Understanding The Landscape: A Scoping Review on Learning Disabilities in Malaysia

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Abstract
Learning disabilities (LDs) present a multifaceted challenge in Malaysia, impacting individuals' educational attainment, social inclusion, and overall quality of life. Despite growing recognition, a comprehensive understanding of the landscape of LDs in Malaysia remains elusive. This scoping review aims to address this gap by synthesizing existing literature to elucidate the interventions in educational approaches among LDs students in Malaysia. Methodologically, a systematic search of academic databases has been conducted to gather relevant literature. Expected results include a comprehensive mapping of the current state of knowledge, identification of key themes, trends, and disparities, and highlighting of gaps in research and practice. By consolidating existing evidence, this review endeavors to inform policymaking, guide professional practice, and raise awareness of LDs as a critical issue in Malaysian society. Ultimately, this scoping review seeks to foster greater understanding and inclusivity for individuals with LDs, promoting equitable access to education and support services across Malaysia.
Keywords: Scoping Review, Learning Disability, Intervention, Special Education, Malaysia

Introduction
Learning disabilities (LDs) pose significant challenges to individuals, families, and educational systems worldwide (Francisco et al., 2020; Wattanawongwan et al., 2021). In Malaysia, as in many other countries, LDs represent a complex and multifaceted issue that warrants comprehensive examination (Dzulkifli, 2023). This scoping review endeavors to provide an in-depth exploration of the landscape of LDs in Malaysia, aiming to consolidate existing knowledge, identify gaps, and offer insights for future research and intervention efforts. By synthesizing the available literature, this review seeks to enhance our understanding of the interventions and educational approaches within the Malaysian context.

The importance of addressing LDs in Malaysia cannot be overstated, given their potential long-term impact on individuals' academic, social, and emotional well-being (Martín-Ruiz et al., 2023). Despite growing awareness and recognition of LDs in recent years, disparities in identification, assessment, and support services persist, posing barriers to effective intervention Isaak et al (2021); Nelson et al (2022) and inclusive education (Francisco et al., 2020; Kauffman & Hornby, 2020; Zweers et al., 2021). Moreover, cultural factors,

socioeconomic disparities, and linguistic diversity further complicate the landscape of LDs in Malaysia, necessitating a nuanced and culturally sensitive approach to research and practice.

Through a systematic scoping review, this study aims to delineate the current state of knowledge regarding LDs in Malaysia, drawing upon a diverse range of sources including academic publications, government reports, and community initiatives. By synthesizing and mapping the existing literature, this review seeks to elucidate key themes, trends, and areas of contention within the field of LD research in Malaysia. Ultimately, this endeavor strives to inform policymaking, guide professional practice, and foster greater awareness and understanding of LDs as a critical issue in Malaysian society.

Research Methodology
The five stages scoping review process proposed by Arksey & O'Malley (2005) were adopted in this study. The following summarizes the approach used in each stage.

Stage 1: Identify the research question.
The research question was developed by drawing on themes from preliminary searches in the field of learning disabilities. A comprehensive research question was formulated.
What is the scope and breadth of existing literature on learning disabilities in Malaysia?

Stage 2: Identifying the relevant studies.
The second step involved examining 154 papers in accordance with the study's inclusion and exclusion criteria after the initial screening deleted 117 publications (see Figure 1). English-language publications that were published between 2019 and 2023 were examined and considered for coverage. Research articles, which also include conference proceedings that were not included in the most current research, were the first criterion since they offer useful guidance. Noting that some of the full articles were removed because they were incomplete, 4 items were not accessible and had broken links. Table 1 shows the selection criterion in identifying relevant studies, used in this study.

Table 1
The selection criterion in identifying relevant studies.

Criterion	Inclusion	Exclusion
Language	English	Non-English, Malay
Timeline	2020 – 2023	< 2019
Literature type	Journal (Article) and Proceeding	Book, Review
Country	Malaysia	Non-Malaysia

Stage 3: Study selection.
Scoping reviews are typically iterative, with reviewers becoming more familiar with the research and evidence (Arksey & O'Malley, 2005). This study focuses on the learning disabilities in Malaysia in the field of education so studies focusing on 'school children' was added to the existing search criteria. The title, abstract and keywords used to search and extract relevant studies (Table 2).

