societies

MDPI

Article

Democratizing Higher Education: The Use of Educational Technologies to Promote the Academic Success of University Students with Disabilities

Maria de las Nieves Sanchez-Diaz * and Beatriz Morgado

Department of Developmental and Educational Psychology, University of Seville, 41018 Seville, Spain
* Correspondence: msdiaz@us.es

Abstract: The rise of information and communication technologies has not gone unnoticed in the university context. An increasing number of university faculty members are using technological resources in their teaching. However, the success of technologies in the teaching and learning process depends on the way they are used. This article analyses the actions of university faculty members who engage in inclusive teaching practices using educational technologies in their classrooms. A qualitative approach was followed using the biographical narrative method. Data collection was carried out through semi-structured individual interviews with 42 inclusive faculty members from 6 Spanish public universities. The results obtained reveal the technological resources used by these faculty members in their classrooms, the main uses they make of virtual learning platforms, as well as the actions that the faculty members implement to facilitate access and participation of students with disabilities through the use of technologies. These results allow us to detect some of the faculty's training needs related to the use of educational technologies and offer practical keys that contribute to guaranteeing inclusive and quality learning for all students.

Keywords: inclusive pedagogy; higher education; educational technologies; accessibility; participation; faculty members

Citation: Sanchez-Diaz, M.N.; Morgado, B. Democratizing Higher Education: The Use of Educational Technologies to Promote the Academic Success of University Students with Disabilities. *Societies* **2023**, *13*, 57. https://doi.org/10.3390/soc13030057

Academic Editor: Sandro Serpa

Received: 27 January 2023
Revised: 27 February 2023
Accepted: 28 February 2023
Published: 2 March 2023

1. Introduction

The inclusion of students with disabilities in higher education is an important issue that needs to be addressed. In these inclusion processes, information and communication technologies (ICT) become particularly important. There are several international reports that point out the importance of technologies to promote successful inclusion processes. Thus, the United Nations Convention on the Rights of Persons with Disabilities highlights the importance of promoting the development of ICT for persons with disability to improve their lives [1]. More recently, the Sustainable Development Goals (SDGs) of the 2030 Agenda allude—as a response measure to COVID-19 in SDG 4—to the need to design and implement innovative solutions that contribute to bridging the content and connectivity gaps in education systems, and to facilitating inclusive learning opportunities for all [2].

The rise of information technology in education provides university faculty with a wide range of educational resources that can be translated into learning opportunities for students [3]. Several studies claim that the use of technological media benefits all students, regardless of whether or not they have a disability [4]. Furthermore, there are studies that focus on the application and effectiveness of these media in the university context, as well as the potential of these media in the learning of students with disabilities [5,6]. It would be useful to further explore the impact of the use of mainstream technology—not just assistive technology specifically—on all students, particularly students with disabilities.

1.1. The Use of Technological Resources for Inclusive Learning

In recent years, there has been an unprecedented digital revolution at all levels [7]. In the educational context, the use of social networks for educational purposes, or the growing emergence of emerging technologies such as augmented reality, artificial intelligence, robotics, or 3D printing [4], requires a transformation in the way in which the teaching–learning process is developed [8].

This reality requires, among other actions, a response to the existing diversity in university classrooms, promoting digital learning that guarantees access and participation for all students, without exceptions. To achieve this ambitious requirement, blended learning [9] in face-to-face universities—blended learning is the use of elements of face-to-face teaching together with technological elements—is presented as a beneficial option for students in general [10], and for students with disabilities in particular, since technological media can reduce the difficulties experienced by these students [11]; so much so that the recent Horizon Report 2022 points out, following the consequences of COVID-19, the need to promote hybrid learning models in universities, based on the immersion of the virtual modality [12] in face-to-face learning environments.

It is well known that the success of technologies in the teaching and learning process depends on the way they are used [13] and there are currently various difficulties in effectively promoting the use of technologies in Spanish university classrooms. Research on the educational possibilities of these resources is still very scarce [14] and their use is not very widespread among university faculty members. Among the technological media and resources most commonly used by faculty members in university classrooms are the use of digital presentations [15], videos [16], digital texts [17], and virtual learning platforms. The latter deserve special attention given that most Spanish universities have them (Moodle, Blackboard Ultra, etc.). Among their main uses in university teaching, [18] highlights their possibilities as (1) virtual repository, where faculty can upload text files, slides, or videos, which can be viewed by students using any electronic device (smartphones, tablets, or PCs) and from anywhere; (2) creation of discussion forums or chats which, in addition to enabling communication between students or between faculty and students, allow faculty members to hear the different opinions of the student body, and even to rate these opinions; (3) sending messages or announcements which allow faculty members to communicate via messages with students; and (4) online rating or assessment, which allows students to upload assignments or make assessments, and faculty members to rate them online.

Given the wide variety of technological resources, technological media, and materials that can be used in university classrooms, it is necessary to be aware of the benefits they bring to students—considered digital natives or Net Generation [19]—as well as those issues that may facilitate or hinder their use, particularly for students with disabilities.

