Intellectual disability students' learning in higher education.

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Abstract

The objective of the research is to analyze the Intellectual Disability construct, its characteristics and pedagogical strategies that teachers should use in the teaching-learning processes, according to the characteristics of the students. The approach of the study is qualitative, with non-experimental design and exploratory scope. A documentary review was carried out through the use of the Prisma methodology, which made possible the analysis of the phenomenon under study and the drawing of conclusions. The results obtained allow affirming that intellectual disability demands the mastery of knowledge, methodologies, didactic strategies and the use of Information and Communication Technologies to promote a satisfactory insertion of students in the university context. In conclusion, today's society requires highly trained teachers to serve students with intellectual disabilities, who promote good inclusion practices through innovative proposals, which allow promoting their development and comprehensive training in higher education.

Keywords: intellectual disability, higher education, teaching and training.

Resumen

El objetivo de la investigación es analizar el constructo Discapacidad Intelectual, sus características y estrategias pedagógicas que los docentes deben emplear en los procesos de enseñanza-aprendizaje, según las características de los estudiantes. El enfoque del estudio es cualitativo, con diseño no experimental y alcance exploratorio. Se realizó una revisión documental por medio de la utilización de la metodología Prisma, que posibilitó el análisis del fenómeno objeto de estudio y la obtención de conclusiones. Los resultados obtenidos permiten afirmar que la discapacidad intelectual demanda el dominio de conocimientos, metodologías, estrategias didácticas y el empleo de las Tecnologías de la Información y la Comunicación para promover una inserción satisfactoria de los estudiantes en el contexto universitario. En conclusión, la sociedad actual requiere de profesores altamente capacitados para atender a los estudiantes con discapacidad intelectual, que promuevan buenas prácticas de inclusión a través de propuestas innovadoras, que permitan promover su desarrollo y formación integral en la educación superior.

Palabras clave: discapacidad intelectual, educación superior, enseñanza y formación.

Introduction

Intellectual disability is a special educational need and people with this condition have learning difficulties that affect the development of their cognitive abilities, communication, self-care and interpersonal relationships, among others (Herrero et al., 2020). This is why specific support is required to enable these individuals to advance in their education and to better adapt to the environment in which they develop (Bumble et al., 2019; Santana del Sol et al., 2021).

In this sense, intellectual disability can be defined as the slow and incomplete acquisition of cognitive skills during human development (Ke & Liu, 2017). The same implies that the subject may develop difficulties in learning, understanding and remembering certain elements, which may manifest as part of their

mental and cultural development. Such conditions affect the level of general intelligence, such as cognitive, motor, social and language skills (Grigal & Papay, 2018; Prendergast et al., 2017).

The most frequent causes of the presence of this type of disability are associated with complications in the prenatal, perinatal, postnatal stage and as a result of genetics (Heuvelman et al., 2018; Lyall et al., 2017; Malinowski et al., 2020). For its diagnosis, intelligence tests are performed, which allows calculating the IQ of individuals, which determines the level of severity of the individual, as addressed by Ke & Liu (2017):

• Mild severity comprises an IQ in the range of points between 50 and 69. In this section, the individual's performance level subscribes to the development of basic skills. Individuals can communicate, calculate and read at a level comparable to that of a student between the third and sixth grade of elementary school. In addition, they can take care of themselves, carry out household chores and perform tasks with a low level of complexity.

• Moderate severity, ranging from a score of 49 to 35, characterizes an individual with the ability to think logically and learn, but at a diminished level. In this case, they have the ability to communicate and can develop occupational skills. However, they can care for themselves with the support of another person.

• Severity status, which is between 34 and 20 points, characterizes the person by a level of performance with a very limited vocabulary. This group of people can achieve with practice and appropriate time the acquisition of basic skills such as being able to take care of themselves. However, for this they need the necessary support from the people around them.

