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Learning disabilities: Technology and interventions

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Abstract

This article focuses on learning disabilities and various strategies and tools that can assist in addressing them. Learning disabilities may affect a child's ability to acquire skills in reading, writing, and mathematics, and are not related to their intelligence. Specific learning disabilities such as dyslexia, dyscalculia, and dysgraphia are common and require specialized intervention methods. Diagnosis of learning disabilities can be based on three main categories of causes: biological, genetic, and environmental factors. Tools used for intervention include digital media, e-learning applications, and support systems such as robots and specialized software, which provide personalized solutions to enhance learning abilities.

Keywords: Learning Disabilities; Working Memory; Brain Anomalies; and SLD; E-learning; Intervention Tools

1. Introduction

Modern education faces many challenges, especially in supporting students with specific learning disabilities. According to the World Health Organization (2015), 15% of the global population has some form of disability, and special education aims to address the needs of these individuals (Doğan & Delialioğlu, 2020). However, the complexity and variety of learning disabilities, such as dyslexia, dyscalculia, and dysgraphia, require specialized methods and technologies for support (American Psychiatric Association). Although there are many types of disabilities managed by special education, specific learning disabilities (SLD) are the most common.

2. Learning Disabilities

Learning disabilities refer to a variety of disorders that affect an individual's ability to acquire, understand, and use specific academic skills, such as reading, writing, mathematical reasoning, and comprehension of spoken or written language. Learning disabilities are not related to intelligence and often occur in children with normal or even high intelligence.

According to Polychronopoulou (2012), the causal factors of specific learning disabilities are generally categorized into three main categories: biological, genetic, and environmental.

Learning disabilities can also be categorized as follows:

2.1. General Learning Disabilities

General learning disabilities refer to widespread learning difficulties that affect many areas of academic performance. These difficulties are usually associated with general cognitive problems and may affect a child's ability to follow the school curriculum in various subjects. Children with general learning disabilities often have lower-than-average

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intelligence and may face challenges in areas such as memory, attention, language ability, and social skills (American Psychiatric Association, 2013).

2.2. Specific Learning Disabilities

Specific learning disabilities refer to difficulties in one or more areas of learning despite having normal or superior intelligence. These include: dyslexia, dyscalculia, and dysgraphia. Children with specific learning disabilities may perform well in other areas of learning and have normal or high intelligence. These difficulties are often neurodevelopmental in nature and require specialized educational interventions (Lyon, Shaywitz, & Shaywitz, 2003).

2.3. Secondary Learning Disabilities

Secondary learning disabilities arise due to external factors that affect a child's ability to learn. These difficulties may be related to: socio-economic factors, environmental factors, emotional and psychological issues.

While the DSM-5 defines learning disabilities as specific learning disorders and categorizes them into three main areas:

2.4. Reading Disorder (Dyslexia)

According to Stasinou (2020), dyslexia is a specific disorder in the acquisition of written language, in which children diagnosed with it face significant difficulties in recognizing and decoding individual words.

2.5. Mathematics Disorder (Dyscalculia)

Neurologist Cohn (1961) defined dyscalculia as a dysfunction of the central nervous system, causing inexplicable difficulties in acquiring mathematical concepts and skills in some children, with effects similar to acquired brain injuries in adults (Karagiannakis & Papadatos, 2022).

2.6. Written Expression Disorder (Dysgraphia)

Dysgraphia is defined as difficulty in the automatic recall of continuous visual-motor coordination between the hand, pencil, and eye, and the control of the muscular movements required for writing letters and numbers. These difficulties do not align with the individual's intelligence, normal teaching, and (in most cases) the use of the pencil in non-academic tasks. They are neurologically based and vary in degree from mild to moderate. They can be diagnosed and overcome through appropriate therapeutic strategies, which, when applied systematically and daily, generally yield results (Karampatzaki, 2021).

3. Working Memory, Brain Anomalies, and SLD

Learning difficulties have been extensively studied, with an emphasis on brain abnormalities and their consequences on working memory (WM). Neuropathological studies have revealed abnormalities in the white matter of the brains of individuals with dyslexia through 3D magnetic resonance imaging (MRI), allowing for the quantification of gyral thickness and the analysis of the cerebral cortex through spherical harmonic analysis (Drigas & Galitskaya, 2023). Furthermore, structural differences have been observed in the temporal lobe of the left hemisphere of the brain, linked to the processing of linguistic information, and differences in the ratio of gray to white matter (Vlachos, 2010, as cited, Karampatzaki, 2021).

The analysis of brain regions shows that in individuals with learning difficulties, there is reduced activation of the temporo-parietal area and the associative visual cortex, with dysfunction in the connection between the Wernicke and Broca areas, which affects language comprehension and expression, respectively (Vlachos, 2010, as cited, Karampatzaki, 2021).

The dysfunction of the cerebellum, which is associated with motor control and automation, may also affect the learning of phoneme-grapheme correspondence and create difficulties in articulation and writing (Stoodley & Stein, 2011, as cited, Karampatzaki, 2021).

Beyond brain abnormalities, learning difficulties are strongly associated with deficits in working memory. Research shows that children with learning difficulties, including dyslexia, have significant deficits in working memory, which affect the execution of arithmetic operations and the temporary storage of verbal and audiovisual information (Drigas, 2023). Visual and visuospatial working memory are important predictors of students' performance in geometric

problems (Bizzaroa et al., 2018). Furthermore, difficulties in geometry are associated with deficits in the representation and development of problem-solving strategies (Mayer, 2013).

The theory of neurological basis supports that dysfunctions in brain regions and their connections lead to reading problems in individuals with dyslexia (Vlachos, 2010, as cited, Karampatzaki, 2021). Abnormal eye movements and deficits in phonological processing are significant factors contributing to the difficulties dyslexic children face in reading and writing (Pavlidis, 2005, as cited, Karampatzaki, 2021). Deficits in phonological awareness, verbal short-term memory, and naming speed largely explain the difficulties in working memory (Morris et al., 1998).

4. Intervention Tools

4.1. Digital media

A study on the rehabilitation of dyslexia through **digital television (DTV)** has been presented, focusing on children in Italy. This is an ICT-based service aimed at individuals who do not have access to the internet or the necessary skills to use it but are familiar with television. The **T-islessia** program is a health initiative involving six-year-old children at risk of dyslexia, who perform daily rehabilitation exercises at home or at school.

An interactive service developed in this project is called "**Magicabra**," offering highly interactive games to develop reading and writing skills. The results of the study were very positive, showing that the more interactive the sessions, the higher the level of skills acquired by the children (Drigas & Dourou, 2013).

Another study conducted in the United Kingdom examined how digital media affect the learning outcomes of individuals with dyslexia. Using **Dual Code Theory (DCT)** and contemporary theories of dyslexia, the research found that different combinations of digital media have varying effects on students with dyslexia compared to those without it. The findings highlight the need to adapt the design of e-learning educational materials to enhance their effectiveness (Beacham, 2006).

4.2. E-learning and Special Learning Difficulties

If one reads the introduction to the law on special educational needs and disabilities (SENDA), it is easily understood that learning websites and educational materials must undergo reasonable adjustments to facilitate individuals with learning difficulties (Woodfine, 2005, as cited in Drigas, 2023).

Woodfine et al. (2008) in their research examine how a modern, text-based e-learning environment creates challenges for dyslexic students. They found that students with dyslexia face more difficulties, such as reading, spelling, and argumentation issues, compared to non-dyslexic students, which may discourage them and reduce their performance.

Considering that individuals with dyslexia face challenges in e-learning activities, a study was developed focusing on a personalized e-learning environment for dyslexic students. The framework includes: the application of a phenomenological approach to learning, adapting the learning process to the needs of dyslexic students, activities focusing on reading ability, and collaborative features for creating an educational environment. It allows teachers to compile various learning modules, using educational material from different databases and applying learning models (Drigas & Dourou, 2013).

Another study developed a customizable e-learning environment for personalized education of dyslexic students. The framework is agent-based and supports the automatic production of learning setups based on ontology, as well as the management, reuse, and retrieval of external resources. It includes agents such as Knowledge Expert, Teacher, Dyslexic Learner Personal, Collaboration, Evaluator, Ontology Search, Web Search, Mapping, Annotation, and External Resource. This framework ensures an effective e-learning environment by utilizing the capabilities of semantic technologies and agents to achieve flexibility and semi-automation (Drigas & Dourou, 2013).

"SEVERI," an e-learning environment developed by Starcic et al. in 2010, presents the results of its application to students with reading, writing, and perception difficulties. SEVERI includes various tools such as guidance messages, a learning diary, library, tasks, and discussions tailored to specific groups of students. The program has been applied in five countries, helping students make progress in their learning while simultaneously supporting teachers in improving their teaching planning and organization. Furthermore, it enhances networking and collaboration between specialists and parents (Drigas & Dourou, 2013).

