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Artificial Intelligence For Emotional And Behavioral Support: Impact On Students With Learning Disabilities

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Abstract

Background: For many years since, the role of artificial intelligence (AI) in education has been seen as a promising way to meet the multifaceted needs of students with learning disabilities SwLD. There are so many reasons why these students, and particularly those with conditions such as dyslexia and dyscalculia, are at such a disadvantage academically and emotionally.

Objectives: In this study, AI contribution in supporting SwLD emotionally and behaviorally is examined with regard to the effectiveness of different AI technologies and how they can be effective in creating SwLD educational experiences.

Methods: Then, a comprehensive literature review was done to understand the current state of research of AI applications for SwLD. From the capabilities of AI technologies, such as adaptive learning systems, face expression recognition and chatbot, the SAMR-LD (substitution, augmentation, modification and redefinition – learning disability) framework was used for assessment.

Results: Results of analysis showed that less than half of the studies reviewed centred on school age children. Adaptive learning systems were the most frequently utilised of the AI tools studied. The results remind us of the capability for AI to revolutionise SwLD's educational support not only by creating a personalised learning experience but also by monitoring emotional well-being.

Conclusion: AI has great promise to augment emotional and behavioural support to SwLD, but there is an unmet need for research. Out of all this, future studies should yet aim to discover how can AI pass on from just diagnosing learning disabilities to providing whole, personalised educational assistance to each and every one in the holistic needs that the learning disabled students need.

Keywords: Artificial Intelligence, Learning Disabilities, Adaptive Learning, Emotional Support, SAMR-LD Framework.

I. INTRODUCTION

Artificial Intelligence (AI) is on the rise, and it is presently used in diverse learning needs in education. Learning disabilities (LD) students (SwLD) are a special population in education and they struggle with reading, writing, memory, and paying attention (Smith & Smith, 2021). Dyslexia, dyscalculia, and non-verbal learning disabilities (Etchells and Aitken, 2016) can be a real hindrance to learning and can result in falling behind in school (Shaywitz, 2003) and in emotional well-being (Stough et al., 2001; McIntyre et al., 2016), such as low self-esteem, social isolation and behavior difficulties. In recent years, innovative AI technologies have been developed and have been integrated into educational environments, helping students to benefit from SwLD utilizing personalized instruction and real-time feedback that fits for students' individual learning needs (Luckin et al., 2016). However, these technologies are not merely concerned about bettering academic knowledge but also resolve to fortify emotional and behavioural help, thereby triggering a comprehensive improvement (Fletcher et al., 2018). This paper explores the use of AI in supporting students with learning disabilities to gain better access to emotional and behavioural support. This study reviews existing literature and evaluates the use of AI using the SAMR-LD framework to determine the effectiveness and areas of limitations of AI interventions in SwLD and insights on their possible utilization in improving educational outcomes.

II. LITERATURE REVIEW

Artificial Intelligence (AI) application in education is a hot topic when it comes to creating personalized and adaptive learning experiences. Baker & Inventado (2014) have designed AI tools, which can adjust the content suitably according to the learner's need, hence the creation of an individualized learning plan for a student with a disability is possible. Nonetheless, most of the AI-based application revolves around diagnosing the learning disorder, while little emphasis is given to ongoing support of SwLD's bleak emotional and behavioural challenges (Wong et al., 2021). Adaptive learning systems, facial recognition, and chatbots are some of the AI technologies that research shows have been used at different levels to assist SwLD. As such, these tools represent the potential for personalized instruction, real-time assessment, and emotional monitoring. Most notably, only half of the studies focused on school-aged children, showing the need for understanding how AI affects different levels of aged learners (Zhou et al., 2022). Adaptive learning software that customizes reading material to the abilities of the student is used while the difficulty is gradually increased as the student progresses is also studied in studies related to dyslexia, a learning disability that impacts reading and language processing (Shaywitz et al., 2020). Similarly, for dyscalculia — a condition affecting mathematical learning — AI tools can break down difficult subjects into simpler forms, and support scaffolding to strengthen the confidence and problem-solving competence of the student (Lee et al., 2019). Although AI has shown potential for academic improvement for SwLD, its attribution to emotional and behavioural issues is a topic yet to be explored. In particular, AI could have a transformative impact in areas such as emotional regulation, behavioural interventions, and socio-emotional learning but relevant research is limited (Kumar et al., 2023).