1.2. Facilitating Learner Accessibility and Participation through the Use of Technology

It has been mentioned above that blended learning offers significant benefits for students in general, and for students with disabilities in particular. Among these benefits, the combination of the traditional and the technological allows teaching to be adapted to the needs of students [20], facilitates accessibility to content [10], favors student participation and motivation [21], broadens communication channels for students, and enables faculty to offer their materials in various and multiple formats [17], such as printed texts, digital texts, audios, videos, podcasts, apps, etc.

On the one hand, in terms of technological materials and resources, using digital texts (PDF, Word, or similar) benefits students with disabilities, as they can use screen-reading software to facilitate this task (such as TalkBack, Be My Eyes, or JAWS) or even manipulate and organize written information (enlarging the font, changing the line spacing and font, etc.) in a way that suits their needs [17]. As for videos, they can be viewed anytime, anywhere, and on multiple devices, which allows students to be flexible in time and access the content as many times as they need [16]. Slide presentations can benefit all learners as long as they are properly designed and verified using PowerPoint's "Check Accessibility" tool [22].

On the other hand, among the benefits of virtual platforms, they save time for faculty members and are environmentally friendly, as their use prevents the waste of unnecessary paper; they can be intuitive, their use is usually known by the educational community; enable online monitoring and evaluation of students; they are accessible, as they give students the autonomy to view content on most electronic devices and from any location—this point is of particular interest, as it benefits in particular those students with mobility difficulties or illnesses that require long periods of hospitalization, as they can access content from home, avoiding the feeling of being outside the learning community—and allow faculty members to teach using inclusive and innovative teaching methodologies and methodological strategies, such as flipped classroom, gamification, augmented or virtual reality, etc. [18,23].

All of these benefits are closely connected to the three core principles of universal design learning (UDL): providing multiple forms of representation, expression, and participation or engagement [24]. Teaching practices based on UDL principles are known to provide learning opportunities for all students, including students with disabilities, and to foster more motivating and meaningful learning for all students [25].

However, despite the benefits of using technology for students with disabilities, there are some issues that need to be taken into account for the effective inclusion of students with disabilities in the teaching–learning process. Specifically, Seale et al. [26] point out various difficulties that students with disabilities may experience when using technological resources. For example, subtitles and audio-descriptions in videos are aspects to be taken into account, since sometimes the videos shown in the classroom are not subtitled, which makes access difficult for students with a hearing disability; neither are they audio-described, in this case making access difficult for students with a visual disability [26,27]. Finally, in relation to virtual learning platforms, if they are not accessible, they are far from being inclusive. Among the main difficulties that virtual learning platforms may present are the design of the virtual platform itself, which is sometimes non-intuitive and difficult to use for students with disabilities, or the inaccessibility of the materials uploaded by faculty [26], as they may contain elements (texts, tables, or figures) that are not designed in such a way that they can be easily decoded or interpreted by these students.

With all this, and in order to mitigate these difficulties, it is necessary for university faculty to have techno-pedagogical competence and to feel comfortable and familiar with technologies so that students can benefit from these resources and media [28]. Otherwise, technological resources and tools can be a "double-edged sword" [26], as they undoubtedly benefit and support students with disabilities, but can sometimes be a barrier for them.

This paper aims to analyze the actions of inclusive faculty members in relation to the use of technology in the classroom. Specifically, it pursues three objectives: (1) To find the type of technological resources and media used by inclusive faculty members in their classrooms; (2) To describe the different uses that inclusive faculty members make of virtual learning platforms; and (3) To explore the actions implemented by inclusive faculty members to promote the access and participation of students with disabilities through the use of technology.

2. Materials and Methods

This study is framed in a qualitative paradigm. Specifically, a biographical narrative research design has been used, focusing on the importance of emphasizing the experiences of the protagonists of the research, in this case, inclusive faculty members. The results of this work are part of a larger research project, funded by the Ministry of Science and Innovation, entitled "*Inclusive Pedagogy at University: Faculty Members' Narratives" (MINECO, ref. EDU2016-765887-R)*, which aims to find out how inclusive faculty members develop inclusive pedagogy.

2.1. Participants

A total of 42 faculty members from 6 Spanish universities, who teach in faculties of Education Sciences, participated in this study. As for the selection of participants, they

were selected exclusively by students with disabilities. For this purpose, the collaboration of the technical staff of the different disability support services (DSS) of the participating universities was requested. The technical staff of these services contacted the students with disabilities in their databases and provided them with information about the project so that they could designate, on a completely voluntary basis, those faculty members who carried out inclusive practices in their classrooms and who, therefore, had favored their academic success at the university. To this end, students were provided with a set of criteria to be met by these faculty members. These criteria were as follows: They believe in the possibilities of all students; they facilitate learning processes; their teaching is active, using different methodological teaching strategies; they show concern for their students' learning; they show flexibility, willingness to help; they motivate students; they maintain close relationships and favor interactions between students; they make you feel that you are important, that you are one more in the classroom; they allow students to participate in the class and build knowledge together; the communication they maintain with you and with your classmates is horizontal.

Once these students had provided information about the faculty members who had facilitated their educational inclusion, they were contacted through a formal email, where they were introduced to the study and asked to participate. A total of 65 faculty members were contacted, of whom 42 eventually participated. Both students and faculty members participating in the study were guaranteed anonymity throughout the research process, in accordance with the guidelines established in Organic Law 3/2018, on personal data protection and guarantee of digital rights.