Table 2
The search string

Scopus	TITLE-ABS-KEY ((("learning disabilities" OR "learning difficulties" OR "learning disorders") AND (students OR pupils OR "school children") AND Malaysia)) AND PUBYEAR > 2019 AND PUBYEAR < 2023 AND (EXCLUDE (DOCTYPE , "bk") OR EXCLUDE (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English"))

Stage 4: Charting the data
Charting tables were created into a customized Excel spreadsheet to capture and organize extracted data from included research (Murray et al., 2017). A data extraction form will be used to gather information on the study design, procedures, participants, interventions, and results. It includes author(s), year of publication, aims/purposes, methodology/methods, and key findings that relate to the scoping review research questions. During scoping reviews, charting results is often an iterative process. If unexpectedly useful data can be charted, then more table categories may be included, or table headers may need to be altered.

Stage 5: Collating, summarizing, and reporting the results.
Study characteristics (such as the name of the author, the year of publication, the aims and purposes of the study) were gathered, compiled, and reported as follows: 1) A descriptive analysis that plots the data and shows how the studies are distributed based on publication date, country of origin, study methodology, and theme/focus; and 2) A thematic summary that explains the main conclusions from the identified research, grouped thematically, and how it relates to the study question and objectives.
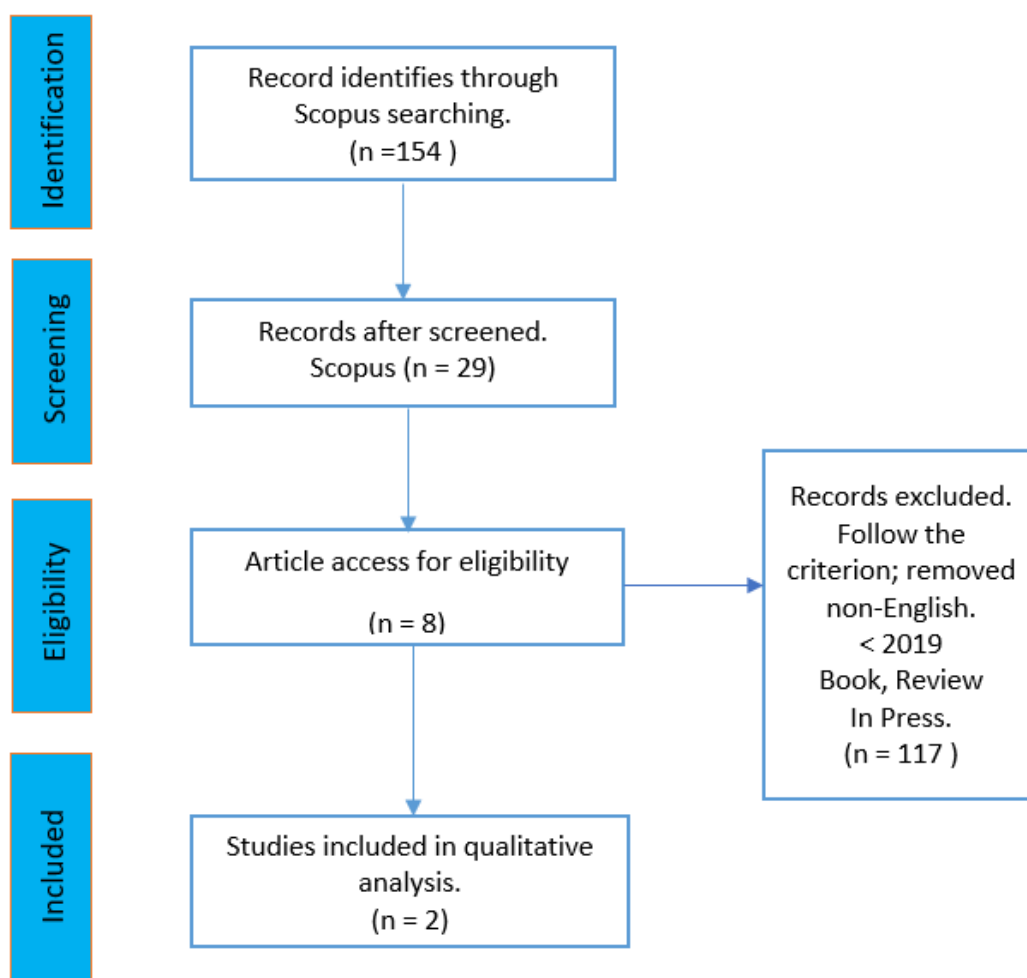
Figure 1 Flow diagram of the proposed searching study adopted from (A. Murray et al., 2016).

