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DyslexiSolve: Mind Map-Based AI Learning Platform for Dyslexic Students

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Abstract

Dyslexia is not a reading or writing disability it can impact confidence, learning ability, and broader academic experience, especially in conventional and distance learning. DyslexiSolve responds to the issue by delivering a graphically rich, mind map style learning platform that structures lessons in interactive diagrams to facilitate an exploration of complex concepts and simplify understanding. Driven by AI-based personalization, the program tailors learning pathways to align with each student's advancement, strengths, and weaknesses for a unique experience. Access is built-in to the design, including text-to-speech functions, dyslexia-aided fonts, and dynamic layouts to mitigate hindrances to learning. This document highlights the conceptual framework of DyslexiSolve, reviews literature on personalized learning for dyslexic students, and highlights how mind map-based instruction can enhance comprehension, retention, and engagement. The intention is to make schooling more inclusive, adaptive, and empowering for neuro diverse learners, transforming learning from a source of struggle into a possibility for growth.

Introduction

Dyslexia, a learning disability affecting an estimated 5- 10% of the world's population, dramatically affects reading, writing, spelling, and understanding skills, often causing standard classrooms and word-intensive online learning environments to be difficult for impacted students. These challenges can contribute to disengagement, slow academic achievement, and low confidence. Developments in learning technology now enable platforms to be designed to meet these special needs, and visual learning techniques such as mind maps are especially useful for increasing understanding and retention through hierarchically structured, non-linear information displays. DyslexiSolve extends this idea by suggesting a mind map-based AI learning platform to structure curriculum material in interactive visual maps, monitor progress, and tailor learning directions to personal achievement using AI-based personalization. To provide additional accessibility, it also includes functions such as speech-to-text, content highlighting, and dyslexia- friendly typefaces, so students can interact with material in a manner best suited to their way of learning. This article presents the conceptual framework of DyslexiSolve, reviews existing assistive technologies for treating dyslexia, and highlights the possibilities of

combining mind maps and adaptive AI to develop inclusive, interactive, and green mastering environments For neuro various students.

Literature Review

Recent research displays the growing significance of technology, and especially artificial intelligence (AI), for the accommodation of students with dyslexia in learning settings. Yap et al. [1] performed a scoping review of how AI allows for earlier identification, tailored intervention, and progress tracking to provide adaptive assistance beyond conventional approaches. Likewise AI supportive models have been implemented for children with dyslexia and dysgraphia, detecting areas of difficulty and providing skill-level–specific exercises to avert cognitive strain [2]. Applications such as "Let AI Read First" [3] display how AI-primarily based totally tools, together with text-to-speech and reading profiling, notably boost understanding and fluidity by condensing and highlighting essential information before readers experience it. In addition to AI, assistive technology research has investigated software, games, and interactive learning environments and concluded that an integration of visual tools, audio assistance, and interactive exercises notably maximizes engagement and understanding [4]. In highly bespoke, inclusive, and efficient learning experience for learners with dyslexia. Most of the available solutions, however, are still piecemeal, concentrating on detection, reading support, or single exercises. DyslexiSolve addresses this shortcoming by harmonizing mind map–based learning, AI-based personalization, and full accessibility extensions within a single interactive framework aimed at elevating understanding, retention, and learning achievement.

Proposed System

The DyslexiSolve program is a mind map style of learning application in particular designed for college students who are dyslexic using a unique and visual method of learning. Rather than books and textbooks with written information, information is presented interactively in mind maps with complex information reduced to smaller, relate-able chunks less likely to be forgotten. It enables students to interactively explore subjects opening nodes, exploring subtopics, and creating a personalized learning trail, both of which encourage participation and independence. As a further boost to varying learning styles, DyslexiSolve also possesses features like text-to-speech, so students can hear instead of read content, and highlighting and colour coding to tag key information on screen. Facilitated by AI-driven personalization, the software tracks students' progress, recommends what to do next, suggests exercises, and changes the learning tempo so students drill on difficult areas and zip through what they've already become experts at. DyslexiSolve's long-term goal is to create an inclusive, responsive, and motivational learning solution in which dyslexic students can thrive through a combination of visual learning methodologies, accessibility tools, and personalization.

