

CHALLENGES OF DIVERSIFICATION IN INITIAL TEACHER TRAINING FROM UDL PRINCIPLES: WHAT DO PRE-SERVICE TEACHERS KNOW? DESAFÍOS DE LA DIVERSIFICACIÓN EN LA FORMACIÓN INICIAL DOCENTE DESDE LOS PRINCIPIOS DEL DUA: ¿QUÉ CONOCE EL ALUMNADO?

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ABSTRACT

Keywords:

diversification of education, learning method, teacher training, educational policy, educational inclusion.

Introduction. The educational system in the 21st century faces the task of ensuring inclusion and diversification in the classroom. In this context, Universal Design for Learning (UDL) emerges as a key strategy to address the diverse educational needs of students. However, teacher preparation in this area remains a challenge as teachers do not always have skills in teaching, assessment and diversity management. The aim of this study was to analyze what students in training know about UDL and the challenges of diversification in initial teacher training at a Chilean university. Methodology. A mixed research approach was used, considering the use of surveys and focus groups. The participants were trainee teachers from various cohorts of the degree course. A diagnostic survey was used with 117 participants, followed by a focus group in which 6 trainee teachers participated. Results. It is observed that trainee teachers have a general knowledge of the principles of UDL, although their mastery of the specific guidelines is limited. Self-efficacy to implement inclusive practices increases with years of study, but does not guarantee effective implementation of the UDL. The main challenges include lack of time for planning and resistance to change in institutions. Conclusions. The current training does not allow for adequate practical development of UDL. It is recommended that practical training and institutional support be strengthened to improve UDL implementation.

RESUMEN

Palabras clave: diversificación de la educación, método de aprendizaje, formación de docentes, política educacional, inclusión educativa.

Introducción. La educación del siglo XXI enfrenta el desafío de garantizar la inclusión y la diversidad en el aula. En este contexto, el Diseño Universal para el Aprendizaje (DUA) surge como una estrategia clave para atender las distintas necesidades de los estudiantes. Sin embargo, la preparación docente en este tema sigue siendo un desafío ya que no siempre cuentan con habilidades en enseñanza, evaluación y gestión de la diversidad. El objetivo de este estudio ha sido analizar qué conoce el alumnado en formación sobre el DUA y los desafíos de la diversificación en la formación inicial docente en una universidad chilena.

Metodología. Se ha realizado una investigación con enfoque mixto, considerando el uso de encuestas y de grupos focales. Los participantes fueron docentes en formación de varias cohortes de la carrera. Se utilizó una encuesta diagnóstica con 117 participantes y, posteriormente, un grupo focal en el que participaron 6 docentes en formación. **Resultados.** Se observa que docentes en formación tienen un conocimiento general de los principios del DUA, aunque su dominio de las pautas específicas es limitado. La autoeficacia para implementar prácticas inclusivas aumenta con los años de estudio, pero no garantiza una aplicación efectiva del DUA. Los principales desafíos incluyen la falta de tiempo para planificar y la resistencia al cambio en las instituciones. **Conclusiones.** La formación actual no permite un adecuado desarrollo práctico del DUA. Se recomienda fortalecer la formación práctica y el apoyo institucional para mejorar la implementación del DUA.

Introduction

In recent years, education has undergone a paradigm shift, oriented towards the search for quality and excellence in an increasingly complex context. The educational institutions of the 21st century face challenges, among which the need for an education that is inclusive and promotes values, principles and democratic and solidarity-based convictions stands out (Leiva Olivencia, 2013).

Universal Design for Learning (UDL) is a pedagogical strategy that seeks to respond to diversity in the classroom and aims to reduce the barriers present in the educational environment. It considers the wide range of abilities, learning styles and preferences (Montoya Naguas et al., 2024). The UDL promotes educational equity by offering multiple forms of representation, expression and participation.

Inclusive education starts from the premise of transforming the education system, so that it allows all students to have equal access to learning opportunities, eliminating barriers and adapting policies respecting diversity and developing their potential (Bell Rodríguez et al., 2022; Echeita Sarrionandia, 2017).

In Chile, the education system has Decree 83/2015, which approves criteria and guidelines for curricular adaptation for students with special educational needs in Basic and Kindergarten Education. This decree establishes the principles of educational inclusion, allowing the elimination or reduction of barriers in schools. It also introduces measures to design and make the curriculum more flexible to the specific needs of students, including the application of curricular adjustments and differentiated assessments, which are implemented through planning, cooperation and feedback among educational actors.

In this sense, promoting inclusion addresses multiple aspects. In addition to the challenges mentioned above, it is essential to recognize the importance of teacher preparation and attitude. This involves skills related to teaching, assessment, interactions, and creating a collaborative and accepting classroom environment. Research highlights the concern of teachers to make their teaching more flexible and to respond effectively to the diversity of students in heterogeneous classrooms. For example, Cisternas and Lobos (2016) discuss student difficulties in practice and beginning teachers. Among their findings, they underline the scarce contribution of initial training to solve common situations in teaching, such as the design of evaluation instruments that reflect the diversity of learning in the classroom.