Overview of the selected articles
Eight articles that focused on intervention and technology were thoroughly reviewed (2020, 1 article, 2021, 1 article, 2022 2 articles and 2023, 4 articles). Different types of literature were included in this review such as five journal articles and three proceedings. Figure 1 shows the flow diagram of the proposed searching study adopted from (Murray et al., 2016).

Results
Several interventions targeting students with learning disabilities in Malaysia have been investigated to enhance their academic performance and overall well-being. One exclusive study examined the effectiveness of Ruqyah Syariah therapy among hyperactive students, employing an Islamic medical research framework based on Quranic principles and prayers (Asilah et al., 2023). Using a one-group quasi experimental design, the study demonstrated a significant improvement in hyperactive behavior among 8-11-year-old students following the therapy, suggesting its potential applicability in classroom settings. Another intervention focused on developing a teaching aid Sohaeir et al (2023), Easy Match, using the Word Wall website to engage students with learning difficulties in Basic Cooking subjects. Qualitative

analysis revealed positive feedback from experts, highlighting the potential of Easy Match to address specific learning challenges.

Furthermore, research aimed at improving dyslexia detection and intervention involved the development of a Convolutional Neural Network (CNN) model for dyslexic handwriting recognition (Rosli et al., 2021). The model achieved a remarkable accuracy of 95.34%, indicating its effectiveness in identifying dyslexic handwriting patterns. Additionally, a scoping review examined available interventions for dyslexic students in Malaysia, emphasizing the prevalence of assistive technology tools, particularly mobile learning applications (Lim et al., 2023). However, the review highlighted the need for more comprehensive applications addressing phonics and multiple language skills. Finally, a study exploring teachers' perspectives on inclusive education underscored the importance of professional development, network connections, and supportive school environments in facilitating the participation of students with learning disabilities in mainstream classrooms (Hosshan, 2022). These interventions collectively contribute to advancing inclusive education practices and support systems for students with learning difficulties (Buli-Holmberg & Jeyaprathaban, 2016; Francisco et al., 2020) in Malaysia .

Interventions targeting learning disabilities aim to improve educational access and engagement through technology (Baker El-Ebiary et al., 2020; Mokmin & Ridzuan, 2022; Yahya et al., 2023). One approach focuses on diversifying learning strategies to accommodate students' diverse needs and preferences. Recognizing the challenges faced by students with learning disabilities in traditional educational settings, a study proposes employing multiple styles of records and expression presentation to make learning more dynamic and appealing (Baker El-Ebiary et al., 2020). Similarly, efforts to make physical education (PE) inclusive for students with learning disabilities involve leveraging immersive technologies (Mokmin & Ridzuan, 2022). An app utilizing virtual reality (VR) and augmented reality (AR) aims to provide tailored PE experiences, enabling students to control their learning progress and select content according to their abilities. By integrating motor learning theory and multimedia learning principles, this app enhances the PE learning process and fosters student engagement. Amid the COVID-19 pandemic, virtual teaching, and learning (VTL) strategies are crucial for ensuring continued education for students with learning disabilities, such as autism spectrum disorder (ASD). A research initiative in Malaysia investigates the challenges faced by teachers and students with ASD during online education and explores suitable VTL technologies for autism care centers (Yahya et al., 2023). Through on-site observations, interviews, and online questionnaires, an instructional digital model (IDM) for VTL is developed, guiding the creation of a VTL platform to support effective online learning for students with ASD. These technological interventions exemplify innovative approaches to addressing learning disabilities and promoting inclusive education environments (Baker El-Ebiary et al., 2020; Bouck et al., 2017, 2020).

