



## Use of Information and Communication Technologies to Promote the Learning Process of Students with Intellectual Disabilities



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### Abstract

Students with intellectual disabilities have difficulties in advancing in the teaching-learning process, because traditional methods are used by teachers, and this causes poor performance. The objective is to introduce the use of computer and communication technologies to improve academic capabilities, the methodology used was descriptive, qualitative, and bibliographic review. The results obtained indicate that the use of new technologies enhanced the abilities of the students, confirming cognitive improvements for learning the subjects, in this way it was proven that these tools allow greater development of the academic skills of each of them.

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## 1 Introduction

The use of Information and Communication Technologies (ICTs) in education has its roots in the early stages of the development of computing and digital technologies. From their first attempts in the 1950s and 1960s to their widespread adoption today, they have experienced a significant evolution in the educational field (Temporelli, 2018). This advance has been driven by the constant search to improve the teaching-learning process, providing access to a wide range of educational resources and encouraging greater interactivity in classrooms. The influence of ICTs is forcing new interaction situations for which people were not prepared Temporelli (2018), their use for students with intellectual disabilities has been gaining relevance and has proven to be a valuable tool to promote educational inclusion and improve the access to quality education for this group of students, the use of online platforms and digital educational resources has allowed these students to access educational content from anywhere with an Internet connection (Consoli, 2012; Freitag et al., 2021).

Inclusive education pursues the search for an equitable and just society, where everyone, regardless of their abilities, has access to significant and enriching learning opportunities (Cruz Pérez et al., 2019). In this context, ICTs emerge as powerful and transformative tools that allow teaching to be adapted to the particular needs of students with intellectual disabilities. The teaching and learning process represents a universal form of human development, based on students maintaining a closer relationship with technological devices that facilitate access to information, promote communication, foster autonomy, and stimulate motivation in the classroom. inclusive (Lorduy Flórez & Naranjo Zuluaga, 2021). People with intellectual disabilities face unique challenges in their educational process, which is where technological tools play a crucial role by offering a wide range of innovative solutions to support and empower these students in their academic and social development (Alhassan & Adam, 2021; Mushtaq & Bruneau, 2019).

Recognizing the gaps and in the context of ICT support, inclusive education as a process of creating a social environment between students and teachers seeks to enhance teamwork and contribute to the well-being of students by emphasizing the importance of knowledge in the community. academic (Buzón García et al., 2021). The effective implementation of ICTs in inclusive education goes beyond the simple adoption of devices and applications, as it requires a deep understanding of the individual needs of each student, as well as the adequate training of teachers and professionals to create an educational environment. Truly inclusive. Currently, education is undergoing important changes to introduce the use of new technologies as tools for students to achieve their learning objectives (Cruz Pérez et al., 2019). ICTs have the potential to contribute to education and equity, to improve the quality of learning and teaching, the professional development of teachers and the effectiveness of educational management Buzón García et al. (2021), technological tools positively transform the educational field in various aspects (Patel et al., 2012; Tang, 1991).

In the application of ICTs in the education of people with intellectual disabilities, it is necessary to adopt an inclusive and personalized approach that adjusts to the individual difficulties and abilities of each student; teachers must be provided with adequate training in the use of these technologies adapted to the needs of each student, since educators must be familiar with applications, software and support tools that can help students in their learning process, providing quality education that allows them to achieve their skills Fernández Batanero (2020), teachers must foster diverse talents as a starting point for learning, getting involved based on their position and characteristics as human beings (Castro et al., 2007). However, it is important to keep in mind that the success of the use of ICTs in education depends on adequate implementation, teacher training and access to resources and technologies for all those involved in the educational process (Delgado et al., 2009).

Intellectual disability can have its onset in a wide variety of hospital and environmental circumstances, among them some are genetic, the most common are: Down syndrome, which is based on the genetic alteration caused by the presence of an extra chromosome in pair 21, produced through cell division at the time of gestation, without the parents being responsible for what happened; Hydrocephalus (too large skull) or microcephaly (small skull) (Tolosa & Mayaney, 2015). Currently, there are high degrees of social exclusion due to the different types of intellectual disabilities present in the world (Oproiu, 2015; Schoenfeld, 1999).

## 2 Materials and Methods

The research is oriented towards a descriptive approach and consists of knowing predominant situations, customs, and attitudes by carrying out activities, objects, processes, people, to find and specify the characteristics from a qualitative point of view (Alban et al., 2020).

Qualitative research was used, where the object of study is analyzed in an integrated or complete manner, the researcher interacts with the participants, information could be collected, using different search tools, bibliographic review, analysis, and synthesis.

## 3 Results and Discussions

Intellectual disability is a set of limitations that are analyzed for medical and environmental causes to present more effective support strategies for this type of people, achieving successful social inclusion. People with intellectual disabilities need emotional, educational, and social support to develop optimally and participate in society fully and meaningfully. That is why it is vital to apply effective support and adaptation strategies (Pellegrino & Florence, 2020). Depending on the level of intellectual disability, several types of classifications can be identified as shown in Figure 1.