In Chile, educational institutions have begun to include a growing number of students with diverse characteristics and educational needs, driven in part by sociocultural diversity due to immigration (Espinoza and Valdebenito, 2018). In response to this phenomenon, especially in municipal schools, it is crucial that teachers implement differentiated teaching strategies that recognize and address diversity (Jorgensen et al., 2007). Law No. 20,845 on School Inclusion and Official Decree No. 83 provide the regulatory framework that seeks to facilitate relevant adaptations (MINEDUC, 2015). However, there is a lack of clarity about how these inclusive practices are implemented in the classroom, with indications that some are based on improvisation (Jiménez et al., 2017).

Against this backdrop, it is imperative that teachers adopt better practices to respond effectively to the demand for quality and equity, particularly with regard to student inclusion, where the objective is to promote diversification of learning in the classroom.

The concern for inclusive schools has become one of the greatest challenges currently facing education systems, teachers and society. Progress towards inclusion requires not only political will, but also social agreements based on values of equity and social justice. It is difficult to identify a notable confusion around the concept of inclusion and inclusive school, both in the academic literature and in current regulations, as well as in the debates and practices of professionals in the sector. The reasons behind this confusion are diverse and, throughout history, have been linked to different movements that seek to ensure that all students, regardless of their origin and personal characteristics, receive attention in the context of common education. (Durán and Giné, 2011). Therefore, it is crucial to provide teacher training. When teachers feel underprepared, they are likely to develop negative expectations of their students, and this creates fewer opportunities for interaction and attention. This, in turn, can lead to academic failure and the confirmation of those expectations (Marchesi, 2001).

In the current Basic Education program in Chile, students receive only partial preparation in UDL, since they only have one lecture in one semester of the five years of study. This limitation in training prevents future educators from fully developing the necessary competencies to implement effective diversification strategies in the classroom, especially considering that Exempt Decree No. 83, which has been in force for a decade, establishes frameworks and guidelines for attention to diversity.

This article analyzes the results of the diagnosis carried out to identify the challenges of diversification in initial teacher training based on UDL principles in the Basic Education Pedagogy program of a Chilean Higher Education institution. The objectives of the study were a) to identify the main knowledge and resources that facilitate students' application of the UDL in the classroom; b) to know the barriers and limitations they face when applying the UDL in the educational practices of the course. In general, we inquired about their knowledge and preparation to develop the UDL in educational practices in order to identify gaps and possible lines of action.

THEORETICAL FRAMEWORK

Introduction to Universal Design for Learning (UDL)

The DUA was developed in 1984 by the Center for Applied Special Technology (CAST) for the purpose of creating technologies that help improve the educational experience of students with disabilities by enabling them to access the same educational content as their peers. This approach is based on advances in neuroscience that evidence the existence of diverse brain functions, which implies a variety of learning styles (Alba *et al.*, 2014).

Thus, it is assumed that each individual processes information in a unique way, which influences his or her learning preferences. Some are more receptive to visual learning, while others respond better to auditory stimuli. Although the UDL was initially focused on students with special educational needs, it is now considered a comprehensive methodological reform that needs to be adopted by teachers at all educational stages. Methodological strategies should be oriented towards creating diversified spaces and opportunities in the classroom opportunities that

consider differences as something enriching for the teaching and learning process; it allows each student, regardless of the conditions in which he/she returns to the educational center, to be attended from his/her characteristics, needs and conditions from an approach of equity, inclusion and respect for diversity (Covarrubias *et al.*, 2021).

UDL Principles and Guidelines

The UDL is based on a series of guidelines derived from neuroscientific knowledge about how human beings learn. These guidelines are organized into three key principles: commitment, representation and action-expression. Each principle is broken down into specific guidelines designed to facilitate access, construction, and internalization of learning (Blanco *et al.*, 2016; CAST, 2018).

One of the main challenges identified by CAST (2018) is inflexible curricula that create unintended barriers to learning. In response, the UDL proposes three fundamental principles for curriculum design, each subdivided into concrete guidelines detailing different means to implement these principles (Díez and Sánchez, 2015).

In practical terms, a curriculum designed under the UDL approach promotes educational accessibility by allowing for adaptations that provide options and make objectives, content, materials, methodological strategies and assessment methods more flexible. The objective is to guarantee equitable access for all students (Sánchez and Díez, 2013). In the face of this challenge, the UDL presents itself as an innovative approach that complements the world conferences and consolidates itself as one of the pillars for inclusion in global classrooms. According to Alba *et al.* (2014), UDL is defined as: "a research-based approach to curriculum design-i.e., educational objectives, methods, materials, and assessment-that enables all people to develop knowledge, skills, and motivation and engagement with learning" (p. 9).

