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Role of digital learning pedagogy in remediating learning disability

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ABSTRACT

Recent studies have indicated that digital platforms cannot amalgamate learning solutions for students with learning disabilities. In this paper, we provide a comprehensive overview of the literature on the topic and methods to elaborate on earlier studies on learning disabilities. These findings can help new researchers develop effective techniques to improve learning skills, and cognitive development and motivate teachers toward remediation programs to overcome the problem of learning disability.

Keywords: Digital-learning pedagogies, learning disability, resource management, teachers' readiness.

INTRODUCTION

Digital learning refers to the practice and recognition of digital technologies excellently. To increase confidence and active participation among students with learning disabilities, digital tools can be tailored to provide personalized learning. Digital tools can oversimplify the management of teaching resources. Effective management of learning resources can help teachers organize and share content easily and swiftly. Stakeholders should also work on redesigning the curriculum that should reflect contemporary education needs. The curriculum should be redesigned in such a way that it should build life skills such as critical thinking, problem solving

and digital literacy in slow learners. Digital tools should promote teamwork among educators and foster a community of practice where innovative strategies can be refined and shared. By straying abreast of educational advancements teachers can enhance their instructional methods. By incorporating digital technology educators can address the diverse needs of students with learning disabilities.

Digital literacy refers to the ability to practice and recognize digital technologies excellently. Digital competence involves identifying the specific skills and abilities required to demonstrate digital competence. Digital literacy is the ability to access, evaluate, use and create digital content via a variety of digital technologies. This includes basic computer skills such as using the mouse, keyboard and software applications. Learn how to use the internet for research and communication, including assessing the trustworthiness and reliability of online information. Learn about digital tools and platforms such as social media, video-conferencing, and cloud storage. How can they be used effectively and safely? Awareness of digital security risks and how to protect personal information online? The ability to use appropriate software and tools to create digital content such as documents, presentations, and multimedia projects. Stromer (1977); Cihak et al., (2015) both illustrated the adequacy of advanced education aptitudes in remediating scholarly insufficiencies and expanding cooperation in an advanced society, individually. The objective of the present study is to gain insights whether teachers and parents are motivated toward remediation programs to overcome the problem of learning disability with the use of digital platforms or not. The following objectives were taken into consideration while performing the review (1) Planning strategies to adopt the latest advancements in technologies. (2) encouraging teachers' readiness for the use of the latest technologies. (3) Management of teaching resources. (4) Designing a curriculum to motivate students with learning disabilities toward maximum utilization of digital platforms.

LITERATURE REVIEW

An extensive study was performed by reading books, journals, blogs and newspapers on digitalization and learning disabilities. An interpretation-based core cognitive process was also studied to understand the concept thoroughly. We provided a brief overview of the studies that follow alignment between our objectives and findings.

Planning strategies to adopt the latest advancements in technologies

Zionch (2011) revealed that digital simulators had a positive effect on acquiring life skills by learning disabled students. Basic life skills such as driving skills and communication skills can be enhanced by incorporating computer software such as Stand -Alone Computer. A personal digital assistant can be beneficial for the functional teaching of students with learning disabilities.

Perelmutter (2017) investigated the effects of assistive devices on adults with learning disabilities. The participants exhibited mixed attitudes toward the use of these devices. Interventions such as the implementation of hypertext and word processing had the most significant effect on the performance of disabled students. Digital game-based learning, augmented reality and virtual reality can be used as tools for virtual tutoring. To assist students with learning disabilities. These virtual tutors must be used for their assessment. The teaching content should be customized according to their level of understanding and individual differences Stančin & Hoić-Božić (2019). Muhibbin (2020) obtained 32 articles from different databases to perform a meta-analysis. After the inclusion and exclusion criteria were met, only 7 articles were analyzed. The researcher reported that when smartphones and smart pens were used by disabled students their performance was highly improved. Aleksandrova et al. (2021) investigated the possibilities and challenges of using digital devices to improve the learning skills of students with learning disabilities. The researcher used a mixed research strategy to collect data from 6 universities in Russia. The researcher collected the data through a Google Forms IT specialist and the teachers revealed the challenges faced during the use of digital devices while teaching students with learning disabilities. The participants concluded that there are a number of ways to facilitate the learning of disabled students by introducing digital devices.

