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Educational Inclusion through the Universal Design for Learning: Alternatives to Teacher Training

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Abstract: Universal design for instruction (UDI) is a teaching strategy that has proved its value in the process of educational inclusion, resulting in a fundamental tool for the achievement of objective 4 of the 2030 agenda for sustainable development. The lack of time of university professors and the scarce training offered in this subject make it difficult to know and implement UDI in university classrooms, increasing the risk of exclusion of students with some kind of disability. This study analyses the level of knowledge and implementation of the principles and strategies of UDI by university professors. Those professors did not have prior training, but they had access to the Curricular Adaptations of University Students with Special Educational Needs (CAUSSEN) tool as guide to implement different guidelines. The CAUSSEN tool is a document, developed by the Unit of Attention to People with Disability, in which there is information about UDI guidelines and accommodations referring to students with special educational needs. Results show a wide implementation of the UDI principles, despite the low level of previous knowledge its principles. This study concludes that there are practical alternatives to the lack of training, and that teachers' self-perception of their own effectiveness and ability to cope with the inclusion of all students should be strengthened.

Keywords: inclusion; universal design for learning; universal design for instruction; sustainable development goals; higher education

1. Introduction

Sustainable Development Goals (SDG) [1] propose the basis for a model of inclusive education at all educational levels, including the university level [2–6].

This is set out in goal 4 of the SDG: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all [1]. This is an educational philosophy widely developed in previous work during the recent decades. Furthermore, this is an issue that continues being a subject of controversy due to the lack of progress and forcefulness in its management [7–10].

Inclusive education is the realization of the right to learn in an educational system designed by taking into consideration the needs of all people, including those with disabilities. Inclusive schools welcome all students, regardless of their physical, intellectual, social, linguistic or other conditions [6]. Thus, diversity is respected and understood as an enriching element of the learning process [11]. Therefore, it is necessary to address education in three different areas which have the capacity and potential to encourage or limit the full inclusion of people with disabilities in the educational field. Those areas are "Culture, Policies and Inclusive Actions" [12]. Those areas aim to promote the presence, participation and achievement of all students, regardless of their status or background [11].

Various studies have analyzed the main barriers that limit the full inclusion and participation of students with disabilities at university [13], paying special attention to those related to the presence of

architectural barriers and the access to communication and information. However, it is important to take into consideration, as a key element in the learning process, teacher training and student attitudes towards fellow students with disabilities [14–18].

Another element which stands out as a barrier to achieve full inclusion is the tightly knit curriculum, described as "one size fits all" [19] for all students. This curricular rigidity makes it difficult to address the educational needs that may arise from situations of disability in the classroom [20]. The paradigm that can guarantee the elimination of the educational barriers and the basis which guarantees the access to the curriculum for all students is the universal design for learning (UDL) [21]. The application of the UDL in the academic area, with the aim of guaranteeing the full inclusion of all its members, is made by taking into consideration two perspectives: teaching by universal design and training in universal design [22].

From this perspective, universities, in first place, must guarantee that all students receive training in accessibility and design for all. Following the Spanish Royal Decree 1393/2007, of 29 October, in which is stablished the organization of Higher Education, special emphasis is made of the fact that all university degrees must contribute to the knowledge of the principles of accessibility and design for all. However, only 16% of Spanish universities have introduced training in this subject in their official degree courses [15,23–25].

The second strand, linked to teaching from the perspective of universal design, reveals the need to train university professors in UDL, understanding this as "a research-based approach to curriculum design that enables everyone to develop knowledge, skills, motivation and involvement in the learning process" [19].

This pedagogically based tool has given rise to various conceptions. One of them is the universal design for instruction (UDI), whose specific field of application is the university environment. UDI aims to anticipate and to plan the learning process in order to guarantee the access to the university curriculum for all students [26].

In Spain, training of university teachers in the field of UDI is not developed enough. This is demonstrated by studies which analyzed this issue and the impact of the lack of training on the self-efficacy perceived by teachers in terms of their ability to deal with diversity in the classroom [14,27]. In this sense, services provided by the Unit of Attention of People with Disability in Spanish universities [28] have developed training initiatives and practical application of the UDI focused on university professors with the aim of promoting full inclusion in the classroom. One example of this is the Curricular Adaptations of University Students with Special Educational Needs (CAUSSEN) initiative [29].