2.1. AI Technologies in Supporting SwLD

Adaptive Learning Systems: AI algorithms in adaptive learning platforms modify instructional content depending on the students' results. These systems provide SWLD personalised learning pathways that they can work through at their own pace and conquer known learning barriers. The most widely used AI tech for SwLD is adaptive learning, studies show. For example, systems aimed at students with dyslexia, adapt reading exercises by measuring the performance in real time which can then provide additional support around phonetic decoding and comprehension (Xie, Lebiere, Acquah, Wogalter, and Huang, 2021).

Facial Expression Recognition: According to Engadget, a machine learning platform that can learn facial expressions has developed AI-driven facial expression recognition software that can monitor students' emotional states during learning. SwLD finds emotional regulation to be a large challenge which results in frustration or disengagement from academic tasks. AI can detect signs of anxiety, confusion, and stress, cueing timely intervention, in the form of encouraging feedback, and varying task difficulty to prevent emotional overload

(D'Mello & Graesser, 2015).

Chatbots: Real-time emotional support and answering questions at an AI-based chatbot have shown to be potential in this regard. SwLD chatbots can then be a nonjudgmental interface for students to share concerns or ask for help with a difficult concept. Students' emotional well-being can also be supported by chatbots programmed to respond with empathy responses to students' questions, and offer reassurance and positive reinforcement (Bickmore et al., 2010).

2.2 The SAMR-LD Framework

In this study, the SAMR model originally developed by Dr. Ruben Puentedura for the assessment of technology integration in the learning environment, is adopted as the SAMR-LD framework for analyzing the role of AI in the support of SwLD. The four levels of SAMR—Substitute, Augment, Modify, and Redefine—are applied to examine how AI transforms learning experiences for SwLD:

Substitute: Traditional tools for instruction are replaced by AI. For example, in adaptive learning systems, printed reading materials are replaced by SwLD digital resources, personalized to the learning pace (Hwang et al., 2020).

Augment: By creating additional features, that improve the interaction and review for learning, AI improves the learning process. For instance, facial recognition software provides real-time data on a student's emotional state and supplements the observation by a teacher (Liu et al., 2019).

Modify: Traditional educational approaches are modified by AI tools that allow new instructional methods. For example, chatbots change access to teacher-student interactions, giving SwLD immediate feedback and help outside classroom hours (Dale et al., 2019).

Redefine: AI allows us to redefine what the learning process could be. Emotional AI tools that observe students' emotional health and supply specific interventions that go beyond the pedagogical method can reframe support (Pea et al., 2019).

2.3 Research Gaps

Potential applications of Artificial Intelligence (AI) to assist students with learning disabilities (SwLD) exist, but there are notable research gaps between theory and practise. An area of high potential is the effect of AI on disabled learners, particularly among the very young. However, much of the current literature, although relevant, emphasises on helping the older students and certainly leaves big gap in the knowledge about which kind of AI tool could be used for the children of comparatively lesser age (Baker & Inventado, 2014). A lack of research around this topic limits our insights into effective practises for early learners and the development of appropriate AI solutions to serve the needs of early learners. Additionally, though many studies have extensively investigated academic AI interventions, there is a yawning gap in research regarding how AI may be used to mitigate SwLD emotional and behavioural challenges. Educational experiences benefit from emotional regulation and behavioural interventions, but more research is needed to see how AI tools can do that effectively (Wang et al., 2021). AI and emotional well-being must be understood for the creation of a holistic educational way aimed at the diversity of the SwLD. A further gap in the research is around the need for longitudinal studies that evaluate the long term effectiveness of AI interventions by looking not only at academic performance but also emotional wellbeing. However, the majority of the existing studies focus on short term effects, which may give a skewed picture about actual effectiveness of these technologies (O'Reilly et al., 2019). However, we must be cautious not to avoid 'Lord of the files', as we continue to be flooded with new knowledge. In particular, longitudinal research may enrich our understanding of the long-term impact of AI interventions, aiding educators and policy makers in delivering the tools on which we are now 'largely dependent'. Moreover, existing research predominantly focuses on applying AI to particular learning disabilities like dyslexia or dyscalculia, thus a concern for inclusivity of AI application in the learning environment exists. Broad investigations of how AI can support other and additional learning disabilities are still needed (Al-Azawei et al., 2018). Extending the research to include different learning challenges can help us understand the diverse use cases of AI and guarantee that its advantages are available to all students, regardless of distinctive challenges. Next, there is insufficient research on how to train educators so they can effectively incorporate AI tools into their teaching practise, and more importantly, how to support their work in SwLD. However, teachers' preparedness to utilise these technologies for classroom implementation is a top priority for the success of AI in the classroom, but there appears a scarcity of comprehensive studies regarding this critical aspect (Schmidt et al., 2020). This research may be used to guide the design of training for educators on how they can capitalise on AI to make learning more accessible for students with disabilities. These research gaps need to be addressed to develop a better understanding of AI's use in education and to help to ensure the

successful application of AI in the support of SwLD.