4.3. Robotics and STEM

In 2018, Zhong and Liying conducted a literature review of 20 studies to examine whether educational robots can assist in learning arithmetic and geometry. Their research sample included individuals aged 3 to 33 years. They found that in the majority of the studies, LEGO robots were used, and students improved their mathematical skills when interacting with the robot (Drigas & Galitskaya, 2023).

In Spain, a pilot STEM program conducted with sixth- and seventh-grade students showed improvements in spatial perception abilities and understanding of algebraic, geometric, and mechanical concepts. The students completed 26-28 sessions, once a week, using seven different Fischertechnike sets (Drigas & Galitskaya, 2023).

In Israel, Brainin et al. conducted a study with kindergarten students using the Bee-Bot robot, finding improvements in spatial relationships and mental rotation (Drigas & Galitskaya, 2023). In Italy, Lieto and her collaborators conducted a study with first-grade students using the Bee-Bot robot. The results of the study showed significant improvements in inhibition skills and visual-spatial working memory (Lieto et al., 2020).

In Turkey, an intervention program with the Robotis Dream ER kit in elementary school students lasting 31 weeks showed that the use of robotics in education improved the students' spatial perception (Drigas & Galitskaya, 2023).

In Hungary, Kálózi-Szabó et al. conducted a study (part of the RIDE project) with students aged 8-14 using the ArTec Robot, with results showing improvements in visual-constructional abilities and a reduction in reading errors, as well as improvements in text comprehension and spatial orientation ability (Kálózi-Szabó et al., 2022).

In Greece, Papadopoulou and her collaborators conducted a study using the NAO robot with third- and fourth-grade students. The study concluded that the NAO robot is equally effective as traditional interventions in improving reading and phonological awareness skills in children with special learning difficulties, and that it had no significant impact on emotional or behavioral outcomes compared to the traditional method (Papadopoulou et al., 2022).

In Greece, Chaidi and her collaborators conducted a study in 2021 using the Lego Boost kit with students from the 11th Primary School of Maroussi. The study included twelve students, five of whom had diagnoses, including learning difficulties, developmental disorders, and ADHD. The process included blended learning, combining in-person and remote teaching. Students with special needs developed skills, improved their self-esteem, and socialized. The use of the Lego Boost kit can develop cognitive and social skills in both students with and without learning difficulties (Chaidi et al., 2021).

4.4. Computer-Based Tools

Papadaki and Karagianni (2023) developed and tested a lesson plan for teaching English through information and communication technologies (ICT) for fourth-grade students with learning difficulties in a Greek private primary school. The research focused on Mary, a 9-year-old student with dysgraphia, but the lesson was applied to a group of 16 monolingual students. The process included the use of direct spelling instruction, the SRSD (Self-Regulated Strategy Development) approach, multisensory approaches, and the writing process. Tools used included auditory, visual, kinesthetic, and tactile elements, as well as digital ICT tools like songs, games, playdough, and mind maps. The results showed significant improvement in students' spelling skills and written expression, as well as increased confidence and participation in educational activities. The researchers emphasized the importance of the multisensory approach, positive reinforcement, and the use of ICT to develop the skills of students with learning difficulties (Papadaki & Karagianni, 2023).

Researchers designed the "Phonological Awareness Educational Software (PHAES)" to provide interactive and engaging activities that train dyslexic students in phonological awareness. These activities include small language units (phonemes and letters) presented within words and sentences, both orally and in writing. Focusing on phonological awareness, the software aims to improve the core skills required for reading and spelling (Kazakou, 2011). It is also designed to be attractive to children with simple graphics, to avoid cognitive overload, with easy navigation and compatibility to run on any computer. Additionally, the age group is not strictly defined, and the tool can be used with or without supervision, serving as a useful and supportive teaching tool. This application has proven to be educational and serves as an example for further research in the field (Drigas & Dourou, 2013).

As mentioned, dyslexia has a hereditary factor, which is why a study examines early prevention before reading age. Children with genetic risk receive home-based education, using a computer to develop phonemic awareness and letter-sound relationships, based on the "Word Building" technique initially developed by Beck. These children show greater

improvement in reading skills compared to non-risk children who have also received additional training and who align more with the typical development of phonemic awareness than untrained children at risk. A conclusion of the research is that home and school-based education until first grade is the best approach for better outcomes (Drigas & Dourou, 2013).

RehaCom is a comprehensive system for the rehabilitation of cognitive and learning difficulties, combining software with an optional special handling keyboard. It includes 30 specialized activities to address sensory-perceptual disorders, based on audiovisual stimuli from the computer. The difficulty level of each activity automatically adjusts according to the trainee's performance, offering personalized training and rehabilitation. The software is available in 16 languages, with 18 activities in Greek, grouped into five categories: attention training, memory training, executive functions, visuomotor skills, and visual field training (Exarchou, 2012).

Another study by O'Connel et al. (2011) examined how Apple technologies can be used to support the education of students with sensory and learning difficulties. The research presented two examples of using Apple products:

- Peter is an 8th-grade student who struggles with mathematics. To assist him, his teacher used the Voice Memos app on her iPhone to record the class lectures. These recordings were then uploaded to the classroom's Mac mini, where students could download them via iTunes. Peter could listen to these recordings at home, helping him better understand the material.
- Mary is a deaf 6th-grade student. For a social studies assignment, Mary used iChat to make video calls with her sister, enabling them to discuss the assignment using sign language. Mary created a video for her assignment by interviewing her sister and edited the video on iMovie. The final video was posted on the class website.

The results showed that students greatly benefited from using Apple technologies, as they provided tools that facilitated understanding and completion of educational tasks, helping them follow their lessons more effectively and complete their assignments with less frustration (O'Connel, 2011).

4.5. Games, Multimedia Tools, and the Web

Some researchers have used multimedia elements as a core part of strategies, activities, and environments, developing a multimedia learning object called IMLO (Interactive Multimedia Learning Object). The methodology was adapted to a protocol for possible thinking, which encourages users to think aloud while performing specific tasks. The main idea is to present the subject in the form of an interactive story. Its usability was tested on children with dyslexia, and the results were positive, demonstrating the usefulness of multimedia in supporting learning for students with dyslexia (Drigas & Dourou, 2013).

"CALDYS2 (Computer-Assisted Learning for Dyslexic Students)" is an e-learning support system designed to help students with dyslexia. It was specifically developed for teaching English to non-native dyslexic students. This system was created to address the unique needs of this group of students by combining foreign language teaching principles with technologies that support dyslexia. It provides lessons and activities aimed at improving reading, writing, and comprehension skills in English. It adapts the content and exercises based on the individual needs of the students, considering both dyslexia and non-native language status. The system uses multimedia elements such as videos, sound, and graphics to make learning more engaging and effective. It also provides support in multiple languages to help students better understand the material. It includes assessment tools, an educational rubric, and learning game evaluation for monitoring student progress. The goal of this project is to create effective learning software for all students, with or without dyslexia, and it has been successfully implemented (Al-Wabil, 2007).

Since reading is a challenge for individuals with dyslexia, an intelligent tutoring system called R2aft tutor (repetitive adaptive reading tutor) has been developed to improve reading fluency for dyslexic students. It trains students in appropriate decoding techniques and motivates them to actively engage in the learning process. Initially, the "TASA" educational tool was created, which uses automatic speech recognition technology to help dyslexic students with reading. The system recognizes and evaluates students' speech as they read aloud, providing immediate feedback on their accuracy and pronunciation. This helps students improve their reading skills in real-time. TASA is a set of events and rules within the expert system shell Clips (by Giarratano and Rilley), and it includes three types of events: user-model, story-world, and lexicon. A second aspect is that motivation is generated by the interactive story, which allows students to make plot choices that affect the unfolding story. The use of the system has shown positive results in dyslexic students, although further evaluations are scheduled to improve and adapt the system in the near future (Drigas & Dourou, 2013).

There are many studies focused on supporting spelling for individuals with dyslexia. One of these presents a spelling check software specifically designed for dyslexic writers, named "BABEL." This software can handle multiple errors and incorporates a model of spelling patterns for each user. The operation of this model is based on the creation of rules and follows the example of Young and O'Shea. According to this approach, only the incorrect rules are modeled, which stem from the cognitive model of Patterson and Shewell. These rules are more complex and describe the errors made by dyslexic writers. By using user choices from a list of suggestions as feedback, researchers measured and improved the system's accuracy. Evaluations and tests demonstrated that the system successfully corrects and detects errors, and the user model allows for more efficient correction of various mistakes (Drigas & Dourou, 2013).

According to the study by Lange et al. (2009), the use of a homophone assistance software tool significantly improved the performance of students with reading difficulties. Students who used this tool on Windows laptops and read texts with highlighted homophones showed a 14.6% improvement in their performance. Additionally, offering homophone options provided further benefits, according to Drigas' study (2013).

