FRI-1.322-1-SW-05

CHALLENGES TO INCLUSIVE EDUCATION FOR INDIVIDUALS WITH DYSLEXIA

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Abstract: the paper aims to identify the essential barriers faced by students with learning disabilities with special focus on those with dyslexia. The subject of inclusive education has been interpreted in the context of neurodiverse learners and how the difference in cognitive abilities affect the educational achievements. Based on comparative approach are systemized the most often met barriers and the appropriate learning strategies and methods. The comparison has been used as a foundation for the outlining of a Curriculum Adaptive Learning Model (CALM) which is the authors' attempt to propose generalized stage approach for improving the inclusiveness of the traditional learning process in case of working with students with dyslexia or similar disabilities.

Keywords: inclusive education, learning disabilities, neurodiverse learners, cognitive ability

INTRODUCTION

The importance of inclusive education is growing in European debates because of its potential to create a fair and accessible learning environment for every student. The idea for inclusivity is fundamental also for the European Pillar of societal rights endorsed by the European Parliament and the Commission, where is highlighted that "everyone has the right to quality and inclusive education, training and life-long learning in order to maintain and acquire skills that enable them to participate fully in society and manage successfully transitions in the labour market" (EC, 2023)

The increasing recognition and understanding of individuals who have learning disabilities, specifically those with dyslexia, has shed light on and significantly deepened our understanding of the systemic obstacles and barriers that consistently hinder and negatively affect their educational life and professional experiences. Dyslexia, as a learning disability, affects approximately 5–15% of the population and leads major and inconsistent challenges in reading, writing, and spelling, which are not aligned with their overall intelligence and cognitive capabilities (Kamran, M., et al. ,2023), (M. Elsherif, Mahmoud et al., 2022). A worldwide pressure for establishing educational equity drives educational systems globally to commit to inclusive learning environments and develop supportive policies. However, current educational frameworks often inadequately address the spectrum of the needs of dyslexic students (M. Elsherif, Mahmoud et al., 2022), (Bondebjerg A., et al., 2023).

This paper aims to systemize the challenges faced by individuals with dyslexia within inclusive education settings, focusing on critical barriers in the Bulgarian higher educational

system related to insufficiently trained staff, lack of adequate resources to adapt the curricula content to the needs of students with learning disabilities and especially those with dyslexia, and on the other hand to propose some accommodations of them to the diverse learning styles and the academic principles and rules (Bondebjerg A., et al., 2023), (Livingston, E. M. et al., 2018). From a macro-societal perspective, the imperative to improve educational inclusivity for dyslexic learners is fundamentally dualistic. It addresses the ethical obligation of the policy-makers and educators to ensure the provision of equitable education while simultaneously contributing to the development of a diverse and thriving society. In this way we often meet the conflict between the concept of individuals' essential right to develop and extend the potential for academic and social flourishing, a position affirmed by existing research literature (Kamran, M. et al. ,2023), (Hardini, F. et al., 2022), (Bong and Chen, 2021), and the prejudice that people with learning disabilities cannot contribute with educational and innovative achievements to the societal development. As a result we face the paradox where the amount in investment and soft measures for support the inclusivity raise year by year and the students with learning disabilities continuously face significant difficulties in the inclusive learning environments. This research paper is an attempt to shed light on these challenges and contradictions and to promote essential changes within the educational system that will lead to a more just and equitable learning experience for all students.

EXPOSITION

Raschle, et al. (2012) states, "*Developmental dyslexia (DD) is a specific learning disability that affects about 5–17% of all children. DD is characterized by difficulties with accurate and fluent word recognition and poor spelling and decoding performance.*" (Raschle, Zuk, & Gaab, 2012). By definition dyslexia is a learning disorder that is refers to persistent difficulties with reading due to underlying deficits in phonological processing, significantly impacts the literacy skills, self-esteem, and social integration of students who are affected by this learning disability (Kamran, M. et al. ,2023).

The individuals with this type of learning disability are often qualified as "neurodiverse learners". The "neurodiversity is a concept that recognizes the natural variations in human brain function and behavior, emphasizing that there is no single "right" way of thinking, learning, or interacting with the world. This perspective views neurological differences, such as autism, ADHD, and dyslexia, as normal variations rather than deficits" (Harvard Health Blog, 2021).