As for the profile of the participants, their age at the time of the study ranged from 33 to 59 years old, with an average of 41.2 years. Seventeen were men (40.5%) and twenty-five were women (59.5%). The participants' teaching experience ranged from 7 to 32 years, with an average of 15.8 years. The participants belonged to different areas of knowledge: social sciences (40%), arts and humanities (31%), health sciences (17%), and sciences (12%). The following table (Table 1) shows the profile of the participating members of the faculty.

Table 1. Profile of the participants.

Sex	Male	17 (40.5%)
	Female	25 (59.5%)
Fields of knowledge	Social and Legal Sciences	17 (40%)
	Arts and Humanities	13 (31%)
	Health Sciences	7 (17%)
	Science	5 (12%)
Average age of participants		41.2 years
Teaching experience of the faculty members (average)		15.8 years

2.2. The Spanish University Context

In order to contextualize the study, the faculty members who took part in it belonged to 6 Spanish public universities. Following the distribution made by the European Higher Education Area, official university degrees are divided into undergraduate studies, of 4 years' duration, and postgraduate studies, which include master's degrees (1/2 year) and doctoral studies (3 years).

In Spain, all public universities have DSS for students with disabilities. According to the *V University and Disability Study* carried out by the Universia Foundation [29], in which 61 Spanish universities participated, there are currently 19.910 students with disabilities enrolled in university degrees, representing 1.5% of the total number of university students. The DSS ensure that these students have the necessary resources for the development of their learning process and advise the faculty members on the reasonable adjustments to be made, where appropriate.

2.3. Instrument and Data Collection Procedure

The research was conducted on the basis of an individual interview designed ad hoc for the study. Prior to its application, the interview was piloted with 17 university faculty members who did not participate in the study. All considerations or suggestions for modification were analyzed and discussed during several meetings held by the research team in order to create the final instrument. The final interview focused on the actions taken by inclusive faculty members in the classroom to facilitate inclusion. The following questions, among others, were explored: (1) What kind of technological resources do inclusive faculty members use in the classroom; (2) How do inclusive faculty members use virtual learning platforms; and (3) How do faculty members promote access and participation of university students with disabilities through technology?

The interviews were conducted by the members of the research team who had been previously trained for this purpose. Most of them were conducted face-to-face (n = 34), but, due to the impossibility of doing so, six were conducted via Skype and two by phone call. All were audio-recorded and lasted between 60 and 90 min. This study met the ethical requirements approved by the Spanish Ministry of Science and Innovation.

2.4. Data Analysis

The information collected in the interviews was transcribed literally. It was then manually coded by seven coders, which ensured the accuracy of the results. In particular, progressive coding was developed [30]. From the interview, a very broad category system was created, which was then completed in a second coding stage, in which new codes emerged.

Finally, it was processed using MaxQDA qualitative data analysis software. Table 2 reflects the categories and codes used for the development of this study.

Table 2. System of categories and codes used.

Dimension	Category	Subcategory	Codes
Faculty actions	Resources and technological media used	Technological resources	Digital presentations
			Digital/online texts
			Audiovisuals
			Gamification Apps
			Social networks
			Wikis/Blogs
			Mobile devices
		Technological media	Virtual learning platforms
			Google Drive
			Course website
	Utility of Learning Management Systems	Virtual learning platforms	Repository
			Announcements/Communications
			Forums/Chats
			Submission of activities and online assessment
	Educational Inclusion through ICT	Faculty actions to promote accessibility and participation	Material adaptations
			Arrangement of material
			Combination and use of a variety of technological resources

3. Results

The first objective of this research was to find out the types of technological resources used by inclusive faculty members in their classrooms. The results found indicate that the faculty make use of a multitude and variety of technological media and resources in their classrooms.

3.1. Different Technological Resources to Respond Successfully to the Diversity of Students

In relation to technological resources, those most used by the participating teaching staff were online texts (n= 19), digital presentations—Power Point and Prezi—(n = 32) and audiovisual resources—images, audios, and videos—(n = 32). They pointed out that these resources enriched the teaching–learning process and complemented each other, as each of them offered different possibilities.

> *"Apart from Power Point, I play videos, or adverts that are on the Internet as well..."* (P1)

> *"I make use of different resources. Internet, of course I do. Videos, songs, short clips, films... That has a brutal richness"* (P24)

> *"Prezi, sometimes PowerPoint... It's just that each one has its own characteristics. Real case studies, recordings of children reading..."* (P28)

> *"They always have texts to go to, whether I hang them up for them, or they are in the library referenced, always. I try, of all possible subjects in sport psychology, there is not always one, but I try to make sure they have audiovisual material, videos that I have made, videos that I know other colleagues have that are linked on their websites, on YouTube... there are very good videos for dissemination, and that is why they are there and why they are used. This year I have started to use podcasts and they are working really, really, really well"* (P31)

In addition to these resources, five faculty members (n = 5) used applications to develop gamified experiences in the classroom, such as *Kahoot* or *Socrative*. They argued that they are very useful for exploring previous ideas, final ideas and making formative assessments. They also mentioned that these types of applications encouraged students while allowing debate and reflection on the content of the subjects.