Siouli et al. (2020) investigated the impact of a computer-based training program on the emotional state and performance of two students with learning difficulties. The participants were a second-grade student with Simpson-Golabi-Behmel syndrome and a fourth-grade student with learning difficulties. The process involved monitoring cognitive training sessions using two tools:

- **BrainHQ**: An online software targeting cognitive development improvement.
- **AffectLecture**: A mobile app that measures the emotional state of the students before and after each session.

The students attended 30 and 40 cognitive training sessions, respectively, both at school and at home. The results showed that the students' positive emotional state had a positive impact on their performance in cognitive tasks, and high performance enhanced their positive emotional state. The researchers concluded that the emotional state of students should be considered by those responsible for improving the learning experience of children with learning difficulties (Siouli et al., 2020).

4.6. Mobile Applications

In 2023, a study was conducted in Jordan to examine the effectiveness of mobile applications in improving learning difficulties. The study involved students from five schools, divided into two groups: the experimental group that used mobile applications and the control group that followed traditional teaching methods. The applications used in the study were designed to assist students with learning difficulties. According to Alzoubi, the best applications for dyslexia are:

- **TAP:** A phoneme library that is very popular among teenagers and adults, especially for children with dyslexia.
- **Claro Speak:** Allows students to import documents from various sources and listen to the text. Students can also use this app for dictation and spell checking.
- **Easy Math**: Helps in learning mathematics through games, sounds, images, puzzles, and problems.
- **ABC Reading Magic**: Includes a series of apps aimed at children with learning difficulties. The "Attention and Dyslexia" app uses text-to-speech technology to read the text aloud.
- **Phonics Genius**: Helps students learn and improve their phonological skills through word lists that they can listen to.
- **Ginger Grammar Checker**: Corrects grammatical rules and offers predictions for the next words that someone might type.
- **Learning Ally:** A source for audiobooks designed for children.

The results showed that mobile applications significantly contributed to addressing the learning difficulties of the students.

The researcher also believes that the increased understanding of mathematical concepts when using smart applications is due to the stimulation of the brain through its connection with moving images, which enhances brain abilities and improves the students' capacity to think, reason, and focus. A key strategy in mobile applications is the use of a multisensory approach (auditory, visual, tactile, and motor) (Alzoubi, 2023).

The study by Skiada and her collaborators developed and evaluated the "**EasyLexia**" application, which aims to improve the skills of students aged 7-12 with learning difficulties, particularly dyslexia. A total of five dyslexic students participated in two rounds of assessment. To compare the results, a control group was created consisting of five students of the same age group without learning difficulties. The "EasyLexia" application includes four main categories:

- "Words" Category: Aims to improve reading skills and enrich the children's vocabulary.
- "Numbers" Category: Aims to develop and support mathematical reasoning.
- "Memory" Category: Focuses on improving short-term memory and concentration.
- "Books" Category: A unique section that enhances concentration through reading and increases the children's interest in reading.

Each category includes three different games, each with four levels of increasing difficulty, allowing the children to progress according to their individual needs and learning abilities. The scoring system is designed to be lenient, enhancing the children's self-confidence and motivating them to continue their engagement with the app.

An important feature of "EasyLexia" is the use of the specially designed Open Dyslexic font, which facilitates letter and word recognition, making the reading process less confusing. The application was developed in English due to the higher market response, although it was noted that some children without dyslexia faced difficulties in completing certain levels due to their knowledge of the English language rather than their inability to learn.

The study showed that children with dyslexia preferred using the application on mobile devices over the traditional paper-and-pencil method. "EasyLexia" helped children focus better and maintain their interest during learning, while showing improvements in their reading and spelling skills (Skiada et al., 2014).

Finalizing this section, we emphasize the significance of all digital technologies in the field of education and in learning difficulties training, which is highly effective and productive and facilitates and improves assessment, intervention, and educational procedures via mobile devices that bring educational activities everywhere [141-144], various ICTs applications that are the main supporters of education [145-167], and AI, STEM, and ROBOTICS that raise educational procedures to new performance levers [168-174]. Additionally, the development and integration of ICTs with theories and models of metacognition, mindfulness, meditation, and the cultivation of emotional intelligence [175-199] accelerates and improves more educational practices and results, especially in children with learning difficulties.

5. Conclusion

Technology and innovative educational methods, such as interactive software, educational robots, and mobile applications, prove to be extremely useful in supporting students with learning difficulties. The personalized approach, the use of multisensory tools, and the integration of ICT in education can significantly contribute to improving academic performance and students' self-esteem. The use of these tools and methods can enhance learning and help overcome the challenges faced by students with special learning needs, offering new opportunities for their development.

Compliance with ethical standards

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Disclosure of conflict of interest

The Authors proclaim no conflict of interest.

References

[1] Papadopoulou, M. T., Karageorgiou, E., Kechayas, P., Geronikola, N., Lytridis, C., Bazinas, C., Kourampa, E., Avramidou, E., Kaburlasos, V. G., & Evangeliou, A. E. (2022). Efficacy of a robot-assisted intervention in improving learning performance of elementary school children with specific learning disorders. Children, 9(8), 1155. https://doi.org/10.3390/children9081155

[2] Chaidi, I., Kefalis, C., Papagerasimou, I., & Drigas, A. (2021). Educational robotics in Primary Education: A case in Greece. Research Society and Development, 10, 1-12. Retrieved from https://doi.org/10.33448/rsd-v10i9.16371

[3] Papadaki, A., & Karagianni, E. (2023). Intervention on my LD Learner's Spelling and Writing Difficulties through spelling instruction and ICTs. World Journal of Advanced Engineering Technology and Sciences, 09(01), 342-357. https://doi.org/10.30574/wjaets.2023.9.1.0182

[4] Mikropoulos, T., Kazakou, M., Soulis, S., & Morfidi, E. (2011). Phonological awareness software for dyslexic children. Themes in Science and Technology Education, 4, 35-54. Retrieved from https://www.researchgate.net/publication/267331599_Phonological_Awareness_Software_for_Dyslexic_Children#fullTextFileContent

[5] T. O'Connell, G. Freed and M. Rothberg, Using Apple technology to support learning for students with sensoryand learning disabilities. Retrieved December, 12, 2011

[6] Doğan, S., & Delialioğlu, Ö. (2020). A systematic review on the use of technology in learning disabilities. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi, 21, 611-638. https://doi.org/10.21565/ozelegitimdergisi.563763

[7] Lyon, G., Shaywitz, S., & Shaywitz, B. (2003). A definition of dyslexia. Annals of Dyslexia, 53(1), 1–14. https://doi.org/10.1007/s11881-003-0001-9

[8] Sung, E., & Mayer, R. E. (2013). Online multimedia learning with mobile devices and desktop computers: An experimental test of Clark's methods-not-media hypothesis. Computers in Human Behavior, 29(3), 639–647. https://doi.org/10.1016/j.chb.2012.10.022

[9] Skiada, R., Soroniati, E., Gardeli, A., & Zissis, D. (2014). EasyLexia: A mobile application for children with learning difficulties. Procedia Computer Science, 27. 218–228. https://doi.org/10.1016/j.procs.2014.02.025

[10] Athanasakou, S. (2023). The attitudes, perceptions, and skills of preschool teachers regarding the integration of ICT in classroom teaching (Master's thesis). University of Western Attica. Retrieved from https://polynoe.lib.uniwa.gr/xmlui/handle/11400/3868

[11] Athanasiou, A. (2020). Teachers' perceptions regarding the use of new technologies in the teaching process. Panhellenic Conference of Educational Sciences, 8, 8–20. https://doi.org/10.12681/edusc.2650

[12] Al-Wabil, A., Zaphiris, P., & Wilson, S. (2007). Web navigation for individuals with dyslexia: An exploratory study. In Universal Access in Human Computer Interaction: Coping with Diversity (Vol. 4554, pp. 593-602). Springer. https://doi.org/10.1007/978-3-540-73279-2_66

[13] Alexandri, S., Gerakaki, S., Grigoriadou, A., Protopapas, A., Skaloubakas, Ch., & Tsagaraki, Ch. (2006). Software for automated identification of elementary school students with potential special learning difficulties: Development and implementation. In Proceedings of the 5th Panhellenic Conference of ICT in Education "Information and Communication Technologies in Education", Thessaloniki, October 5–8, 2006.

[14] Alexandropoulou, V., Anagnostopoulou, P., Drigas, A., Lorentzou, G., Lykothanasi, A., & Ntaountaki, P.(2019). Robotics in autism intervention. International Journal of Recent Contributions from Engineering, Science & IT (iJES), 7, 4-17. https://doi.org/10.3991/ijes.v7i4.11448

[15] Alexandropoulou, V., & Drigas, A. (2020). Specialization in ICTs and special education: Psychopedagogy of integration. Postgraduate program: Strengthening executive functions in children with special educational needs through mobile phone applications.

