

Learning to read in a foreign language in children between 6 and 8 years old with dyslexia, through a technological tool

El aprendizaje de la lectura en una lengua extranjera en niños entre 6 y 8 años con dislexia, a través de una herramienta tecnológica

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ABSTRACT

Reading is considered as an essential tool to the introduction of new knowledges and that is the reason why the students with dyslexia face several difficulties along their educational lives. This is particularly because the curriculum is associated with the decontextualization of its contents, neglecting the integrality between a global world, that requires a foreign language and ICT learning. The current document describes and proposes a technological tool that contributes to the conceptual-practical learning of reading in a foreign language, in order to the students with dyslexia can support the prior knowledges in a didactic way (visual and intended in the proper conditions for them) based on the necessity of an environment that evaluates competences.

Keywords: inclusion, technology, app, abilities, languages, teaching

RESUMEN

La lectura se considera una herramienta fundamental para la introducción de nuevos saberes y es por este motivo que los estudiantes con dislexia se enfrentan a diversas dificultades a lo largo de su vida educativa. Esto ocurre debido a la descontextualización de contenidos a la que se ven ligados sus currículos educativos, ya que deja de lado una integralidad entre un mundo globalizado, que requiere del aprendizaje de una lengua extranjera y de las TIC. El siguiente documento describe y propone una herramienta tecnológica que contribuya al aprendizaje conceptual-práctico de la lectura en una lengua extranjera, para que así los estudiantes con dislexia puedan soportar sus preconcepciones de una manera didáctica (visual y pensada en las condiciones más propicias para ellos) basados en la necesidad de un entorno que evalúa competencias.

Palabras clave: inclusión, tecnología, aplicación, habilidades, idiomas, enseñanza.

Introduction

"Teaching has tried to respond by encouraging the application of different methods with the aim of both facilitating learning and remedying deficiencies" (Ramirez, R. A. 2000) and as educational institutions are evaluated in strategic terms to contribute to the comprehensive training of all types of population, thus, in addition to incorporating inclusive and technological policies, it is possible to embrace a globalized world that requires the learning of a foreign language.

On the other hand, it is possible to evidence the high rates of learning problems (in this case dyslexia) faced by the students and also clearly a low intervention in the learning processes from early childhood. This is how the limitations begin to become noticeable the more a student is decontextualized from an environment, regardless of whether he/she is immersed in a learning problem or not. However, it deepens in terms of quality of service, by connecting a close relationship in what the student faces, what he/she needs to solve and how to make use of information and communication technologies to complement it.

In such a way, an aspect that has unbalanced the educational environments is the lack of strategies linked to the specific needs of the population, the idea of limitation of tools to support learning, the separation of the basic curricular contents with the learning of a foreign language, among others. For this reason, the justification of the project entitled: Learning to read in a foreign language in children between 6 and 8 years old with dyslexia, through a technological tool, is born, taking into consideration a learning problem, contemplated in the competitiveness of a globalized world that requires more than the mother tongue and bringing together these elements in a model of inclusion towards information and communication technologies.

Materials and methods

A teaching environment between virtual tools and the student usually supports learning and directed use of the same, in a dynamic way and creating collaborative spaces (Prokhorets, E. K., Plekhanova, M. V., & Scherbinina, N. G, 2015) of conceptual construction or reinforcement. This is how the use of technological tools for online language learning can become very significant for autonomy, being a flexible resource that generates motivation and efficient support (Gleason, J, 2013). Unfortunately, the strategies and tools that provide students with virtual and digital spaces are sometimes disconnected from the learning problems that some of them may face, in this case dyslexia.