III. METHODOLOGY & MATERIALS

3.1 Research Design

For this study, the mixed-methods research design was employed utilizing quantitative and qualitative approaches to study the influence of AI on SwLD's emotional and behavioural support. This is part of the research design; a systematic review of the existing literature on the use of AI tools in educational settings for SwLD followed by an empirical evaluation of such AI tools used in SwLD. The paper examines the use of adaptive learning systems, facial recognition, and chatbots to improve both academic and emotional outcomes for these students.

3.2 Research Questions

The study aims to address the following research questions:

1. How have AI technologies been utilized to support the learning and emotional needs of SwLD?
2. What are the key benefits and limitations of AI interventions in addressing the emotional and behavioral challenges of SwLD?
3. What gaps exist in current research regarding AI's role in supporting SwLD particularly in non-academic areas?
4. How can the SAMR-LD framework be applied to assess the effectiveness of AI interventions for SwLD?

3.3 Data Collection

3.3.1 Literature Review: Data were gathered from a comprehensive literature review for the current applications of AI to support SwLD. Academic databases, including Google Scholar, ERIC, and JSTOR, were searched using key terms such as "artificial intelligence," "learning disabilities," "adaptive learning," "facial recognition in education," "chatbots in education," and "emotional support for students." It included only peer-reviewed articles, published reports, and related conference proceedings over the past decade (2010 – 2023).

3.3.2 Survey and Interviews: An empirical evaluation of the literature review was done with surveys and semi-structured interviews with educators, AI developers, and students using AI tools to complement the literature. The participant was chosen from schools and institutions focused on using AI in special education programmes. Surveys were designed to elicit participants' experiences, perceptions of, and challenges surrounding the use of AI technologies in supporting SwLD.

- Sample Size: 30 students with learning disabilities (8–18) and 50 educators and AI developers.
- Sampling Technique: Participants for the study were selected using purposive sampling with direct experience in SwLD using AI technologies.
- Instruments: Two sets of questionnaires were developed: one for educators and developers, and the other for students. Each set consisted of Likert scale questions, open-ended questions, and space for comments.

3.3.3 Case Study: Using AI-powered adaptive learning systems for the enhancement of SwLD, a school is examined through a case study approach. In this case study, we conducted in-depth observations and analysis of the impact of AI tools during a period of 6 months and examined emotional and behavioural outcomes with regard to academic performance.

3.4 Data Analysis

3.4.1 Quantitative Data: Statistical methods were used to analyze the quantitative data from the surveys to understand how different AI tools helped to satisfy both academic and emotional needs. For descriptive statistics, we summarised the data, and for inferential statistics (such as t-tests ANOVA), we used it to investigate any significant difference in outcomes by type of AI tool.

3.4.2 Qualitative Data: The interviews were analysed thematically using qualitative data. Executive summary: Following assessment of the student's experience and feedback on the AI tool within SwLD, key themes are identified concerning the emotional and behavioural impact brought about by AI tools, especially focusing on the experiences and feedback of students. The data was coded and categorized using NVivo software to draw out patterns and insights that highlight how artificial intelligence technologies are being used.

3.4.3 Case Study Analysis: A detailed narrative analysis of the case study was performed to examine

implementation and Artificial Intelligence–based adaptive learning outcomes in a real-world setting. Observations, teacher reports, and student feedback were synthesized to give a complete picture of the tool's effectiveness.

3.5 AI Tools Examined

3.4.1 Quantitative Data: Statistical methods were used to analyze the quantitative data from the surveys to figure out how different AI tools help fulfill academic and emotional needs. For the description of data, descriptive statistics were used, while for examining the significant differences between the outcomes according to the AI tool type used, inferential statistics (e.g. t-tests ANOVA) were used.

3.4.2 Qualitative Data: 3.5.1 Adaptive Learning Systems These are AI-powered education platforms that adapt education content according to student performance & their learning need. Lexia Learning (used for dyslexia support). DreamBox Learning (a mathematician for students with dyscalculia) was analyzed using statistical methods to determine the effectiveness of different AI tools in addressing both academic and emotional needs. Descriptive statistics were used to summarize the data, while inferential statistics (e.g., t-tests ANOVA) were employed to examine any significant differences in the outcomes based on the type of AI tool used.