> *"I keep changing and depending on each session, I try to introduce new things. Last year I used two tools: Kahoot, which is like a trivia game, so you pose a question with four answer options and you have to, over a period of time, give them the options that are represented by colours, and the answer percentage comes out, and of course it has music so it's very encouraging, and afterwards we always comment on the results that have come out. So, in reality we are playing, but we are talking about very serious things, about what the aims of social sciences are; and Socrative, which serves more or less the same purpose, but I use it to detect their previous ideas and their final ideas regarding a problem, and then they have to compare what they thought at the beginning and what they thought at the end and see what they have learned"* (P3)

> *"I use Socrative as a continuous assessment tool. I create continuous assessment questions, not just the ones we do in class"* (P34)

Other faculty members (n = 5) made use of social networks as a resource to support their teaching. They used them both to search for information and to carry out activities with their students.

> *"Classes, virtual classroom, YouTube, social networks like Facebook, Twitter..."* (P4)

> *"With Facebook, the truth is that I worked really hard. The activity was too abstract, but it was cool, it was cool. They had to use their Facebook biography...the part that they put on their personal Facebook, like their social identity"* (P39)

Some participants (n = 4) made use of forums, wikis, and educational blogs in their subjects. They indicated that these resources enabled online cooperative learning.

> *"I work with films, with documentaries, with short films, with YouTube... Now I am even starting with blogs and YouTube channels, with certain youtubers"* (P12)

> *"I have always used digital resources because I am attracted to the world of technology, I am interested in it, and I have always signed up for courses of this type. So, I use all kinds of tools, such as forums, Wikis, etc."* (P16)

> *"The collaborative classroom diary is like a Wiki, it is built from the first day of the class, and it is designed as a Wiki so that one person is in charge of collecting everything that happens in the class, and the rest of the people can also make their interventions if they see it necessary. In addition, we ourselves as faculty members can also participate. It becomes a diary where everything that happens in each of the sessions is written down, where both the contents that have been worked on and the activities that have been developed or concerns that arise as a result of the contents that are put into action are recorded"* (P18)

Finally, three faculty members (n = 3) used electronic devices such as smartphones and tablets in their courses. In this respect, the faculty indicated the need to introduce these devices as learning tools in the classroom, as they are elements that they use every day.

> *"Nowadays we are hooked on technology, in this case smartphones, as we can access them easily and we are thinking about the subject, the contents of the subject, as we can participate in the forums from our smartphones. I use a smartphone application called Remind. I put any resource there, and it is immediately sent to the smartphone"* (P5)

> *"I encourage them to participate with their tablets and smartphones...I encourage them to bring tablets, to bring smartphones..."* (P39)

In terms of digital media, all participants (n = 42) used virtual learning platforms in the development of their teaching. They argued that the use of the platforms was convenient, economical, and useful. Four of them, in addition to using the virtual platforms, used Google Drive (N = 4) and only one faculty had designed a website for his course where he shared content and educational resources with his students.

> *"I use the Moodle platform. It is convenient. As far as paper is concerned, well, I have stopped using copying, except for some very, very specific questions that may require filling in something and it is required on paper. But if not, that's the economic saving and the usefulness. Everything is there, you can download it, and it is convenient"* (P14)

> *"I use Drive. This year we participated in a service-learning project and I shared everything with the group through Drive. I use videos, etc."* (P15)

> *"We also use...a web page for the subject, so that apart from the virtual classroom they also have their own web page for the subject"* (P4)

3.2. Use of the LMS to Support Learner Participation and Accessibility

The second objective of this study was to describe the different uses of virtual learning platforms by inclusive university faculty. As mentioned above, all faculty members participating in the research (n = 42) used learning platforms, either Moodle or Blackboard Ultra. However, the use these faculty members made of these technological media was different. All participants used the virtual platform as a repository (N = 42), to make their subject material available to students.

> *"I use it just to deposit notes, because it is convenient for me, because it is practical, because it also allows me to have... for example, the Power Points that we see in class, I leave them after class"* (P7)

> *"The platform, because I use it as a repository, they send their work, but I don't assess them through the platform, but I do it personally because I like to look them in the eye, a more personal approach. I don't like the platform... as a repository, yes"* (P19)

> *"Moodle, which is our platform, because I don't give it all the use and all the potential it has. I simply use it as a repository"* (P32)

On the other hand, slightly less than half of the participants (n = 18) used virtual learning platforms -apart from as a virtual repository- as a means of communication with their students, to post announcements or important information.

"I know it has a lot of features, ..., but I only use it to post material and make announcements" (P26)

"I keep it (the platform) quite minimised. And I only use it to post resources and materials or for announcements... I only use it for announcements, for uploading documents, for notes and little else" (P30)

"To upload materials for them to download. Also, to inform them every time I upload some material. To call some tests that we do during the course, etc. That is, as a means of communication and to leave the material" (P34)

Ten participants indicated that they made use of virtual platforms to create discussion forums or chats, which allowed students to reflect on the contents of the different subjects.

"We have forums, the forum contains news, not only mine, but also theirs. If they have seen a video on Facebook or something that has to do with the previous session, they post it and we all talk about it" (P17)

"I always try to include reflection activities with forums" (P31)

Only six faculty members mentioned that they made use of virtual platforms as a resource for the submission of work and online assessment of students.