Encouraging Teachers' Readiness Toward Digital Competency

Teachers play a pivotal role in creating a classroom where every student is welcomed and valued. Dolgova conducted an experiment on 535 persons who belong to educational organizations. A questionnaire was used as a tool to collect data. The study revealed that the majority of teachers are prone to innovations. The motivation level of teachers to accept innovation works as a barrier to inclusive education. Innovative development is declining due to multiple barriers. The main reason for the low motivational readiness of working teams is that they have little awareness and little work experience Dolgova (2017). Küsel and his colleagues conducted an online survey of 105 preservice and in-service teachers to determine their acceptance of the use of digital technology. The study revealed that learning management systems and supplemental videos were the foremost supportive technology instruments. Social media act as distractor media. Teachers respond positively while redesigning their instructions by incorporating digital technology in classrooms. Küsel et al., (2023). Manuzuna (2021) conducted an online survey to determine the readiness of Russian and foreign teachers for digital competency. The researcher's objective was to create a diagnostic tool. The study revealed that highly competent teachers provide digital solutions to their students in terms of communication. There is greater motivation for digitalization and readiness to develop the ability to modify and redesign resources digitally to meet the needs of

the current scenario professionally. Polly, Martin & Byker (2023) narrated the importance of social media effect on learning of students. LMS and complement videos were readily implemented by in-service teachers. Bong & Chen (2024) read 20 research papers and conducted a survey- based study to the obstacles, due to which the students with learning disability face inaccessibility. Teachers' who have expertise in ICT were able to improve the general skills in digital access of learning-disabled students.

Management of teaching resources

Without upgrading teaching resources from textbooks to digital tools, it is not possible to support students with disabilities. A number of the articles were reviewed to highlight the importance of managing teaching resources. Each student with a disability needs different instructional materials. Jamie Mahoney emphasized the use of different digital tools on the basis of the requirements of students with disabilities. The researcher explained the assessment of the students' Kahoot! The digital tool Vocaroo must be used to help students read alternatives and engage them in learning. Managing these digital tools to differentiate and accommodate is necessary Mahoney (2017). Almenara (2021) used a 5-point Likert scale to determine how efficiently teachers can handle digital devices to teach students with motor, cognitive and auditory disabilities. The researcher recommended that training sessions to train teachers in digital resources are urgently needed. Teacher education programs should be redesigned so that teachers can be familiar with the latest technology and manage digital resources to enhance learning. Nganji (2015) claimed that a teacher cannot apply the same virtual learning e-learning technique to students with special needs. The researcher also emphasized that a video without captions is of no use for a student with hearing impairment and that the same video without transcripts is not beneficial for a student with visual disability. To manage these teaching resources, specific software was designed. An ontology-driven disability awareness personalized e-learning system was used by 30 students. Sixty-eight percent of the students experienced better access and 63% of the students experienced it as easy to use. The design of virtual learning environments facilitates information retrieval for these students. Rao (2021) stated that students with special needs have diverse needs; therefore, their instructional resource materials should differ. Rao focused on aligning digital tools with universal design for learning. Teachers should couple various digital tools with instruction strategies on the basis of diverse needs to support students with learning disabilities. Gender, age, motivation, support from colleagues, educational environment are associated with teachers' attitude (Yada & Alnahdi (2024).

Redesigning curricula

To meet the diverse needs of students with learning disabilities, the curriculum must be redesigned. In terms of digital inequality, socioeconomic factors should be considered when the curriculum is redesigned according to UDL principles. Multiple technologies can be utilized to prepare online courses that are fruitful for students with learning disabilities. Redesigning the curriculum with digital technologies will not be fruitful. Stakeholders should motivate teachers to reframe the curriculum in blended mode, as this responsibility will give them a feeling of acceptance Marsico et al., (2006). Johnson & Hegarty (2003) focused on how stakeholders can resolve the problem of website accessibility to improve the understanding of the core concepts in students with learning disabilities. Eight students ranging from mild to moderate learning disability were assigned a project. The ability to access these websites, which incorporate multiple media, was highly motivated. Teachers should redesign the curriculum by incorporating assistive devices. Cavanaugh et al., (2013) focused on "5Cs". Her intervention focused on "Learner Control," "Safe Climate" "Flexible Curriculum" "Caring Society" and "Connection to Students." These 5Cs can be key factors in enhancing the learning outcomes of students with special needs. The time when computer games are introduced in the teaching and learning process, the selection of relevant software, such as redesigning the curriculum can result in positive effects on the motivation of students Birnbaum (2001). The internet should also be used across the curriculum. Khasawneh (2024). Khasawneh conducted a quasi-experimental study on 32 students having learning disability. The ability of life skills and cognitive ability was enhanced when digital learning was included in curricula.

METHOD

A systematic review was conducted following the PRISMA guidelines. The search was conducted by using "learning disability", "digital learning pedagogy", and "inclusive education" as keywords. Google Scholar and Dimensions was used to search for published data. These words were searched in "Title", and the "Abstract" time was limited from 2015--2022. The search was conducted using relevant keywords. The inclusion criteria were (1) studies published in the English language only (2) studies examining the use of digital devices for students with learning disabilities (3) studies related to teachers' readiness for the use of digital technology; and (4) studies focused on redesigning the curriculum to motivate students with learning disabilities toward digital platforms. A search of the PubMed, Scopus and Web of Science databases was conducted using relevant keywords. There was a total of 108 documents from 2015-2022 these all were extracted for bibliographic analysis. There were a total 15 documents that were not published in English were excluded. Studies in which effect of dependent variable was not measured were

ignored. The "VOSviewer" software was used for bibliographic analysis. The data were extracted in an Excel sheet and then network visualization, density visualization and overlay visualization were performed.