At the international level, the UDL has been incorporated into educational policies. In the United States and Canada, legal frameworks have been developed that implicitly reference UDL, for example, the Every Student Succeeds Act (ESSA) of 2015, with the goal of promoting more equitable and inclusive education. Promoting various strategies, allowing states and districts to adapt educational programs to meet accessibility and inclusion requirements, through the implementation of various strategies.

In Spain the first time the UDL appeared was in the LOMLOE law (2020) and until relatively recently it was effectively incorporated in the educational regulations by means of Royal Decrees (Royal Decree 95/2022, Royal Decree 157/2022, Royal Decree 217/2022, Royal Decree 243/2022). This represents a significant advance in the implementation of the UDL in the school setting. This can also happen in other countries, where interest is not necessarily translated into concrete policies or regulations.

In Chile, similar measures have been promoted to make teaching more flexible to the needs of all students, highlighting Decree 83 and its guidelines on Teaching Diversification and Curricular Adaptations, enacted in 2015 (MINEDUC, 2015-2017). These guidelines understand quality education as a continuous effort to make educational practices more flexible in relation to diversity, fostering not only academic success, but also the well-being and social welfare of students. However, the decree has a number of limitations that affect the

effective implementation of Universal Design for Learning (UDL). First, the lack of specific training for teachers hinders the implementation of inclusive strategies, which prevents educators from fully utilizing the potential of UDL in their classrooms. In addition, insufficient material and human resources restrict the creation of truly inclusive educational environments, where all students can participate and learn equitably.

In addition, the absence of a clear evaluation system complicates the feedback and adjustment of pedagogical practices, which impedes the continuous improvement of the educational process. The lack of consideration of the contextual particularities of each school community can lead to the implementation of inadequate solutions that do not respond to the specific needs of the students. These limitations, taken together, show the low effectiveness of the decree in certain educational establishments in the country, thus hindering progress towards inclusive and quality education.

Given the diversity of contexts that can be found in a country and even in the same region, it is essential that teachers evaluate the environment in which they are inserted in order to adjust the implementation of the UDL. In this sense, Sanchez and Duk (2022) suggest the need to introduce a new term: Universal Design for Contextualized Learning (DUAC), which allows flexibility and the application of these principles to different educational realities. The UDL is presented as an effective model for implementing an inclusive approach. However, if factors such as context, target population and available technological resources are not considered, we run the risk of perpetuating the exclusion and marginalization of certain students, instead of combating it, which is the main objective of the UDL.

Challenges to Inclusion in Higher Education

At the university level, Rose *et al.* (2006) examine the implementation of a course in the United States based on UDL principles, concluding that learning difficulties tend to be more related to the environment than to individual student characteristics. This finding raises a key question: How prepared are the teachers involved in initial training? On the other hand, Díez and Sánchez (2015) suggest that in addition to explicit formative actions, students live and experience the benefits of an essential strategy to integrate UDL effectively into the educational system.

Bravo-Mancero and Santos-Jiménez (2019) point out that in Higher Education institutions there is a diversity of students with educational needs who come from different geographical contexts and with diverse ethnic, religious and gender characteristics, among others. However, this university environment remains focused on the acquisition of cognitive skills, which limits progress towards inclusive education. On the other hand, Flores-Barrera *et al.* (2017) highlight the lack of attention to the pedagogical and practical approach in teacher training, which affects the acquisition of pedagogical tools. In addition, Álvarez-Lozano (2023) highlights the scarcity of competencies in the use of inclusive methodologies during the initial training of future teachers, perpetuating this situation in their professional practice. A similar conclusion is reached in the study by Onoiu and Belletich Ruiz (2024), which analyzes teacher training in Universal Design for Learning in early childhood education in Navarra. The results show that UDL training is limited and the training offer is insufficient, which hinders its effective implementation. Training needs are identified, such as the lack of practical training and adequate teaching resources. See

recommends the creation of modeling and socialization tools to improve teacher training in UDL.

Moriña and Carballo (2018) posit that inclusive education and disability is a challenge currently facing higher education. They point out that the training of university professors in strategies and programs that promote inclusion is fundamental to ensure current educational processes. In their study, participants identified the principles of UDL as a concept that encompasses all prior learning, making it possible to design programs that address the needs of all students before they arise in the classroom, thus preparing teachers to respond appropriately to those needs. On the other hand, the authors highlight as an important element “[...]that policies, processes and actions are articulated so that the response to the needs of students does not remain in goodwill and there are sensitized, informed and trained teachers” (Moriña and Carballo, 2018, p. 93).

Likewise, Azorín (2017) reflects on the diversity in the group of university students in terms of skills, previous experiences, learning styles and needs. It is crucial that university teachers recognize and value this diversity, adapting their teaching practices to ensure the inclusion of all in the educational process. At the same time, university students may face additional challenges, such as the transition to a more rigorous academic environment, autonomy in learning, and the reconciliation of studies with other responsibilities, such as work or family life.