The aspects already mentioned (ICT, a foreign language and a special learning need such as dyslexia) are related in research terms on several occasions with one or at most two of them. Therefore, the study seeks to integrate them in the following phases (according to the parameters offered by Hernández R., Fernández C., and Baptista P., in their book entitled *Metodología de la investigación*, 2014): Planteamiento del problema

1. Description of sampling
2. Literature review
3. Classification and triangulation of the information collected.
4. Proposal or results and conclusions
5. Recommendations

The problem statement scans the learning rates and strategies of children or people with dyslexia to identify the impact of the project. The characteristics of the population are then described. Followed by the exemplification of the use of ICT in the teaching of a second language or ICT in the learning process of students with special needs. Thirdly, the strategies to be taken into consideration for meaningful teaching are mentioned, including previous research on these topics. The conclusions mention a proposal (sketch) that gathers the most effective and efficient results in teaching a foreign language with emphasis on reading skills for children with dyslexia, in order to gather them in an application. Finally, the recommendations allow the opening of a possible continuation of the research previously initiated or to structure ideas based on what has been proposed.

The study follows a qualitative research approach, given that it does not involve an informative-documentary and measurable proposal, but, on the contrary, it intends to expose a final proposal that contributes to the needs of the population, organizing the data already stipulated in terms of number of people with special learning needs or pedagogical strategies established for them.

The sampling of this article is based on different natures due to the study of documents generated at present and different public and private archives. The following is a description of the number of the population with dyslexia and the importance of the

high numbers found around the world, which determines the need for intervention strategies to reduce them.

The World Federation of Neurology (cited by Viñuales S., et al, 2017) defines dyslexia as a disorder with an appropriate intellectual level, without audiovisual drawbacks and a stable socio-cultural interaction, but which manifests learning difficulties in reading given the instruction and in which there is a lower level than standard in terms of decoding the level of simple words, as well as encoding them (spelling), which can be considered an obstacle in the future for the orthographic stage. Not to mention the fundamental dependence of reading on the phonological process (Nijakowska, J. 2010).

The percentage of the world's population suffering from dyslexia does not provide an official figure as many of them are not diagnosed by qualified specialists or doctors. However, it can be indicated that the International University of Valencia (VIU) in its online article entitled: 'Symptoms and consequences of dyslexia' published in December 2014 states that "it is estimated that it affects, to a greater or lesser degree, 15% of the Spanish population", and the Non-Profit Association called: 'Madrid con la Dislexia' estimates that one in five Spaniards has dyslexia, which could be quantified as 20% of the Spanish population. As this is the country that has left a great cultural and genetic heritage in America, these are indicators to take into account about this learning difficulty. This is in addition to taking into consideration the figures mentioned below.

The research work entitled: 'Perfil lector de niños con y sin retraso lector en la ciudad de Cali' published in the journal published by the psychology program at the Universidad del Norte entitled: 'Psicología desde el Caribe', paraphrases Casals (2007) and Talero (2004) as follows: "World statistics on learning difficulties, especially in reading, define that between 5% and 16% of the population is usually diagnosed with dyslexia"; and in the same magazine for the second semester of 2008, it publishes the work entitled: 'Study of prevalence of reading difficulties in 7-year-old school children in Barranquilla, Colombia' which indicates that "the International Dyslexia Association has found that 15% to 20% of the population has a language-based learning difficulty".

On the other hand, the European Dyslexia Association (EDA- Europe Dyslexia Association) stipulates that dyslexia is a condition that occurs regardless of culture or language and is recognized in numerical terms in about 9% to 12% of the population worldwide. It also severely affects between 2% and 4% of them.

The data consulted in the different sources indicated above shows that an average of 15% to 16% of the world population suffers from this difficulty. This percentage will be used as the official one for the development of this work, which indicates that, it is a disorder that seriously involves the learning processes, not only in the reading part, but also in the underlying areas.