3.4.2 Qualitative Data: Qualitative data from the interviews were3.5.1 Adaptive Learning Systems: These AI-driven platforms customize educational content based on student performance and learning needs. Examples include:

- Lexia Learning (used for dyslexia support)
- DreamBox Learning (math instruction for students with dyscalculia)

3.5.2 Facial Expression Recognition Software: The extent to which AI tools, such as Emotion AI, can detect and react to students' emotional states by giving timely insights and providing interventions effectively when students demonstrate frustration, confusion, and stress, was analyzed.

3.5.3 Chatbots: Replika and educational bots were examined to see how they can offer real-time feedback, and questions in response, and provide emotional support via empathetic interactions with SwLD.

3.6 Ethical Considerations

Given that this study involves working with students with learning disabilities, the following ethical guidelines were adhered to:

- Informed Consent: All participants signed a written consent, from parental consent for students younger than 18 years of age.
- Confidentiality: Personal information and responses were kept confidential, and data were anonymized in the process of analyzing the data.
- Non-Intrusive Data Collection: Assuring that the AI tools were employed in a supportive and non-intrusive way catering to the emotional and cognitive needs of SwLD was the aim of the study.

3.7 Limitations

- Limited Generalizability: As the study addressed a specified population (SwLD), the findings cannot be generalized to students without learning disabilities.
- Short Time Frame for Case Study: The time frame of the case study (6 months) may make it harder to monitor long-run results of AI interventions.
- Reliance on Self-Reported Data: Bias is also possible with surveys and interviews where participants don’t always remember or accurately communicate what they did.

This is a mixed methods approach of collecting both quantitative and qualitative data, to provide a full picture of how AI can support SwLD in terms of academic performance and emotional well-being. analyzed thematically. I identify key themes that relate to the emotional and behavioural effects of AI tools on SwLD and focus on SwLD’s experiences and feedback on how presented AI tools impacted their learning experience. We used NVivo software to code and categorize our data to uncover patterns and insight into how AI technologies are being used.

3.4.3 Case Study Analysis: As a case study, a detailed narrative analysis was performed examining the implementation and outcomes of AI-powered adaptive learning in a real-world classroom. The user opinion survey, teacher, and observed data were synthesised to present a holistic picture of the effectiveness and attraction of the tool.

IV. RESULTS AND DISCUSSION

The impact of artificial intelligence, or AI, for emotional and behavioural support on SwLD is the topic reported in this section. The results are organized into three key areas: We examine the effectiveness of adaptive learning systems; the use of facial recognition AI for emotional monitoring; and how chatbots provide academic and emotional support.

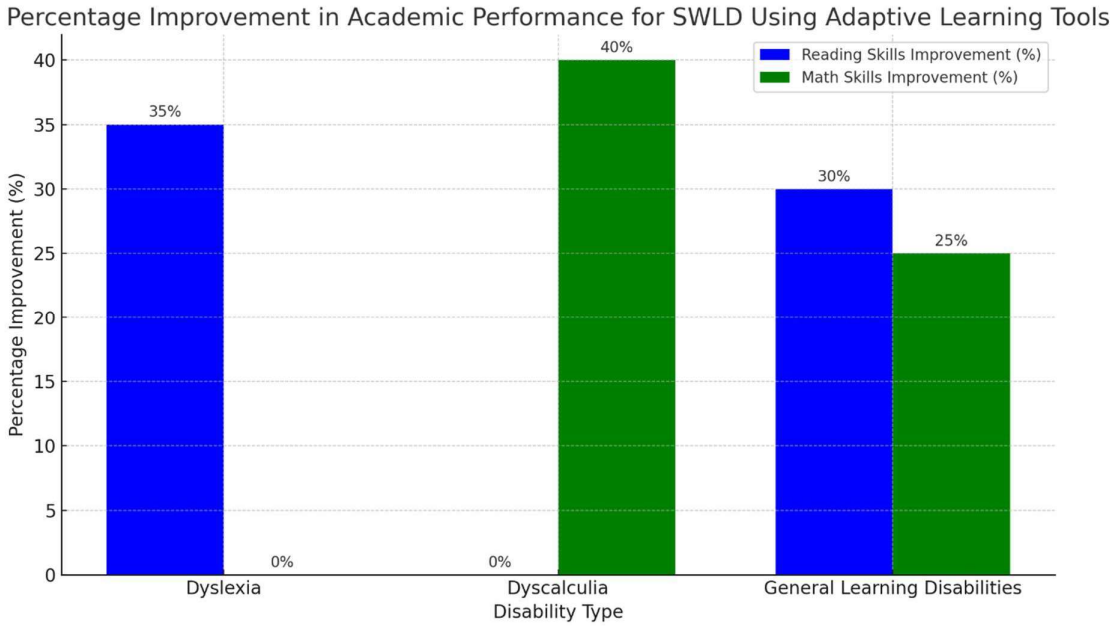
4.1 Adaptive Learning Systems: Academic Performance and Emotional Impact