Higher education institutions have the responsibility to incorporate theoretical and methodological bases that promote inclusion, thus allowing them to adjust to social, educational, political, cultural and economic changes through the reorganization of an inclusive curriculum and the necessary adjustments in teaching processes.

Based on the above, it is pertinent to analyze the challenges that arise with respect to diversification in the initial training of future teachers in a specific context. The knowledge of the DUA strategy allows the trainee teachers to be enriched by the educational experience of all their students during their internships and later on as education professionals. In this way, we are contributing to the creation of more diverse, respectful and successful educational communities.

Method

The present research is part of a doctoral thesis that aims to contribute to understanding how the teaching of diversification could be complemented through UDL by proposing a model that integrates this strategy in a continuous and transversal manner throughout teacher training. The project has been approved by the UNINI Ethics Committee No. CR-162. The current study presents the diagnosis made in order to carry out a training program to support UDL learning in future teachers.

This study is framed within the pragmatist paradigm, using a mixed approach combining qualitative and quantitative methods. This approach is characteristic of pragmatism, as it values methodological flexibility and practical problem solving (Onwuegbuzie and Leech, 2019). By integrating both perspectives, a more complete view of the object of study is achieved, which is essential to address complex issues in the field

dynamic social contexts. The research is applied, which means that it seeks to address and improve a specific problem. In addition, it focuses on a field of habitual practice, oriented towards the development and application of the knowledge obtained (Hernández Sampieri et al., 2014). The choice of the two instruments for data collection - the survey and the focus group - responds to the need to obtain a more complete and enriched understanding of the phenomenon under investigation. It is justified within the framework of a mixed approach as it allows triangulating data, complementing information and strengthening the validity of the findings, integrating both the breadth of the quantitative and the depth of the qualitative. In summary, the qualitative approach not only complements the statistical approach, but also offers key inputs for redesigning training practices that are more contextualized, reflective and aligned with a truly inclusive education.

Participants

The study population consisted of active students in the Basic Education Pedagogy program at a Chilean higher education institution. For the survey, 117 students were invited to participate on a voluntary basis and agreed to complete the survey. For the focus group, third year students of the Diversity and Inclusion course who had already had previous classroom experiences were invited to participate. Six students participated.

Instruments

Survey. A survey was used to collect quantitative data, using a questionnaire composed of measures of teaching practice. The questionnaire used standardized instruments and also items created for the present research. The questionnaires were applied virtually, having previously obtained the informed consent of the participants. The questionnaire consisted of the following variables: knowledge of the UDL and self-efficacy in inclusive teaching. These variables were measured with the following instruments:

Knowledge of the UDL. Quantifiable data on UDL awareness were collected. Specifically, 6 items were created to inquire about theoretical notions of UDL. In this sense, each item presents a statement that must be answered from 1=(not at all) to 6=(quite a lot). An example item is *"I am able to explain and apply UDL principles in a pedagogical activity."*

Teacher Efficacy for Inclusive Practice Scale TEIPS, Sharma et al., 2012 in the Spanish adaptation (Cardona-Moltó et al., 2020). This scale is composed of 15 items and has been designed to measure the perceived effectiveness of teachers in implementing inclusive practices in their classrooms. The response scale used a Likert format ranging from 1 (strongly disagree) to 6 (strongly agree). An example item is *"I know how to use various assessment methods (e.g. portfolio assessment, design/adjust tests or quizzes, assess performance/competency level, etc.)."*

Sociodemographic data. The age, sex and cohort of each participant were recorded.

Focus group. For the qualitative data, participation in a focus group was organized. The criteria used to participate in the research were the following: they had to have taken the Diversity and Inclusion course in their third year of teacher training and to have previous experience in the classroom or in teacher observation processes, which ensured a practical base in the subject. In addition, their participation was completely voluntary, ensuring that only those who

genuinely interested parties contributed to the study. A diversity of perspectives in terms of gender, socioeconomic context and learning styles was also sought in order to obtain a more complete view of the experiences in the subject. Finally, those selected had to demonstrate academic commitment reflected in their performance and availability to actively participate in interviews or focus groups. Thus, the deliberate choice of this group allows access to more elaborated and nuanced discourses, facilitating a deeper understanding of the phenomenon under investigation.

Analytical Strategy

The validity of the *questionnaire* was evaluated in terms of content and construct, while its reliability was determined by internal consistency, calculated with Cronbach's Alpha. A descriptive statistical analysis was performed including frequencies, percentages, ranges, means (\bar{X}) and standard deviation (SD). Measures of dispersion were calculated by standard deviation and analysis of variance. The data were processed and analyzed in Excel spreadsheets and then in the statistical package SPSS, version 22.