[16] Alzoubi, A. (2023). The effect of using mobile applications in treating learning difficulties among students in Jordan. *International Journal of Interactive Mobile Technologies (iJIM)*, 17(22), 54-57. https://doi.org/10.3991/ijim.v17i22.43659

[17] American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing

[18] Anagnostopoulou, P., & Drigas, A. (2020). ICTs, mindfulness and emotional intelligence in international educational policies. International Journal of Recent Contributions from Engineering, Science & IT (iJES), 8(4). https://doi.org/10.3991/ijes.v8i4.18543

[19] Apostolopoulos, N. (2022, July 5). Educational software "Ensfimómata". Blogs.sch.gr. Retrieved from https://blogs.sch.gr/apotoglou/2022/07/05/ekpaideytiko-logismiko-quot-ensfinomata-quot/

[20] Vathrakogianni, M., Pitsadioti, P., & Chalioti, V. (2020). Information and communication technologies in special education. Panhellenic Conference of Educational Sciences, 8, 47–57. https://doi.org/10.12681/edusc.2654

[21] Bakola, L., Drigas, A., & Skianis, C. (2022). Emotional intelligence vs. artificial intelligence: The interaction of human intelligence in evolutionary robotics. Research Society and Development, 11, 1-13. https://doi.org/10.33448/rsd-v11i16.36919

[22] Berger, M., Yule, W. & Rutter, M. (1975). Attainment and adjustment in two geographic areas: II. The prevelance of specific reading retardation. British Journal of Psychiatry, 126, 510-519.

[23] Berger, M., Yule, W., & Rutter, M. (1975). Attainment and adjustment in two geographic areas: II. The prevalence of specific reading retardation. British Journal of Psychiatry, 126, 510-519.

[24] Boder, E. (1973). Developmental dyslexia: A diagnostic approach based on three atypical reading-spelling patterns. Developmental Medicine & Child Neurology, 15(5), 663-687.

[25] Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. Annual Review of Psychology, 53(1), 371-399.

[26] Bravou, V., & Drigas, A. (2019). A contemporary view on online and web tools for students with sensory & learning disabilities. International Journal of Online Engineering (iJOE), 15, 97-104. https://doi.org/10.3991/ijoe.v15i12.10833

[27] Butterworth, B. (2003). Dyscalculia Screener: Highlighting pupils with specific learning difficulties in maths (Age 6–14 years). London: nferNelson Publishing Company Limited. Retrieved from https://books.google.gr/books/about/Dyscalculia_Screener.html?id=EAMrAAAACAAJ&redir_esc=y

[28] Butterworth, B., & Laurillard, D. (2010). Low numeracy and dyscalculia: Identification and intervention. ZDM Mathematics Education, 42, 527-539. Retrieved from https://doi.org/10.1007/s11858-010-0267-4

[29] Giannopoulou, K. (2021). Parents' and secondary education students' views on distance education before and after using assistive technology for dyslexia (Master's thesis). School of Social and Human Sciences and Arts, Department of Educational and Social Policy, Postgraduate Program in Educational Sciences and Lifelong Learning, University of Patras, Greece

[30] C. Lai, R. P. McMahan, M. Kitagawa, and I. Connolly, “Geometry Explorer: FacilitatingGeometry Education with Virtual Reality,” in International Conference on Virtual,Augmented and Mixed Reality , pp. 702–713, 2016. https://doi.org/10.1007/978-3-319-39907-2_67

[31] Chaidi, I., Kefalis, C., Papagerasimou, I., & Drigas, A. (2021). Educational robotics in Primary Education: A case in Greece. Research Society and Development, 10, 1-12. Retrieved from https://doi.org/10.33448/rsd-v10i9.16371

[32] D. Kiger, D. Herro and D. Prunty, Examining the influenceof a mobile learning intervention on third grade mathachievement. Journal of Research on Technology in Educa-tion, 45(1), 2012, pp. 61–82

[33] Di Lieto, M. C., Castro, E., Pecini, C., Inguaggiato, E., Cecchi, F., Dario, P., Cioni, G., & Sgandurra, G. (2020). Improving Executive Functions at School in Children With Special Needs by Educational Robotics. Frontiers in Psychology, 10, 2813. https://doi.org/10.3389/fpsyg.2019.02813

[34] Gountakou, M.-I. (2019). Difficulties in acquiring spelling in Greek-speaking students with dyslexia while learning English as a second language (Master's thesis). Aristotle University of Thessaloniki, Faculty of Philosophy, Department of Italian Language and Literature, Postgraduate Program "Language and Culture Sciences," Specialization: Language Disorders and Educational Intervention.

[35] Diamantaki, K., Davou, M., & Panousis, G. (2001). New technologies and old fears in the school system. Athens: Papazisis.

[36] Drigas, A. (2014). ICTs, mobile learning and social media to enhance learning for attention difficulties. Academia.edu. Retrieved from https://www.academia.edu/94036000/ICTs_Mobile_Learning_and_Social_Media_to_Enhance_Learning_for_Attention_Difficulties?sm=b

[37] Drigas, A., & Dourou, A. (2013). A review on ICTs, e-learning and artificial intelligence for dyslexic’s assistance. International Journal of Emerging Technologies in Learning (iJET), 8, 63-67. https://doi.org/10.3991/ijet.v8i4.2980

[38] Drigas, A., & Kakoura, E.. (2023). Digital tools for children with reading difficulties. World Journal of Biology Pharmacy and Health Sciences, 14, 129-136. https://doi.org/10.30574/wjbphs.2023.14.3.0252

[39] Drigas, A., Mitsea, E., & Skianis, C. (2023). Effects of digital games training on hormonal responses and brain plasticity. Research Society and Development, 12, 1-16. https://doi.org/10.33448/rsd-v12i2.39568

[40] Drigas, A., Pappas, M. & Lytras, M. (2016). Emerging technologies for ICT based education for dyscalculia: Implications for computer engineering education. 32. 1604-1610.

[41] Drigas, A., Pappas, M. & Polychroni, F.. (2019). Assessment of mathematics difficulties for second and third graders: Cognitive and psychological parameters. Behavioral Sciences, 9, 76. https://doi.org/10.3390/bs9070076

[42] Drigas, A. & Politi-Georgousi, S. (2020). Mobile applications, an emerging powerful tool for dyslexia screening and intervention: A systematic literature review. International Journal of Interactive Mobile Technologies (iJIM), 14, 4-17. https://doi.org/10.3991/ijim.v14i18.15315

[43] Drigas, A. & Souliou, P.(2021). Specialization in ICTs and special education: Psychopedagogy of integration. Postgraduate program: Emotional intelligence and learning disabilities in preschool.

[44] Exarchou, P. (2012). Use of software programs for the diagnosis and treatment of learning difficulties in preschool and school age (Bachelor's thesis). University of Epirus

[45] Ellis, A. W. (2016). Reading, Writing and Dyslexia: A Cognitive Analysis. Hove: Lawrence Erlbaum Associates.

[46] Conference Editorial. (2022, March 18). 11th Panhellenic and International Conference "ICT in Education." Publisher. ISBN: 978-618-83186-2-5.

[47] epikoinonia_7pbkra. (2023, 17 Σεπτεμβρίου). Μαθησιακές δυσκολίες (Συμπτώματα και διάγνωση) Μέρος 1ο. Ανακτήθηκε από https://epikoinonia.net/%CE%BC%CE%B1%CE%B8%CE%B7%CF%83%CE%B9%CE%B1%CE%BA%CE%AD%CF%82-%CE%B4%CF%85%CF%83%CE%BA%CE%BF%CE%BB%CE%AF%CE%B5%CF%82-%CF%83%CF%85%CE%BC%CF%80%CF%84%CF%8E%CE%BC%CE%B1%CF%84%CE%B1-%CE%BA%CE%B1%CE%B9/

[48] Erica Melis and Jorg Siekmann : ActiveMath: An IntelligentTutoring System for Mathematics, Lecture Notes in Com-puter Science, 3070, 2004, pp 91–101.39.

[49] Erica Melis, Eric Andres, Jochen Budenbender, Adrian Frischauf, George Goduadze, et al.. ActiveMath: A Generic and Adaptive Web-Based Learning Environment. International Journal of Artificial Intelligence in Education , 2001, 12, σσ.385-407. ⟨hal-00197329⟩

[50] Erica Melis, Giorgi Goguadze, Martin Homik, Paul Libbrecht, Carsten Ullrich and Stefan Winterstein.(2006). Semantic-aware components and services of ActiveMath, BritishJournal of Educational Technology, 37(3), 2006, pp. 405–423

[51] Felani, K. (2022). Utilization of ICT, prerequisites for their successful use in secondary education, and teachers' views on their implementation (Master's thesis). University of Piraeus. Retrieved from https://dione.lib.unipi.gr/xmlui/handle/unipi/14146

[52] Galitskaya, V., & Drigas, A. (2020). Special Education: Teaching Geometry with ICTs. International Journal of Emerging Technologies in Learning (iJET), 15, Article 173. Retrieved from https://doi.org/10.3991/ijet.v15i06.11242

[53] Galitskaya, V., & Drigas, A. (2023). Mobiles & ICT Based Interventions for Learning Difficulties in Geometry. International Journal of Engineering Pedagogy (iJEP), 13, 21-36. Retrieved from https://doi.org/10.3991/ijep.v13i4.36309

[54] Geschwind, N. (1970). The organization of language and the brain. Science, 170(3961), 940-944.