• Finally, the state of profound severity is visualized in people with an IQ of less than 20 points. Already for this group of subjects there are high difficulties for them to take care of themselves. Additionally, they do not have language or adequate communication skills, express emotions in a limited way and are difficult to understand.

In the context of teaching and training, particularly in higher education, depending on the level of severity and the particularities of each individual, the teacher must focus his or her work and educational strategies according to the needs observed (Carter et al., 2019; Hall et al., 2021). In this sense, according to García & Gómez (2018), in the teaching-methodological work and as part of the teaching-learning process, the areas of independence, social life, occupational skills and functional communication will enable a better adaptation of the individual to the social environment. For this purpose, the university must provide access and permanence to students with intellectual disabilities so that they can continue their education in a favorable environment that allows them to strengthen the necessary skills to enter the labor market (Corbí et al., 2021; Rillotta et al., 2021).

Students who have an intellectual disability are generally individuals who better grasp information through the visual pathway. In this way, they improve their explicit memory and short-term memory. For this, strategies such as the use of photographs and texts as complements for the understanding of the subject they are learning should be applied to them (Grigal et al., 2018; Rickson & Warren, 2018). Similarly, it is essential to carry out a variety of activities to promote greater interest, as well as to provide more response time.

Regarding the socialization aspect, people with different levels of severity of intellectual disability have difficulties in establishing and maintaining interpersonal relationships (Rillotta et al., 2021; Wouters et al., 2019). Such a situation harms their emotional state, so spaces for interaction with all the intervening actors in the educational context should be encouraged. In this way, appropriate and conducive behaviors of friendship and solidarity are encouraged, being essential in the favorable development of individuals (Patel et al., 2018). Likewise, the characteristics of each subject must be known in order to establish the different types of support and didactic strategies to be applied in the teaching-learning process.

In addition, students with intellectual disabilities commonly present difficulties in organizing new information. Therefore, it is necessary to work on the connection between previous and new knowledge in the classroom. Visual supports strengthen semantic memory, and according to the level of severity, the level of complexity of each of the activities that the student must perform is determined (Boehm & Carter, 2019; Wouters et al., 2017). Authors such as Carter et

al. (2019) and Constantin et al. (2017) affirm that activities that encourage constant monitoring of the progress of reading, writing, mathematics and art activities skills, as well as the use of information and communication technologies (ICT), should be promoted in teaching collectives in order to achieve better performance in society.

In addition, it has been analyzed that tutoring students with intellectual disabilities provides reinforcement and clarity on certain concepts (Borodina et al., 2017; Meskhi et al., 2019). Therefore, tutoring should be individualized and more time should be provided for students to express their needs, thoughts, and solve problems in class. Additionally, verbal instructions for activities that are executed as part of the academic day should be clear and precise. Similarly, in order to achieve meaningful learning, various technological devices such as tablets, smartphones, computers and televisions should be used to enable the development of attention and memory, which are indispensable resources for the acquisition of knowledge (López & Pérez, 2020).

The objective of the research is to analyze the Intellectual Disability construct, its characteristics and pedagogical strategies that teachers should employ in the teaching-learning processes, according to the characteristics of the students.

Materials and methods

The research approach is qualitative. Through a documentary review, the construct Intellectual Disability is analyzed, as well as the phenomenon of the teaching-learning process of students with intellectual disabilities in higher education. Additionally, the study focuses on the analysis of the main characteristics of the teaching-learning process and the existing teaching-methodological strategies to effectively guide the teacher in good inclusion practices to work with this group of subjects.

Bibliographic research was conducted, as it is a strategy that contributes to the construction of new knowledge regarding the processes of incorporation and management of students with intellectual disabilities. The methodological process for this paper was given by the review of updated and high impact bibliographic background, obtained from the *Web of Science* as shown in Figures 1 and 2, and processed through the Prisma Methodology, which enables the presentation of results obtained through systematic reviews of the literature and meta-analysis (Pérez et al., 2021).