For the *focus group*, first, an inquiry was conducted in which participants could select the correct answer to a series of questions. The analysis consisted of calculating the percentage of each response in relation to the total number of responses obtained. Secondly, a follow-up was conducted with the six teachers in training, when they were in their fourth year of training, where an interview was conducted through a focus group to delve into these conceptions of the UDL with respect to their pedagogical practices. Conceptualizing categories were identified according to Paillé and Mucchielli (2012) and after transcribing the audio of the focus group, cross-cutting and particular elements, as well as types of conceptions and variations among the actors interviewed, were collected. This phase also went through an inter-judge triangulation process, where categories were discussed with a specialist in the area of inclusion and the principal investigator (Creswell and Poth, 2018), and the results were analyzed using NVivo 12 software through qualitative coding. This technique favors the sharing of nuances that are not always apparent in structured instruments, enriching the understanding of the phenomenon from a more interpretative perspective, as well as allowing the elaboration of practical recommendations based on evidence.

Results

Quantitative Aspect

The following are the results of the questionnaire applied to the 117 students of all generations belonging to the career of Pedagogy in Basic Education, who cover five cohorts from 2018 to 2022. The majority of the participants are women, representing 85% of the sample. In terms of age, students are between 18 and 22 years old, with a ($Mean=19.95, SD=1.12$).

Table 1 presents the mean scores, standard deviations and internal consistency coefficients, calculated using Cronbach's alpha, for the study variables. The results show that all the variables under study have internal consistency coefficients above .80, indicating that the measures used are reliable and adequate for the analysis.

Table 1*Descriptive and psychometric statistics of the TEIPS scale and subscales*

Variable	Mean (SD)	Alpha
TEIPS (total 15 items)	4.552 (.749)	.923
Effectiveness in behavioral management in the classroom (Management)	4.282 (.887)	.848
Effectiveness in the use of instruction inclusive (Instruction)	4.752 (.743)	.802
Efficiency in collaboration (Collaboration)	4.589 (.913)	.820

Note. TEIPS is the Teacher Efficacy for Inclusive Practice Scale.

The means of the 6 items designed to measure students' knowledge and management of the UDL in the classroom were also explored. When considering these items as a scale, a Cronbach's Alpha coefficient of .911 was obtained, indicating an excellent level of internal consistency and justifying the use of the global indicator for the analysis.

Table 2*Descriptive statistics of UDL items*

Variable	Mean (SD)
I am able to identify and minimize barriers to learning and participation, maximizing resources to support inclusion in the classroom.	4.85 (.967)
I know and know how to apply the principles of Universal Design for learning in my pedagogical practices.	4.88 (1.15)
I am able to explain and apply UDL principles in a pedagogical activity	4.83 (1.15)
I am able to provide a clear and coherent explanation to a peer on what is diversified planning	4.85 (1.01)
I am familiar with the criteria and guidelines that govern Decree 83	4.83 (.96)
I am aware of the guidelines that are part of the UDL principles	4.54 (1.32)

The data show that trainee teachers have a general knowledge of the UDL, but their mastery of the specific guidelines remains limited. This is consistent with previous studies (Díez and Sánchez, 2015), which identify a gap between theory and

practical application in teacher training. The positive correlation between years of study and self-efficacy suggests that accumulated experience influences the perception of competence, but this does not guarantee effective UDL implementation in the classroom. Therefore, it is essential that teacher training not only reinforces theoretical knowledge, but also provides practical opportunities for application.

To evaluate the difference in means for the variables TEIPS and UDL knowledge, a *Student's t-test* was performed. There were no significant differences by sex, with p -values greater than .129. The correlation between the TEIPS variables and the cohort was analyzed. As shown in Table 3, there is a positive correlation between total TEIPS and cohort, indicating that self-efficacy perception increases according to years of study ($r_{(117)}=.278, p<.01$). This trend is maintained for all subscales. The correlations between the subscales of the TEIPS are verified as expected.

Table 3
Correlation Matrix

	1	2	3	4	5
1. Cohort	—				
2. TEIPS_total	.278 **	—			
3. TEIPS_Management	.237 *	.890 ***	—		
4. TEIPS_Instruction	.230 *	.932 ***	.750 ***	—	
5. TEIPS_Collaboration	.287 **	.859 ***	.611 ***	.739 ***	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. degrees of freedom 115.

In the analysis of the UDL knowledge variable, a significant positive correlation was found with the training process of pre-service teachers. The analysis reveals that ($r_{(117)}=.305, p<.001$). This indicates that as the training process progresses, the students' knowledge of DUA also increases.

Qualitative Aspect

The results of the survey applied to 6 teachers in training of the 3rd year generation who took a course on diversity and inclusion in their training process are shown. Table 4 shows the results based on the percentage of achievement obtained, according to whether their answers were correct or incorrect.