"All the assignments are posted in the virtual classroom, I don't want paper assignments, I don't want them to be sent to me on paper, also avoiding unnecessary expense, so everyone is on their own site to post those assignments, and I assess them there, I assess them on those assignments in the virtual classroom, on the computer, I leave the assignment, I give them the mark and I also post the mark in that section. And everyone knows at the time, the rate for each of these sections" (P21)

Finally, only one faculty member indicated that he used the e-learning platform as a virtual repository, for the creation of discussion forums or chats, as a means of communication with his students and for online rating and assessment of students.

"I use e-learning. Not only to post the material, but also for the evaluation of the activities. The activity is delivered through e-learning. I have sometimes used forum and chat tools to discuss with the class some activities that have not been clear. I usually use the messaging tool to get them to communicate with me. And that's it. I don't think I use anything else within the platform. I also post the videos or the links, rather the links to the videos, so that they can watch them at home" (P12)

3.3. Actions of Faculty Members to Promote the Inclusion of University Students with Disabilities

The third objective of this study was to explore the actions implemented by inclusive faculty to promote accessibility and participation of students with disabilities through the use of technologies. Among the main results, some lecturers mentioned the importance of responding to the diverse needs and realities of their students by offering them different types of adapted materials (subtitled videos, audio-described, accessible and editable presentations, etc.).

"I try to ensure that the videos I show in class are subtitled, I work with other types of audiovisual resources and if I have any needs I also put subtitles and audio in voice, I put it in large letters so that people with disability.... In other words, I try to adapt the material to the multiple realities that may exist in my classroom" (P12)

"When we start teaching the subject and we are preparing a Power Point we think about all the students, we are thinking about the background, we are thinking about the subtitles, or videos and we are thinking about using different materials... so, if I find out that there

is a student with a disability, then I will surely think about whether the PDF is accessible or not, which normally, we have always tried to make it accessible" (P18)

Other faculty members pointed out the importance of making subject material available to students in advance. They indicated that doing so made it easier to adapt to students' different learning paces and in particular, gave students with disabilities the opportunity to prepare the material in advance and adapt it to their needs.

"The material is always available on campus, from the beginning of the class, everything, because everyone has their own pace and wants to start when they want. So, we have all the resources, all the documents, all the audios... Everything is uploaded on the platform from the first day of class and is free. So, each student has access to this information when they want to, let's say" (P17)

"Many times, for example, blind people tell me <I need this material not only before, but digitalised, so that I can have it on the computer>. So we have to provide them with this material well in advance" (P35)

Making use of diversity and a multitude of resources was another of the actions put in place by faculty members to facilitate student inclusion. This facilitated the learning of the subject content, as the information could be perceived and processed through different channels and also enriched the teaching and learning process, promoting accessibility and student participation.

"I believe that the more senses we bring into play, the easier it is for information to enter. So, for example, they have the auditory and visual material, which, in many cases, like the Power Point presentation, can be voiced. They have more channels to access the content" (P9)

"The combination of resources allows for richer learning due to two factors that I think are closely related: motivation and learning. In other words, the most innovative resource, for example, augmented reality, always impresses on the first day, but if you only use augmented reality, it ceases to exist" (P14)

"Something that we take care of and that we look for when we are going to advance in different blocks is to provide them with information through different ways, and also that they produce it through different ways. For example, when we use the parable of the dinner guest, they have it in written form, we see it in the presentation and we transfer it to audio" (P18)

"I use many resources because I think they offer a different way of learning, not just reading a text and the faculty explaining it to me, but if a text is supporting an idea, then I reaffirm it more because I have seen this video or this song. I really like the educational accompaniment and that is an idea that is difficult to put into practice" (P24)

4. Discussion

The results obtained in this study allow us to draw clear conclusions about the many and varied technological resources used by university faculty who promote inclusion in their teaching. It also makes it possible to find out which are the main uses that these lecturers make of virtual learning platforms, as well as those that they use to a lesser extent. Finally, it shows the different actions that the teaching staff implement to facilitate access and participation of students with disabilities through technology. These results contribute to the advancement of knowledge of those key practices that guarantee inclusive and quality learning for all students.

With regard to the first objective of this study—*to find out the type of technological resources and media used by inclusive university faculty in their classes*—it has been found that, as Ferreira et al. [15], Dinmore [16], and Edyburn [17] point out, the technological resources and media most used by university faculty continue to be digital presentations, digital texts, videos, and virtual learning platforms. There are still few faculty members who use more innovative technological resources and media in the development of their

teaching practices, such as tools like Google Drive, applications like Kahoot, Socrative, or Remind; the educational use of audiovisual platforms like Spotify or Youtube; the use of mobile devices in the classroom; and even the use of social networks for academic purposes, such as Facebook or Twitter. These results allow us to affirm that it is not necessary to have expert technological knowledge in order to be able to carry out inclusive teaching practices. The analysis of the results shows that faculty who favor the inclusion of students with disabilities do not make use of emerging technologies in the development of their teaching—such as augmented reality, virtual intelligence, 3D printing, etc.—although they do begin to use some less conventional technological media and resources. Therefore, the results found serve to encourage and stimulate those faculty members who wish to teach in an inclusive way with technological resources and consider that they do not have sufficient technological competences to do so.