The CAUSSEN report, an acronym for "Curricular Adaptations of University Students with Special Educational Needs", developed in 2018 by the Unit of Attention of People with Disabilities and Special Educational Needs. This tool aims to inform professors about the accommodations necessary in the curricular design of their subjects in those cases where a student with a disability or Special Educational Need is enrolled [29].

This study aims to find out the level of implementation of the principles of the UDI, as well as the perceived effectiveness of professors at Rey Juan Carlos University during the 2018/2019 academic year and after being trained with the CAUSSEN tool.

As a brief contextualization, Rey Juan Carlos University is the most modern public university in Spain. Inaugurated in 1996 and located in Madrid, it comprises five campuses, which are in the cities of Aranjuez, Fuenlabrada, Móstoles, Alcorcón and Madrid. In addition, it has several centers where degrees are also taught (Madrid-Manuel Becerra, Madrid-Quintana and Madrid-Velázquez). In turn, it has various faculties (Faculty of Legal and Social Sciences; Faculty of Health Sciences; and Faculty of Communication Sciences) and schools (School of Computer Engineering; School of Experimental Sciences and Technology; School of Telecommunications Engineering; School of Official Masters; and International School of Doctoral Studies). According to the latest data, available in the 1985–2019 Statistical Yearbook of the Community of Madrid [30] during the 2017–2018 academic year, the Rey

Juan Carlos University had 46,451 students, making it the second largest university in number and only surpassed by the Complutense University of Madrid (with 64,384 students). As far as teaching and researching staff is concern, data indicate a total of 1780 professors during 2017/2018 academic year.

It is important to highlight that, from the total number of students, nearly 2% are students with disabilities. In this sense, the Unit of Attention of People with Disability is the service which provides students with special educational needs with the accommodations needed in order to guarantee equality in university studies.

2. Materials and Methods

This research is based on the application of a questionnaire as a technique for the collection of information. Results were analyzed with the SPSS v22 software. This study was focused on Rey Juan Carlos University professors who, during the academic year 2018/2019, had students with disabilities in the classroom who had previously requested support from the Unit of Attention to Students with Disabilities. At the end of the academic year (July 2019), professors who had received the CAUSSEN report during the academic year were contacted by e-mail.

The questionnaire applied was an adaptation of the Inclusive Teaching Strategies Inventory (ITSI) [31], which describes an excellent reliability (Cronbach's alpha = 953). ITSI is a revised scale that measures six constructs [31]: multiple means of representation, inclusive lecture strategies, accommodations, campus resources, inclusive assessment and accessible course materials.

Items are distributed in two main dimensions:

- Five items collect information relating to the socio-demographic profile of the people that have participated in the research and their level of knowledge about the UDL and UDI guidelines.
- The second dimension is made up of 23 items, organized on a Likert-type scale (from 1 "totally disagree" to 5 "totally agree"). This part of the questionnaire is focused on identifying the level of implementation of the teaching strategies transmitted by the technical staff, who are specialized in educational inclusion and who are responsible for the selection of different UDI guidelines.

3. Results

Of the 342 professors who received the CAUSSEN report in the academic year 2018/2019, 255 responses were obtained (response rate 74.56%). Of these, 49% of were male and 51% were female. These professors represent 100% of the degree courses that have had students with disabilities in their classrooms during the 2018/2019 academic year. During this academic year, a total of 372 students identified themselves as having a disability when they registered at university. Of all of them, 120 were enrolled at the Unit of Attention of Persons with Disabilities (Table 1).

When teachers were asked about the type of disability their students presented, answers were similar to the actual representation of the census (Table 2). In this sense, 45.5% of the answers identified that their students presented physical disability; 53.3% of the total number of students in the census with a disability profile presented physical disability, followed by mental disability (18.3%), and sensory disability (23.5%).

When asked for information about the level of knowledge of the UDL, 54.5% indicated that they did not know about it; 12.9% indicated that they did know it; and 32.5% indicated that they did not know it as much as they would like. As far as UDI is concerned, the level of ignorance increases: 62.7% did not know it, 31.4% did not know it as much as they would like, and 5.9% claimed to know it (Table 3).

