Educational Technology as a Support Tool

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A “Specific Learning Difficulty” (SLD) is considered to be the affectation and involvement of language, reading, writing, and/or calculation at a cognitive level. In the field of educational technology, there is a great deal of research that seeks to develop educational inclusion. Emerging technologies, such as Augmented Reality (AR), Virtual Reality (VR), the Semantic Web, or Artificial Intelligence (AI), are fundamental in the development of this new context.

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1. Introduction

The development of today’s educational society implies new competences from different perspectives, and so the educational field needs the involvement of new technologies to guide and direct a new educational paradigm that provides personalized responses and that focuses learning on the development of the student’s potential.

Information and Communication Technologies (ICT) allow the development of keys that will enable the student to be seen as a coprotagonist in their learning in order to: increase motivation to awaken interest in learning and understanding; lighten the immediacy of the transmission and reception of information; and provide flexibility in the pace and time of learning [1].

For the UNESCO [2], inclusive education is a process of strengthening the capacity of the education system to reach all students.

An inclusive educational system can only be created if the curricular contents are adapted to a more diverse reality.

Following Benítez, Peral, and Hermida [3], to guarantee the access of people with difficulties to these contexts, support is essential (that is, an organization of the environments that makes them inclusive). New technologies have not only become a requirement for participation in society, but also an important facilitating environment. For Camacho, Vera, and Méndez [4], they fulfill adaptive functions that involve different processes of the elaboration, communication and development of school information.

2. Educational Technology

This educational-technological evolution, and the growing presence in schools, imply new lines of research and the implementation of new challenges, as they open up an enormous field of action within inclusive education. The implementation of audiovisual technology is one of the most widely used for the improvement in learning difficulties and disability, and for the following reasons [5][6][7]:

- Educational technology is an important support within the most diverse disabilities, from sensory to cognitive;
- Educational technology personalises needs, and therefore creates self-sufficient learners;
- Educational technology fosters communicative interaction between students and teachers;
- Educational technology facilitates the acquisition of content in less time;
- Some applications and programs help diagnosis, and always as a means of support and used by a specialist;
- Educational technology is based on multisensory models;
- Educational technology helps in the inclusion of people with disabilities in the workplace;
- Educational technology opens new scientific and cultural horizons to students;
- Educational technology enhances self-esteem, as pupils feel more capable.

The role of the educator is essential to determining the types of tools that are needed for the optimal achievement of objectives, and this selection is even more important if it involves people with disabilities or learning difficulties. Therefore, the selection and knowledge of the different technological solutions, characteristics, adaptabilities, etc., are an important part of the selection and decision-making process [7].

For learners with special educational needs, the following should be considered [5]:

- The type of disability determines the use of one or another technological proposal;
- The degree of disability is a determining factor in this selection;
- It is necessary to determine not only the type of software, but also the hardware, that may be necessary to carry out the adaptations;
- Materials can and must be adapted, supplemented, and combined on numerous occasions;
- Interdisciplinarity in the design of materials and their adaptation is very important. Therefore, different professionals from different perspectives must collaborate.

In the field of educational technology, there is a great deal of research that seeks to develop educational inclusion [8][9][10]. Currently, emerging technologies, such as Augmented Reality (AR), Virtual Reality (VR), the Semantic Web, or Artificial Intelligence (AI), are fundamental in the development of this new context [11][12][13][14].

The main results show the use of educational technology, the perceived usefulness of educational applications, and the use of educational technology as support for students with specific learning difficulties by future professionals of the education.

3. Specific Learning Difficulties

A “Specific Learning Difficulty” (SLD) is considered to be the affectation and involvement of language, reading, writing, and/or calculation at a cognitive level.

Within European legislation, there is no unanimous legislative development with regard to learning difficulties. The European Education Area aims to promote cooperation between the Member States of the European Union to further enrich the quality and inclusiveness of national education and training systems in terms of Children’s Rights and the European Child Guarantee [15]. However, each country in the European Union is responsible for its own education and training systems.

One of the objectives of the 2030 agenda is the guarantee of an inclusive education, the quality of which is not a difficulty, and the promotion of learning opportunities, to be developed through particular and general actions.