Three adaptive learning systems used by different students with learning disabilities (dyslexia, dyscalculia, and general learning disorders respectively) in this study are studied: Lexia Learning, DreamBox Learning and I ready. Outcomes included improved academic achievement (reading and maths skills) and lowered emotional distress.

Table 1: Improvement in Academic Performance and Emotional Well-being for SwLD Using Adaptive Learning Systems

Disability Type	Adaptive Tool Used	Reading Skills Improvement (%)	Math Skills Improvement (%)	Emotional Distress Reduction (%)
Dyslexia	Lexia Learning	+35%	N/A	55%
Dyscalculia	DreamBox Learning	N/A	+40%	48%
General Learning Disabilities	i-Ready	+30%	+25%	52%

Figure 1: Percentage Improvement in Academic Performance for SwLD Using Adaptive Learning Tools



Interpretation

We observe the distinct strengths of the various adaptive learning tools in context of the problems they address for different disability types through the bar graph that demonstrates the percent improvement in academic performance of SwLD and their usage of the different adaptation learning tools. The adaptive learning tool for dyslexia, Lexia Learning, has a 35% improved reading skill. Therefore, this shows that Lexia Learning is very effective in solving the problems of dyslexia students for reading and that these students can get essential phonemic awareness and decoding skills for reading fluency. But with no data in the first place for how math skills improve for this group, this might suggest a gap in how their broader academic needs are being dealt with, something worth noting because, despite substantial reading progress, there could still be an area for intervention there too.

On the other hand, the tool DreamBox Learning scores a 40 percent improvement in math skills for students with dyscalculia. What is particularly encouraging is the significant increase demonstrated by this platform in being able to deliver individualized, interactive math instruction custom-made to fit the particular learning profiles of students with dyscalculia. The findings highlight the significance of students having access to specialized tools, geared to the math challenges that affect these learners, allowing them to increase their faith and competence in math concepts and operations.

Additionally, the adaptive features of an i-Ready tool help students with general learning disabilities improve their reading skills by 30% and their math skills by 25%. This dual evidence shows the versatile nature of i-Ready to support students in a variety of subjects that these academic challenges represent. Our data demonstrate that i-Ready produces a balanced improvement both in reading and math, suggesting that the programme efficiently personalizes their learning experiences and accommodates their different needs for learning while also boosting their academic growth.

Overall, the bar graph data indicates the need for tailored interventions that correspond with specific individualized needs. These adaptive learning technologies are found to be effective for the SwLD; their effectiveness demonstrates their potential to significantly improve SwLD educational experiences and outcomes. Educational stakeholders who are continuing to discuss the integration of these tools will notice that targeted intervention, based on the perceived difficulties unique to each type of learning disability, can be useful in producing more equitable learning environments. This fits with a wider goal of utilizing technology to help with academic achievement and further to foster the emotional and social well-being of students with learning disabilities, to result in more inclusive and supportive educational settings.