When asked about the application and development of methodologies, techniques and strategies focused on UDI (Table 4), the answers (n = 255) are fairly homogeneously distributed. Of the 14 items analyzed, 12 are situated above 4 out of 5, being the extension of time for the carrying out of assessment tests the one that presents the greatest acceptance (M = 4.93; SD = 0.250). On the other hand, items related to the possibility of offering different alternatives to demonstrate the acquired knowledge

(M = 3.96; SD = 1.211), along with the strategy of ending the class making a summary with the most relevant aspects of the session, are the least implemented by professor (M = 3.78; SD = 1.206).

Table 1. Distribution of students with disabilities by university degrees.

Legal and Social Sciences	**62.8%**
Degree in Physical Activity and Sport Sciences	2.8
Degree in Pre-Primary Education	4.2
Degree in Primary Education	6.8
Degree in Spanish Sign Language and Deaf Community	6.4
Degree in Business Administration and Management	8
Degree in Journalism	11.6
Degree Audiovisual Communication	4.4
Degree in Political Science and Public Management	6.2
Degree in Science, Management and Service Engineering	0.8
Degree in Law	4.4
Degree in Advertising and Public Relations	0.4
Degree in Economics	2.4
Degree in Labour Relations and Human Resources	0.8
Degree in Protocol, Events organization and Corporate Communication	0.8
Degree in International Relations	0.4
Degree in Social Working	1.6
Degree in Tourism	0.4
Degree in Criminology	0.4
Science	**7.2%**
Degree in Biology	6.0
Degree in Environmental Sciences	0.8
Degree in Experimental Sciences	0.4
Health Science	**10.8%**
Degree in Nursery	4.4
Degree in Physiotherapy	0.4
Degree in Medicine	1.6
Degree in Dentistry	0.8
Degree in Psychology	3.6
Engineering and Architecture	**11.2%**
Degree in Architecture	6.0
Degree in Chemical Engineering	0.4
Degree in Energy Engineering	0.4
Degree in Software Engineering	0.4
Degree in Computer Engineering	0.8
Degree in Informatics	1.2
Degree in Designing and Development of Videogames	2.0
Arts and Humanities	**8%**
Degree in Integral Design and Image Management	1.2
Degree in Fashion	0.8
Degree in Fine Arts	2.0
Degree in History	4.0

Table 2. Students with disability by type of disability.

	N	**Answers**	**Valid Percentage**	**Cumulative Percentage**
Physical disability	255	116	45.5%	45.5%
Mental disability	255	79	31.0%	76.5%
Visual disability	255	32	12.5%	89.0%
Hearing disability	255	28	11.0%	100.0%
Total		255	100.0%	100.0%

Table 3. Level of knowledge of universal design for instruction (UDI) perceived by professors.

		Do You Know Universal Design for Learning (UDL)?			Do You Know UDI?		
		No	Yes	Not as Much as I Would Like to	No	Yes	Not as Much as I Would Like to
Kind of contract	Visiting lecturer	21.56%	6.27%	13.72%	25.09%	1.96%	14.5%
	Associate professor	4.31%	1.17%	8.23%	5.09%	0.78%	7.84%
	Hired doctor professor	5.88%	0.78%	2.74%	7.05%	0.39%	1.96%
	Tenured lecturer	16.86%	2.35%	4.31%	18.03%	1.56%	3.92%
	Full professor	2.74%	0.39%	1.17%	3.52%	0.39%	0.39%
	Assistant lecturer	3.13%	1.96%	2.35%	3.92%	0.78%	2.74%

Table 4. Application of methodologies, techniques and teaching strategies based on UDI.