A working map based on counties was constructed by selecting five documents as the minimum number of documents per country, with a minimum of one citation per document. Among the eighty-four countries only forty-one countries met the threshold. The thirty-six items were divided into eight clusters. Australia, Austria, Germany, Greece, Ireland, Mexico, New Zealand, Spain, Ukraine and the United Kingdom are included in the first and largest clusters. The second cluster includes six countries- Canada, China, Japan, Pakistan, Russia and Taiwan. Brazil, Denmark, France, Italy and Switzerland fall under the third cluster. Finland, India, Slovenia, Sweden and the United States have the lowest number of documents with a minimum of one citation. Spain was linked with 10 countries and their 118 documents were cited. United Kingdom was linked with 12 countries and its 60 documents were cited. The United states had maximum link strength of 21 and the no of documents cited are 72. Whereas Netherland had the least link strength of 4 and only 23 documents were cited by others.

This paper address that India is far away in main streaming of students with special needs. To highlight our point of discussion, we can easily check the network visualization. Research articles published in Spain has maximum 118 citations. United States have a total of 21 link strength and the papers have 72 citations.

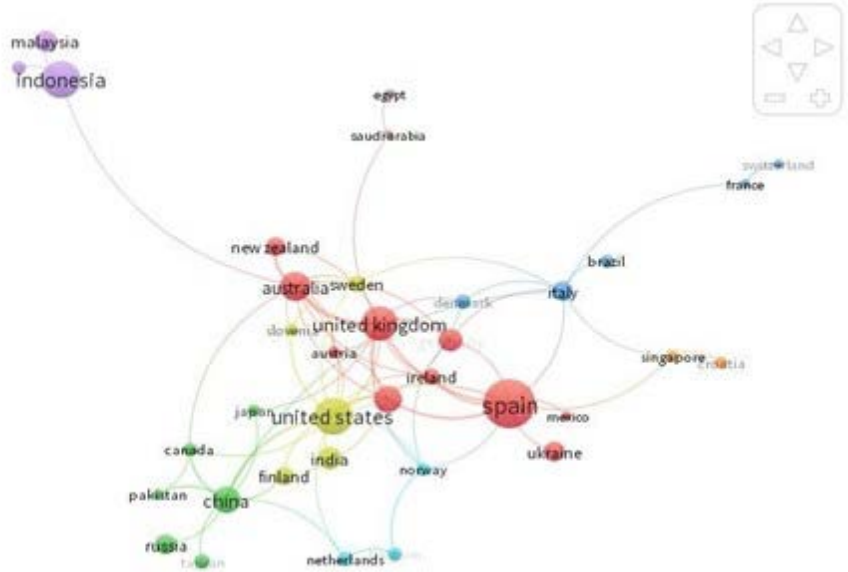


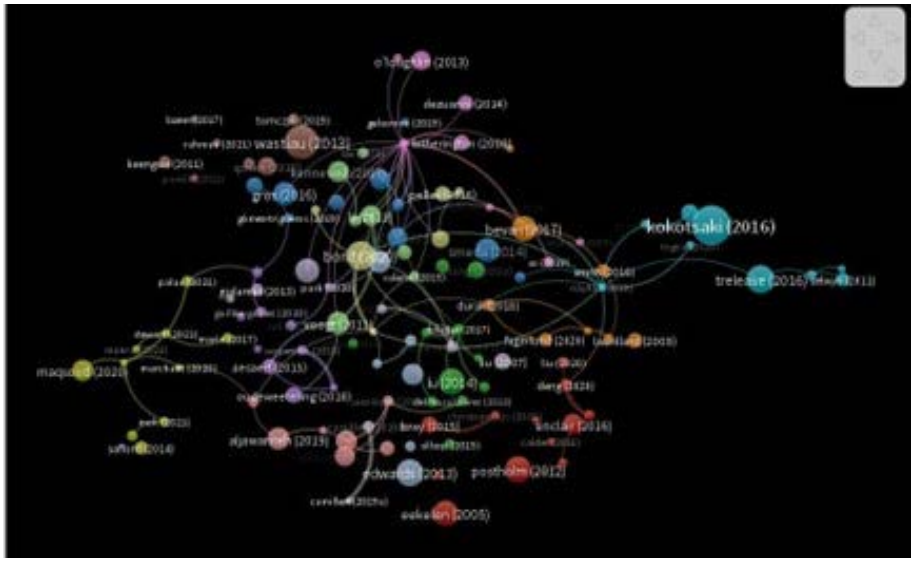
Figure 1:
Source Citation: VOSviewer-Dimensions-Publications version 1.6.18 (2023)

There are a total 5 clusters of which shows connections between them. In first cluster total 5 countries are inter-linked. In second cluster there are total 7 countries are inter-linked.in second cluster 9 countries are inter-linked. Indonesia and Malaysia both are interlinked.