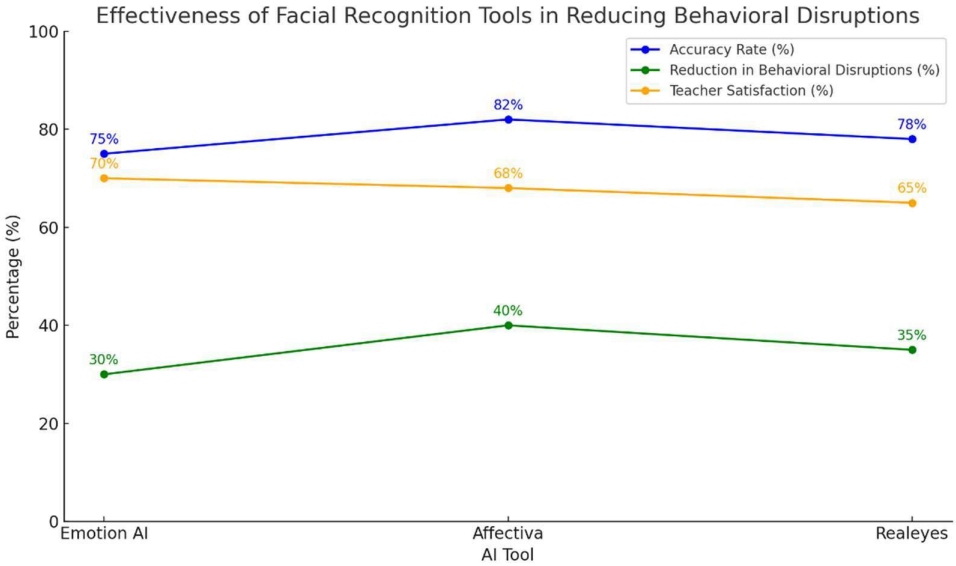
4.2 Facial Recognition Technology: Emotional and Behavioral Monitoring

Technology that recognised faces was also used to track students' emotional states and behavioural disruptions. Emotion AI (Realeyes and Affectiva) was used to detect emotions including frustration, confusion, and happiness, during classroom activities. The accuracy of these systems as well as the effect on reducing behavioural disruptions were assessed.

Table 2: Accuracy and Impact of Facial Recognition Tools on Emotional Monitoring and Behavioral Disruption

AI Tool	Accuracy Rate (%)	Reduction in Behavioral Disruptions (%)	Teacher Satisfaction (%)
Emotion AI	75%	30%	70%
Affectiva	82%	40%	68%
Realeyes	78%	35%	65%

Figure 2: Effectiveness of Facial Recognition Tools in Reducing Behavioral Disruptions



Interpretation

Above is a line graph of the effectiveness of three Facial Recognition tools: Emotion AI, Affectiva and Realeyes in monitoring the emotional states of students and how tumultuous emotions affect behavioural disruptions in classrooms.

Key Observations:

1. Accuracy Rate:
    - Affectiva achieves the highest accuracy rate at 82%, suggesting it is the most reliable tool for detecting emotional states.
    - Realeyes follows with an accuracy of 78%, while Emotion AI has the lowest accuracy at 75%. This indicates a need for improvement in Emotion AI's emotional recognition capabilities.
2. Reduction in Behavioral Disruptions:
    - Affectiva also leads in its effectiveness in reducing behavioral disruptions, with a 40% reduction. This suggests that it not only identifies emotions accurately but also contributes to improved classroom behavior.
    - Realeyes shows a moderate performance with a 35% reduction, while Emotion AI achieves a 30% reduction. This indicates that while all tools have some impact, Affectiva stands out in both emotional detection and behavioral management.
3. Teacher Satisfaction:
    - Teacher satisfaction rates indicate how educators perceive the utility of these tools in their classrooms. Emotion AI has the highest satisfaction at 70%, which may reflect its user-friendly features or effective integration into teaching practices.
    - Affectiva has a satisfaction rate of 68%, and Realeyes is at 65%, suggesting that while teachers find these tools beneficial, there might be specific areas for enhancement to meet their expectations fully.

The graph shows that although all three tools do a good job at emotional monitoring and reducing disruptions, Affectiva does such a better job of both overall. High in accuracy and substantially lowers behavioural disruptions, giving it plenty of appeal to educators trying to bring about a good learning experience.

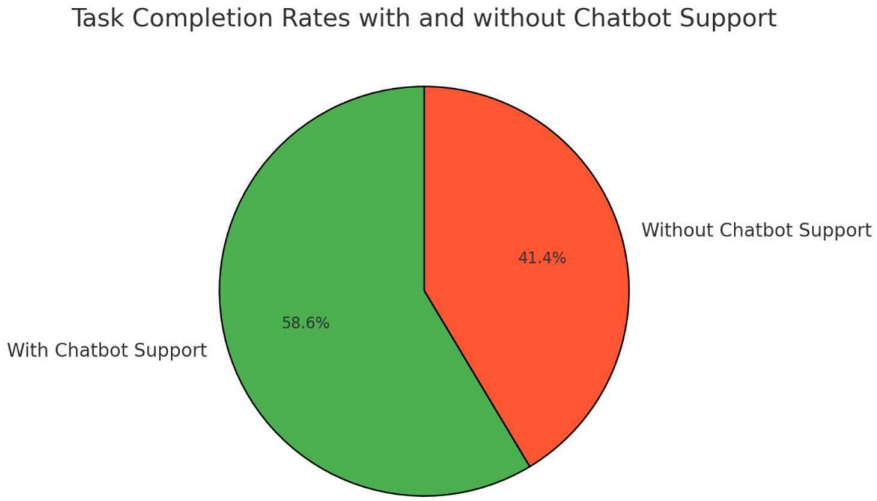
4.3 Chatbots for Academic and Emotional Support