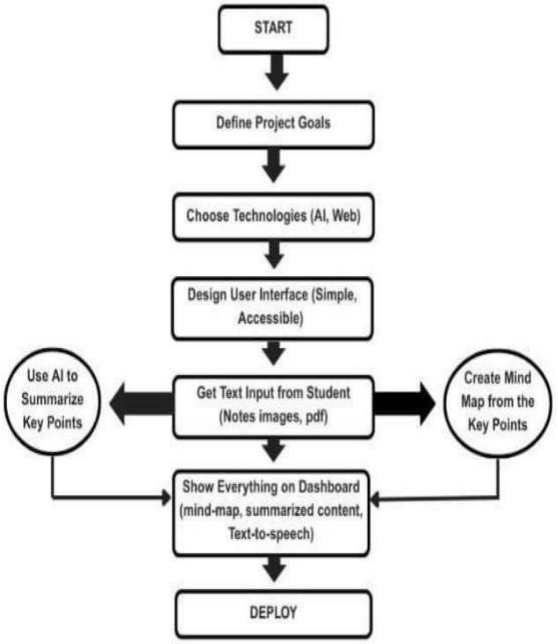

Fig 1: Work flow of DyslexiSolve

Use Cases

DyslexiSolve is built to provide inclusive and efficient learning for students who are dyslexic through an integration of personalization, interactivity, and accessi - bility. The AI-enabled platform develops learning pathways customized that enable students to progress at their own rate and concentrate on the areas in which they are most challenged. Educational materials are delivered using interactive mind maps for learners to see relationships among concepts and enhance understanding and retention. For accessibility purposes, the platform also integrates factors such as text-to-speech, speech-to-text, dyslexia-friendly typefaces and highlighting tools to minimize impediments to technology-enabled learning. Teachers also can track student prognosis, recognize areas of difficulty and customize lesson plans for improved assistance. Through an understanding of learning behaviour,

DyslexiSolve also provides early intervention functions to help detect onset of serious learning demanding situations and offer help in a well-timed manner. Collectively, the various components provide adaptive and empowering surroundings for each college students and teachers.

Methodology

The DyslexiSolve methodology lays out its conceptual framework and anticipated platform workflow, highlighting its interaction with dyslexic students and its provision for learning personalization. It starts with the definition of a personal profile for students who are asked to provide information on age, grade, preferred learning style, and particular difficulties so that the system can customize the presentation of the content and make appropriate learning strategy recommendations. Educational content is implemented as interactive mind maps in which nodes are points of information on a topic or subtopic and learners can browse them without any constraint and explore at will the expansion or contraction of ideas. Each of the nodes can be equipped with text, audio, or visual components to enable multisensory learning. The platform uses AI-based personalization through student behaviour such as time on topic and navigation to provide relevant topic suggestions, modify content formats and adapt constantly and refine learning paths to correlate them to the learner's understanding. Accessibility is a fundamental aspect, incorporating functionalities such as text-to-speech, speech-to-text, highlighting, and colour coding to facilitate ease of reading, writing, and understanding. An adaptive learning cycle adjusts the system to follow the student, refining profiles and learning approaches constantly through feedback to create an inclusive, adaptable, and efficient learning experience for every person.