	N	Min	Max	M	SD
Level of agreement in the use of technology for class monitoring and testing	255	1	5	4.64	0.735
Level of agreement in the provision of a copy of the contents to be discussed in class or a summary with the most important aspects to facilitate follow-up	255	1	5	4.22	1.204
Level of agreement in the use of different forms of examinations, adapted to the educational needs of the students (test, short questions, essay questions, oral questions, etc.)	255	1	5	4.05	1.180
Level of agreement in the use of individualized accommodation according to the educational needs of students based on the Curricular Adaptations of University Students with Special Educational Needs (CAUSSEN) report	255	1	5	4.32	1.034
Level of agreement related to the beginning of classes with a brief summary of the points to be covered that day	255	1	5	4.36	0.839
Level of agreement related to the ending of classes by doing a brief summary of the important aspects seen that day	255	1	5	3.78	1.206
Level of agreement related to the connection of the important points taught in class with the main objectives and competences of the subject	255	1	5	4.35	0.794
Level of agreement related to the display materials available in different formats	255	2	5	4.44	0.775
Level of agreement related to display of contents in different formats (e.g., text, audio, video, diagrams, etc.)	255	1	5	4.14	1.078
Level of agreement related to the use of different alternatives to encourage students' engagement to the subject	255	1	5	4.01	1.101
Level of agreement related to the use of different methodologies in class to encourage the participation of all students (e.g., master classes, small group work, cooperative work, etc.)	255	1	5	4.36	0.958
Level of agreement related to the demonstration of knowledge through different ways than traditional exams	255	1	5	3.96	1.211
Level of agreement in the use of additional time for exams as indicated in the CAUSSEN report	255	4	5	4.93	0.250
Level of agreement in the use of additional time to students with disabilities for assignments submissions (if required), as indicated in the CAUSSEN report	255	4	5	4.89	0.308

When analyzing the level of implementation of each element that contains UDI, according to the type of disability in the classroom, it was detected that professors allow the use of assistive technology to facilitate the monitoring of classes and the taking of exams, regardless of the type of disability

presented by the student (Table 5). In all cases, an M = 4.5 is obtained, being the highest score obtained in cases in which the students presented visual disability (SD = 0.397).

Table 5. Use of assistive technology by type of disability.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of technology in class and during exams	N	116	79	32	28
	M	4.65	4.51	4.81	4.75
	SD	0.737	0.845	0.397	0.645

Professors provide students with the content taught in each session through the virtual classroom (Table 6). Normally professors tend to upload slides and audiovisual resources they use as a support of their classes. Results in this item are above 4 in all cases. Although it is relevant that the lowest score was obtained in the cases where a student with hearing disability was in the classroom (M = 4.04; SD = 1.347), followed by cases of mental and intellectual disability (M = 4.15; SD = 1.199). The types of disability in which the result of this item increases is in physical disability (M = 4.25; SD = 1.201) and sensory disability (M = 4.47; SD = 1.107).

Table 6. Copy of contents thought in class.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the provision of a copy of the contents to be discussed in class or a summary with the most important aspects.	N	116	79	32	28
	M	4.25	4.15	4.47	4.04
	SD	1.201	1.199	1.107	1.347

The possibility of offering different ways for students to show what they have learned is often an alternative present in the classroom, as shown in Table 7. However, it is striking to note that teachers of students with physical disabilities are the least likely to offer these format modifications (not content or evaluation criteria).

Table 7. Different forms of evaluation.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of different forms of evaluation, adapted to the educational needs of the students (test, short questions, essay questions, oral questions, etc.)	N	116	79	32	28
	M	3.97	4.05	4.31	4.04
	SD	1.219	1.197	1.091	1.071

As shown in Table 8, teachers admit to making the individualized accommodations reflected in the CAUSSEN report. In this way, teachers of hearing and mentally impaired students are the ones who implement those accommodations with more frequency. On the contrary, teachers of students with visual impairment (M = 4.12; SD = 1.212) and physical impairment (M = 4.25; SD = 1.110) indicate a lower acceptance of standardized accommodations and a higher dispersion of results. However, all the scores are above 4.

Table 8. Individualized accommodations according to type of disability.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of individualized accommodations according to the educational needs of students based on the CAUSSEN report	N	116	79	32	28
	M	4.25	4.42	4.12	4.57
	DT	1.110	0.928	1.212	0.690

The participating professors stated that they present a summary of the most relevant aspects that will be dealt with in the classroom (Table 9). The highest scores were given by professor of students with hearing and visual impairment (M = 4.64 and 4.53; SD = 0.678 and 671 respectively).