[55] Ginsburg, H., Jamalian, A., & Creighan, S. (2013). Cognitive guidelines for the design and evaluation of early mathematics software: The example of MathemAntics. Retrieved from https://doi.org/10.1007/978-94-007-6440-8_6

[56] Gregor, P., Dickinson, A., Macaffer, A., & Andreasen, P. (2003). SeeWord - A personal word processing environment for dyslexic computer users. British Journal of Educational Technology, 34. https://doi.org/10.1111/1467-8535.00331

[57] Guha, S. (2003). Are we all technically prepared? Teachers' perspective on the causes of comfort or discomfort in using computers at elementary grade teaching. Information Technology in Childhood Education Annual, 2003.

[58] Hammill, D. D. (1990). On defining learning disabilities: An emerging consensus. Journal of Learning Disabilities, 23(2), 74-84.

[59] Hargreaves, A., & Fullan, M. (1992). Understanding Teacher Development. New York: Teachers College Press.

[60] Hargreaves, A., & Fullan, M. (1992). Understanding Teacher Development. Teachers College Press.

[61] Hattingh, M. J., & Smith, C. (2020, November). Assistive technologies for students with dyslexia: A systematic literature review. In Innovative Technologies and Learning (pp. xx-xx). Springer. https://doi.org/10.1007/978-3-030-63885-6_55

[62] Honey, M. (1990). Teachers' beliefs and technology integration: Different understandings. Technical Report No. 90-8. Center for Technology in Education.

[63] Honey, M., & Moeller, B. (1990). Teachers' beliefs and technology integration: Different beliefs, different actions. Technical report, Center for Technology in Education, Bank Street College of Education.

[64] Hung, Pi-Hsia & Su, I-Hsiang. (2010). Applying affective assessment to detect the ICT infused mathematics intervention effect. CAR 2010 - 2010 2nd International Asia Conference on Informatics in Control, Automation and Robotics. 2. 321 - 323. 10.1109/CAR.2010.5456537.

[65] iMommy. (2012, Οκτώβριος 18). Μαθησιακές δυσκολίες. Ανακτήθηκε από https://www.imommy.gr/2012/10/18/mathhsiakes-dyskolies/

[66] Ινστιτούτο Εκπαιδευτικής Πολιτικής. (2022). Στρογγυλά με Αξία. Ανάκτηση από https://prosvasimo.iep.edu.gr/el/gia-mathites-me-metria-kai-elafria-nohtikh-anaphria/strogila-me-aksia

[67] J. L. Rodríguez, I. Romero, and A. Codina, "The Influence of NeoTrie VR's ImmersiveVirtual Reality on the Teaching and Learning of Geometry," Mathematics, vol. 9, no. 19,p. 2411, 2021. https://doi.org/10.3390/math9192411

[68] Jamali, H. R., Nicholas, D., & Williams, P. (2006, July). Using ICT with people with special education needs: What the literature tells us. Aslib Proceedings, 58(4), 330-345. https://doi.org/10.1108/00012530610687704

[69] Kafai, Y. B., & Resnick, M. (Eds.). (2002). Constructionism in Practice: Designing, Thinking, and Learning in a Digital World. Routledge.

[70] Kafai, Y. B., Ching, C. C., & Marshall, S. K. (2002). Children as designers of educational multimedia software. Computers & Education, 29(1-2), 117-126.

[71] Kálózi-Szabó, C., Mohai, K., & Cottini, M. (2022). Employing Robotics in Education to Enhance Cognitive Development—A Pilot Study. Sustainability, 14(15951). https://doi.org/10.3390/su142315951

[72] Karagianni, E., & Drigas, A. (2023). New Technologies for Inclusive Learning for Students with Special Educational Needs. International Journal of Online and Biomedical Engineering (iJOE), 19, 4-21. Retrieved from https://doi.org/10.3991/ijoe.v19i05.36417

[73] Karvounis, M. (2007). "Learning and psychological support for children with learning difficulties in the classroom," in Makri-Botsari, E. (Ed.), Issues in Classroom Problem Management (Vol. A). Athens: Pedagogical Institute. pp. 72-83.

[74] Karkouli, M. (2021). 4th Industrial Revolution: Digital Transformation and the Greek Educational System. Challenges and Opportunities. The views of primary school teachers (Master's thesis). Hellenic Open University. Retrieved from https://apothesis.eap.gr/archive/item/154697

[75] Kasimati, K., & Yalamas, V. (2001). Teachers' views on the contribution of new technologies to the educational process, Review of Educational Issues, 114-127.

[76] Kirk, S. A. (1962). Diagnosis and remediation of learning disabilities. *Exceptional Children, 29*(2), 73-78.

[77] Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. Educational Psychologist, 41(2), 75-86. https://doi.org/10.1207/s15326985ep4102_1

[78] Kubier, A. A. H. (2019). The effectiveness of using some iPad applications to reduce dyscalculia among a sample of students with learning disabilities in Rafha Province. Journal of Organizational Behavior Research, 4(2), 283-298.

[79] Kumar, R. (2009, April). Convergence of ICT and Education. Retrieved from https://www.researchgate.net/publication/242589222_Convergence_of_ICT_and_Education

[80] Komis, V. (2004). Information and Communication Technologies in Education. Kritiki Publications.

[81] Karamani, E. (2021, February 13). Detection of learning difficulties: When does it happen? Which tests are used? KE.PSY.PE. Retrieved from https://kepsype.gr/news/anichneusi-mathisiakon-diskolion-pote-ginetai-poia-test-chrisimopoiountai

[82] Komis, V. (2004). Introduction to Educational Applications of Information and Communication Technologies. Athens: New Technologies Publications.

[83] Komis, V. (2004). Introduction to Applications of ICT in Education. Athens: New Technologies Publications.

[84] Korelis, I. (2023). Enhancement of mathematical education for students with learning difficulties and disabilities: The role of ICT (Master's thesis). University of Western Attica. Retrieved from https://polynoe.lib.uniwa.gr/xmlui/handle/11400/4609

[85] Kourkoutas, H. (1978). Learning difficulties and mental disorders. Patakis Publications.

[86] Koutsileoua, S. K. (2015). Evaluation of the effectiveness of teacher training in Attica on the pedagogical use of Information and Communication Technologies. National Technical University of Athens. Retrieved from http://hdl.handle.net/10797/14903

[87] Metta, G., & Skordialos, E. (2020). Learning difficulties, types, and educational intervention. Panhellenic Conference of Educational Sciences, 8, 707–720. https://doi.org/10.12681/edusc.2716

[88] Metta, G., & Skordialos, E. (2020). Learning difficulties, types, and educational intervention. Panhellenic Conference of Educational Sciences, 8, 707–720. https://doi.org/10.12681/edusc.2716

[89] Balioukas, G. (2023). Special education teachers' perceptions on the use of Information and Communication Technologies (ICT) in Special Education Schools (S.M.E.A.E.) (Master's thesis). University of Peloponnese. Retrieved from https://amitos.library.uop.gr/xmlui/bitstream/handle/123456789/7182/Baliouskas_6062202003042.pdf?sequence=1&isAllowed=y

[90] Xesternou, M., & Iliopoulou, M. (2007). Software "The Verb Train," Teaching of Ancient Greek verb conjugation. Why it constitutes an appropriate learning environment for dyslexic students. 4th Conference, Syros. Retrieved from https://www.academia.edu/7148003/Ξέστερνου_M_and_Ιλιοπούλου_M_2007_Λογισμικό_Το_Τρενάκι_των_Ρημάτων_Διδασκαλία_της_κλίσης_των_ρημάτων_της_αρχαίας_ελληνικής_γλώσσας_Γιατί_αποτελεί_κατάλληλο_περιβάλλον_μάθησης_για_μαθητές_που_παρουσιάζουν_δυσλεξία

[91] Lampropoulos, Georgios & Keramopoulos, Euclid & Diamantaras, Kostas & Evangelidis, Georgios. (2022). Augmented Reality and Gamification in Education: A Systematic Literature Review of Research, Applications, and Empirical Studies. Applied Sciences. 12. 6809. 10.3390/app12136809.