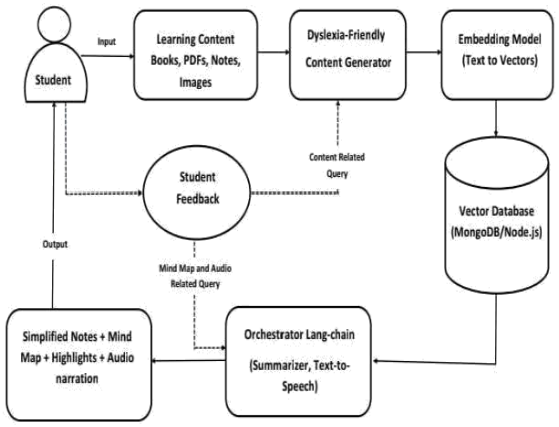

Fig 2: Architecture Diagram of DyslexiSolve

Results

Since DyslexiSolve is a conceptual platform, this section discusses its potential benefits rather than experimental results. Displaying study material interactively in the form of mind maps, the platform allows students to witness relationships between concepts and thus grasp and retain material more effectively. Learning paths tailored to the individual allow students to concentrate on areas most in need of practice and zoom over areas of which they are well familiar. Integrated accessibility tools, including text-to-speech, dyslexia-friendly fonts, and highlighting, serve to reduce cognitive load and make reading and understanding content less stressful and less of a strain, thus reducing frustration. The AI-backed system monitors interactions of students and provides real-time corrections to nudge students to interact and feel inspired and to make progress. In short, DyslexiSolve students are likely to retain better concepts, enhance understanding, and build confidence in learning relative to conventional online modes.

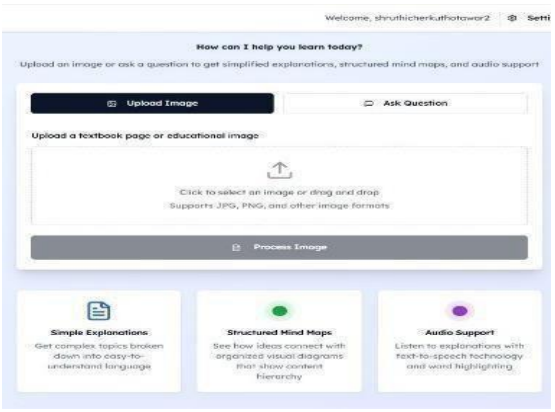

Fig 3: Summrization of Input

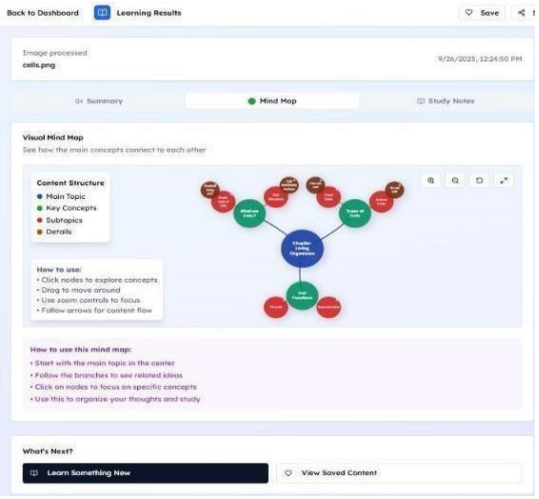

Fig 4: Generated Mind Map

Conclusion

DyslexiSolve embraces a conceptual framework for a mind map–based learning platform developed for dyslexic students, blending interactive visual learning,
AIdriven personalization, and accessibility functionalities to create an enjoyable, inclusive, and efficient online learning experience. The platform addresses key challenges of dyslexic learners such as difficulty in reading, understanding, and retention in a structured, flexible, and adaptable mode of learning. Going beyond the technical architecture, DyslexiSolve also emphasizes the human aspect of learning, focusing on accessibility, understanding, and empowerment, so the experience of each learner is unique, distinct, and development-centric. With an expanding education moving to the digital sphere, DyslexiSolve emphasizes how critical it is to develop technology to be inclusive of all learners so they are in a position to thrive regardless of differences.

Future Scope

Future directions for DyslexiSolve might be to create a completely functional platform and trial it in real-world classroom situations with students who are dyslexic. It might be extended to include multilingual and multicultural provision to reach different learners and include gamification features of rewards, challenges, and interactive quizzes to enhance interactivity. Teacher and parent dashboards would give detailed analytic information to be able to track progress, and advanced AI methods, such as deep learning and natural language processing, might be able to provide more accurate personalization, predictive difficulty levels, and earlier recognition of learning difficulties.
Additionally, including collaborative learning activities, such as group work, peer-to-peer debate and shared mind maps, might encourage social activity and collaborative learning and make the platform more holistic, adaptive, and effective for neuro diverse students.

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