Table 9. Summary of key points before class.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement related to the beginning of classes with a brief summary of the points to be covered that day	N	116	79	32	28
	M	4.31	4.27	4.53	4.64
	SD	0.796	0.983	0.671	0.678

Less frequently, professors close each session by summarizing the most relevant aspects dealt with in class (Table 10). Teachers of students with visual impairment make the most use of this strategy (M = 4.19; SD = 0.965).

Table 10. Summary of key points after class.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement related to the ending of classes with a brief summary of the points seen that day	N	116	79	32	28
	M	3.78	3.58	4.19	3.86
	SD	1.207	1.307	0.965	1.079

In all cases, professors coincide in the connection they make between the content seen in the classroom and the objectives and competences of each subject (Table 11). All the results obtained are close to an average mark of 4.5 with a SD between 0.507 and 0.883.

Table 11. Connection of the important points taught in class.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the connection of the important points taught in class with the main objectives and competences of the subject	N	116	79	32	28
	M	4.31	4.39	4.53	4.21
	SD	0.796	0.883	0.507	0.787

Professors confirm the use of technology to offer teaching materials and didactic proposals in different supports and formats (Table 12). The average mark is around 4.5 points.

Table 12. Use of technology to make contents available in different formats.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of technology to make contents available in different formats?	N	116	79	32	28
	M	4.49	4.28	4.53	4.54
	SD	0.752	0.861	0.671	0.693

Less common, although with results above 4, are shown when offering the contents in different formats (Table 13). In this case, professors of students with visual, mental and intellectual disabilities are the ones who offer varied alternatives in this matter. In the case of students with physical and hearing disabilities this option is less frequent.

Table 13. Use of contents in different formats.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement related to the presentation of contents in different formats (e.g., text, audio, video, diagrams, etc.)	N	116	79	32	28
	M	4.09	4.20	4.28	4.00
	SD	1.134	1.005	0.991	1.155

Students with visual disability receive more alternatives to promote their engagement with the subjects (M = 4.38; SD = 0.907) (more than the rest of the disability profiles). In this sense students with a physical disability tend to have less alternatives to strengthen their adherence to the subject (M = 3.79; SD = 1.146), as reflected in Table 14.

Table 14. Alternatives to promote engagement.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the provision of different alternatives to encourage students' engagement to the subject	N	116	79	32	28
	M	3.79	4.15	4.38	4.07
	SD	1.146	1.099	0.907	0.979

The combination of different methodologies in the classroom has been varied, as reflected in Table 15, where all teachers are close to an M = 4.5. Professors do not opt for a single methodology. Those teachers whose students present sensory disabilities tend to be more perceptive. Again, it is the case of students with physical disabilities where the greatest dispersion is detected (M = 4.27; SD = 1.016).

Table 15. Use of different methodologies to encourage participation in class.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of different methodologies to encourage the participation of all students (e.g., master classes, small group work, cooperative work, etc.)	N	116	79	32	28
	M	4.27	4.32	4.66	4.57
	SD	1.016	0.955	0.787	0.836

As reflected in Table 16, professors of students with sensory disabilities are more likely to allow students to show their knowledge through different ways than the traditional tests. In contrast, professors of students with physical, mental and intellectual disabilities show that they do not offer this alternative as often, accumulating an M < 4 and a SD = 1.269 and 1.263, respectively.

Table 16. Demonstration of knowledge through different ways.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement related to the demonstration of knowledge in other ways different than traditional exams by students	N	116	79	32	28
	M	3.82	3.91	4.31	4.25
	SD	1.269	1.263	0.780	1.143

Professors show high acceptance of the "extra-time" variable to facilitate access to the curriculum for their students, regardless of the type of disability. This can be seen both in the performance of assessment tests (Table 17) and in the preparation and submission of assignments (Table 18).

Table 17. Use of additional time for exams.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of additional time for exams as indicated in the CAUSSEN report	N	116	79	32	28
	M	4.94	4.92	4.94	4.93
	SD	0.239	0.267	0.246	0.262

Table 18. Use of additional time for assignments submission.

Type of Disability		Physical Disability	Mental and/or Intellectual Disability	Visual Disability	Hearing Disability
Level of agreement in the use of additional time to students with disabilities for assignments submissions (if required), as indicated in the CAUSSEN report	N	116	79	32	28
	M	4.88	4.91	4.91	4.89
	SD	0.327	0.286	0.296	0.315

If the level of implementation of strategies proposed by the UDI work frame are analyzed, according to the areas of academic knowledge (Table 19), the results are positive. As it can be observed, items related to the extension of time for taking exams and for preparing/submitting assignments reach a total mark M > 4.9.