Table 4*Results of the application of the diagnostic questionnaire*

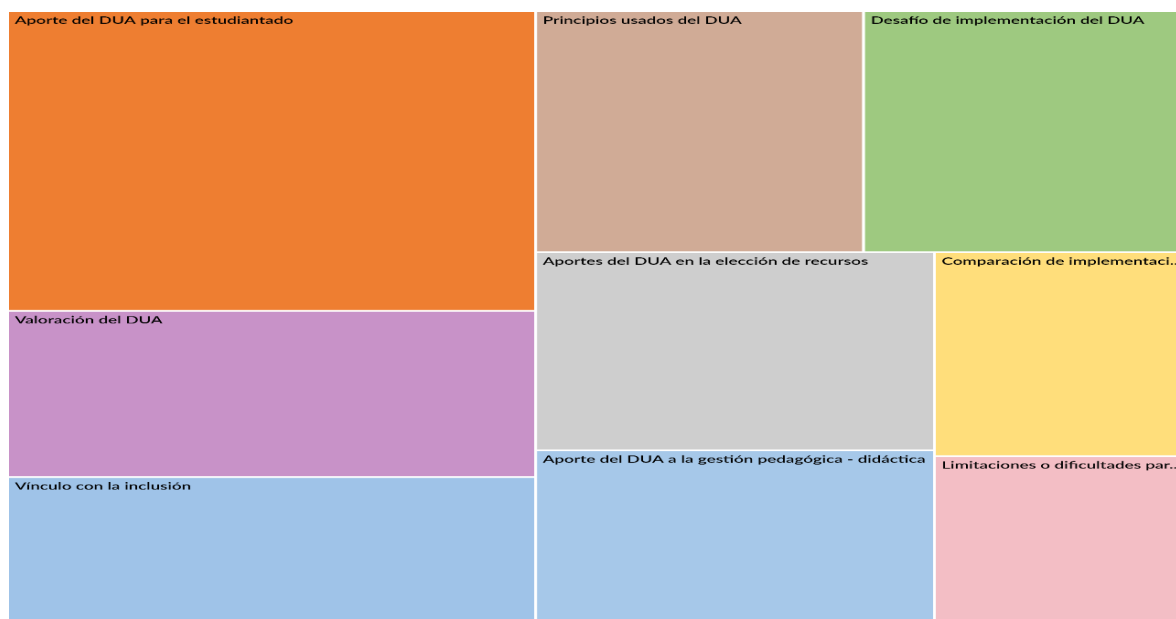
Teachers in training	Percentage of achievement (%)
PF03	50,0%
PF04	66,6%
PF06	66,6%
PF05	66,6%
PF02	66,6%
PF01	83,3%

The results indicate that most of the trainee teachers performed well, with achievement percentages ranging from 50% to 83.3%. However, it is important to note that 70% of the participants answered questions related to Decree 83 incorrectly, suggesting a lack of understanding or familiarity with this regulatory framework. Additionally, it was observed that the students faced difficulties in responding correctly to the items related to the knowledge of the UDL guidelines, obtaining a margin of error of 57%. This indicates that these questions were challenging for students and additional review or reinforcement is needed on topics related to Decree 83 and the UDL guidelines.

Subsequently, a longitudinal follow-up was conducted with the same 6 trainee teachers during their fourth year of training. In this context, a focus group was organized in order to obtain their opinions on the topics covered in the diversity and inclusion course. According to the findings of the focus group, several thematic categories were identified and are presented in Figure 1. This hierarchical map shows the predominant tendency of certain categories in relation to others, which makes it possible to visualize the areas of greatest interest and the concerns of trainee teachers regarding inclusion and the application of the UDL in their educational practices.

Figure 1

Hierarchical map of categories, according to their appearance in the textual corpus of the focus group



Source. Extracted from Nvivo.

Table 5 provides and details outstanding elements mentioned by the trainee teachers by categories, the order of appearance of the categories in the table is descending (according to their appearance in the textual corpus).

Table 5

Elements highlighted by trainee teachers according to categories

Categories Highlights	
UDL contribution to the student body	The UDL is a powerful tool for fostering inclusion and effective learning for all students. By applying its principles, teaching can be tailored to meet the diversity of the student body, motivate students and provide multiple forms of participation and expression. This not only enhances the learning experience, but also ensures that all students, regardless of their abilities or special needs, have the opportunity to learn and participate in the educational environment.
UDL valuation	There is a highly positive assessment of the UDL by FP. They highlight their ability to include all students, address special educational needs, and improve accessibility and participation in the classroom. The implementation of the UDL encourages continuous reflection and improvement of pedagogical practices. Overall, the UDL is seen as an essential guide to achieve inclusive and personalized learning, benefiting the entire student community.
Principles used in the UDL	The UDL principles used by PF are fundamental to creating an inclusive and effective educational environment. The most mentioned by FP was that of representation, which ensures that information is presented in multiple ways, facilitating understanding for all students. Next, the principle of involvement ensures that students are motivated and engaged, which is crucial for their learning. Finally, the principle of expression allows students to show what they have learned in a variety of ways, adapted to their individual needs.