[92] Lepicnik Vodopivec, Jurka & Bagon, Špela. (2016). Motivation for Using ICT and Pupils with Learning Difficulties. International Journal of Emerging Technologies in Learning (iJET). 11. 70. 10.3991/ijet.v11i10.5786.

[93] Lerner, J. W. & Johns, B. (2009). Learning Disabilities and Related Disabilities: Strategies for Success, 11th Edition, Stamford: Cengage Learning.

[94] Lontrup, J., Denager, T., & Christensen, M. B. (2012). Enhancement of 7th-10th graders' understanding of equations with tangible representations. In Proceedings of the 2012 IDC Conference. Retrieved from https://www.cse.chalmers.se/research/group/idc/ituniv/sider12/wp-content/uploads/lonstrup_et_al_paper.pdf

[95] Maitrei, Kohli & Prasad, T.. (2010). Identifying Dyslexic Students by Using Artificial Neural Networks. Lecture Notes in Engineering and Computer Science. 2183. 118.

[96] Manghirmalani, P., More, D., & Jain, K. (2012). A fuzzy approach to classify learning disability. International Journal of Advanced Research in Artificial Intelligence (IJARAI), 1(2), 1-8. Retrieved from https://thesai.org/Downloads/IJARAI/Volume1No2/Paper_1-A_Fuzzy_Approach_to_Classify_Learning_Disability.pdf

[97] Manghirmalani, P., More, D., & Jain, K. (2012). A fuzzy approach to classify learning disability. International Journal of Advanced Research in Artificial Intelligence (IJARAI), 1(2), 1-8. Retrieved from https://thesai.org/Downloads/IJARAI/Volume1No2/Paper_1-A_Fuzzy_Approach_to_Classify_Learning_Disability.pdf

[98] Mikropoulos, T., Kazakou, M., Soulis, S., & Morfidi, E. (2011). Phonological awareness software for dyslexic children. Themes in Science and Technology Education, 4, 35-54. Retrieved from https://www.researchgate.net/publication/267331599_Phonological_Awareness_Software_for_Dyslexic_Children#fullTextFileContent

[99] Mouzaki, A. & Sideridis, G. (2007). Poor readers profilies among Greek students of elementary school. Hellenic Journal of Psychology, 4, 205-232.

[100] Mouzaki, A., & Sideridis, G. (2007). Poor readers' profiles among Greek students of elementary school. Hellenic Journal of Psychology, 4, 205-232.

[101] O'Malley, S. Jenkins, B. Wesley, C. Donehower, D.Rabuck and M. E. B. Lewis, Effectiveness of Using iPadsto Build Math Fluency, Online Submission, 2013

[102] Paidagogiko.gr. (n.d.). Evaluation of learning ability. Retrieved from https://paidagogiko.gr/blog/aksiologisi-tis-mathisiakis-ikanotitas

[103] Palacios, Ana & Sanchez, Luciano & Couso, Inés. (2010). Diagnosis of dyslexia with low quality data with genetic fuzzy systems. International Journal of Approximate Reasoning. 51. 993-1009. 10.1016/j.ijar.2010.07.008.

[104] Panteliadou, S. (2004). The mapping of the special education field. Presentation at the seminar "Mapping – Special Education Curriculum" by the Pedagogical Institute, EPEAEK – Ministry of National Education and Religious Affairs, April 25, 2004, Thessaloniki.

[105] Papadaki, A., & Karagianni, E. (2023). Intervention on my LD Learner's Spelling and Writing Difficulties through spelling instruction and ICTs. World Journal of Advanced Engineering Technology and Sciences, 09(01), 342-357. https://doi.org/10.30574/wjaets.2023.9.1.0182

[106] Papadimitriou, P. (2022). Response to teaching and intervention for the detection and treatment of learning difficulties in mathematics (Doctoral dissertation). University of Thessaly. . https://doi.org/10.12681/eadd/51228

[107] Papadopoulou, M. T., Karageorgiou, E., Kechayas, P., Geronikola, N., Lytridis, C., Bazinas, C., Kourampa, E., Avramidou, E., Kaburlasos, V. G., & Evangeliou, A. E. (2022). Efficacy of a robot-assisted intervention in improving learning performance of elementary school children with specific learning disorders. Children, 9(8), 1155. https://doi.org/10.3390/children9081155

[108] Pekka Ra¨sa¨nena, Jonna Salminena, Anna J. Wilsonb, PirjoAunioa, Stanislas Dehaene: Computer-assisted interventionfor children with low numeracy skills, Cognitive Develop-ment, 24, 2009, pp. 450–472 DOI: 10.1016/j.cogdev.2009.09.003

[109] Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. Computers & Education, 37(2), 163-178. https://doi.org/10.1016/S0360-1315(01)00045-8

[110] Peter Gregor .:SeeWord - a personal word processing environment for dyslexic computer users. British Journal of Educational Technology, 34(3),pp. 341-355, (2003)

[111] Plerou, A., & Vlamos, P. (2013). Algorithmic problem solving using interactive virtual environment: A case study. In M. A. Orgun & J. Thornton (Eds.), Intelligent Data Engineering and Automated Learning – IDEAL 2013: Lecture Notes in Computer Science (Vol. 8206, pp. 383-390). Retrieved from https://doi.org/10.1007/978-3-642-41013-0_45

[112] Politis, P., Roussos, P., Karamanis, M., & Tsouosis, G. (2000). Evaluation of teacher training within the framework of the project ODYSSEAS, in V. Komis (Ed.), Proceedings of the 2nd Panhellenic Conference "Information and Communication Technologies in Education", 583-592, Patras.

[113] Polydouri, E. A. (2015, October). Development of teacher skills in special education for managing problems in students with complex cognitive, emotional, and social difficulties and their families (Master's thesis). University of Peloponnese.

[114] Polychronopoulou, St. (2012-2013). Diagnosis, evaluation, and treatment of dyslexia [Course notes]. University of Athens. Retrieved from http://www.primedu.uoa.gr/fileadmin/primedu.uoa.gr/uploads/Pdfs/Proptyxiaka/Polyxronopoulou/SIMEIOSEIS_GIA_TO_MATHIMA___Diagnosi__axiologisi_kai_antimetopisi_tis_dyslexias__.pdf

[115] Protopapas, A., Skaloubakas, Ch., Gerakaki, S., Alexandri, S., Grigoriadou, A., & Tsagaraki, Ch. (2006). Software for automated identification of elementary school students with potential special learning difficulties: Development

and implementation. In Proceedings of the 5th Panhellenic Conference of ICT in Education, Thessaloniki, October 5–8.

[116] Räsänen, P., Salminen, J., Wilson, A. J., Aunio, P., & Dehaene, S. (2009). Computer-assisted intervention for children with low numeracy skills. Cognitive Development, 24, 450-472. Retrieved from https://doi.org/10.1016/j.cogdev.2009.09.003

[117] Raver, C. C. (2004). Placing emotional self-regulation in sociocultural and socioeconomic contexts. Child Development, 75(2), 346-353.

[118] S. Syafril, Z. Asril, E. Engkizar, A. Zafirah, F. A. Agusti, & I. Sugiharta, Designing Prototype Model of Virtual Geometry in Mathematics Learning using AugmentedReality," in Journal of Physics: Conference Series, vol. 1796, no. 1, p. 012035, 2021. https://doi.org/10.1088/1742-6596/1796/1/012035

[119] Silin, Y., & Kwok, D. (2016). A study of students' attitudes towards using ICT in a social constructivist environment. Australasian Journal of Educational Technology, 33, 1-15. Retrieved from https://doi.org/10.14742/ajet.2890

[120] Singleton, C. Fiona Simmons and Horne, J. Computerised screening for dyslexia inadults, Journal of Research in Reading, volume 32 (1),pp. 137-152. (2009). http://dx.doi.org/10.1111/j.1467-9817.2008.01386.x

[121] Siouli, S., Makris, S., Romanopoulou, E., & Bamidis, P. P. D. (2020). Living with learning difficulties: Two case studies exploring the relationship between emotion and performance in students with learning difficulties. Retrieved from https://doi.org/10.1007/978-3-030-57717-9_10

[122] Skraparlis, Ch. (2022). ICT in the education of individuals with Autism Spectrum Disorders (Master's thesis). University of Western Macedonia & University of Piraeus.

[123] Slaouti, D., & Barton, A. (2007). Opportunities for practice and development: Newly qualified teachers and the use of information and communications technologies in teaching foreign languages in English secondary school contexts. Journal of In-Service Education, 33(4), 405-424

[124] Snowling, M. J., & Hulme, C. (2012). The Science of Reading: A Handbook. Oxford: Blackwell Publishing.

[125] Spantidakis, G., Mouzaki, A., & Charoula, A. (2021). Methodology of design and development of educational software for students with learning difficulties: The example "In the Land of Lenou."

[126] Stasinos, D. (1999). Learning difficulties and education. Athens: Dioptra Publications.