Teachers of Legal and Social Sciences indicate that they implement all the proposals in a very positive way, achieving scores above 4 in 13 of the 14 items. However, the least frequent strategy is to finish their classes with a summary by emphasizing key contents taught during the lesson (M = 3.84; SD = 1.198).

In the case of professors of Arts and Humanities, the results are very similar to those obtained in Social Sciences. That is, 13 of the 14 items, scored higher than 4. Besides, six of them show a higher level of implementation among all the knowledge areas. Specifically, professors in this branch of knowledge tend to make a summary at the end of each session; they provide students with different formats and materials for the instructions of their subjects; they combine different methodologies; they offer learning alternatives to strengthen the commitment of the students with the subject. Also, they provide with different evaluation systems so that they can adjust it to the capacities of the students with disabilities (M = 4.20; SD = 696). This last strategy contradicts the results obtained when asking about the possibility of presenting the assessment tests in different ways and adapted to students with disabilities (M = 3.80; SD = 1.152).

In the case of Health Sciences, the number of items which are higher than 4 is reduced to a total of eight, emphasizing the following ones. First of all, the use of assistive technology (branch of knowledge with the highest score in this item: M = 4.83; SD = 0.378). Secondly, the offer of a summary of key contents prior to start of each session. Thirdly, the willingness to take curricular accommodations proposed in the CAUSSEN report by professors and the effort to allow extra time for assessment tests and assignments. Moreover, they tend to integrate different methodologies to favor the learning process of every student. On the contrary, there is evidence of a lack in the provision of content; in the variety of supports in which the materials are offered; and in the additional and complementary learning alternatives.

Teachers of Engineering, Architecture and Sciences have shown a level of implementation of the strategies offered by the UDI very similar to the previous ones, described in Health Sciences. However, in the case of Science, professors tend to offer the contents taught in class (M = 4.63; SD = 1.025) in different formats so that students can access to them regardless of their characteristics derived from their disability situation. Also, Science professors stand out for the implementation of the curricular adaptations reflected in the CAUSSEN report (M = 4.45; SD = 0.925) and for guaranteeing the extension of time in the evaluation processes (M = 5; SD = 0.000).

Table 19. Distribution of UDI by branch of knowledge.

		Legal and Social Sciences	Health Sciences	Arts and Humanities	Science	Engineering and Architecture
Level of agreement in the use of technology for class monitoring and testing	N	152	36	20	16	31
	M	4.65	4.83	4.50	4.37	4.55
	SD	0.712	0.378	0.513	1.204	0.925
Level of agreement in the provision of a copy of the contents to be discussed in class or a summary with the most important aspects to facilitate follow-up	N	152	36	20	16	31
	M	4.15	3.97	4.55	4.63	4.45
	SD	1.233	1.424	0.759	1.025	1.028
Level of agreement in the use of different forms of examinations, adapted to the educational needs of the students (test, short questions, essay questions, oral questions, etc.)	N	152	36	20	16	31
	M	4.21	3.89	3.80	3.88	3.68
	SD	1.040	1.260	1.152	1.360	1.536
Level of agreement in the use of individualized accommodation according to the educational needs of students based on the CAUSEEN report	N	152	36	20	16	31
	M	4.30	4.39	4.30	4.19	4.45
	SD	1.097	0.964	0.733	1.167	0.925
Level of agreement related to the beginning of classes with a brief summary of the points to be covered that day	N	152	36	20	16	31
	M	4.53	4.22	4.20	3.38	4.32
	SD	0.700	0.591	0.410	1.586	1.013
Level of agreement related to the ending of classes by doing a brief summary of the important aspects seen that day	N	152	36	20	16	31
	M	3.84	3.64	4.00	3.06	3.90
	SD	1.198	1.099	0.795	1.436	1.375
Level of agreement related to the connection of the important points taught in class with the main objectives and competences of the subject	N	152	36	20	16	31
	M	4.35	4.11	4.35	4.31	4.68
	SD	0.816	0.887	0.489	1.014	0.475
Level of agreement related to the use of technology for the display of materials available in different formats	N	152	36	20	16	31
	M	4.50	4.19	4.55	4.50	4.29
	SD	0.728	0.920	0.510	0.516	1.006
Level of agreement related to display of contents in different formats (e.g., text, audio, video, diagrams, etc.)	N	152	36	20	16	31
	M	4.16	3.97	4.40	4.13	4.10
	SD	1.080	1.000	0.940	1.310	1.136