Given the importance of making good use of ICT [26], it is necessary to train university faculty in techno-pedagogical competences. The results of this study show that, despite using technological resources and media to promote student participation and accessibility, inclusive faculty members tend to use more conventional technologies rather than emerging or more innovative technologies.

This techno-pedagogical training would contribute to mitigating the resistance that persists among faculty members to the use of new technologies in higher education [28,31], since, as Cabero-Almenara [32] points out, faculty members tend to use technologies as resources to support their teaching practice instead of valuing them as transformative elements of the teaching-learning processes.

With regard to the second objective of this study—*to describe the different uses that inclusive university faculty make of virtual learning platforms*—the results show that faculty make a very instrumental use of these learning platforms, despite the great advantages and possibilities that these media have to develop quality digital learning and to promote the participation and accessibility of students with disabilities [18,23]. In this sense, most of the university faculty participating in this study use virtual learning platforms as a virtual repository and as a space for one-way communication with their students. Few lecturers used them to encourage communication and reflection among students, through the use of forums and chats, and very few lecturers used them as a means of delivering online activities and marking. This use of virtual learning platforms—only as a repository of materials and unidirectional communication—although it is true that it favors accessibility and flexibility in learning, prevents the participation of those students who, due to certain circumstances, cannot attend university classrooms for long periods of time.

These results invite us to reflect on the need to promote blended learning models [9] that enhance the pedagogical uses of these platforms. To this end, and to empower faculty members in the use of these tools, faculty must receive specific training to avoid the uncertainty generated by the lack of knowledge about the different applications that are hosted on them [33].

However, in addition to training faculty, in order to promote the inclusive use of virtual learning platforms and the progressive increase in their use, it is necessary for universities to have a good internet connection; a wide range of accessible learning materials adapted to the needs of all students [26]; and training for students in the use of the tool itself [34].

Finally, in relation to the third objective—to explore the actions implemented by inclusive university faculty to promote access and participation of students with disabilities through the use of technologies—the results allow us to draw very interesting conclusions, all of them related to the way in which faculty use technologies in the development of their teaching, so that it is inclusive and favors accessibility and participation of all students. With regard to the accessibility of technological resources, it can be concluded that inclusive faculty members are concerned to offer the different types of digital materials for their subjects in a way that responds to the preferences and needs of all their students (subtitled videos, audio-descriptions, presentations and texts in editable formats, etc.). In this sense, and as Seale et al. [26] and Youngblood et al. [27] point out, providing students with

accessible material is fundamental, as it contributes to removing barriers that students with disabilities may experience at university, and facilitates the academic success of all students.

The second conclusion that can be drawn from the results obtained is related to the point at which faculty involved in inclusive teaching practices provide their subject material to their students. Most of the faculty who participated in this study provided their students with the material in advance, either at the beginning of the subject or prior to the beginning of the thematic block to be addressed in class. In this respect, it is known that providing the material in advance facilitates accessibility to the content, as it allows students to adapt it to their needs [35], and thus promotes the participation of all students, especially those with disability, in the teaching–learning process.

A third finding of this study is related to the use of a variety of technological resources used by inclusive faculty members to present the contents of their subjects, as well as the diversity of ways or means through which they provide the material to their students. The results show that inclusive university faculty provide students with a variety of resources (videos, texts, concept maps, audio, etc.) to address each of the contents of their subjects and also make course material available to their students through different means (virtual learning platform, email, platforms such as Google Drive, etc.). These actions favor accessibility and participation in learning for students with disabilities, since, as Aquino and BuShell [21], Balakrishnan and Lay [20], or Young and Nichols [10] highlight, they increase students' motivation and attention, favor the development of technological skills, respond to students' needs, adapt to different learning paces and styles, offer the opportunity to obtain information from the resource that is most comfortable or familiar to them and promote more meaningful learning for students.

It is necessary to indicate that the participants in this study, in line with the findings of Lombardi et al. [36], choose to develop learning processes characterized by flexibility and accessibility for all students. In this sense, these faculty members offered their students various alternatives for access, representation and involvement, connecting these teaching practices with the three basic principles of UDL [24]. In this line, inclusive faculty members use a variety and multitude of resources to teach subject content, which allows students to perceive and understand the information presented to them, thus responding to the first principle of the UDL: offer multiple means of representation. On the other hand, it often provides course material in advance, allowing learners to modify and personalize it, adapting it to their needs. This action is closely linked to the second principle of the UDL: to provide multiple means of action and expression. Finally, faculty members use a variety of methodologies and teaching strategies, which makes it possible to respond to the different learning styles and interests of students. This last idea connects directly with the third UDL principle: providing multiple forms of engagement.

By way of conclusion, the results found in this study connect on the one hand with constructivist approaches [37], as faculty members encourage their students to play an active and autonomous role, considering them the true protagonists of the teaching and learning process [38], through the use of technological resources, virtual learning platforms, and the development of actions that favor the accessibility and participation of all students, including those with disabilities. Finally, it should be pointed out that, in order to continue making progress and to be able to take advantage of the benefits of technology as a transforming element in the teaching–learning processes, it is necessary for universities to offer solid training plans in two areas: the use of educational technologies and technological accessibility to favor the learning of all students.