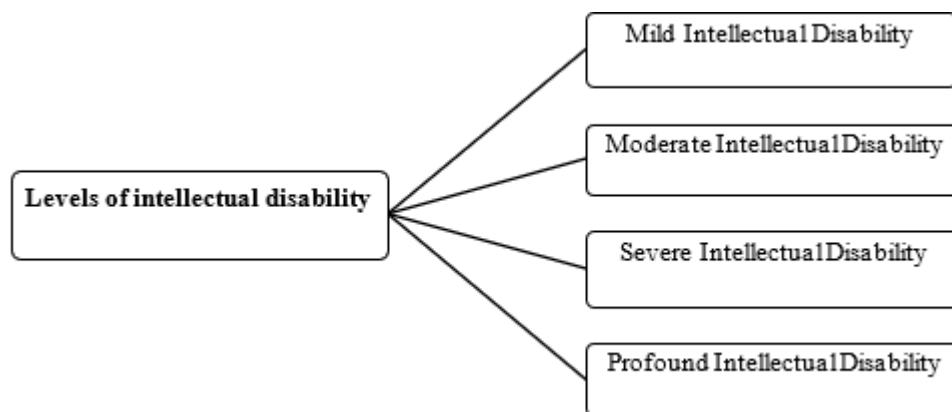


Figure 1. Levels of intellectual disability

- Mild Intellectual Disability*, intellectual limitations are minimal, and the person can generally learn academic and life skills, within these there may be difficulties in problem solving, delay in the development of language, social skills and the need for support in daily life (Vahia, 2013).
- Moderate Intellectual Disability*, People with this level of disability manage to learn self-care and communication skills, needing assistance with limited independence from work and participation in the community (Schalock et al., 2010).
- Severe Intellectual Disability*, Intellectual limitations are significant, generating limited communication and self-care skills (Vahia, 2013).
- Profound Intellectual Disability*, they are considered serious when people have very limited functioning in academic and life areas (Schalock et al., 2010).

In the educational field there are several learning methodologies for children with intellectual disabilities as shown in figure 2.

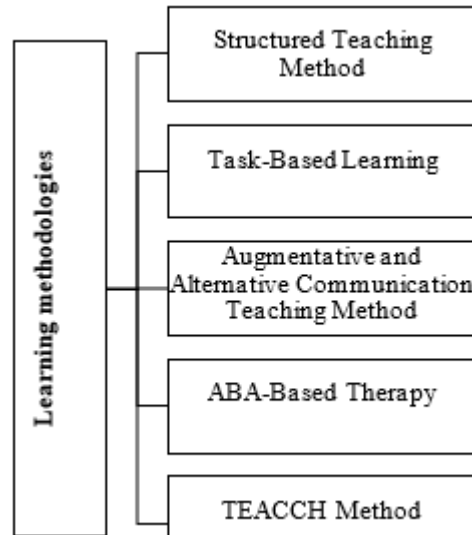


Figure 2. Learning methodologies applied to students with intellectual disabilities

- a. *Structured Teaching Method (Structured Teaching - TEACCH)*: This approach focuses on organizing and structuring the environment to support children with intellectual disabilities. Uses visual systems and routines to improve comprehension and independence (Glenn et al., 2022).
- b. *Task Based Learning (Task-Based Learning)*: This approach is based on teaching skills through practical tasks relevant to daily life. The tasks are adapted to the child's individual abilities and needs (Lequia et al., 2012).
- c. *Augmentative and Alternative Communication Teaching Method (AAC)*: This method uses communication systems such as pictograms, signs, or electronic devices to facilitate communication in children with intellectual disabilities (Ronski & Sevcik, 2005).
- d. *ABA Based Therapy (Applied Behavior Analysis)*: ABA focuses on modifying specific behaviors through positive reinforcement and repetition. It is widely used in teaching skills in children with intellectual disabilities (Cooper et al., 2020).
- e. *TEACCH method (Treatment and Education of Children with Autism and Related Communication Problems)*: This approach focuses on structuring the environment and providing visual supports to promote independence and understanding in children with intellectual disabilities (Mesibov & Shea, 2010).

Technological tools have enhanced skills in cooperative work, innovative practices, thus allowing the promotion of digital skills, technological literacy, new forms of socialization, etc., favoring autonomous and independent development, reducing academic and personal failure in this sense (Romero et al., 2018). The usefulness of technological tools favors the cognitive development of students with intellectual disabilities Rodríguez (2015), agrees with several authors that, by using these tools, they will have a development of communicative capacities, competencies, and skills, which will help them experience new pedagogical areas for the teaching-learning process.

It is evident that the learning of people with intellectual disabilities allows teachers to improve their educational practice by using varied and creative ways of teaching (Gallegos, 2018). There are tools that promote the cognitive development of students as can be seen in figure 3.