According to López-Tejeda, S. I., Uribe Viquez, Z., Concepción, M., Rivas, V., Mendoza Barrera, G., & Durand-Rivera, A. (2012) in their text entitled: 'Dyslexia from a cognitive focus: classification review' Revista Mexicana de Comunicación, Audiología, Otoneurología y Foniatría, the characteristics of a student with dyslexia between the ages of 6 and 9 years are divided into: language, reading, writing and calculation, described as follows:

- *Reading: Confusion in letters, words and syllables, inverting, changing or suppressing them. Complication with punctuation marks and difficulty in comprehension identification.
- * Language: Omissions, minimal verbal form expression and difficulty with new vocabulary knowledge.
- * Writing: mirror in letters or omission (there is no inconvenience in strokes, but alternate strokes).
- * Calculation: mirror writing of numbers, confusion of similar sounds, complexity of order.

This study seeks to emphasize the student's reading comprehension. However, it does not neglect the possibility of including and supporting the difficulties that may arise "especially in early childhood education and the first cycle of primary school, since sometimes the beginning of literacy learning is brought forward and others reinforce the error itself with exercises that try to remedy, achieving the opposite effect" (Cayuelas, M. (2017.)). Therefore, dyslexia should not be evaluated and helped based on only one of the difficulties, but to reduce each of them, as mentioned by Cabrera Solano, M. I. (2010), in his title: 'La dislexia: dificultad en el lenguaje? Pedagogía Magna.

Most people when they hear the term dyslexia, immediately associate it with reading problems, but this is not entirely correct. Children with dyslexia have difficulty not only in oral or verbal language as previously mentioned, but also this problem is extrapolated to written language. This means that these children usually also present great difficulty in the field of reading and writing.

Reading is then an aspect that enhances favorable or unfavorable results in the child's daily life. Given that textual comprehension skills and their relationships are found between linguistic understanding and inferences (Gil, L., & Flórez, R. 2011) regardless of the area to which they are linked. Therefore, reading and writing are closely related and a first step of reading reinforcement can have positive results in their derivatives.

Results and Discussion

Foreign language learning and students with dyslexia

Students who manifest a different way of learning due to difficulties in reading skills, show in turn complications in the application of syntax, new vocabulary, grammar, among others. Which, leads to compromise areas attached to the textual analysis of the curriculum (Alloway, T. P., Tewolde, F., Skipper, D., & Hajar, D., 2017). For children with dyslexia it becomes (on many occasions) confusing to learn a foreign language, given that the decoding process between word and reference limits the handling of the language. So, for those who consider a vocabulary acquisition tool in terms of the relationship between image, word and writing, it results a disadvantage for students with dyslexia.

For students to feel comfortable learning a foreign language, it is advisable to reduce the vocabulary to be learned where a clear structuring of grammar is necessary, adapting the texts to the student's reading level, with preparations prior to the planned contents (Viñuales S., et al, 2017).

In the case of students with dyslexia, there are several advantages of the use of ICT, from the use of multimedia equipment (allowing multisensitivity), a spelling checker, printouts instead of handwritten work, and the current affordability of this type of technological elements (Rooms, M., 2000). In this way, instead of taking the foreign language as an unattainable task, the student's vision of the subject begins to change in a more open way.

Thus, depending on the student, the teacher must maximize the student's potential. On some occasions, the decision is made to include an alternative course in the new language to be learned (Schneider E. and Crombie M., 2003). However, it is essential to complement all types of education with strategies that are effective enough to achieve the goals, without disturbing the student with one more area of the curriculum.

Learning strategies for people with dyslexia

Considering the above mentioned figures, it is possible to define a need to search for different strategies in formal and informal education so that students with special learning abilities feel involved in an autonomous process, but guided within their competencies. For this reason, it is not only necessary to find ways of teaching, but also to understand the existing connection from the understanding of the student to the processes of prevention of reading difficulties.