The bibliometric analysis shown below comprises 136 researches between the years 2012 and 2021, of which 67 are from the last five years (2017-2021), all belonging to the *Web of Science Core Collection* and obtained from the keywords "*intellectual disability, higher education and teaching and training*". The main results and conclusions were drawn from this study. The use of Prisma led to the filtering and selection of the 34 most important bibliographic references included in this section.

Figure 1 shows the number of publications (136) comprising the keywords: *intellectual disability, higher education* and *teaching and training*, for the period from 2012 to 2021. Similarly, Figure 2 visualizes the main categories and research areas where the scientific topics of intellectual disability, higher education, teaching and training are most applied. The main research areas identified are rehabilitation, special education, research on education in its broadest sense, psychological development and psychiatry.
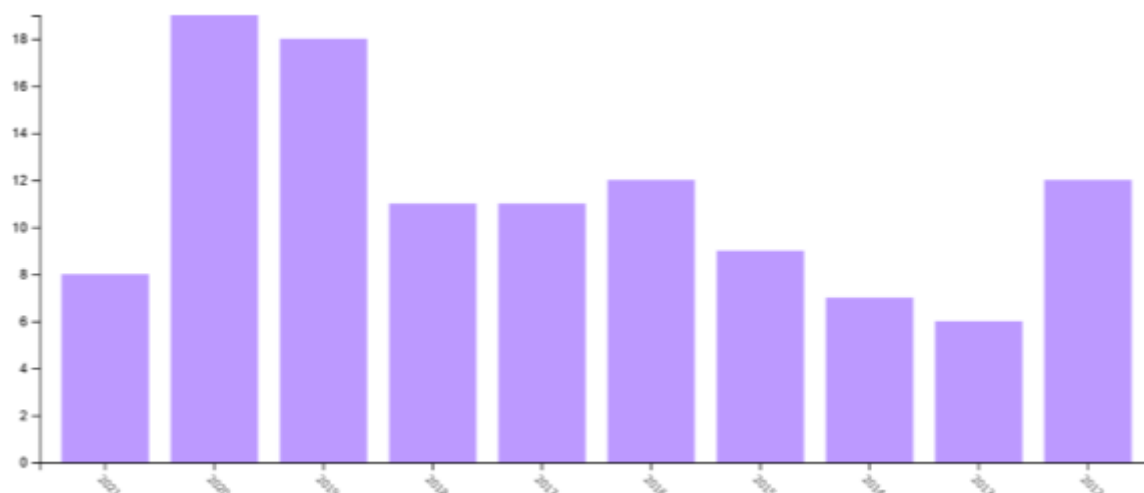
Figure 1. Number of publications comprising the keywords "*intellectual disability*, *higher education* and *teaching and training*". Source: data obtained from *Clarivate Analytics*.
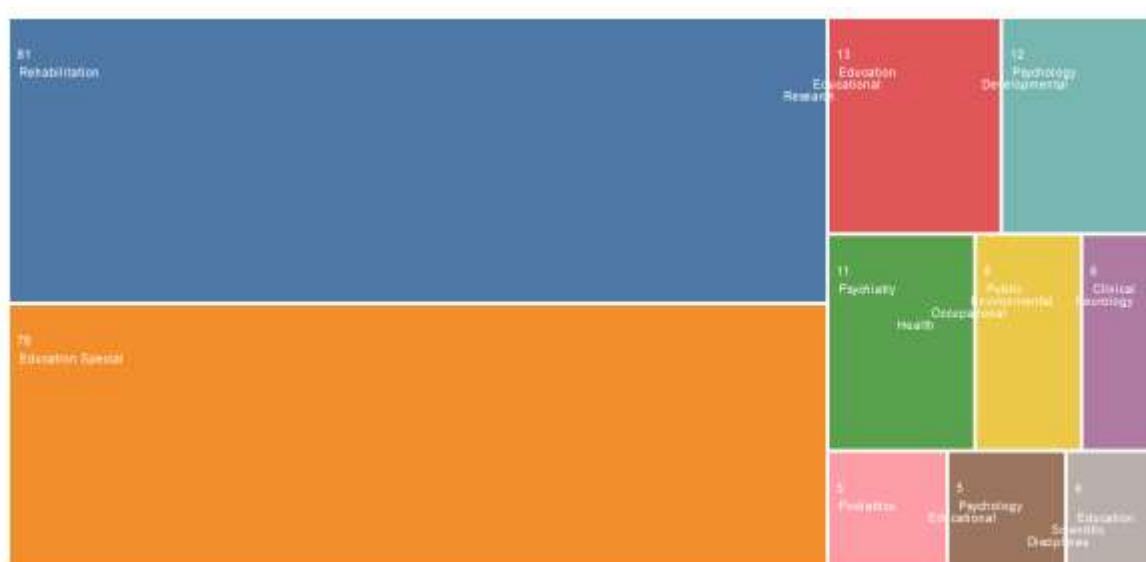
Figure 2. Main categories and research areas where the scientific topics of intellectual disability, higher education, teaching and training are most applied.

