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Fostering Inclusive Learning  
for Children with Dyslexia



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## NEWSLETTER - NOVEMBER 2021

## FORDYSVAR WILL BE AVAILABLE IN PORTUGUESE

The FORSDYSVAR European Project presented the presentation:

**“Emerging technologies in the context of the FORDYSVAR project. Virtual Reality & Augmented Reality”**

Held on May 25, 2021 at the Escola Superior de Educação of the Polytechnic Institute of Bragança (IPB).

FORDYSVAR has signed a collaboration agreement with the Portuguese University for the translation of the software into Portuguese. Therefore, the VR and AR software will be freely available in the following languages:



May 2021, Bragança (Portugal)



English, Spanish, Italian, Romanian and Portuguese.



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## Visit of FORDYSVAR to the Faculty of Education of the University of Barcelona

Members of the FORDYSVAR project visited the Faculty of Education of the University of Barcelona (Spain).

During the stay, the professors of the University of Burgos Sonia Rodríguez Cano and Vanesa Delgado Benito held a meeting with the professor **Anna Forés Miravalles**, Doctor in Philosophy and Education Sciences, Graduate in Pedagogy and Director of the postgraduate course in Neuroeducation at the University of Barcelona.



Septiembre 2021, Barcelona (Spain)

During the meeting the objective of the FORDYSVAR project was explained. The UB teachers, Anna Forés and Isabel Piedrola, were able to use the Virtual Reality viewers with the application designed and developed in video game format.

After the meeting, they expressed their interest in the project as well as in the development of possible future collaborations between both institutions.



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## ERASMUS DAYS 2021



One more year, the FORDYSVAR project participated in the celebration of ERASMUS DAYS, a space for the dissemination of financed European projects and activities, emphasizing inclusion as well as the progress and objectives to be achieved in this project. `p



On this occasion, these conferences gave the students of the Faculty of Education and the Faculty of Health Sciences the opportunity to enjoy the Virtual Reality and Augmented Reality software developed by this project.

In addition, different informative talks on the project were held in both faculties.



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#ERASMUSDAYS

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## MULTIPLIER EVENT – 25/11/21

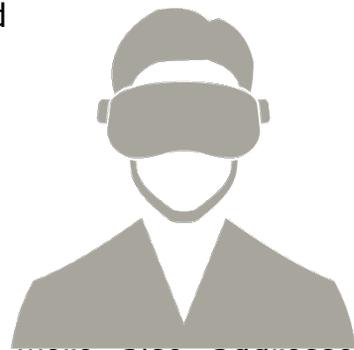
The last Multiplier Event of the FORDYSVAR project was held on November 25, 2021.

This event, coordinated by the University of Burgos, presented the results of more than 36 months of work.

### "OTHER REALITIES OF DYSLEXIA"

Throughout the day they were presented the intellectual results generated in the project:

- Kit de herramientas
- Ebook
- White paper



Future lines of research in Dyslexia were also addressed through representatives of the members of the University, Associations, research and projects.



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# OTRAS REALIDADES DE LA DISLEXIA



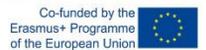
 25/11/21

 17:30 h.

 Salón de actos Fundación Cajacírculo  
Plaza de España, 3, Burgos



 [https://bit.ly/FORDYSVAR\\_ME](https://bit.ly/FORDYSVAR_ME)



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## PROGRAM



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### OTHER REALITIES OF DYSLEXIA

25/11/21

17:30 h.

Salón de actos Fundación Cajacírculo  
Plaza de España, 3, Burgos



Registration



[https://bit.ly/FORDYSVAR\\_ME](https://bit.ly/FORDYSVAR_ME)

17:30 h. Reception

17:45 h. **Presentation of the FORDYS-VAR project**

**D<sup>a</sup>. Sonia Rodríguez Cano**  
FORDYSVAR project coordinator  
*Fostering inclusive Learning for Children with Dyslexia*

18:00 h. **What is FORDYS-VAR?**

**D<sup>a</sup>. Vanesa Delgado Benito**  
VR / AR Design Toolkit

**D. Santiago González Izard**  
VR / AR Software development

**D. Vitor Gonçalves**  
*Ebook*  
Good practices and technological resources for students with Specific Learning Difficulties

**D<sup>a</sup>. Gemma Santa Olalla Mariscal**  
*White paper*  
Educational policies in Europe for students with specific learning difficulties