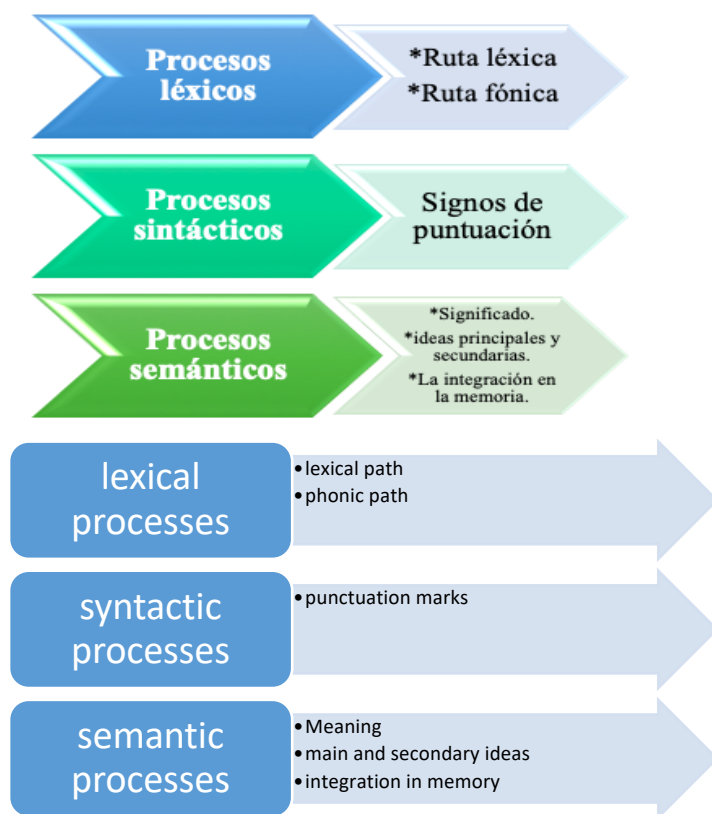


Illustration 1. Processes of prevention and recovery of reading disabilities .

Source: elaborated taking into account information taken from Viñuales S., Conde M., Panadero B., Pérez I., Valtueña M., Vicente L. (2017).

Viñuales S., (et al, 2017) in his title *La Dislexia: Guía de Detección y Actuación en el Aula*, exposes three processes of prevention or recovery of reading difficulties from a psycholinguistic approach (see Illustration 1). The lexical processes (which in turn are divided into lexical route and phonological route) emphasize the increase of visual vocabulary and the conversion of graphemes to phonemes. Next, syntactic processes are mentioned, in which importance is given to punctuation marks (making the necessary pauses) and finally, a semantic process, in which both main and secondary ideas are defined from a relationship with the environment and with the text itself.

Taking into consideration the processes of learning to read and comprehend information, different strategies are proposed to capture the attention of students with dyslexia. Thomson, B. M. (2014) understands the competencies of learning a foreign language in vocabulary acquisition, speaking, grammar and syntax, consolidation,

performance and creativity. However, in Table 1, we take into consideration those competencies that pertain to the reading area from the objective of the proposal.

As evidenced in Table 1, students should have access to different strategies (among them technological) to fulfill competencies such as vocabulary acquisition, grammar and syntax and, undoubtedly, creativity. So, it is possible to talk about the great variety of alternatives to involve the student's attention by making a previous diagnosis of the difficulties to continue with a structured academic plan. That is why, dyslexia should be catalogued as a different way of learning and teaching, and not simply as an impediment or disadvantage (Politt, R., Waller, E., & Pollock, J. 2004). This is done by taking resources from the environment and supplementing strategies to remedy the difficulties.