UDL implementation challenge	UDL implementation presents several significant challenges, including the additional planning and time required, the management of large groups, and the need for greater student engagement. In addition, inclusion of the entire student body is complicated by the tendency to plan for a generic student. Adapting traditional teaching methodologies to the UDL can also meet resistance, although openness to change can lead to improvements in learning. The UDL in the choice of
UDL's contributions to the choice of resources	resources contributes significantly to the creation of an inclusive and effective educational environment. By incorporating audiovisual materials, pictograms, and various forms of presentation and response, teachers can cater to the diversity of learning styles present in the classroom. In addition, attention to specific details in planning and the use of concrete and visual resources contribute to more accessible and engaging learning for the entire student body. The application of UDL in the choice of resources and teaching strategies is intrinsically linked to the promotion of an inclusive educational environment. By
Link to inclusion	considering and accommodating the diverse needs and learning styles of students, the UDL helps ensure that all students can participate and progress in the educational environment.
Contribution of the UDL to didactic pedagogical management	The contributions of the UDL to pedagogical and didactic management are significant and varied. By diversifying methods of presentation and assessment, tailoring lessons to different learning styles, promoting active participation and inclusion, and using games and dynamic activities, teachers can create a more inclusive and effective learning environment. The implementation of UDL in pedagogical practices is a dynamic process that evolves over time and is influenced by several factors, such as the time dedicated to
Comparison of implementation between pedagogical practices	the practice, the relationship with students, the availability of resources and the school context. The UDL facilitates more inclusive and effective teaching by adapting pedagogical strategies to the individual needs of students. However, their implementation may vary significantly depending on the conditions and resources available in each educational environment. PF were flexible and creative in overcoming the constraints and maximizing the benefits of UDL in education. The implementation of the UDL faces various limitations and challenges ranging from lack of material and financial resources to time constraints and resistance to change on the part of the teaching staff. Internet connectivity and student motivation are also critical factors that can influence the effectiveness of the UDL. Overcoming
Limitations or difficulties for UDL implementation	these limitations requires flexibility, creativity and a collaborative approach among all the actors involved in the educational process.

During the focus group, participants highlighted the UDL as a useful tool to promote inclusion and motivate students. In relation to the results presented in the previous table, it is observed that although the teachers in training recognize the UDL as an essential tool, they highlight the lack of time for its planning and the resistance to change in the educational institutions.

It was mentioned that the UDL encourages continuous reflection and improvement of pedagogical practices, being essential to achieve inclusive and personalized learning that benefits the entire student community. The principles of representation, involvement and expression were highlighted as fundamental to creating an inclusive and effective educational environment. Presenting information in multiple ways facilitates student understanding and motivation, is important for increasing student engagement and allows for diverse forms of expression, and adapts learning to individual needs.

The main challenges for UDL implementation are related to the fact that it requires additional planning and time, which can be an obstacle for teachers. In addition, managing large groups and securing student engagement were

mentioned as additional complications. Resistance to change on the part of the teaching staff was also highlighted as a significant obstacle. Despite these challenges, the UDL contributes significantly to the choice of resources and teaching strategies, promoting an inclusive educational environment by incorporating audiovisual materials and pictograms that cater to the diversity of learning styles. Internet connectivity and student motivation were also highlighted as critical factors that can influence the effectiveness of the UDL. In summary, the focus group highlighted the benefits of UDL for inclusion and effective learning, but also identified significant challenges in its implementation. The need for flexibility and creativity to overcome these limitations and maximize the benefits of UDL in the educational environment was emphasized.

Discussion and Conclusions

The study has focused on identifying the main knowledge and limitations faced by trainee teachers when applying the UDL. The survey data and a focus group have made it possible to analyze the challenges that arise with respect to diversification in initial training. It should be noted that in the course of study, teachers in training have a superficial knowledge of the UDL, and need to strengthen their knowledge of the guidelines presented by the UDL.

These findings are consistent with Bravo- Mancero and Santos - Jiménez (2019), who argue that the effective implementation of UDL requires structural changes in teaching practices and a continuous commitment on the part of educators. To overcome these barriers, it is necessary for educational institutions to foster in-service training spaces and promote collaborative support among teachers. This will not only facilitate the adoption of the UDL, but will also contribute to the creation of a more inclusive educational environment. Ignorance of the UDL guidelines can translate into difficulties in designing inclusive strategies in the classroom. Therefore, it is essential that teacher training incorporates active methodologies that allow future teachers to experience the application of UDL in real scenarios. Strategies such as project-based learning or inclusive classroom observation can help reduce this gap (Blanco et al., 2018).