[127] Synefias, G. (2019). Epidemiological study of special educational needs in the student population of the Evia region (Master's thesis). National and Kapodistrian University of Athens, School of Health Sciences, Medical School. Retrieved from https://pergamos.lib.uoa.gr/uoa/dl/object/2873332/file.pdf

[128] T. O'Connell, G. Freed and M. Rothberg, Using Apple technology to support learning for students with sensoryand learning disabilities. Retrieved December, 12, 2011

[129] Tziviniku, S. (2015). Learning difficulties: Teaching interventions. Greek Academic Libraries Association. National Technical University of Athens, Greek Academic Electronic Texts and Resources.

[130] Tzimogiannis, A., & Komis, V. (2004). Attitudes and perceptions of secondary education teachers regarding the application of ICT in their teaching, in M. Grigoriadou (Ed.), Proceedings of the 4th Panhellenic Conference with International Participation "Information and Communication Technologies in Education", Volume A, 165-176, Athens.

[131] Tzouveli, P., Schmidt, A., Schneider, M., Symvonis, A., & Kollias, S. (2008). Adaptive reading assistance for the inclusion of students with dyslexia: The AGENT-DYSL approach. In Proceedings of the 8th IEEE International Conference on Advanced Learning Technologies (ICALT 2008) (pp. 167-171). IEEE. https://doi.org/10.1109/ICALT.2008.236

[132] Triga-Mertika, E. (2010). Learning difficulties. General & special learning difficulties – Dyslexia. Athens: Grigori Publications.

[133] Tsomboli, E.I. (2017). Learning difficulties – Dyscalculia. Panhellenic Conference of Educational Sciences, Vol. B, 2016(2), pp. 1308 – 1322. Source from http://dx.doi.org/10.12681/edusc.1011

[134] Williams, B. (2009). Investigating the effects of authentic learning practices in a higher education course: A mixed method approach. Australasian Journal of Educational Technology, 25(2), 177-193. https://doi.org/10.14742/ajet.1143

[135] Wilson AJ, Revkin SK, Cohen D, Cohen L, Dehaene S: An opentrial assessment of "The Number Race", an adaptive computergame for remediation of dyscalculia, Behavioral and Brain Func-tions, 2(20), (2006)

[136] Wilson, A. J., Dehaene, S., Pinel, P., Revkin, S., Cohen, L., & Cohen, D. (2006). Principles underlying the design of "The Number Race", an adaptive computer game for remediation of dyscalculia. Behavioral and Brain Functions, 2, 19. https://doi.org/10.1186/1744-9081-2-19

[137] Wilson, A.J., Dehaene, S., Pinel1, P., Revkin, S.K., Cohenand L.and Cohen, D.: Principles underlying the design of "The NumberRace", an adaptive computer game for remediation of dyscalculia,Behavioral and Brain Functions , 2(19), (2006) doi: 10.1186/1744-9081-2-19

[138] Woodfine, B.P. , Baptista Nunes, M., Wright, D.J. : 'Text-basedSynchronous E-*learning and Dyslexia: Not Necessarily thePerfect Match!', Computers & Education 50, (2008). https://doi.org/10.1016/j.compedu.2006.08.010*

[139] *Y.-S. Su, H.-W. Cheng, and C.-F. Lai, "Study of Virtual Reality Immersive TechnologyEnhanced Mathematics Geometry Learning," Frontiers in Psychology , vol. 13, 2022.https://doi.org/10.3389/fpsyg.2022.760418*

[140] Zogopoulos, St. (2001). New Technologies and Communication Tools in the Educational Process. Kleidarithmos Publications.

[141] Stathopoulou, et all 2018, Mobile assessment procedures for mental health and literacy skills in education. International Journal of Interactive Mobile Technologies, 12(3), 21-37, https://doi.org/10.3991/ijim.v12i3.8038

[142] Kokkalia G, AS Drigas, A Economou 2016 Mobile learning for preschool education. International Journal of Interactive Mobile Technologies 10 (4), 57-64 https://doi. org/10.3991/ijim.v10i4.6021

[143] Stathopoulou A, Karabatzaki Z, Tsiros D, Katsantoni S, Drigas A, 2019 Mobile apps the educational solution for autistic students in secondary education , International Journal of Interactive Mobile Technologies 13 (2), 89-101https://doi.org/10.3991/ijim.v13i02.9896

[144] Drigas A, DE Dede, S Dedes 2020 Mobile and other applications for mental imagery to improve learning disabilities and mental health , International Journal of Computer Science Issues (IJCSI) 17 (4), 18-23, DOI:10.5281/zenodo.3987533

[145] Drigas A, Petrova A 2014 ICTs in speech and language therapy , International Journal of Engineering Pedagogy (iJEP) 4 (1), 49-54 https://doi.org/10.3991/ijep.v4i1.3280

[146] Bravou V, Oikonomidou D, Drigas A, 2022 Applications of Virtual Reality for Autism Inclusion. A review , revista Retos 45, 779-785 https://doi.org/10.47197/retos.v45i0.92078

[147] Chaidi I, Drigas A, 2022 "Parents' views Questionnaire for the education of emotions in Autism Spectrum Disorder" in a Greek context and the role of ICTs , Technium Social Sciences Journal 33, 73-9, DOI:10.47577/tssj.v33i1.6878

[148] Bravou V, Drigas A, 2019 A contemporary view on online and web tools for students with sensory & learning disabilities , iJOE 15(12) 97 https://doi.org/10.3991/ijoe.v15i12.10833

[149] Chaidi I, Drigas A, C Karagiannidis 2021 ICT in special education , Technium Social Sciences Journal 23, 187, https://doi.org/10.47577/tssj.v23i1.4277

[150] Xanthopoulou M, Kokalia G, Drigas A, 2019, Applications for Children with Autism in Preschool and Primary Education. Int. J. Recent Contributions Eng. Sci. IT 7 (2), 4-16, https://doi.org/10.3991/ijes.v7i2.10335

[151] Drigas AS, Koukianakis LG, Papagerasimou YV, 2005 A system for e-inclusion for individuals with sight disabilities Wseas transactions on circuits and systems 4 (11), 1776-1780

[152] S Politi-Georgousi, A Drigas 2020 Mobile Applications, an Emerging Powerful Tool for Dyslexia Screening and Intervention: A Systematic Literature Review , International Association of Online Engineering

[153] A Drigas, P Theodorou, 2016 ICTs and Music in Special Learning Disabilities, International Journal of Recent Contributions from Engineering, Science & IT (iJES), 4(3), pp. 12–16. https://doi.org/10.3991/ijes.v4i3.6066

[154] Galitskaya, V., & Drigas, A. (2020). Special Education: Teaching Geometry with ICTs. International Journal of Emerging Technologies in Learning (iJET), 15(06), pp. 173–182. https://doi.org/10.3991/ijet.v15i06.11242

[155] Moraiti, I. ., Fotoglou, A. ., Dona, K. ., Katsimperi, A. ., Tsionakas, K. ., & Drigas, A. (2022). IoT in Special Education. Technium Social Sciences Journal, 30(1), 55–63. https://doi.org/10.47577/tssj.v30i1.6307

[156] Alexopoulou, A., Batsou, A., & Drigas, A. S. (2019). Effectiveness of Assessment, Diagnostic and Intervention ICT Tools for Children and Adolescents with ADHD. International Journal of Recent Contributions from Engineering, Science & IT (iJES), 7(3), pp. 51–63. https://doi.org/10.3991/ijes.v7i3.11178

[157] Pergantis, P., & Drigas, A. (2023). Assistive technology for autism spectrum disorder children that experiences stress and anxiety. Brazilian Journal of Science, 2(12), 77–93. https://doi.org/10.14295/bjs.v2i12.426

[158] Pergantis, P., & Drigas, A. (2023). Sensory integration therapy as enabler for developing emotional intelligence in children with autism spectrum disorder and the ICT's role. Brazilian Journal of Science, 2(12), 53–65. https://doi.org/10.14295/bjs.v2i12.422

[159] Stathopoulou A, Spinou D, Driga AM, 2023, Burnout Prevalence in Special Education Teachers, and the Positive Role of ICTs , iJOE 19 (08), 19-37

[160] Stathopoulou A, Spinou D, Driga AM, 2023, Working with Students with Special Educational Needs and Predictors of Burnout. The Role of ICTs. iJOE 19 (7), 39-51

[161] Loukeri PI, Stathopoulou A, Driga AM, 2023 Special Education Teachers' Gifted Guidance and the role of Digital Technologies , TECH HUB 6 (1), 16-27

[162] Stathopoulou A, Temekinidou M, Driga AM, Dimitriou 2022 Linguistic performance of Students with Autism Spectrum Disorders, and the role of Digital Technologies , Eximia 5 (1), 688-701