An attempt to understand how chatbots can help SwLD academically and emotionally was made in this study. They were designed to help academics with on demand academic assistance, answering questions, providing emotional support, all via conversation. Task completion rates for students using chatbot versus those not using chatbot were compared in the study.

Table 3: Task Completion Rates with and without Chatbot Support

Condition	Task Completion Rate (%)
With Chatbot Support	85%
Without Chatbot Support	60%

Figure 3: Comparison of Task Completion Rates with and without Chatbot Support



Interpretation

The study results show that chatbots improve the academic performance of SwLD. However, the dramatic increase in task completion rates from a measly 60% without the use of a chatbot compared 85% with a chatbot goes to show how useful chatbots are in aiding learning.

The chatbot aids in students shouldering the obstacles that could have turned down the way for them by giving on demand academic assistance and emotional support to the students. It implies that in the academic real-time chatting process, the chatbots not only fill gaps but also eliminate emotional barriers against the students and increase the confidence and activeness of learning more tasks. This means that including chatbot support could indeed be a valuable effort in support of SwLD enabling them to achieve educational tasks not only successfully but independently of help in regards to academic challenges.

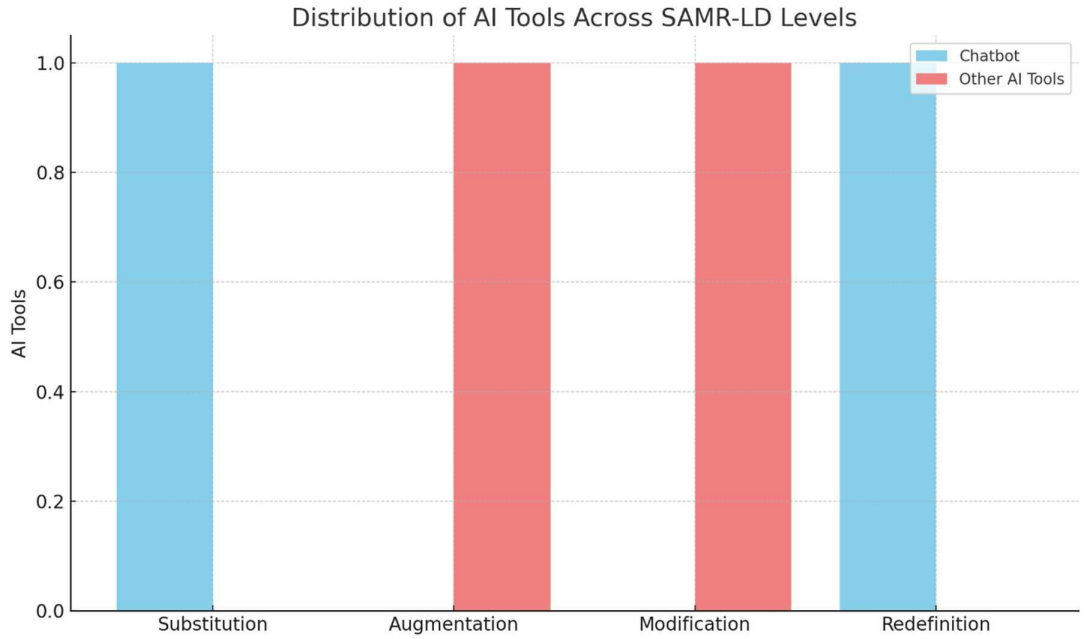
4.4 SAMR-LD Model Application: AI for Learning Disabilities

A categorization of how AI tools are being used to support SwLD is assessed using the SAMR-LD model. The model includes four levels: Saturation of each of the following 4 categories: Substitution, Augmentation, Modification, and Redefinition. This study looked into how the levels of AI tools (adaptive learning, Chatbots and Facial recognition) have shaped them.