In Spanish legislation, some interesting aspects have been developed around learning difficulties. With regard to the Spanish legislation, Organic Law 8/2013, of 9 December, for the improvement of educational quality (LOMCE), develops, in its Article 71, these aspects [16]:

- The responsibility for obtaining the means of any kind (human or material) that are considered necessary for the optimal development of students in their intellectual, personal or social levels and for the achievement of the objectives promoted by this law, falls on the educational Administration, likewise these bodies will develop priority intervention plans for centers that school students with special educational needs;
- The resources of students whose special educational needs and specific learning difficulties give rise to extraordinary measures must be ensured and guaranteed.

On the other hand, Organic Law 3/2020, of 29 December, which modifies Organic Law 2/2006, of 3 May (LOMLOE), highlights the need for the individualisation of education in the field of inclusive education, with the aim of achieving adequate development within the personal, intellectual, social, and emotional spheres of students [17]. The same legislation considers adaptations to the postcompulsory school stages to be fundamental.

In recent years, educational strategies and methodologies have been developed with an important and necessary vision of inclusion. The most important of these is the Universal Design for Learning (UDL), which was developed

by the Center for Applied Special Technology (CAST). The UDL approach focuses on the design of the school curriculum to explain why some students do not reach the expected learning outcomes. CAST criticises that many curricula are designed to cater to “most” students, but not to all.

There are three main principles of the UDL:

- To provide a wide variety of media to encourage student participation and the consequent motivation to learn;
- To carry out the representation of the contents through multiple forms that facilitate the perception and understanding of what is presented. The learner will be able to identify what is most important;
- To let the learners choose the means by which they will express what they have learnt or identify what is most convenient for them. In this way, written tests, oral presentations, or group work can be chosen.

“The curriculum that is created following the UDL framework is designed, from the outset, to meet the needs of all learners, making subsequent changes and the cost and time associated with them unnecessary. The UDL framework encourages the creation of flexible designs from the outset, featuring customizable options that allow all learners to progress from where they are, not where researchers imagine them to be” [18].

The Universal Design for Learning (UDL) brings together didactic practice and neuroscientific research to create flexible curricula that are responsive to all learners.

By following the UDL-curriculum-creation structure that is proposed by [18], multiple forms of presentation and representation of content can be used to optimize learning:

- Options to modify and personalize the presentation of information (offering visual, auditory, motor alternatives…);
- The provision of multiple options for language and symbols (clarifying syntax, vocabulary, mathematical symbols, etc.) and illustrating meaning;
- The provision of options for comprehension (activating prior knowledge and ideas, and aiding information processing and memory).

Active methodologies and the inclusion of technology respond to the UDL approach as they favour the input of information through different senses, cooperative learning, or gamification, and they help to integrate information in a natural and interactive way. The importance of the UDL methodology lies in the process of the positive interdependence of responsibility and interaction. Student interaction fosters peer learning and is based on one of the main characteristics of humans as social beings [19].

The technological approach complements the attention to diversity that is provided by active methodologies by supplying flexible and adaptable environments that facilitate and provide a unitary curriculum for the different students in the classroom.

4. Educational Technology and UDL

Research has gone beyond audiovisual technology and has focused on different applications, the objective of which has been the development of reading and writing intervention proposals for students with learning difficulties [19][20][21][22][23][24][25][26].

Learning difficulties have been little taken into account within the educational system; however, in recent years, there has been a growing interest in offering quality inclusive education. Educational applications that enable educational intervention for students with specific learning difficulties improve the quality of education and allow for greater inclusion.

The acronym App comes from the term “Application”. In the educational field, researchers understand “educational Apps” as programmes or multimedia educational resources that are used through mobile devices connected to the Internet.

The use of Apps in education offers some advantages, as long as they are adapted to the needs of the child:

- Learning is extrapolated to any context, and is not specifically circumscribed to the classroom;
- The motivation and involvement of the student is better when using educational Apps sporadically;
- Educational Apps usually have an important playful component, as they integrate the typical dynamics of games and rewards to achieve learning objectives on the basis of gamification. This allows the student to learn while playing;
- They allow for the movement from passive learning to richer and more effective activity-based learning that is focused on active participation throughout the process. As a result, attentional levels are also improved;
- Autonomy and the personalisation of learning are the pillars on which this educational technology is developed;
- Some of these applications favour collaborative environments and, given the current pandemic situation, these environments can be a specific alternative to face-to-face cooperative learning;
- Experience, without the need for uncorrectable errors, is the proposal that is made by many of these applications, which is why it is important training for many skills.

- The versatility of the technological applications, the great variety, and the supply they offer make them adaptable to different contexts and capacities [27][28][29][30].

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