Ict tools applied to SEN students at university

Herramientas TIC aplicadas al estudiantado NEAE en la universidad

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HIGHLIGHTS

- The use of self-knowledge and self-assessment tools is addressed.
- Tools and software are analysed and explained.
- Greater teacher interest is required to understand SEN student.

TITULARES

- Se aborda el uso de herramientas de autoconocimiento y autoevaluación
- Se analizan y explican las herramientas y el software.
- Se requiere un mayor interés por parte del profesor para entender al alumno con necesidades educativas especiales.

RESUMEN

El presente documento muestra los resultados de un trabajo de investigación realizado para facilitar el paso por la educación superior al alumnado con necesidades específicas de apoyo educativo. Para ello, se ha realizado una búsqueda exhaustiva de herramientas en varias bases de datos de programas y utilidades creadas con este fin (TICNE). Entre los parámetros de búsqueda se establecieron la gratuidad, la facilidad de implantación y la utilidad de la herramienta. Después de esto, un análisis concreto de cada una de las herramientas se ha realizado con el fin de explicar el funcionamiento, las características y las utilidades de cada una de ellas. El análisis contiene también ventajas e inconvenientes de la utilización, así como características básicas de funcionamiento. La finalidad de este studio es acercar herramientas y programas al estudiantado de manera que la brecha existente debido a las capacidades de aprendizaje se vean reducidas y permitan la inclusión de todas las personas en la educación superior.

Palabras clave: *NEAE, TIC, Aprendizaje, Educación superior.*

ABSTRACT

This document shows the results of a research work conducted to facilitate the transition to higher education for students with specific educational support needs. To this end, an exhaustive search for tools was conducted in several databases of programmes and utilities created for this purpose (TICNE). Among the search parameters, free of charge, ease of implementation and usefulness of the tool were established. After that, a concrete analysis of each of the tools has been conducted to explain the functioning, characteristics, and utilities of each of them. The analysis also contains advantages and disadvantages of use, as well as basic operating characteristics. The aim of this study is to bring tools and programmes closer to the students so that the existing gap in learning abilities is reduced and allows the inclusion of all people in higher education..

Keywords: *SEN, learning, ITC, high education*

1. INTRODUCCIÓN

EN pupils (Specific Educational Support Needs) are understood to be those pupils who, at some point in their educational cycle, at whatever level, require support or unique requirements so that the whole class can make simultaneous progress. These needs may be due to several factors. On the one hand, we have the situations produced by cognitive situations, where students with attention deficit hyperactivity disorder (ADHD) and High Intellectual Abilities (ALCAIN) would come in. These situations are timeless, i.e., they affect education at all levels, including higher education.

On the other hand, there are situations produced by external factors, such as special personal conditions or school history (ECOPHE) or late incorporation into the education system (INTARSE). These situations concern and are more visible in early periods of education.

Committing to inclusive education implies a philosophy of action that goes beyond the educational framework and promotes the construction of a society that rejects exclusion and is committed to the real integration of all the people who make up this society [1].

Attention to diversity in the classroom is one of the main pillars of our education system and, at the same time, one of the greatest challenges. They are aimed at responding to the specific needs of each student, to make it possible to achieve the objectives set for each educational stage. They seek to promote policies and practices that enable all students to have access to a common education, with methods that consider different paces and types of learning. Diversity in human beings is complex and multiple, and this reality finds a privileged space of relationship in the different educational microcosms, such as our classrooms [2].

The approach to students with SEN has undergone multiple modifications throughout its history and has traditionally been related to significant academic delays, even if they have capacity and it is not a specific learning disability. However, the characteristics of this disorder present associated difficulties that can hinder the correct progress through the educational stage of these students if it is not done from a more adapted approach. It is possible to confuse the added difficulties of students with SEN diagnosed with a lack of interest, laziness, or defiance, and in turn, fall into the error of blaming the student directly for their academic delay, causing frustration among the teaching team.