According to what was observed in the present sample, it can be mentioned that teachers in training have knowledge that can contribute to developing more inclusive classrooms. According to Muñoz and Gómez (2017) they should facilitate the learning of the totality of students, recognize diversity as a positive value. In addition to being flexible and changeable teachers, adapting to constantly changing needs, structures and people. Encourage autonomy, self-management and participation in their own teaching and learning process, as well as working in teams and using inclusive language consistent with the values of inclusion.

Specifically, in the focus group, it was found that the difficulty persists in the handling and knowledge of the UDL guidelines. Despite the fact that this group has already taken subjects related to diversity and inclusion within their curricula. In addition, there is a need for more knowledge about Decree 83. These teachers-in-training highlight the following: (a) the UDL as an essential tool to promote inclusion and learning; (b) the principles allow for flexibility in teaching to the interests and needs of the student body; (c) resources, strategies, methods of representation and evaluation can be selected. On the other hand, one of the biggest challenges

the most common reasons for this are the increased time involved in the planning process, group management when carrying out innovations, and resistance to change on the part of the teaching staff. This is related to the deficient tools and development of skills to respond to the diversity of students in the regular education classroom. This may be due, according to the literature, to an initial training that did not delve deeply into this area of enhancing skills to adequately address and respond to the totality of students. Also to an improvement that focuses on other aspects and not on responding to the characteristics, rhythms, styles and ways of learning of the students.

According to Sanchez-Gomez and Lopez (2020) with respect to planning, the support system should encompass the four components of the curriculum. Although most of the supports contemplated in the UDL focus on two of them (materials and methods), which refer to how and with what the content is taught, there are also relevant recommendations for objectives (such as graduation of difficulty levels) and assessment (various modalities of action and expression). Thus, although not in the same proportion, support is found for each component of the curriculum in all dimensions. According to Alba *et al.* (2014) each guideline, in addition to justifying its relevance to learning, provides recommendations on how to implement the corresponding principle. Many are already part of standard teaching practice, while others are innovative and highly beneficial in addressing the needs and interests of students, as well as removing barriers that many students encounter in accessing the curriculum. In order to install this type of innovative work strategy, it is necessary for schools and teachers to be aware of its benefits, such as greater involvement of the management team, improvement of the quality of education, better response to diversity, promoting relationships of respect and trust in which teachers share methodologies, favoring teacher development, etc. And this change so that the leadership team can facilitate the necessary space and time, encouraging this type of practices.

Despite the fact that current regulations promote inclusive classrooms, schools have not yet managed to generate substantial structural changes based on inclusion. In Chile, a series of milestones have been implemented that mark the transition from an integration approach to an inclusive education approach (Ramos, 2013). But, even so, the need to think and redesign education is evident.

UNESCO notes that inequalities and cultural fragmentation of the population have increased. "Social exclusion goes beyond poverty as it has to do with the absence of participation in society" (UNESCO, 2008, p. 5). In this way, it is the state that must take responsibility for attending to the different needs of the community and the country. And legislating to advance in educational terms is also one of its obligations "Although legislation alone does not ensure the success of educational inclusion, it is a very important aspect, since having it makes it possible to establish rights and responsibilities" (Blanco, 1999, p.13). For this reason, it is imperative to have, in the first instance, national policies that regulate education from an inclusive approach. Build decrees and laws that guide, train, invest and monitor schools to promote practices and modifications in their culture to address diversity. In this sense, the quality of education is not given by results, but by an education capable of responding to diversity so that each student achieves the maximum of his or her potential through an approach that values his or her differences and promotes the modification of homogenizing practices towards students.

On the other hand, there is a need to analyze the curriculum from the institutions that are training future teachers, i.e., Higher Education institutions, in order to enhance curriculum alignment, which “is the effort to achieve coherence between the declared, implemented and learned curriculum” (Volante, *et al.*, 2015, p. 97 cited in Perilla, 2018). In this regard, in 2006 Biggs put forward the idea of constructive alignment, whose purpose was to guarantee deep learning for all students participating in a teaching and learning process. This term arises as a response to the need to guarantee quality learning in contexts of high diversity, generated by the access of previously excluded social groups to the university. Constructive alignment “reduces the gap” (Biggs, 2006, p. 58), as it aims for the entire student body to achieve deep learning and develop their competencies.

In conclusion, this study reveals that although prospective teachers recognize the value of UDL in promoting inclusion and effective learning, their knowledge of specific UDL guidelines is limited. The results indicate that trainee teachers face challenges such as lack of time for planning and resistance to change in educational institutions. In addition, it highlights the need for more in-depth training in UDL so that educators can design effective inclusive strategies. To overcome these barriers, it is suggested that educational institutions foster spaces for in-service training and promote collaborative support among teachers, which would not only facilitate the adoption of the UDL, but also contribute to the creation of a more inclusive educational environment.

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