Table 1. *Learning strategies for students with dyslexia according to difficulty.*

Competence	Difficulty	Strategies
Vocabulary acquisition	• Phonology • Short term memory • Rename vocabulary • Recognition and distinction • Recognition and distinction of heard sounds or words • Forgetting or inverting syllables • Follow-up of instructions	• Distinctive Methods • Use of songs • Memory games, especially with pictures or diagrams • Use audio o TIC
Grammar and syntax	• Prediction • Order words in sentences • Use of dictionary • Note taking • Illegible lettering • Spelling • Dictations	• Order sentences with pictures first. • -Limit writing • Use electronic dictionaries • Video clips
Creativity	• Concentration in difficulties • Low motivation • Organization and sequence	• Flashcards to give ideas • Have flashcards to support presentations

<i>Competencia</i>	<i>Dificultad</i>	<i>Estrategias</i>
<i>Adquisición de vocabulario</i>	• <i>Fonología</i> • <i>Memoria de corto plazo</i> • <i>Renombrar vocabulario</i> • <i>Reconocimiento y distinción de sonidos escuchados o palabras</i> • <i>Olvidar o invertir sílabas.</i> • <i>Seguimiento de instrucciones.</i>	• <i>Métodos sensitivos.</i> • <i>Uso de canciones.</i> • <i>Juegos de memoria, especialmente con imágenes o diagramas.</i> • <i>Utilizar audio o TIC.</i>
<i>Gramática y sintaxis</i>	• <i>Predicción.</i> • <i>Ordenar palabras en oraciones.</i> • <i>Uso de diccionario.</i> • <i>Toma de notas.</i> • <i>Letra ilegible.</i> • <i>Ortografía.</i> • <i>Dictados.</i>	• <i>Ordenar primero las oraciones con imágenes.</i> • <i>Limitar escritura</i> • <i>Usar diccionarios electrónicos.</i> • <i>Videos.</i>
<i>Creatividad</i>	• <i>Concentración en dificultades.</i> • <i>Baja motivación.</i> • <i>Organización y secuencia.</i>	• <i>Tarjetas de vocabulario para dar ideas.</i> • <i>Tener tarjetas de vocabulario para soportar presentaciones.</i>

Source: created from information taken and modified of Thomson, B. M. (2014). La dislexia y las lenguas extranjeras modernas. *Dyslexia and Modern Foreign Languages*, (2). <https://doi.org/10.4324/9780203458709>.

For future studies related to supporting the reading process in a foreign language for students with learning difficulties (dyslexia), it is recommended to establish a measurable scope by evaluating the study directly with outcome evaluation surveys after the sample has performed the application test.

On the other hand, it would be possible to expand the foreign language learning competencies from the same application to include support for writing, listening and speaking, and not only reading. This is because the reading of students with dyslexia is amplified to the other competencies.

Finally, and as mentioned throughout this paper, reading is the gateway to learning and it is not possible to state that it affects exclusively a humanistic area, but also interferes in different subjects. Therefore, an opportunity for reinforcement could be interdisciplinary from reading and also from a foreign language. In this way, the objectives to be achieved in a complete and cross-cutting curriculum become integral.

Conclusions

Students with dyslexia face a world that requires them to be at the forefront in terms of information and communication technologies, in addition to the importance of learning a foreign language for a globalized world that maintains constant relationships from all areas of daily life of any person, whether work, education, entertainment, social, among others. To date, despite the many actions that have been carried out from inclusive policies, students with dyslexia, continue to assume their student role from the reception and not from the production of their own learning dynamics.

The above study seeks to integrate elementary aspects of the current educational requirements, with aspects such as ICT and reading in a language other than the mother tongue, with an application that supports the curriculum and therefore, helps to achieve a higher competitive level to students with dyslexia. For this purpose, the strategies previously investigated (studies conducted previously) are taken into account, due to the importance of evaluating the most effective results for each of the difficulties that have been identified in children with learning disabilities in the reading area.

Since the need for ICT in learning and teaching processes must be considered for a society that requires digital competence (Puente, A. G. 2001), this study develops an application idea that requires no more than an Android operating system to maximize the possibilities of affordability for students. This application has several dynamics that position the student as a producer and that involves the student's attention due to the visual attractiveness of the tool and its opportunity to reach goals and achievements. In this way, it improves the student's motivation in the face of the requirements he/she is facing.

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