The different laws that have been passed have increasingly included these students, considered their needs, and tried to make their passage through the entire system as inclusive as possible. Thus, in the last three education laws enacted in Spain [3]–[5], we can see reflected the valuing and inclusion of different cases of specific educational learning needs. This increase can be seen in the following table.

Table 1. Special needs included in each educational law.

LOE	LOMCE	LOMLOE
Special educational needs	Special educational needs	Special educational needs Maturational delay
		Developmental language and communication disorders
Specific learning difficulties attention or learning disorders	ADHD Specific learning difficulties	attention or learning disorders Due to severe lack of knowledge of the language of learning
		Being in a situation of educational vulnerability
High intellectual abilities	High intellectual abilities	High intellectual abilities
Late entry into the education system Due to personal conditions or school history	Late entry into the education system Due to personal conditions or school history	Late entry into the education system Due to personal conditions or school history

The presence of diverse learners in the mainstream classroom is still a matter of misunderstanding for some teachers, who feel incompetent to offer an educational response. They feel incompetent because they have not received specific training and the inclusion of this group is recent. Legislation on SEN in the university environment is not defined, only 7 of the 17 communities have some form of specific regulation [6].

For this reason, the universities approve regulations that are renewed annually. In the case of the Madrid region, most of its universities are members of the SAPDU network [6]. These guides and documents, which we can see are newly created, support and back up the normalisation and adaptation of the curriculum to SEN students, although, due to the particularity of each specific case, the measures proposed, and the intervention sometimes fall

short. In this way, as the approval is so particular, it is sometimes difficult to establish which lines are the most appropriate to achieve greater performance and effectiveness.

These guides include, for each of the SEN, measures related to class attendance and teaching, assessments and examinations, and resources specific to SEN, but in a general way. However, these guidelines are only oriented towards teachers, providing them with resources and allowing adaptations to improve the learning process.

Most of the measures are designed to be applied, nowadays, using ICT tools (information and communication technologies), which, when applied to education, become ICT4I, for learning and knowledge. The development of ICT is advancing at an unbridled speed, bringing about changes in all areas of society and, of course, also in education. One of the fundamental characteristics of ICT is that it has bridged the gap between knowing and doing, between theory and practice. Moreover, they have proven to be an educational resource with the capacity to complement, enrich and transform the teaching and learning process [7].

Technologies are a significant help as a means of individualising teaching, accessing the curriculum, facilitating learning, as a didactic reinforcement and as an essential tool for teaching. In this sense, in our country, Organic Law 2/2006 of 3 May on Education (BOE of 4 May), amended by Organic Law 3/2020 of 29 December [4], includes the use of new technologies as a crucial element in the performance of the teaching task and in the acquisition of student learning.

Digital competence is that which involves the creative, critical and safe use of information and communication technologies to achieve

objectives related to work, employability, learning, use of free time, inclusion and participation in society [8].

In education, ICT tools have five functions that are decisive in the learning process. Access, to learn how to use them correctly. Adoption, to support the traditional way of learning. Adaptation, to integrate new methodologies. Appropriation, so that students use them in necessary projects and situations. And finally, Innovation, to discover new uses for which they were not intended [9].

But the importance of using them in the field we are dealing with lies both in what they can contribute to the subject (acquisition of competences), and in how they can favour the transformation of the context to offer more and better learning and development opportunities for all. In other words, it means emphasising that their importance lies more in how the presence of ICTs contributes to thinking about and building an educational space that minimises barriers to learning, participation, communication, and play.

Thus, going deeper into the issue of ICT and Attention to Diversity, it is relevant to reflect on the ways in which ICT is used in schools as a tool to support all children to reach their maximum development. This means distinguishing between what years ago we called inclusive and integrative uses [10]−[12]. We positioned the former as tools to support learning and the latter as a focus for innovation. In the first case, their purpose would focus more on compensating for inequalities from a more individualistic approach. Adaptive technology and assistive software represent the maximum exponent [13]. In the second, inclusive uses, the introduction of ICT and its use represented an opportunity to move towards a more cooperative, meaningful, and interactive model of education at the service of

contexts, allowing for more individualised attention or attention tailored to needs and interests.

