

Rewiring Education: AI's Promise for minds that learn differently

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Education is a continuous loop involving teachers, students, and technology, working together and strengthening one another. Teachers guide students who bring curiosity, and feedback that reshapes learning. Technology provides the tools that expand both possibilities. Artificial intelligence is playing a crucial role in reshaping and reimagining education by making it more adaptive, personalized, and accessible to a broader audience. Through AI, education can become more flexible, allowing fast learners to be challenged while slow learners receive the support they need.

The traditional educational system focuses on a standard curriculum, rigid assessments, and a belief that all students learn in the same way. It emphasizes rote memorization, grades, and text-based learning, requiring sustained attention over extended periods. The fact that grades hold a high weightage when measuring success creates a competitive environment, leading to increased anxiety and reduced motivation among learners. Such an approach not only narrows learning but also affects creativity, critical thinking, and problem-solving. While a normal student can learn to adapt to this system, it is extremely challenging for students suffering from neurological disorders like dyslexia and ADHD. For these learners, decoding long texts, sitting through lengthy lectures, and processing information in a single prescribed format can be difficult and overwhelming. This is a huge gap in our education system that needs to be addressed effectively and immediately.

Dyslexia is a learning disability that affects an individual's reading and writing capabilities. The interaction of the genetic and environmental factors causes it. Dyslexia affects about 15 to 17 percent of the population. It affects boys and girls alike and does not discriminate based on religious, economic, or social status. It is diagnosed through a series of tests of memory, vision, spelling, and reading skills. NGOs like the Madras Dyslexia Association (MDA) and initiatives like Made By Dyslexia are spreading awareness about it. Studies conducted at the Yale Center for Dyslexia & Creativity showed that dyslexic brains use a different neural pathway when reading compared to non-dyslexic brains. Instead of using the left hemisphere reading circuits, they engage other regions, making reading slower.

ADHD (Attention Deficit Hyperactivity Disorder) is a neurodevelopmental disorder characterized by symptoms such as hyperactivity, difficulty focusing, challenges in following instructions, and problems with time management. Students with this condition often have difficulty sitting still, waiting their turn, and exhibit fidgety and impulsive behaviour. Scientists have not yet identified the specific causes of ADHD, but there is growing evidence that genetics contributes to the disorder. Some non-genetic factors, such as low birth weight, premature birth, and exposure to toxins during pregnancy, have been linked to the disorder. It is diagnosed by an assessment of a person's behavioural and mental development while ruling out drugs, medications, or other medical/ psychiatric causes. Advocacy groups like CHADD (Children and Adults with Attention-Deficit/Hyperactivity Disorder) and ADDA (Attention Deficit Disorder Association) spread awareness and provide support.

Dyslexia and ADHD are distinct conditions, but they can frequently occur together in the same individual. Approximately 12–24 percent of people with dyslexia have ADHD, and up to 35 percent of people with ADHD have dyslexia. This overlap amplifies the difficulties faced in classrooms and requires the need for alternate teaching approaches.

Most teachers are under-skilled in identifying the early signs of learning differences. This delayed diagnosis can prevent the student from getting the additional support he/she need during their crucial years. A report by Made By Dyslexia (a global charity and movement founded by Kate Griggs) reveals that over half of the schools globally fail to understand dyslexic challenges and over 80 percent of dyslexic students leave school undiagnosed, highlighting the importance of training teachers in dyslexia. These students attend school every day and wonder why they are unable to read and spell as fluently as their friends. They start to question their intelligence and are labelled as slow, lazy, and

unmotivated individuals. They might require twice as much time to complete their homework compared to other students. However, when presented with information in an auditory format, they are often able to recall every detail. What they require is to be taught in a different way than the traditional rote learning. This calls for an urgent need to rethink the current educational system so that every student can thrive.

Conventional teaching methods include extended test time, reduced workload, and personalized learning plans developed by teachers, parents, and specialists. A study conducted by the National Center for Education Statistics (NCES) revealed that students who were provided with extended test time scored higher and were greatly engaged with the test content, as part of the 2017 National Assessment of Educational Progress (NAEP) Grade 8 digital mathematics assessment. AI tools, such as text-to-speech software, help dyslexic students by reading text aloud, which can help them focus on understanding, reduce fatigue, and allow for longer engagement with the material. Voice notes allow learners with ADHD to record their thoughts quickly. Many with ADHD find it easier to speak than type, allowing ideas to flow with less disruption. Audiobooks make reading more accessible and less frustrating. They transform the experience into one of enjoyment rather than struggle, allowing students to consume stories, textbooks, and academic material at their own pace.

Yet, these Edtech tools come with limitations. They often lack structure, accessibility, and engagement. Many platforms are designed for general learners, overlooking those suffering from dyslexia, ADHD, and other learning differences. They struggle with complex visuals, math notations, and interactive learning. Background noise, accents, or unclear speech can lead to errors. Listening back to long, unstructured voice notes can be overwhelming for these students. Rather than acting as a learning aid, it becomes a source of stress. Quality audiobooks for textbooks and academic material are often expensive or unavailable. Even if they are available, they lack interactive elements and adaptive pacing, making them less effective for neurodivergent learners.