Source: data obtained from *Clarivate Analytics*.

All this made it possible to approach the Intellectual Disability construct, as well as its characteristics and most used pedagogical strategies that enable the inclusion of the student in the educational and social context and his preparation for his insertion in the labor market. Likewise, some aspects derived from the experience of the work carried out by academics and researchers were compiled, which serve as valuable evidence and theoretical contributions to inclusive education.

Results

Intellectual Disability, characteristics and pedagogical strategies.

Learning in students with intellectual disabilities is a process in which the teacher is required to make use of knowledge, didactic strategies, methodologies and computational tools to promote the adequate insertion of the learner in the university context and later in the workplace (López & Pérez, 2020). Table 1 below addresses five updated and significant studies by different authors that provide valuable theory in the analysis of the phenomenon of intellectual disability of students in higher education.

Table 1. Learning in students with intellectual disabilities.

Author	Main contribution	Results obtained
Pastor et al. (2018).	A project based on a Service-Learning methodology is being developed.	The contents are applied in physical activities carried out in a natural environment. In these activities, social commitment and commitment to nature are encouraged in an inclusive and active way.
Martin (2017)	Promentor Program	Training of professional competencies for labor inclusion, through service-learning and collaborative learning projects.
Víquez-Alfaro et al. (2019).	ICT in education	ICT as an educational support for the teaching-educational process.
Lopez and Perez (2020)	Teaching strategies	Learning and teaching strategies based on the experiences of teachers and students at the University of Antioquia.
Palomino & Martinez (2017)	Capacitas Program	Curriculum to strengthen the professional and occupational competencies of students with intellectual disabilities.

Source: own elaboration.

Likewise, Vaz & Pedro-Viejo (2013) propose the following dimensions to be taken into consideration in students with intellectual disabilities:

Table 2. Dimensions of integral formation of the individual.

Dimensions	Intentionality
Academic background	To enable the acquisition of comprehensive academic competencies to enter the labor market.
Training in values	To reflect on the ethical codes to develop in a society.
Integrated training	Include activities in various art disciplines: painting, theater, music, and sports activities to strengthen their skills.
Spiritual formation	To allow respect and freedom of belief.

Source: own elaboration with data obtained from Vaz & Pedro-Viejo (2013).

For the development of autonomous learning activities, it is necessary to work with visual aids and multimedia audiovisual materials. For example, in order for the student to analyze a concept, a video is presented, so that he/she can then explain it. With this strategy, the teacher is the one who guides the use of the learning resources available to carry out a better understanding of the topics analyzed. Regarding the reading comprehension of a text, a comprehensive reading must be done, which implies reading the information at least twice. Depending on one's needs, one can also resort to the memoristic method, through the repetition of a text, fragmenting by means of underlining and transcription of the main ideas.