Educationally associating ICT and diversity sometimes means setting off a time bomb in static educational contexts of an integrative (but not inclusive) nature, because they doubly upset a teacher who is without resources and sometimes perceives both issues as a threat to his or her professionalism.

1.1 Objective

The main aim of this study is to provide SEN students with a series of accessible but unknown tools that will allow them to develop their passage through higher education as inclusively as possible, thus reducing the frequent obstacles they face due to their needs. Teachers' knowledge of these tools also allows them to share them with students to facilitate the learning process.

2 METHODOLOGY

2.1   Context.

To bring the contents of the tools closer to and facilitate them for teachers and students, this study has been conducted considering a series of determining factors when choosing the tools to be shown.

Firstly, the specific needs to be addressed were defined. The SAPDU guide [6], mentioned earlier in the introduction, includes in its statistics which of the needs are the ones that most appear at higher or university education levels. Thus, for this study, those where the impact on the academic curriculum is the least have been selected. It has been decided to choose this way because the existing tools produce a significant

impact on the students without a great investment of time in adaptations.

Thus, the needs chosen were attention deficit hyperactivity disorder (ADHD) and Specific Learning Difficulties in reading and/or writing (dyslexia and dysgraphia).

Then, using the TICNE database, which is a national database containing many ICT resources for educational support, a first search was conducted for existing tools dedicated to the specific needs mentioned. Then, a second filter was conducted to discard those paid tools that could not be purchased by the students or the university. The eight most valued and used tools were selected.

2.2   Procedure.

After this selection, a list was drawn up of aspects of all the tools selected that had to be explained to ensure a simple and quick understanding of how they work, as well as the ease of acquisition of skills for their correct use by the students. Therefore, of all the tools selected, it has been decided to mention and explain:

- SEN for which it is intended.
- How it is obtained (free of charge, extensions with payment plans, etc..).
- Characteristics of the tool. Main uses in the academic and teaching field, attractive properties, what type of programme it is, whether it is a desktop application, a browser extension, as well as the link to obtain it.
- Compatibility. It shows which browsers or operating systems are more appropriate for the use of the different tools analysed and which are not compatible.

- Functions. Basic forms of use, main objectives of the tool and some tips for use.
- Advantages. Main benefits of using the different tools.
- Disadvantages. Factors not covered by the different tools, which could be included.

3 RESULTS AND DISCUSSION

In response to these adaptations, the following ICT resources can facilitate the implementation of these adaptations:

3.1   Microsoft Word.

By providing the material in Word format, students can modify the text according to their needs, facilitating the learning process for both students with ADHD and dyslexia.

It is one of the most widely used word processors, and although it is not freely available, it is often provided by universities for their students. It is compatible with Windows, macOS, iOS and Android and requires installation.

Microsoft Word allows you to change the font, size, colour or spacing of the text, allowing you to customise the document and making it much easier to read.

There are also other functions such as being able to listen to the reading of any part of the document that has been indicated with the cursor and simultaneously the tool highlights the words, improving reading accuracy. It gives the option of modifying the reading speed.

One of its advantages is that it can be installed on more portable terminals such as smartphones, making it even easier to use on a day-to-day basis.

The disadvantages include the limited customisation of the voice function and the fact that it cannot be exported in audio format. It also requires the document provided by the teacher to be in this format and not in other more commonly used formats such as PDF, which does not allow its manipulation.

3.2   Balabolka.

Allows text files to be adapted to audio format, making learning more flexible for both students with ADHD and dyslexia by allowing them to access information not only through reading, but also through other channels, such as auditory.

It is a free application that requires installation. Compatible with Microsoft Windows XP/Vista/7/8/10/11.