Table 19. *Cont.*

		Legal and Social Sciences	Health Sciences	Arts and Humanities	Science	Engineering and Architecture
Level of agreement related to the use of different alternatives to encourage students' engagement to the subject	N	152	36	20	16	31
	M	4.16	3.44	4.35	3.69	3.87
	SD	0.984	1.157	0.933	1.401	1.284
Level of agreement related to the use of different methodologies in class to encourage the participation of all students (e.g., master classes, small group work, cooperative work, etc.)	N	152	36	20	16	31
	M	4.44	4.22	4.80	4.13	4.00
	SD	0.919	0.929	0.410	1.147	1.183
Level of agreement related to the demonstration of knowledge through different ways than traditional exams	N	152	36	20	16	31
	M	4.13	3.39	4.20	3.75	3.71
	SD	1.161	1.315	0.696	1.291	1.346
Level of agreement in the use of additional time for exams as indicated in the CAUSSEN report	N	152	36	20	16	31
	M	4.93	4.89	4.95	4.94	5.00
	SD	0.260	0.319	0.224	0.250	0.000
Level of agreement in the use of additional time to students with disabilities for assignments submissions (if required), as indicated in the CAUSSEN report	N	152	36	20	16	31
	M	4.91	4.89	4.75	4.94	4.90
	SD	0.290	0.319	0.444	0.250	0.301

Apart from the descriptive study, a deeper analysis was developed. ANOVA test was carried out by studying separately the relation of two factors. On the one hand, the profile of the professor and, on the other, the branch of knowledge in which he or she usually teaches.

With regard to the teacher profile, statistically significant differences were detected in the variables indicated in Table 20.

Table 20. Differences between professor's profile and brand of knowledge.

Item	p (<0.05)
Do you know UDL?	0.002
Do you know UDI?	0.001
Do you explain your contents properly?	0.008
Are your activities adjusted to the teaching guide?	0.017
Level of agreement related to the beginning of classes with a brief summary of the points to be covered.	0.000
Level of agreement related to a brief summary of the points seen in class	0.012
Level of agreement related to the connection of the important points taught in class with the main objectives and competences of the subject	0.004
Level of agreement related to alternatives to encourage students' engagement to the subject	0.01
Level of agreement to demonstrate knowledge in different ways than through traditional exams	0.049

Using Bonferroni's test to identify where such differences occur, it was observed that associate teachers know UDL more in depth than full professors. As far as the UDI guidelines are concern, associate lecturers are more into them than permanent professors (hired doctors, tenured and full professors). Associate professors also consider that they explain contents better than full professors ($p = 0.039$), starting their classes with a brief summary. Related to this, associate professors tend to do it with more frequency than visiting lecturers ($p = 0.011$), full professors ($p = 0.002$) and tenured professors ($p = 0.031$). Similarly, associate's professors tend to conclude their classes with a brief summary of the of the principal contents taught rather than visiting professors ($p = 0.024$). Apart from that, it is observed that assistant lecturers connect points seen in class with the objectives and competences of the subject more than visiting teachers (0.003). Besides, assistant lecturers tend to offer different alternatives to encourage students' commitment to the subject more often than full professors ($p = 0.038$).

With regard to the Bonferroni test, using the branch of knowledge as a grouping factor, more in-depth information was obtained about the differences detected with the ANOVA of a factor, presenting in this section only the items where statistically significant differences were detected ($p < 0.05$). Thus, it can be stated that professors in the field of Health Sciences consider themselves capable of identifying the type of disability presented by their students more frequently than those in Legal and Social Sciences ($p = 0.018$), Arts and Humanities ($p = 0.006$), Science ($p = 0.047$) and Engineering and Architecture ($p = 0.005$).