Limitations and Future Research

One of the limitations of this work is linked to the methodological design, as the participants were not differentiated according to the area of knowledge to which they belong. In future research, it would be recommendable to take into account this differentiation by subject area in order to be able to analyze whether there are differences in the uses that teachers make of ICTs.

Another limitation of the study is related to the accessibility of the content. Future research could look more deeply into the degree of accessibility of the materials that teachers make available to students, in order to detect possible training needs in the design of accessible digital materials.

Author Contributions: Conceptualization, M.d.l.N.S.-D. and B.M.; methodology, M.d.l.N.S.-D. and B.M.; software, M.d.l.N.S.-D. and B.M.; validation, M.d.l.N.S.-D. and B.M.; formal analysis, M.d.l.N.S.-D. and B.M.; investigation, M.d.l.N.S.-D. and B.M.; resources, M.d.l.N.S.-D. and B.M.; data curation, M.d.l.N.S.-D. and B.M.; writing—original draft preparation, M.d.l.N.S.-D. and B.M.; writing—review and editing, M.d.l.N.S.-D. and B.M.; visualization, M.d.l.N.S.-D. and B.M.; supervision, M.d.l.N.S.-D. and B.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Ministry of Science and Innovation, State Research Agency and FEDER funds European Union, grant numbers EDU2016-76587-R/Feder Funds.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data can be obtained by contacting the authors of the article directly.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. United Nations. Convention on the Rights of Persons with Disability. 2006. Available online: https://www.un.org/development/desa/disability/convention-on-the-rights-of-persons-with-disability/conventionon-the-rights-of-persons-with-disability-2.html (accessed on 20 December 2022).
2. United Nations. Transforming Our World: The 2030 Agenda for Sustainable Development. 2015. Available online: https://www.un.org/ga/search/view_doc.asp?symbol=A/70/L.1&Lang=E (accessed on 20 December 2022).
3. Grasha, A.F.; Yangarber-Hicks, N. Integrating teaching styles and learning styles with instructional technology. *Coll. Teach.* **2010**, *48*, 2–10. [CrossRef]
4. McMahon, D.; Walker, Z. Leveraging emerging technology to design an inclusive future with Universal Design for Learning. *Cent. Educ. Policy Stud. J.* **2019**, *9*, 75–94. [CrossRef]
5. McNicholl, A.; Casey, H.; Desmond, D.; Gallagher, P. The impact of assistive technology use for students with disabilities in higher education: A systematic review. *Disabil. Rehabil. Assist. Technol.* **2021**, *16*, 130–143. [CrossRef] [PubMed]
6. Seale, J.K. *E-Learning and Disability in Higher Education: Accessibility Research and Practice*; Routledge: Abington-on-Thames, UK, 2013.
7. Núñez-Canal, M.; De Obesso, M.; Pérez-Rivero, C.A. New challenges in higher education: A study of the digital competence of educators in covid times. *Technol. Forecast. Soc. Chang.* **2022**, *174*, 121270. [CrossRef]
8. Bagur-Femenías, L.; Buil-Fabrega, M.; Aznar, J.P. Teaching digital natives to acquire competences for sustainable development. *Int. J. Sustain. High. Educ.* **2020**, *21*, 1053–1069. [CrossRef]
9. Porter, W.W.; Graham, C.R.; Spring, K.A.; Welch, K.R. Blended learning in higher education: Institutional adoption and implementation. *Comput. Educ.* **2014**, *75*, 185–195. [CrossRef]
10. Young, S.; Nichols, H. A reflexive evaluation of technology-enhanced learning. *Res. Learn. Technol.* **2017**, *25*, 1–13. [CrossRef]
11. Fernández Batanero, J.M.; Gonçalves Brigas, C.J. El juego como estrategia didáctica en la formación del profesorado en TIC y discapacidad. *Eur. J. Child Dev. Educ. Psychopathol.* **2019**, *7*, 225–233. [CrossRef]
12. Pelletier, K.; McCornack, M.; Reeves, J.; Robert, J.; Arbino, N.; Al-Freih, M.; Dickson-Deane, C.; Guevara, C.; Koster, L.; Sánchez-Mendiola, M.; et al. *EDUCAUSE Horizon Report, Teaching and Learning Edition*; EDUCAUSE: Boulder, CO, USA, 2022.
13. McNaughton, D.; Light, J. The iPad and mobile technology revolution: Benefits and challenges for individuals who require augmentative and alternative communication. *Augment. Altern. Commun.* **2013**, *29*, 107–116. [CrossRef]
14. Cabero-Almenara, J.; Puentes Puente, A. La Realidad Aumentada: Tecnología emergente para la sociedad del aprendizaje. AULA. *Rev. Humanid. Cienc. Soc.* **2020**, *66*, 35–51. [CrossRef]
15. Ferreira, C.M.; Santos, A.I.; Serpa, S. Electronic slideshow presentations in the higher education teaching and learning process. *J. Educ. Train. Stud.* **2018**, *6*, 120–124. [CrossRef]
16. Dinmore, S. Beyond lecture capture: Creating digital video content for online learning—A case study. *J. Univ. Teach. Learn. Pract.* **2019**, *16*, 1–10. [CrossRef]
17. Edyburn, D.L. Harnessing the potential of technology to support the academic success of diverse students. *New Dir. High. Educ.* **2011**, *154*, 37–44. [CrossRef]
18. Chowdhury, F. Virtual classroom: To create a digital education system in Bangladesh. *Int. J. High. Educ.* **2020**, *9*, 129–138. [CrossRef]