Neurodiverse learners usually have unique strengths as extremely developed creativity, fast ability for problem-solving, deep focus on specific interests, or strong pattern recognition. However, they may also face challenges with traditional learning methods, social interactions, executive functioning, or sensory processing. The effective teaching strategies for neurodiverse learners must involve personalized instructions, flexible learning environments, and supportive accommodations to help them (Armstrong, T., 2011), (Armstrong, T., 2018). That's why the major efforts of the contemporary educators should drive not only to the formal establishment of inclusive environment, but to the building of a sustainable adaptive educational system that fully recognize and appreciates the valuable contributions of neurodiverse learners.

The concept of inclusive education for individuals with dyslexia has developed significantly over the years, based on the dynamic changes in the public attitudes toward the learning disabilities, the improvements of the educational policies, and the deeper understanding

of dyslexia's complexities. In the early 20th century, educational practices were largely segregated, and dyslexia was often viewed through a lens of deficit rather than one of diversity in learning needs. This mindset began to shift in the 1970s, when researchers began to emphasize the importance of addressing the specific learning challenges faced by students with dyslexia, identifying phonological processing difficulties as a core characteristic of the disorder (Kamran, M. et al., 2023), (Raschle, Zuk, & Gaab, 2012). However, despite this progress, significant barriers persisted. Studies in the 1990s highlighted that many educators lacked the necessary training to effectively implement inclusive practices, leading to inadequate support for students with dyslexia (M. Elsherif, Mahmoud et al., 2022), (Bondebjerg A., et al., 2023). By the late 20th century, the emergence of legislative frameworks aimed at protecting the rights of individuals with disabilities began to lay the groundwork for inclusive education. Moving into the 21st century, there has been a growing recognition of the need for professional development focused on inclusive strategies. Research indicates that effective implementation of such strategies can improve educational outcomes for students with dyslexia (Livingston, E. M. et al., 2018). Nonetheless, challenges remain. Recent studies continue to reveal gaps in resources and training among educators, as well as widespread misconceptions about dyslexia that hinder inclusion (Weller, et al., 2014), (Parsons, & Carlone, 2013). As the field progresses, it is clear that ongoing efforts to adapt curricula, train educators, and foster inclusive environments will be essential to fully realize the benefits of inclusive education for individuals with dyslexia (Kamran, M. et al., 2023).

Within the realm of educational discourse, the pursuit of inclusivity remains a pressing concern, particularly as it pertains to students with specific learning disabilities, such as dyslexia. Inclusive education lays down on the equal opportunity concept and has a non-discriminative nature aiming to provide an environment where all students can participate fully in the learning process, regardless of their cognitive abilities. Its significance is underscored by legislative frameworks and educational policies that advocate for the rights of individuals with disabilities, fostering a more equitable society. However, despite growing awareness and advancements in inclusive practices, substantial challenges persist in the effective implementation of such educational models for students with dyslexia.

The inclusive education concept is based on the fundamental right of every student to receive a high-quality education that is both equitable and accessible. That means that the individual approaches adapted to learning needs or differences in the abilities should not affect the educational quality or to lead to differentiate treatment. Unfortunately, the goal of inclusivity faces significant obstacles for those with dyslexia; these difficulties often manifest as unmet educational requirements and, as a result, negatively impact their academic achievements.

A critical examination of existing literature reveals several key themes that recur in discussions about the obstacles faced by these individuals. For instance, research highlights that both teacher training and curriculum design frequently fall short in addressing the unique needs of students with dyslexia, often resulting in inadequate support within mainstream classrooms. Studies emphasize the necessity for targeted professional development that equips educators with the skills to recognize and effectively respond to dyslexia, as current training programs may not sufficiently address these learning complexities. In addition, the literature indicates that a lack of appropriate instructional strategies and resources poses significant barriers, preventing students with dyslexia from accessing the same educational opportunities as their peers. Furthermore, the

social stigma surrounding dyslexia contributes to an environment where students may experience isolation rather than inclusion, exacerbating the challenges they face.

Moreover, existing research often points to the critical role of family and community involvement in supporting the academic success of students with dyslexia. Yet, there remains a notable gap in understanding how various stakeholders—such as parents, teachers, and school/academic administrators—can collaboratively promote a more stimulating and motivating atmosphere. The intersectionality of dyslexia with other factors, including socio-economic status and cultural backgrounds, also necessitates further exploration, as these variables can significantly influence educational experiences and achievements.

