the educational reality of the practices and challenges faced by faculty members who attend to the needs of students with disabilities. It would also be advisable for future research to further delve into the pedagogical implications for students of the application of the principles of UDL in virtual environments, with digital materials and inclusive educational programmes.

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