19. Saunders, F.C.; Gale, A.W. Digital or didactic: Using learning technology to confront the challenge of large cohort teaching. *Br. J. Educ. Technol.* **2012**, *43*, 847–858. [CrossRef]
20. Balakrishnan, V.; Lay, G.C. Students' learning styles and their effects on the use of social media technology for learning. *Telemat. Inform.* **2016**, *33*, 808–821. [CrossRef]
21. Aquino, K.C.; BuShell, S. Device usage and accessible technology needs for posttraditional students in the e-learning environment. *J. Contin. High. Educ.* **2020**, *68*, 101–116. [CrossRef]
22. Fichten, C.; Jorgensen, M.; Havel, A.; King, L.; Harvison, M.; Lussier, A.; Libman, E. More than meets the eye: A Canadian comparative study on PowerPoint use among postsecondary students with and without disability. *Int. Res. High. Educ.* **2019**, *4*, 25–36. [CrossRef]
23. Fichten, C.; Olenik-Shemesh, D.; Asuncion, J.; Jorgensen, M.; Colwell, C. Higher education, information and communication technologies and students with disability: An overview of the current situation. In *Improving Digital Practices in Higher Education: Challenges and New Practices for Inclusion*; Seale, J., Ed.; Palgrave: London, UK, 2020; pp. 22–44.
24. CAST. Universal Design for Learning Guidelines. Version 2.2. 2018. Available online: http://udlguidelines.cast.org (accessed on 1 January 2023).
25. Scott, L.; Bruno, L.; Gokita, T.; Thoma, C.A. Teacher candidates' abilities to develop universal design for learning and universal design for transition lesson plans. *Int. J. Incl. Educ.* **2022**, *26*, 333–347. [CrossRef]
26. Seale, J.; Colwell, C.; Coughlan THeiman, T.; Kaspi-Tsahor, D.; Olenik-Shemesh, D. Dreaming in Colour: Disabled Higher Education Students' Perspectives on Improving Design Practices That Would Enable Them to Benefit from Their Use of Technologies. *Educ. Inf. Technol.* **2021**, *26*, 1687–1719. [CrossRef]
27. Youngblood, N.E.; Tirumala, L.N.; Galvez, R.A. Accessible media: The need to prepare students for creating accessible content. *Journal. Mass Commun. Educ.* **2017**, *73*, 334–345. [CrossRef]
28. Fernández-Batanero, J.M.; Román-Graván, P.; Montenegro-Rueda, M.; López-Meneses, E.; Fernández-Cerero, J. Digital Teaching Competence in Higher Education: A Systematic Review. *Educ. Sci.* **2021**, *11*, 689. [CrossRef]
29. Universia Foundation. Discapacidad y Universidad. V Estudio Sobre el Grado de Inclusión del Sistema Universitario Español Respecto de la Realidad de las Personas con Discapacidad. 2021. Available online: https://www.fundacionuniversia.net/content/dam/fundacionuniversia/pdf/estudios/V%20Estudio%20Universidad%20y%20Discapacidad%202019-2020%20%20 (accessed on 20 December 2022).
30. Huber, G.L. The analysis of qualitative data as process of classification. In *Qualitative Research in Psychology*; Kiegelmann, M., Ed.; Verlag Ingeborg Huber: Tübingen, Germany, 2004; pp. 206–216.
31. Mercader, C. Las resistencias del profesorado universitario a la utilización de las tecnologías digitales. *Aula Abierta* **2019**, *48*, 167–174. [CrossRef]
32. Cabero-Almenara, J. University Teacher Training in ICT. Application of Delphi Method for the selection of training context. *Educación XXI* **2014**, *17*, 111–132. [CrossRef]
33. Aliaga, C.L.; Dávila, O.M. La plataforma Blackboard: Una herramienta para el proceso de enseñanza-aprendizaje. *Hamut'ay* **2021**, *8*, 42–58. [CrossRef]
34. Aguilar-Camaño, D.; Pifarré, M. Promoción de la creatividad social en la educación científica con tecnología digital para superar las desigualdades: Una revisión de alcance. *Front. En Psicol.* **2019**, *10*, 1–16. [CrossRef]
35. Perera, V.H.; Moriña, A.; Sánchez-Díaz, N.; Spinola-Elias, Y. Technological Platforms for Inclusive Practice at University: A Qualitative Analysis from the Perspective of Spanish Faculty Members. *Sustainability* **2021**, *13*, 4755. [CrossRef]
36. Lombardi, A.R.; Murray, C.; Kowitt, J. Social support and academic success for college students with disability: Do relationship types matter? *J. Vocat. Rehabil.* **2016**, *44*, 1–13. [CrossRef]
37. Cubero, R. La Intersección Entre el Significado, la Interacción y el Discurso. In *Perspectivas Constructivistas*; Graó: Barcelona, Spain, 2005.
38. Huber, G.L. Aprendizaje activo y metodologías educativas. *Rev. Educ.* **2008**, 59–81.