The programme can read files in DOC, RTF, PDF, ODT and HTML formats. And it allows you to save the audio document in WAV, OGG, MP3 and OGG. It also allows you to alter the speed and pitch of the voice that is speaking the text.

As advantages, it is worth highlighting the large number of formats that the programme allows, both for the document to be processed and the audio to be exported.

The disadvantages are that in Spanish it only allows reading in a male voice and that it does not allow the font of the imported document to be modified, making simultaneous reading difficult.

3.3   TTSreader

Tool that converts text to speech, facilitating learning for students with ADHD and/or dyslexia by allowing access to information through various channels.

It is a web link compatible with the most commonly used browsers such as Google Chrome, Mozilla, Opera and Safari.

It allows you to change the speed of speech, choose between different types of voices, import documents, or write directly on the web text screen. A major advantage over the programmes mentioned above is that it does not require installation to use it. The disadvantage is that it does not allow audio export.

3.4   Claroread

Google Chrome web store extension that requires installation, has a free version and a more extensive paid version. It has several tools that can reduce the difficulties that SEN students may have in general.

This tool converts text documents into speech format, allowing the words to be spoken as they are written. Among its most notable functions is that it allows the reading of PDF documents.

It also has a function that activates a transparent layer of colour so that the pages are coloured in a uniform tone and with less contrast, making them easier to read.

3.5   Lenguaje.com

This is a tool that can help to reduce the difficulties that students with dyslexia in particular may have when writing documents.

It is a web link with different linguistic tools including verb conjugator, spelling checker, synonym, and antonym search engine, syllabifier and it can also convert numbers into words.

It is online and compatible with the most commonly used browsers such as Google Chrome, Mozilla, Opera and Safari. It is an advantage that it does not require installation and is free to access. A disadvantage is the appearance of advertising as it is a free access page.

3.6   Helperbird

Allows adaptation of texts from web pages to different learning styles, and is designed especially for students with dyslexia.

It is a free Google Chrome web store extension that requires installation and is also compatible with other browsers such as Opera. It has a paid version with more functions.

It allows changes to fonts, colours, text-to-speech and colour overlay in the browser itself, facilitating access to online web content. One of the recommendations to improve the quality of written texts for dyslexics is the use of these colour contrasts and adapted typographies.

3.7   MidnightLizard

Extension that allows you to customise the text and appearance of web pages, facilitating access for SEN students. It is a free extension that requires installation and is compatible with the most commonly used browsers.

Among its functions, it allows you to modify the colours and sizes of letters and backgrounds, brightness, saturation, and contrast. It works with everything opened in the browser, including PDF files.

3.8   Dyslexia Friendly

This is a browser extension that is designed especially for students with dyslexia.

Compatible with Google Chrome, it is free and requires installation. It allows you to change the fonts of all web pages opened with this browser to a font specifically designed to make it easier for people with dyslexia to read. It also provides colour contrasts between odd and even paragraphs.

It allows you to choose between two types of fonts depending on which one is more

comfortable for the person who is going to use it: OpenDyslexic or Comic Sans.

Like the others mentioned above, it also has the function of reading aloud the words that are marked with the cursor.

4 CONCLUSIONS

Once the ICT programmes and tools have been analysed, the following conclusions can be drawn.

- At present, despite the existence and treatment of legislation for the full inclusion of people with specific learning needs at higher education levels in Spain, there is still a long way to go in terms of development and understanding of the particularities of students with these needs.
- There is a growing number of tools and support for learners with specific learning needs, as evidenced by the TICNE database.
- Most of the tools suitable for the integration and inclusion of learners with SEN require a low implementation cost.
- The proposed improvements have a significant impact on students, who always appreciate the provision of materials and tools that facilitate their passage through higher education.
- Future lines of action for the inclusion of SEN students involve the acquisition or development of tools such as those presented in this study to be made freely available to students.

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