19:15 h. **The future of dyslexia**

#### RESEARCH

**D<sup>a</sup>. Lucía Simón Vicente**  
*Research Unit of the University Hospital of Burgos*

**D<sup>a</sup>. María Lozano Álvarez**  
*Pedagogical center El Búho, Salamanca*

#### ASSOCIATIONS

**D<sup>a</sup>. Silvia González Díez**  
*Federation of Dyslexia Support Associations and DEAs of Castilla y León*

**D<sup>a</sup>. María Suárez Martínez**  
*Burgos Dyslexia Association (ADBU)*

#### PROJECTS

**D<sup>a</sup>. Pilar Aparicio Martínez**  
*VRAllexia (University of Córdoba)*

**D<sup>a</sup>. Hénar Guillén Sanz**  
*Development of a VR video game for the treatment of dyslexia in children*

20:15 h. **Closing event**



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Burgos (Spain), 2021

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## VIDEOS



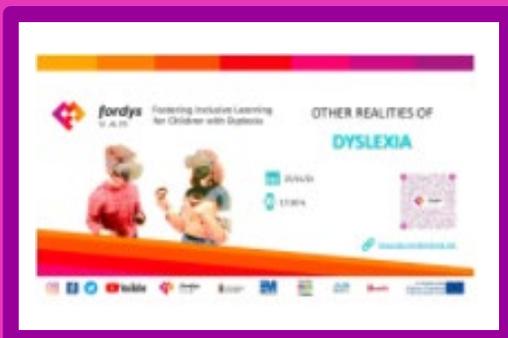
**Morning session:**

<https://www.youtube.com/watch?v=Q0peKVHARrE>



**Afternoon session (Spanish):**

<https://www.youtube.com/watch?v=VxZH7ZtFBRY&t=8972s>



**Afternoon session (English):**

<https://www.youtube.com/watch?v=gd2iC14fWnI&t=977s>



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## SCIENTIFIC ARTICLES

Article  
**Evaluation of Motivational Learning Strategies for Children with Dyslexia: A FORDYSVAR Proposal for Education and Sustainable Innovation**

Isma Rodríguez-Cano , Patricia Sebastián Alonso , Yanesa Delgado Benito and Yanera Asin Villaverde

Faculty of Education, Didactics and School Organization, University of Burgos, Castilla y León, 09001 Burgos, Spain; pstaeban@alumnos.UBU.es (P.S.); ydelgado@alumnos.UBU.es (Y.D.B.); isasin@alumnos.UBU.es (I.A.)  
\* Correspondence: isarod@alumnos.UBU.es (I.A.); ydelgado@alumnos.UBU.es (Y.D.B.)

**Abstract:** This study was part of the European project Erasmus+ FORDYSVAR, whose main objective is to contribute to the educational inclusion of students aged between 10 and 16 with dyslexia through the use of technology. The purpose of this study was to analyze the motivation of students with dyslexia during their learning process and to assess whether technology can be a motivating educational tool to create sustainable educational spaces at a social level. It used a descriptive, transversal, and correlational methodology to determine whether the participating sample shows motivation in the learning process. In order to answer this by profession, we designed a data collection instrument that included a motivational assessment questionnaire of the learning. The participants were students with dyslexia aged between 10 and 16 (N = 20). The results obtained allowed us to conclude that information and communication technologies can be used as a motivating education strategy for students with dyslexia. The conclusions drawn were consistent with previous research showing that the use of technology for educational purposes can contribute to student motivation.

**Keywords:** dyslexia; educational technology; motivational learning; sustainable education

**1. Introduction**

Dyslexia is a specific learning disorder found within the neurological development disorder [1] which presents a prominent, specific character and that can be manifested in different contexts and cultures [2]. This disorder has a neurobiological basis and implies a difficulty in the appropriate and fluid recognition of words, including deconstruction of the phonological component of language and affecting the reading environment [3]. As a language disorder, it can also affect people's writing ability in some cases.

Although dyslexia is a lifelong condition, it is manageable by intervention through recovery and adaptation therapy. Its worldwide prevalence is estimated between 5 and 15%. In Spain, it has an impact on primary and secondary education in a percentage between 5 and 10% of students [4,5].

The traditional methods that are currently employed to treat this learning disorder are mostly in paper and pencil format, which tend to be monotonous, very demanding, and often leading to poor adherence. In this regard, multisensory approaches have been shown to produce increased treatment adherence and quite promising results [6,7].