The implementation of inclusive education for individuals with dyslexia presents various challenges, stemming primarily from pedagogical, systemic, and societal factors. One significant theme is the pedagogical barriers associated with insufficient teacher training and awareness. Many educators lack the necessary knowledge about dyslexia, which not only affects their ability to recognize the disorder but also hampers their capacity to provide appropriate instructional strategies tailored to dyslexic students' needs (Kamran, M. et al. ,2023). This gap in understanding can lead to inadequate support in classrooms, consequently affecting students' academic performance and self-esteem. Another major challenge is the systemic issues within educational institutions that hinder the effective delivery of inclusive education. Research shows that the lack of resources, such as specialized teaching materials and support staff, can create an environment where dyslexic students struggle to receive the accommodations they require (M. Elsherif, Mahmoud et al., 2022), (Bondebjerg A., et al., 2023). Despite the breadth of literature covering the challenges associated with dyslexia, there is a need for more nuanced studies that delve deeper into the lived experiences of affected individuals and their motivations for learning in inclusive contexts. Engaging with these perspectives can provide valuable insights into effective interventions that transcend mere policy changes.

Based on comparative analyses we systemized the most often met barriers by dyslexics' students and the widely-accessible tools for support individually-oriented learning and teaching.

Table 1. Comparison of barriers faced by dyslexic students and appropriate learning strategies and methods.

Barriers	Learning Strategies & Methods
Reading Difficulties: **Struggles with reading comprehension, slow reading speed, and difficulty processing dense academic texts.**	*Text-to-Speech Software*: Tools like Kurzweil, NaturalReader (NaturalReader n.d.), or VoiceOver (VoiceOver n.d.) can help students listen to written content instead of reading. *Summarization Tools*: Apps like Grammarly (Grammarly Inc. n.d.) and Resoomer (Resoomer n.d.) help break down complex texts.
Writing Challenges: **Spelling errors, difficulty structuring essays, and problems with grammar and punctuation.**	*Speech-to-Text Software*: Tools like Dragon NaturallySpeaking (Dragon NaturallySpeaking n.d.) help convert speech into written text. *Mind Mapping Software*: Applications like MindMeister (MindMeister n.d.) and Inspiration

	(Inspiration Software, Inc. n.d.) assist in organizing ideas visually before writing.
Time Management & Organization: **Difficulty in organizing tasks, planning assignments, and meeting deadlines.**	*Assistive Planning Apps*: Apps like Evernote (Evernote Corporation n.d.), Todoist (Todoist n.d.), and Google Calendar (Google n.d.) help with task management. *Chunking Tasks*: Breaking down assignments into smaller, manageable sections.
Memory & Information Retention Issues: **Struggles with retaining large amounts of information, recalling facts, and following multi-step instructions.**	*Mnemonics & Visual Aids*: Using color-coded notes, diagrams, and memory techniques to aid recall. *Spaced Repetition*: Apps like Anki (Anki n.d.) and Quizlet (Quizlet Inc. n.d.) help reinforce learning over time.
Lecture Comprehension Difficulties: **Trouble processing spoken information quickly and taking effective notes during lectures.**	*Recorded Lectures & Note-Taking Support*: Using apps like Otter.ai (Otter.ai n.d.) or Livescribe Smartpens (Livescribe Inc. n.d.) to record and transcribe lectures. *Mind Mapping Notes*: Structuring notes visually for better understanding.
Confidence & Self-Esteem Issues: **Fear of being judged for reading and writing difficulties, leading to anxiety and lack of participation.**	*Support Networks & Accommodations*: Seeking disability services, mentorship programs, and academic coaching. *Self-Advocacy Training*: Encouraging students to communicate their needs to instructors and seek necessary accommodations.

As it can be visible from the comparison there is a large variety of assistive technologies that can be involve in the learning process but this fully depends on the adaption of the existing conventional rules and procedures, the improvement of the specific legislation and the establishment of inclusive educational framework at institutional level.

On the other hand, we should highlight that the use of appropriate learning strategies, methods and tools (including assistive those) requires new type of learning design as well as the extended knowledge on neurodiverse learning difficulties and their impact on the cognitive abilities of the students as well as refined skills to apply new technologies.

The present paper cannot give the answers how to convert the traditional learning to inclusive and oriented to the specific needs of the students but we tried to propose a generalized Curriculum Adaptive Learning Model (CALM) designed to address the barriers faced by dyslexic students in higher education.
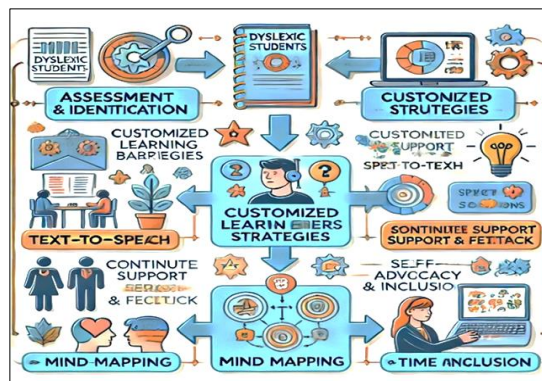
Fig. 1. Curriculum Adaptive Learning Model (CALM)