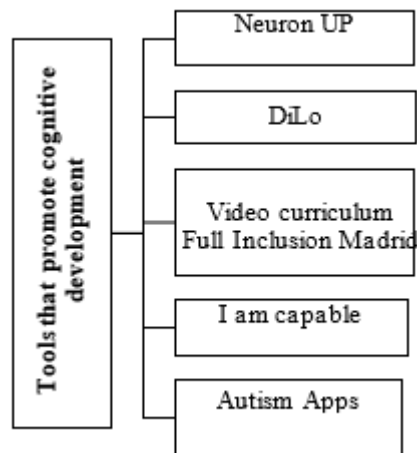


Figure. 3 Technological tools that promote cognitive development

The challenges that teachers are committed to are maintaining students' motivation and avoiding rejection and frustration with certain cognitive activities; In a survey it was shown that 95% of teachers agree that the use of ICT in educational centers contributes positively to the motivation of students with intellectual disabilities (Muñoz Manjón, 2020). ICTs improve the lives of people with disabilities within society (Parra & Luque-Rojas, 2012). However, this type of students may be limited in their understanding due to the inappropriate use of tools within the classroom. Each student is unique and may require different learning approaches since technology is not exclusive of other traditional instruments of education. teaching (Muñoz Manjón, 2020). These technologies offer multimedia resources that improve the attention and concentration of students with intellectual disabilities through digital tools that encompass virtual reality, assistive technologies, augmentative and alternative communication (AAC) devices, interactive and adapted applications, software; Figure 4 shows the digital tools applied in the teaching and learning process such as: Educaplay, Brain Games, Detective.

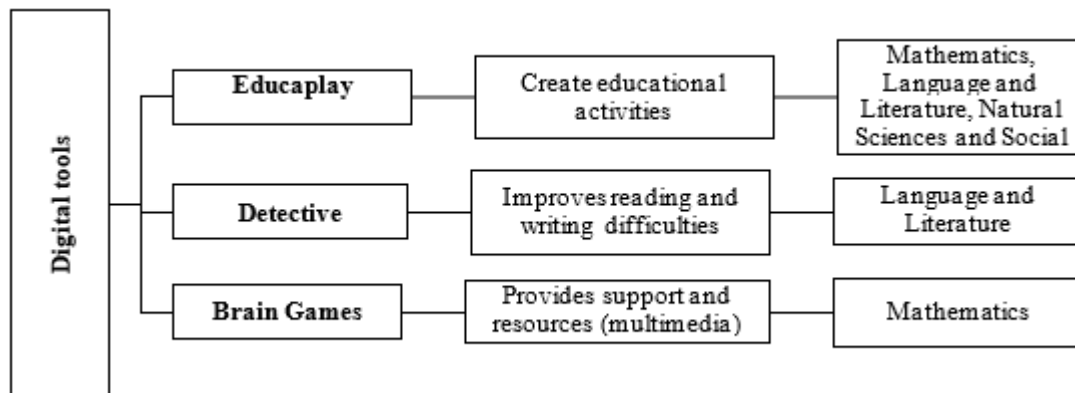


Figure 4. Digital tools applied in the teaching and learning process

- Educaplay*, offers the creation of 12 types of educational and recreational activities and contains a tutorial for teachers, allowing the download of resources, printing and playing in any browser locally from different storage media, to reinforce learning, individually or collaboratively, through the construction of participatory maps, video-tests, crossword puzzles, word searches, riddles, dictation applications, among others (Espitia & Mercado Castro, 2021).
- Dyctective*, is an application that helps treat dyslexia and other disorders in children with learning problems through training games, allowing them to improve reading, writing and comprehension skills, offering more than 42,000 exercises that can be applied in the teaching and learning of students, which are personalized based on 24 cognitive

skills such as: linguistics, memory, executive function, prescriptive processes, performance or performance (Sánchez Bautista, 2022).

- c. *Brain Games* is designed to stimulate and exercise the mind. These games can include puzzles, riddles, memory games, and other challenges that help improve cognitive skills such as logical thinking, memory, attention, and problem solving. It is believed that participating in these games on a regular basis can have benefits for brain function and mental agility (Quiroga et al., 2019).

ICTs provide educational tools such Educaplay which has the purpose of facilitating the teaching-learning processes for teachers and students, providing multiple benefits for classes, generating a space and environment different from the traditional method, where students are more active and participate in the educational process (Ramírez López, 2018). The research carried out shows that this is one of the optimal options for working with students who have intellectual disabilities due to its high functionality in the design of interactive activities and development of content for the teaching and autonomous learning process (Adey et al., 2007; Carroll, 2003).

## 4 Conclusion

Technological resources reduce the limitations in the learning of students with intellectual disabilities, contributing with strategies, use and purpose, in the timely development of their skills, leading to greater teacher involvement since they must be in a continuous period of training and updating. periodically in the advances of ICTs. Digital tools improve the quality of life and inclusion of people with intellectual disabilities by facilitating communication, learning, social participation, autonomy, and the development of skills.

### *Conflict of interest statement*

The authors declared that they have no competing interests.

### *Statement of authorship*

The authors have a responsibility for the conception and design of the study. The authors have approved the final article.

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