Recently, approaches have been made from the field of educational technology [8]. Among the advantages that technologies can provide, we found the following: they offer safe and controlled environments, generate greater motivation, allow for interactivity, provide immediate feedback, and contribute to the improvement of skills related to visual processing and working memory [9].

The strength of technology is that it permits the information by means of multimodal elements (audio, text, images, or videos) it can be stored and transferred, and it allows for the combination and transformation of different media. This is considerably beneficial

**Citation:** Rodríguez-Cano, I.; Sebastián Alonso, P.; Delgado Benito, Y.; Asin Villaverde, Y. Evaluation of Motivational Learning Strategies for Children with Dyslexia: A FORDYSVAR Proposal for Education and Sustainable Innovation. *Sustainability* **2021**, *13*, 4825. <https://doi.org/10.3390/s13124825>

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<https://www.mdpi.com/2071-1050/13/5/2666>

Article  
**Design of a Virtual Reality Software to Promote the Learning of Students with Dyslexia**

Isma Rodríguez-Cano , Yanesa Delgado-Benito, Yanera Asin-Villaverde and Lucía Muñoz Martín

Faculty of Education, Didactics and School Organization, University of Burgos, Castilla y León, 09001 Burgos, Spain; ydelgado@alumnos.UBU.es (Y.D.B.); isasin@alumnos.UBU.es (I.A.); luciamunoz@alumnos.UBU.es (L.M.M.)  
\* Correspondence: isarod@alumnos.UBU.es (I.A.); ydelgado@alumnos.UBU.es (Y.D.B.)

**Abstract:** The research conducted in part of the European project Erasmus+ FORDYSVAR, whose main objective is to contribute to the educational inclusion of students with dyslexia, aged between 10 and 16 years old, through the use of technology, specifically virtual reality (VR), to improve the access, participation, and educational achievement of students with this learning difficulty. This is a qualitative and interpretative study with a descriptive character. The objective of this work is to design a VR application that contributes to the learning of students with dyslexia based on user-centered design as a methodology. The development lines to be addressed in the application have been defined, the features to be included have been determined, and the activities that make up the software have been designed. All this is based on the analysis of the needs and interests of the end users (students with dyslexia) as well as the views of professional teachers and dyslexia intervention specialists. The results obtained allow us to conclude that VR technology is an interesting means of treatment, as it offers a safe, safe, controlled, and motivating environment for students with dyslexia.

**Keywords:** dyslexia; educational technology; virtual reality; FORDYSVAR

**1. Introduction**

The etymological origin of the word dyslexia comes from the Greek roots *dys-* meaning difficulty, and *lexis*, meaning reading, referring to the difficulty in reading, a term coined in the late 1800s [1].

The International Dyslexia Association was a pioneer in providing a definition that allowed the delimitation of the concept at the international level, defining dyslexia as a specific learning difficulty (SLD) of neurobiological origin, characterized by the presence of difficulties in the accuracy and fluency in the recognition of (written) words and by a deficit in decoding (reading) and spelling skills. These difficulties are usually a consequence of a deficit within the phonological component of language, and occur unexpectedly, as other cognitive skills are normally developed and the reading instruction is adequate. As secondary consequences, some reading comprehension difficulties can manifest and the reading performance can be reduced, which can hinder vocabulary growth and general knowledge [2–4].

From the clinical point of view, dyslexia is also framed in the context of learning disorders, although more emphasis is placed on its nature as a dysfunctional behavioral and cognitive disorder. Thus, the International Classification of Diseases (ICD-10) conceptualizes dyslexia as a specific reading disorder whose main characteristic is a specific and significant deficit in the development of the ability to read, which cannot be explained by the intellectual level, visual acuity problems, or inadequate schooling [5].

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), dyslexia is found in the subcategory of neurodevelopmental disorders denominated "specific learning disorder", referring to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, misspelling, and poor spelling ability [6]. Consequently, dyslexia can be defined as a specific learning disorder in reading

**Citation:** Rodríguez-Cano, I.; Delgado-Benito, Y.; Asin-Villaverde, Y.; Muñoz Martín, L. Design of a Virtual Reality Software to Promote the Learning of Students with Dyslexia. *Sustainability* **2021**, *13*, 4825. <https://doi.org/10.3390/s13124825>

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