With regard to knowledge of the UDL, Legal and Social Science professors know its principles and guidelines better than Health Science professors ($p = 0.002$) and Science professors ($p = 0.011$). Arts and Humanities professors also know more about it than Health Science professors ($p = 0.004$) and Science professors ($p = 0.006$). As UDI guidelines are concerned, they are better implemented by teachers of Legal and Social Sciences rather than those of Health Sciences ($p = 0.005$) and Science ($p = 0.007$).

Legal and Social Science professors and Science professors begin their classes with a brief summary, unlike Science professors ($p = 0.000$ and $p = 0.02$ respectively). Furthermore, Engineering and Architecture professors tend to connect the important points of the subject to its objectives and its competencies. However, Health Science professors ($p = 0.018$) do so less frequently.

In terms of offering different alternatives to encourage students' commitment to the subject, Legal and Social Sciences and Arts and Humanities professors are more used to doing that, rather than those of Health Sciences ($p = 0.004$ and $p = 0.016$, respectively). On the other hand, professors of Arts

and Humanities tend to use different methodologies in their classes to promote student participation with more frequency than professors of Engineering and Architecture ($p = 0.048$).

Legal and Social Science professors, moreover, make it possible to demonstrate the knowledge acquired by students through assessment methodologies other than the traditional exam. This contrasts with the results obtained from professors of Health Sciences, who do so to a lesser extent ($p = 0.007$).

4. Discussion

Coinciding with Moriña et al. [14], professors show a clear lack of knowledge of both UDL and UDI guidelines, which puts the educational success of university students with disabilities at risk [32,33]. It is essential to promote and enhance training aimed at strengthening the amount of pedagogical and didactic tools available in order to achieving full inclusion and, with it, SDG 4.

Despite this fact, professors have shown a high level of implementation of the principles and actions described in the DUI guidelines, regardless of the type of disability presented by students and without significant differences in terms of the branch of knowledge in which they teach.

This level of acceptance and implementation of strategies focused on UDI is due to the tool used by the Unit of Attention of People with Disabilities, the CAUSSEN Report [29], which acts as a vehicle for providing teachers with the necessary information to promote the presence of inclusive teaching strategies in the classroom.

This report mitigates the impact that the lack of specific teacher training generates in the academic course of students with disabilities, because it works as a channel of information about educational needs and principal UDI guidelines to implement in the classroom. Thus, attention to diversity is presented from an inclusive perspective and approach, providing university teachers with appropriate strategies and tools. As recommended by Comes et al. [34], there is a need to provide professors with a structured guide that collects the most relevant information related to student's situation just to meet their educational needs, in order to promote the inclusion process.

Having analyzed the results, it is essential that professors perceive that they are following the general guidelines that describe inclusive education, so that the perception they have about their levels of effectiveness in this situation will correspond to reality. It can help to prevent this false belief from jeopardizing the dynamics of the classroom and the learning process for students with disabilities [14–17].

Following the work of Sandoval, Simon and Marquez [13], in which they identify the main barriers which limit the full participation and inclusion of students with disabilities in the university environment, this study has highlighted the strategies and tools developed by professors to eliminate barriers. These strategies include flexibility in the time taken to carry out assessments, tests and in the submission of tasks by respecting the different rhythms of learning and execution; the distribution of materials in different supports and formats as a key element to eliminate any barrier to access to communication that could interfere with the acquisition of learning by any student; and the incorporation of the use of technology in a standardized way as a tool to promote the academic development and follow-up.

On the contrary, although the level of implementation is positive, it is necessary to emphasize the need to allow students to show their knowledge and learning through tests and formats that are adjusted to their real abilities, without altering the objectives, contents or evaluation criteria.

It is clear that professors tend to collaborate and to get involved in the process of inclusion of students with disabilities, following the guidelines offered by the specialized services for this group of people in the university environment.

In order to achieve higher levels of inclusion, it is essential to reinforce teacher training mechanisms in this subject and to articulate a homogeneous information system in the university network which allows professors to be informed of the needs of people with disabilities. The link between specialized services and professor must be close, so the first could be perceived as allies with a common goal.

All of this would promote a true inclusive, equitable and quality education, as described in SDG 4 of Agenda 2030.

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