Common classroom accommodations offer support but lack personalization, consistency, and scalability for students with dyslexia and ADHD. A 2019 report by the National Center for Learning Disabilities found that only 17 percent of general education teachers felt 'very well prepared' to teach students with learning disabilities. Personalizing classes means redesigning the material, creating assessments based on it, and monitoring students' progress, which teachers find difficult and time-consuming when dealing with a large class size. Many schools lack assistive technologies or support staff, leaving teachers with limited resources. This creates inefficiencies for both students and teachers, highlighting the need to shift from isolated tools to integrated solutions that address multiple needs at once.

This is where AI can truly revolutionize education, bridging the gap between conventional teaching methods and the cognitive needs of neurodivergent students. We propose an AI-powered, classroom-integrated learning assistant that actively listens to classroom lectures and converts them into a structured multisensory video that combines visuals, audio, and interactivity. It boosts engagement with interactive questions and gamified elements directly in the content. Offers real-time adaptive solutions according to each learner's pace and understanding, ensuring personalized learning pathways. Students can record verbal explanations and generate mind maps and flowcharts, fostering understanding and long-term retention. It also generates the students' progress report and informs the teacher about the topics the student finds challenging. The AI assistant is compatible with both phones and laptops. Unlike Edtech tools with isolated features, this assistant works in real time within the classroom, combining accessibility, adaptability, and engagement into one seamless system.

For example, the teacher is teaching the concept of photosynthesis to the students. The AI assistant listens and captures everything through its integrated microphone. The AI then converts the lecture into a video within a few minutes. It includes visuals such as the plant growing with arrows showing sunlight, carbon dioxide, and oxygen. Clear narration that can be played at any moment. The assistant

also inserts quick interactive questions every few minutes in between the video. “Tap the correct part of the plant where chlorophyll is present.” This keeps the learner engaged and participating actively. If a dyslexic student struggles with written responses, the AI offers a voice-response option. If the student feels that the pace is too fast, then the AI gently slows down, matching the learner’s pace. Students can record their own voice that the assistant uses to generate mind maps and save it in a folder along with the questions and answers, so that the student can revisit and revise at any time. The AI can also generate reports about the student’s progress. The teacher is also informed about the topics that the student finds difficult to understand so that the teacher can provide extra assistance to the student.

This solution offers personalized, engaging, and structured content tailored to their cognitive needs. Adapting the lecture into a multisensory video helps in addressing learning barriers and ensures that the content is both accessible and memorable. The integration of short interactive activities helps maintain attention and prevents disengagement.

Artificial Intelligence in education is not meant to replace the role of teachers but rather to act as a powerful support tool that enhances their effectiveness, just like our solution. Instead of spending long hours redesigning content, they receive personalized content, allowing them to focus their energy on mentoring students only on topics they find challenging. For parents, the solution provides reassurance. They see their child actively engaging with learning in a way they find comfortable. This builds trust in the education system and alleviates concerns about their child being left behind.

Socially, the approach promotes equity and inclusion in education. Students with learning differences are no longer at a disadvantage compared to their peers. They are empowered to participate fully in class discussions, assessments, and collaborative projects, nurturing a learning environment of acceptance, empathy, and equal opportunity. This boosts their self-confidence and makes them better prepared for future academic and career pursuits.

Our solution can be a game changer, ensuring that education aligns with the unique strengths and challenges of each learner rather than forcing learners to align with it. To achieve this vision, collaboration among educators, policymakers, and developers is essential. Educators bring meaningful insights from classroom experiences, and technical expertise from developers is needed to develop and improve the functionality of the AI assistant. Policymakers are needed for scaling and unding innovation. With ongoing research and continuous testing, we can upgrade the technology to better understand diverse cognitive needs. Through pilot programs, schools can test and validate the impact on learning outcomes and engagement levels. Initial steps can include integrating AI assistants in selected subjects to create familiarity and receive feedback. Schools can then gradually expand to more subjects based on successful outcomes. Establishing partnerships with governments, NGOs, and EdTech firms will help subsidize costs, making these tools available across private and public institutions worldwide. Short workshops can be conducted for training educators and students on using AI assistants effectively. This step-by-step integration ensures that no learner is left behind and provides a realistic path for schools to implement change.

The AI assistant should be efficient in working across diverse resource levels, such as smartphones, tablets, and offline functionality. This will be advantageous for schools in rural or less developed areas that have unstable internet connectivity. Artificial intelligence provides us with the opportunity to reshape education in a flexible, inclusive, and empowering process. It will provide students suffering from dyslexia and ADHD a chance to learn in a way that best suits their unique strengths and encourages them not just to dream but to work towards turning those dreams into reality. It does not replace teachers but amplifies their impact, allowing them to focus where their expertise matters most.

True progress in education begins when every mind is seen, heard, and supported.