NETWORK BAEDS ON BIBLIOGRAPHIC COUPLING

To determine how many authors have common references that a network visualization was performed. The map was drawn by selecting only those documents that had a minimum of ten common references. Among the 1399 documents, only 182 met the threshold and only 120 items were interred connected.

Figure 2:
Network visualization based on bibliographic coupling



From the above network visualization, it is concluded that three authors have the maximum number of citations. Kokotsaki's document has 275 citations, Trelease's document has 139 citations and Wastiano's document is cited 194 times.

In research related to remediating students with learning disabilities through the use of digitalization, 2035 organizations were considered. Based on bibliographic coupling and the greatest total link strength 108 organizations meet the threshold. The University of Toronto has the maximum link strength of 1125, and 20 research papers of this organization have 7 citations per document.

DISCUSSION AND CONCLUSION

The results of studies using neuroimaging and other studies have encouraged researchers to recommend early identification of dyslexia and early placement in the remediation program. Learning disabled children find difficulties in synchronizing with auditory, by implying rhythm -based intervention with digital tools can remove the hurdles. Digital tools should be integral part for early intervention for phonological abilities Thomson & Goswami (2008); Kovelman et al., (2012). These actions will provide opportunities for students with dyslexia to acquire skills and develop reading and spelling strategies to master reading, spelling and phonological awareness successfully. Failure to identify and remediate dyslexia in a timely manner results in the development of feelings of dissatisfaction among these students as a result of poor academic performance. Videogames with spatial structures can contribute in aesthetic aspects Gazzard (2010)). With early identification and placement in a remediation program, researchers have recommended the use of technology to teach dyslexic students in effectively and positive way Beacham (2002); Anderson & Horney (2007); Maldonado (2010); Winsor (2011). Owing to the use of online classes and online assessments, the whole scenario has changed. Owing to limited access to the internet, limited resources and low power support, the identification of students with learning disabilities is adversely affected. Now it is necessary that education, teachers, schools, counsellors and parents come together to identify learning disables early. It is truly a big problem that should be addressed, as it is disturbing not only the students but also their families. Inclusive and modern teaching environments can significantly improve educational outcomes for students with learning disabilities by fostering a sense of belonging and accommodating diverse needs. The use of flexible and adaptive instructional methods supports varied learning styles, making material more accessible. By prioritizing inclusivity and contemporary teaching tools, educators can create more equitable learning spaces that boost engagement and performance among students with learning disabilities Onwubiko (2024).

Print motivation, print awareness, letter knowledge and rapid automatized naming should be emphasized to increase fluency accuracy and effective comprehension. The findings from this study are useful from both clinical and academic aspects, guiding clinicians and school psychologists to outline clinical assessments and protocols at the screening, diagnostic and management levels. In addition, on the basis of our findings, early identification and screening will also help clinicians design more efficient and economical tools for the assessment of learning-disabled students at the individual and collective levels. The findings of the present study not only revealed a significant general prevalence of learning disability but also examined the prevalence across genders and schools and across the comorbidities of dyslexia, dysgraphia and dyscalculia. From an indigenous perspective, these findings set a benchmark for future researchers to explore these dimensions from more diverse perspectives. Furthermore, there is a dire need to

screen out SLD at very initial levels of schooling so that suitable management for SLD can be provided in a timely manner. Implications for Practice The presented results are in line with previous encouraging findings of screening reading difficulties predictively by preliteracy CBA/GBA measures of phonological awareness, letter knowledge, and related cognitive skills Carson et al. (2014); Puolakanaho & Latvala (2017). If professionals like advocates and organizations provide their services, then disable students can self-manage their needs to achieve sustainability Fisher (2024).

We conclude that countries such as Spain, America and Canada are working to meet the requirements of individuals with learning disabilities. The University of Toronto has performed much research. There is a dire need for Indian researchers to provide their insights to school administrators to reframe their curriculum and manage their resources to gain maximum output by utilizing digital platforms to remediate learning disable students. Parent's active participation can help their children to overcome from these issues.

Digital tools are revolutionizing the way we learn, providing a more interactive and accessible experience for students with disabilities. These tools, including audio, video, text, and interactive media, can engage students with disabilities more effectively than traditional methods. They also help assess progress and identify areas for intervention. The potential of digital learning to close the achievement gap between students with and without disabilities is significant, necessitating increased funding and policy support for schools.

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