Discussion

The findings from the various studies underscores the multifaceted nature of addressing learning disabilities and enhancing educational outcomes in Malaysia. The results demonstrate promising interventions across different domains, ranging from the effectiveness of Ruqyah Syariah therapy in managing hyperactive behavior Asilah et al (2023) to the development of innovative teaching aids like Easy Match for students with special needs (Sohaeir et al., 2023). Additionally, advancements in technology, such as the successful implementation of a Convolutional Neural Network (CNN) model for dyslexia handwriting

recognition, showcase the potential for tailored solutions to support learning and inclusion (Rosli et al., 2021). However, the findings also highlight areas for improvement, particularly in the design and focus of mobile learning applications for dyslexic students, which currently lack emphasis on phonics and comprehensive language skills. Moreover, the identification of factors contributing to online learning difficulties, with poor internet accessibility and lack of self-motivation emerging as prominent challenges, underscores the need for holistic approaches to address systemic issues affecting educational experiences (Mokmin & Ridzuan, 2022; Yahya et al., 2023).

The results of the present study also suggest the transformative potential of innovative technologies, particularly the social web and virtual reality (VR) Bouck et al (2020); Morris et al (2022), in enhancing educational experiences for students with special educational needs (SEN). The incorporation of social web tools can not only motivate students and boost their self-esteem but also address feelings of inadequacy and isolation, crucial factors for learners facing learning difficulties. Similarly, the integration of VR technology, informed by motor learning theory and multimedia learning principles, demonstrates promising outcomes in facilitating physical education (PE) learning processes for students with learning disabilities (SLDs) (Mokmin & Ridzuan, 2022). Moreover, the development of virtual teaching and learning (VTL) platforms, guided by comprehensive models and frameworks, holds significant promise for supporting autism care centers and fostering inclusive education environments. These findings underscore the importance of purposeful integration and strategic application of innovative technologies, coupled with pedagogical approaches tailored to individual needs, to create equitable and engaging learning environments. Furthermore, the studies highlight the need for continued research and global advocacy to promote the adoption and implementation of such technologies across educational settings, ultimately enhancing learning outcomes for students who may have previously struggled within traditional teaching paradigms.

The diverse array of studies presented here sheds light on various facets of educational practices and societal perceptions regarding individuals with learning disabilities (LD) in Malaysia. Firstly, the findings underscore a concerning lack of awareness and understanding of dyslexia among university students, highlighting the urgent need for enhanced education and awareness campaigns to mitigate the negative impacts of misconceptions and inadequate support systems (Subramaniyan et al., 2020). Moreover, insights from teachers' perspectives on inclusive education reveal both readiness and challenges in supporting students with LD in mainstream classrooms, underscoring the importance of professional development and policy interventions to foster inclusive learning environments (Hosshan, 2022). Finally, investigations into social participation experiences and employability skills of students with LD highlight the need for targeted interventions and support systems to enhance their integration into society and the workforce. Overall, these findings collectively emphasize the imperative of multi-stakeholder collaboration and policy reforms to foster inclusive education and employment opportunities for individuals with learning disabilities in Malaysia.

Conclusion
In conclusion, the breadth of studies reviewed underscores the multifaceted approach required to address learning disabilities and enhance educational outcomes in Malaysia. Promising interventions across various domains, from Ruqyah Syariah therapy to innovative teaching aids like Easy Match, demonstrate progress in supporting students with special

needs. Advancements in technology, such as Convolutional Neural Networks for dyslexia handwriting recognition, show promise for tailored solutions, but gaps remain in mobile learning applications' design and focus. Challenges like poor internet accessibility and lack of self-motivation in online learning highlight the need for holistic approaches.

Moreover, innovative technologies like the social web and virtual reality offer transformative potential in enhancing educational experiences for students with special needs. Integrating these technologies, informed by comprehensive models and frameworks, holds promise for fostering inclusive education environments and supporting autism care centers. However, purposeful integration and strategic application of these technologies, coupled with tailored pedagogical approaches, are essential for equitable and engaging learning environments.

Additionally, the studies shed light on societal perceptions and educational practices concerning individuals with learning disabilities in Malaysia. There's a concerning lack of awareness among university students regarding dyslexia, emphasizing the need for enhanced education and awareness campaigns. Insights from teachers' perspectives underscore the importance of professional development and policy interventions for inclusive learning environments.

In summary, multi-stakeholder collaboration and policy reforms are imperative to foster inclusive education and employment opportunities for individuals with learning disabilities in Malaysia. Continued research and advocacy efforts are essential to promote the adoption and implementation of innovative technologies and inclusive practices across educational settings, ultimately improving learning outcomes and societal integration for individuals facing learning difficulties.

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