Another fundamental aspect at the moment of learning is motivation guided by the pedagogy of affectivity. The achievements of each student should be congratulated, so that he/she is motivated in this process. The confidence that teachers provide is essential for the fulfillment of learning objectives. When the student experiences situations of depression, it is

suggested: to provide emotional support and implement outdoor activities and relaxation that allow the student to reduce their anxiety levels and can resume learning activities.

Ramírez (2017) establishes the pedagogical strategies shown in Table 3, which are essential to apply in the teaching-learning process to achieve a comprehensive training of students.

The objective of these strategies is to improve the attention and memory processes, to make the class dynamic, attractive and inclusive, to value the potential that each young person with intellectual disabilities has and to make it possible to analyze their psychological situation by allowing them to express themselves openly and in an appropriate context.

Table 3. Pedagogical strategies in the approach to intellectual disability in students.

Technique	Definition
Didactics	Perform manual work to increase the student's concentration, through activities where they have to manipulate instruments and perform molding of materials, cutting and sewing.
Interrogative	Encourage students to improve the assimilation of the contents learned. For this purpose, questions of easy comprehension and simplicity are asked.
Interactive	These are interactive tools for learning different contents. In this section we can mention the applications that are used on mobile and computer infrastructures.
Audiovisual	The use of multimedia such as documentaries, songs and movies allows to increase the student's concentration, interest and learning. In this way, teacher-student interaction is more favorable.
Graph	The presentation of diagrams, photographs, tables, maps and images is another widely used and valuable resource to capture the individual's attention.
Artistic	The use of diverse resources and materials such as artistic works stimulates concentration, interest and motivation in learning and to express emotions and thoughts.
Interaction	Interaction in the teaching-learning process between students and teachers stimulates creativity, collaboration and appropriate human relations.

Source: own elaboration with data obtained from Ramírez (2017).

As part of the methodologies to be used, it is relevant to mention project-based learning. This is a means by which skills and abilities can be developed in the subjects studied by students with intellectual disabilities. In this sense, it is a method that affects the curricular contents, meeting a real need in a given context. The application of this method in the university will encourage students to become committed to the problems of the environment (Pastor et al., 2018).

In addition, it is essential to point out that in these times of SARS-Cov-1, learning in virtual environments has been strengthened. For this

reason, the use of ICT as a didactic support is essential. Technology contributes positively in this context, to a positive access to the labor market and to facilitate interpersonal relationships for greater independence and autonomy. For this reason, it is essential to promote projects based on the demands of current technologies because digital competence is a requirement of the labor market.

Therefore, the teacher is a support guide in the teaching-learning processes, which requires a mastery of theoretical and practical knowledge so that they acquire competencies according to their work profile and prepare them for life. In line with the aspects addressed, Table 4 shows the main findings regarding the various methodologies and actions carried out as

inclusive practices, based on pedagogical innovations, to improve the performance of students with intellectual disabilities.

Table 4. Inclusive practices, based on pedagogical innovations, to improve the performance of students with intellectual disabilities.

Authors	Findings
Garcia & Gomez (2018).	This study highlights the importance of the needs of autonomy, self-determination and interpersonal relationships, with the contribution of a multidisciplinary team for the overall improvement of people with intellectual deficits.
Pastor et al. (2018).	This study is based on the Service-Learning methodology, where nature and the practice of physical activity are the axes of the proposal. The student with intellectual disabilities learns in a propitious and favorable environment, using good practices to increase his concentration and adequate human relations with other young people with the same condition.
Lopez and Perez (2020)	This study models the phenomenon of intellectual disability in students, as part of the programs called DEMOS, at Comillas Pontifical University. These programs enable the development of adequate professional competencies for inclusion in the work environment. Additionally, they stimulate the integral formation of the individual for his or her favorable performance in all facets of life.
Sanchez et al. (2020)	This study explains the relationship between intellectual disability and the use of ICTs as a strategy for learning and inclusion of students with intellectual disabilities in today's society.

Source: Prepared by the authors.