CALM is a systematic way with strong foundation for addressing the needed changes in order to facilitate the overcoming of barriers faced by dyslexic students in higher education without neglecting the universal learning design framework nor the principles of equal treatment of all students. The model consists of four key stages:

1.   *Assessment & Identification*: aiming to diagnose learning barriers and identify personalized solutions. This stage requires the proactivity at institutional and teachers' level strongly supported and undertaken in collaboration with the students and other stakeholders e.g. parents, psychologist etc. and at least refers to the undertaking of the following steps:

A)   Incorporate multi-modal assessments (professional and self-assessment) e.g., cognitive, emotional, and behavioural evaluations to identify specific challenges and strengths;

B)   Facilitate the process by using AI-driven diagnostic tools to provide real-time insights into learning preferences and barriers;

C)   Collaborate with specialists (e.g., psychologists, learning disability experts) for accurate diagnosis and with parents, previous teachers and other stakeholders to accumulate the knowledge from the previous learning experience;

2.   *Customized Learning Strategies*: this stage is aiming to adapt the traditional learning design to the needs of the student by choosing and involving appropriate assistive tools and techniques. Important precondition for this stage is the existence of relevant legislative and regulatory base both at national and institutional levels, otherwise the adaptations could create negative practices of differentiate treatment of the students and direct or indirect case of discrimination. Other necessary precondition is the improved qualification of the learning designers to apply assistive tools during the teaching process, as well as the availability of such tools and the related infrastructural accommodations for their real-time use. Last but not least is the language localization of the existing applications, most of them are universally designed but often directly supporting dyslexic students' applications don't provide language opportunities in the students' native language. The following steps a relevant to this stage:

A) Introduce a tiered approach:

▪ *Tier 1: Universal tools (e.g., text-to-speech software, mind-mapping tools).*

▪ *Tier 2: Targeted interventions (e.g., structured literacy programs, phonics-based learning).*

▪ *Tier 3: Intensive, one-on-one support (e.g., personalized tutoring, executive function coaching).*

B) Integrate gamification and interactive content to engage students;

C) Leverage adaptive learning platforms that adjust content difficulty based on performance.

3.   *Continuous Support & Feedback:* this stage refers to the continuous monitoring and periodical adjustments of the teaching methods to the advancements and the achievements of the students. It requires as precondition the development of appropriate evaluation tools and monitoring plan with clearly defined learning objectives which are subject of discussion with the students. The following key steps are relevant to this stage:

A)   Implement regular check-ins (e.g., weekly or monthly) to monitor progress and emotional well-being of the students;

B)   Use data analytics to track learning outcomes and identify areas for improvement;

C)   Provide actionable feedback in multiple formats (e.g., visual, auditory, written);

D)   Encourage peer support groups or mentoring programs for additional reinforcement.

4.   *Self-Advocacy & Inclusion:* aiming to encourage student's independence and the provision of institutional support for socialization and integration. This stage requires the development of additional forms of non-lecture engagement of the students based on their interests as well as including topics strengthening especially the civil engagement and the culture of diversity by:

A) Offer workshops on self-advocacy skills (e.g., how to request accommodations, communicate needs).

B) Foster a culture of inclusion through awareness campaigns and faculty training.

C) Create student-led initiatives or clubs to promote dyslexia awareness and peer support.

D) Partner with institutions to ensure policies and infrastructure support inclusivity (e.g., accessible materials, flexible exam formats).

CONCLUSION

Several pedagogical, systemic, and societal obstacles hinder the inclusion of dyslexic learners in mainstream education. One significant topic is the pedagogical barriers associated with insufficient teachers' and learning designers training and awareness. Most of the educators have limited or no knowledge about dyslexia, which directly affect their ability to recognize the potential problem and the need for adaptions, as well as hamper their ability to provide appropriate instructional strategies tailored to dyslexic students' needs. This gap in understanding can lead to inadequate educational support in-class, low quality of the educational service provided, low level of motivation of the other students and raise of negative attitudes toward the students with learning disabilities. The last affects consequently students' academic performance and self-esteem. Another major challenge is the systemic issues within educational institutions that hinder the effective delivery of inclusive education. It is directly related not only to the institutional willingness and resources to provided student-centred tailored to the need's education but to the existing regulatory framework in the country.

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