[163] Vouglanis T, Driga AM 2023 Factors affecting the education of gifted children and the role of digital technologies. TechHub Journal 6, 28-39

[164] Vouglanis T, Driga AM 2023 The use of ICT for the early detection of dyslexia in education , TechHub Journal 5, 54-67

[165] Drakatos N, Tsompou E, Karabatzaki Z, Driga AM 2023 Virtual reality environments as a tool for teaching Engineering. Educational and Psychological issues , TechHub Journal 4, 59-76

[166] Drakatos N, Tsompou E, Karabatzaki Z, Driga AM 2023 The contribution of online gaming in Engineering education , Eximia 8, 14-30

[167] Drigas A, Vrettaros J, Tagoulis A, Kouremenos D, 2010 Teaching a foreign language to deaf people via vodcasting & web 2.0 tools World Summit on Knowledge Society, 514-521 DOI:10.1007/978-3-642-16324-1_60

[168] Chaidi E, Kefalis C, Papagerasimou Y, Drigas, 2021, Educational robotics in Primary Education. A case in Greece , Research, Society and Development journal 10 (9), e17110916371-e17110916371, https://doi.org/10.33448/rsd-v10i9.16371

[169] Lytra N, Drigas A 2021 STEAM education-metacognition–Specific Learning Disabilities , Scientific Electronic Archives journal 14 (10) https://doi.org/10.36560/141020211442

[170] Demertzi E, Voukelatos N, Papagerasimou Y, Drigas A, 2018 Online learning facilities to support coding and robotics courses for youth , International Journal of Engineering Pedagogy (iJEP) 8 (3), 69-80, https://doi.org/10.3991/ijep.v8i3.8044

[171] Drigas A, Kouremenos S, Vrettos S, Vrettaros J, Kouremenos S, 2004 An expert system for job matching of the unemployed , Expert Systems with Applications 26 (2), 217-224 https://doi.org/10.1016/S0957-4174(03)00136-2

[172] Pergantis, P., & Drigas, A. (2024). The effect of drones in the educational Process: A systematic review. Education Sciences, 14(6), 665. https://doi.org/10.3390/educsci14060665

[173] Chaidi I, Drigas A 2022 Digital games & special education , Technium Social Sciences Journal 34, 214-236 https://doi.org/10.47577/tssj.v34i1.7054

[174] Doulou A, Drigas A 2022 Electronic, VR & Augmented Reality Games for Intervention in ADHD , Technium Social Sciences Journal, 28, 159. https://doi.org/10.47577/ tssj.v28i1.5728

[175] Drigas A, Mitsea E, Skianis C 2021 The Role of Clinical Hypnosis & VR in Special Education , International Journal of Recent Contributions from Engineering Science & IT (iJES) 9(4), 4-18. https://doi.org/10.3991/ijes.v9i4.26147

[176] V Galitskaya, A Drigas 2021 The importance of working memory in children with Dyscalculia and Ageometria , Scientific Electronic Archives journal 14 (10) https://doi. org/10.36560/141020211449

[177] Drigas A, Karyotaki M 2019 Attention and its Role: Theories and Models. International Journal of Emerging Technologies in Learning 14 (12), 169-182, https://doi.org/10.3991/ijet.v14i12.10185

[178] Drigas A, Mitsea E, Skianis C. 2022 Virtual Reality and Metacognition Training Techniques for Learning Disabilities , SUSTAINABILITY 14(16), 10170, https://doi.org/10.3390/su141610170

[179] Drigas A,. Sideraki A. 2021 Emotional Intelligence in Autism , Technium Social Sciences Journal 26, 80, https://doi.org/10.47577/tssj.v26i1.5178

[180] Drigas A, Mitsea E, Skianis C.. 2022 Subliminal Training Techniques for Cognitive, Emotional and Behavioural Balance. The role of Emerging Technologies , Technium Social Sciences Journal 33, 164-186, https://doi.org/10.47577/tssj.v33i1.6881

[181] Bamicha V, Drigas A, 2022 The Evolutionary Course of Theory of Mind - Factors that facilitate or inhibit its operation & the role of ICTs , Technium Social Sciences Journal 30, 138-158, DOI:10.47577/tssj.v30i1.6220

[182] Karyotaki M, Bakola L, Drigas A, Skianis C, 2022 Women's Leadership via Digital Technology and Entrepreneurship in business and society , Technium Social Sciences Journal. 28(1), 246–252. https://doi.org/10.47577/tssj.v28i1.5907

[183] Drigas A, Bakola L, 2021The 8x8 Layer Model Consciousness-Intelligence-Knowledge Pyramid, and the Platonic Perspectives , International Journal of Recent Contributions from Engineering, Science & IT (iJES) 9(2) 57-72, https://doi.org/10.3991/ijes.v9i2.22497

[184] Mitsea E, Drigas A,, Skianis C, 2022 Breathing, Attention & Consciousness in Sync: The role of Breathing Training, Metacognition & Virtual Reality , Technium Social Sciences Journal 29, 79-97, https://doi.org/10.47577/tssj.v29i1.6145

[185] Mitsea E, Drigas A, Skianis C, 2022 ICTs and Speed Learning in Special Education: High-Consciousness Training Strategies for High-Capacity Learners through Metacognition Lens , Technium Social Sciences Journal 27, 230, https://doi.org/10.47577/tssj.v27i1.5599

[186] Drigas A, Karyotaki M, Skianis C, 2017 Success: A 9 layered-based model of giftedness , International Journal of Recent Contributions from Engineering, Science & IT 5(4) 4-18, https://doi.org/10.3991/ijes.v5i4.7725

[187] Drigas A, Mitsea E, Skianis C, 2022 Intermittent Oxygen Fasting and Digital Technologies: from Antistress and Hormones Regulation to Wellbeing, Bliss and Higher Mental States , Technium BioChemMed journal 3 (2), 55-73

[188] Drigas A, Mitsea E 2022 Conscious Breathing: a Powerful Tool for Physical & Neuropsychological Regulation. The role of Mobile Apps , Technium Social Sciences Journal 28, 135-158. https://doi.org/10.47577/tssj.v28i1.5922

[189] Drigas A, Mitsea E 2021 Neuro-Linguistic Programming & VR via the 8 Pillars of Metacognition X 8 Layers of Consciousness X 8 Intelligences , Technium Social Sciences Journal 26(1), 159–176. https://doi.org/10.47577/tssj.v26i1.5273

[190] Drigas A, Mitsea E, Skianis C 2021. The Role of Clinical Hypnosis and VR in Special Education , International Journal of Recent Contributions from Engineering Science & IT (IJES) 9(4), 4-17.

[191] E Mitsea, A Drigas, C Skianis 2022 Metacognition in Autism Spectrum Disorder: Digital Technologies in Metacognitive Skills Training , Technium Social Sciences Journal, 153-173

[192] Kontostavlou, E. Z., & Drigas, A. (2021). How Metacognition Supports Giftedness in Leadership: A Review of Contemporary Literature. , International Journal of Advanced Corporate Learning (iJAC), 14(2), pp. 4–16. https://doi.org/10.3991/ijac.v14i2.23237

[193] Vouglanis T, Driga A M, Drigas A 2022 Charismatic Children: Heredity, Environment and ICTs , Technium Sustainability journal 2,5 1-15https://doi.org/10.47577/sustainability.v2i5.7378

[194] Chaidi, I. ., & Drigas, A. (2022). Social and Emotional Skills of children with ASD: Assessment with Emotional Comprehension Test (TEC) in a Greek context and the role of ICTs. , Technium Social Sciences Journal, 33(1), 146–163. https://doi.org/10.47577/tssj.v33i1.6857

[195] Vouglanis, T. ., Driga, A. M., & Drigas, A. (2022). Physical and mental exercise to create new congenial neurons, to increase intelligence and the role of ICTs. , Technium BioChemMed journal, 3(3), 21–36. https://doi.org/10.47577/biochemmed.v3i3.7325

[196] Chaidi , I. ., & Drigas, A. (2022). Emotional intelligence and learning, and the role of ICTs. Technium Social Sciences Journal, 35(1), 56–78. https://doi.org/10.47577/tssj.v35i1.7249

[197] Pergantis, P.; Bamicha, V.; Chaidi, I.; Drigas, A. Driving Under Cognitive Control: The Impact of Executive Functions in Driving. World Electric Vehicle Journal 2024, 15, 474, doi:10.3390/wevj15100474.

[198] Pergantis, P. Developmental Coordination Disorder and the Role of New Technologies as Intervention Tool. World Journal of Advanced Research and Reviews 2023, 19, 519–528, doi:10.30574/wjarr.2023.19.1.1333.

[199] Drigas A, Papoutsi C, Skianis C, Being an Emotionally Intelligent Leader through the Nine-Layer Model of Emotional Intelligence-The Supporting Role of New Technologies, Sustainability MDPI 15 (10), 1-18.