Discussion

Currently, inclusive education in a process that is ongoing. For this, it is important to develop inclusive policies that offer opportunities for personal growth and intellectual development to all students, especially those with special conditions, such as those with intellectual disabilities (Alonso et al., 2018; García & Gómez, 2018; Palomino & Martínez, 2017).

In this sense, higher education institutions should implement curricula and methodologies to strengthen the professional competencies of students with intellectual disabilities, which ensures a quality inclusion approach that responds to the individual and group needs of the student body (Ramírez, 2017). This is due to the fact that attending a university environment has proven positive effects, which contribute to the fact that in the future all individuals can be adequately inserted in a work environment.

The above statements are supported by the results presented and the assertions of the authors consulted, which are discussed in the current section, and with which the authors are in agreement. Therefore, in line with the previous idea, universities must manage all types of resources necessary to carry out the teaching-educational programs. The results obtained in students will depend on this, such as improving self-esteem and confidence, since they will feel useful and part of society (Rillotta et al., 2021).

Furthermore, according to López & Pérez (2020), Ramírez-Pérez et al. (2021) and Vaz & Pedro-Viejo (2013), the cognitive and social skills of each student should be strengthened, as well as their communication and the use of ICT, as a tool that favors greater performance and competitiveness in the new knowledge society. The purpose of all this is to favorably prepare the individual for a changing social environment and a demanding and equally competitive labor market.

According to Sánchez et al. (2020), ICTs favor lifelong learning, foster equitable opportunities, enable the development of innovative applications and promote inclusive education. On the other hand, once the university experience is over, students with intellectual disabilities should be prepared to face the world (Alonso et al., 2018). For this, companies must offer opportunities and job stability that promotes personal and professional growth, with a stimulating environment, with people who are empathetic and allow them to be productive entities for a country. The main results presented by the authors of the study agree with the statements presented above.

For this reason, this research emphasizes the importance of teacher training through inclusive practices based on pedagogical innovations. In this order of discussion, the teacher must be able to design study and training programs that promote and develop work organization, task control, tutoring of the group of students, assessment of the needs and work interests of the student body, and the development of basic academic, social and work skills (Barría & Jurado, 2016).

Conclusions

1.   At the conclusion of the study, it can be affirmed that in order to strengthen the teaching-learning processes of students with intellectual disabilities, it is essential that the teacher be trained in the use of the Service-Learning methodology, as well as in collaborative learning. In this way he/she will be able to contribute in a better way to an increase in the levels of autonomy, self-determination and interpersonal relationships in the student. These results were based on the updated and impact research analyzed, where it was determined that teachers who applied strategies and methodologies such as the ones addressed enabled a greater strengthening of cognitive skills and social competencies in students.

2.   Additionally, and in the same line of discussion, it can be affirmed that students with intellectual disabilities regularly attend and respond more favorably to cognitive and social development strategies, which involve continuous repetition of activities to solidify and facilitate learning through persistent work on long-term memory.

3.   It was determined that there are several programs and projects for the formation of professional competencies for the labor inclusion of subjects with intellectual disabilities. For this purpose, use is made of projects that employ a Service-Learning and collaborative learning methodology. These include the Promentor program and the Capacitas program, in which the students' skills are strengthened through a curriculum, so that they can be effectively inserted in the professional context in the future.

4.   Likewise, students with intellectual disabilities can be inserted in the university context in the most normal way possible. For this, only the support of the authorities, the mastery of knowledge on the part of professors and the empathy that can be established with each one to help them in their integral formation are needed. In all this, it is essential to modify the old approaches to work and the conceptions of diversity at this level of higher education, to give way to new ideas that allow the application of methodological strategies and the use of ICT, which favor meaningful learning. All this will allow students to acquire professional competencies that will enable them to enter the labor market in a satisfactory manner and thus not feel marginalized. Instead, they will be part of a free, fair and equitable society, where policies of inclusion and normalization are applied for the continued progress of nations.

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