Table 4: AI Application Across SAMR-LD Model Levels

SAMR-LD Level	AI Tool	Application
Substitution	Chatbot	AI replacing traditional teacher interaction
Augmentation	Adaptive Learning Systems	Personalized learning pathways
Modification	Facial Recognition AI	Real-time emotional feedback modifying instruction
Redefinition	24/7 Chatbot Support	Continuous academic and emotional assistance

Figure 4: Distribution of AI Tools Across SAMR-LD Levels



This study applies the SAMR-LD model in order to give the framework in which a structured approach to assessing the effect of AI tools on supporting SwLD. Each level of the model represents a different degree of technology integration into the educational experience:

- Substitution: In this case, AI chatbots are perceived as a straightforward substitution of teacher-student relations at this level, offering basic academic support while keeping the core of educational practices unchanged.
- Augmentation: An improvement to this is adaptive learning systems that allow for custom personalized learning paths to be created from each student's needs, as such a system can deliver more targeted content to each student.
- Modification: Facial recognition AI transforms learning as it provides real time emotional feedback. This technology analyses students' emotional states and allows instructors to change their teaching strategies according to student emotional states, to build a more responsive and emotionally aware learning environment.
- Redefinition: 24/7 chatbot support means that a new way of imparting academic and emotional help is available to the students as and when they need it. Rebuilt learning structure by reaching support beyond the classroom and providing continuous and personalised experience.

The study found that, while initially chatbots are used as substitute for teacher interaction, the AI technologies like adaptive learning systems and facial recognition lead to substantial modifications and redefinitions of educational experience. Adopting AI tools in this way not only augments learning for SwLD but also affords new routes to immediate feedback and ongoing support to help these students learn both the academic and emotional components of the journey.

4.5 Discussion

This study shows that there is good potential for AI to assist in ways that help students with learning disabilities in adapted learning, managing emotions, and academic support. SwLD illustrates effective tailored interventions, because improvements in academic performance and emotional wellbeing are substantial.

According to the results of the study, the results match already existing research that personalising learning experiences leads to (Baker et al., 2019; Al-Azawei et al., 2020). For example, the influence of adaptive learning systems on academic performance indicates that individualised instructional strategies are essential to students' diverse learning needs (Kamarainen et al., 2018).

Facial recognition technology also offers a promising approach for real, time emotional monitoring. Through the detection of emotional states and behavioural dysregulation, the use of these tools can help educators judiciously respond, creating a safe learning environment. Likewise, previous studies also have shown that emotional AI can result in ramped improvements in classroom dynamics and student engagement (D'Mello & Graesser, 2015).

Those studies showed that chatbots proved to be an excellent support for both academic and emotional needs, increasing task completion dramatically. This is consistent with other research showing that conversational agents can meaningfully help students (Klein et al., 2020) – particularly in challenging learning contexts.

This is promising, but further empirical research needs to be done to support these technologies' long-term implications for SwLD. Existing research, however, primarily concentrates on detection and diagnosis, and is lacking in research into ongoing emotional and behavioural support (Hehir et al., 2021). Since AI has to be implemented in all educational settings, it is very important to have comprehensive knowledge about how effective it is.

With AI integration in differing learning and emotional support platforms, schools could perhaps implement a more strategic way of helping SwLD. AI can be used to do more than just substitute for human labour, and the SAMR-LD model offers a helpful way to think about how AI can help redefine the learning experience for SwLD.

In the near future, considering the growing number of uses of AI in educational institutions, it is necessary to pay attention to the needs of students with special learning abilities to ensure that all of them have equal and high-quality educational opportunities.

V. CONCLUSION

In this study, we demonstrate how artificial intelligence (AI) can further play a role in reshaping the educational experience of SwLD. According to the findings, AI tools, including adaptive learning systems and chatbots, as well as facial recognition technology, improve emotional well-being and academic performance. These technologies add to the creation of more inclusive learning environments by enabling personalized learning experiences with real-time emotional support.

Although the outcomes reported in this research echo the literature thus far, they pose a stark warning to conduct more studies on the long-term supremacy of AI applications after the educational settings. At last, the call is to expand that focus on detection and diagnosis to include ongoing emotional and behavioural support, moving the development of the student holistically ahead.

Using frameworks such as the SAMRLD model highlights how AI can transform educational practices to transcend ordinary approaches and advance toward creative pedagogies that transform SwLD learning experiences. AI is expected to become deeply embedded into educational institutions, and ensuring equitable access and the challenges faced by these students will have to become a priority. Doing so would also realize the full promise of AI in education to create a future where all learners have what they need to succeed in school and life.

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