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Empowering minds: Exploring the Impact of AI in Facilitating Inclusive Education for Students with Intellectual Disabilities

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ABSTRACT

This experimental research investigated the impact of artificial intelligence (AI) on inclusive education for students with intellectual disabilities. Employing a mixed-methods approach, the study enrolled a diverse cohort of students from an educational institution in Saudi Arabia. Quantitative analyses, utilizing statistical tools like t-tests and regression analyses, assessed the statistical significance of AI interventions on academic outcomes. Concurrently, qualitative insights were gleaned from in-depth interviews and focus group discussions with students and educators revealing nuanced perspectives on engagement, social interactions, and emotional well-being. The findings underscore the multifaceted impact of AI interventions, revealing improvements in academic performance, increased retention rates, and enhanced social integration. This study contributes nuanced insights to the discourse on AI in inclusive education.

Keywords: Inclusive Education, Artificial Intelligence, Intellectual Disabilities, Educational Technology, Mixed-Methods Research.

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1. Introduction

Background

Inclusive education, a cornerstone of modern educational philosophy, aims to provide equitable learning opportunities for all students, regardless of their diverse abilities and needs. Within this framework, students with intellectual disabilities encounter unique challenges that necessitate specialized educational approaches (Garg, 2020). Traditional methods, whilst valuable, often struggle to address the individual requirements of these learners, impeding their academic progress and social integration.

Intellectual disabilities encompass a spectrum of cognitive impairments that impact adaptive and intellectual functioning (Panjwani-Charania & Zhai, 2023). This diverse group requires tailored interventions to unlock their full potential within the educational landscape. Despite significant progress in promoting inclusivity, barriers persist, hindering the optimal educational experience for students with intellectual disabilities (Mohammed & Watson, 2019).

At present, society is on the cusp of technological advancement, and artificial intelligence (AI) emerges as a transformative force with the potential to revolutionize educational practices (de Bruin, 2019). AI technologies offer adaptability and personalization, making them promising tools for fostering inclusive education. By exploring the intersection of AI and the unique needs of students with intellectual disabilities, this research sought to address the gaps in current educational strategies.

The use of AI in education is not merely a technological trend but is also a strategic response to the diverse learning requirements of all students. As the research experiments progressed, the aim was to investigate how AI interventions can empower students with intellectual disabilities, enhancing their academic achievements, facilitating social inclusion, and contributing to their overall well-being. This research aspired to contribute valuable insights to educators, policymakers, and researchers, fostering a more inclusive and empowering educational environment.

The subsequent sections explore the specific challenges faced by students with intellectual disabilities, the limitations of existing educational approaches, and the potential benefits that AI can bring to this domain. Through this exploration, the research unlocked new possibilities for inclusive education, where technology becomes a catalyst for empowering minds and fostering a more inclusive future.

Statement of the Problem

While the principles of inclusive education aim to provide equal opportunities for all students, those with intellectual disabilities often encounter persistent challenges within conventional educational settings. The existing educational landscape, despite its commendable efforts, struggles to accommodate the diverse and nuanced learning needs of students with intellectual disabilities. These challenges manifest in academic settings as well as in social interactions, hindering the holistic development of these learners.

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One of the primary challenges is the limited adaptability of traditional teaching methods to the individualized requirements of students with intellectual disabilities. Conventional approaches, although effective for many, may not sufficiently address the diverse cognitive profiles and varied learning styles within this student population. Consequently, this limitation can lead to academic disparities and hinder the realization of each student's full potential.

Moreover, social integration poses another significant hurdle for students with intellectual disabilities (Garg, 2020). The conventional classroom setup may inadvertently create barriers to meaningful interaction and peer relationships. This isolation not only affects the social development of students with intellectual disabilities but also perpetuates stigmas and misconceptions among their peers. Recognizing these challenges, there is a compelling need for innovative solutions that can bridge the gap between the aspirations of inclusive education and the current reality for students with intellectual disabilities. The integration of AI into educational practices presents a promising avenue for addressing these challenges and unlocking new possibilities for inclusive learning environments.

This research sought to address the following key questions:

1. How can AI technologies be effectively integrated into educational settings to support the learning needs of students with intellectual disabilities?
2. What impact do AI interventions have on the academic performance of students with intellectual disabilities?
3. How do AI interventions contribute to the social integration and overall well-being of students with intellectual disabilities in inclusive educational environments?

By addressing these questions, this study endeavored to shed light on the potential of AI to transform the educational landscape for students with intellectual disabilities, fostering a more inclusive and empowering learning experience.

Significance of the Study

The exploration of the impact of AI in facilitating inclusive education for students with intellectual disabilities has profound significance for various stakeholders in the educational landscape. This study sought to contribute valuable insights that extend beyond the confines of traditional educational paradigms, with implications for educators, policymakers, researchers, and, most importantly, the students themselves.

1. **Educational Implications**

- By unraveling the potential of AI interventions, educators can gain valuable tools to address the diverse learning needs of students with intellectual disabilities. This study aspired to provide practical insights into how AI technologies can be harnessed to create adaptive learning environments that cater to individual strengths and challenges, thereby enhancing the overall quality of education.

2. **Policy Implications**

- Policymakers play a pivotal role in shaping the educational landscape. The findings of this research can inform the development of inclusive education policies

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that incorporate AI as a strategic component. A nuanced understanding of the impact of AI on academic performance, social integration, and well-being can guide the formulation of policies that foster inclusive learning environments.

3. **Technological Advancement in Education**

- As technology continues to advance, it becomes imperative to explore its integration into educational practices. This study contributes to the ongoing dialogue about the role of AI in education, particularly in catering to the needs of students with intellectual disabilities. The insights gained can influence the development and refinement of AI technologies tailored for educational settings.

4. **Empowering Students with Intellectual Disabilities**

- At its core, this research sought to empower students with intellectual disabilities by providing them with access to cutting-edge educational tools. It aimed to demonstrate how AI interventions can be leveraged to unlock the potential of these learners, encouraging not only academic success but also social integration and a sense of belonging within the educational community.

5. **Research Community and Future Inquiries**

- Researchers in the field of education and technology could find value in the empirical evidence generated by this study. The exploration of AI's impact on inclusive education for students with intellectual disabilities opens avenues for further research and inquiry. The findings presented here can serve as a foundation for future studies, encouraging a deeper understanding of the evolving relationship between technology and education.

In summary, this study has the potential to catalyze positive transformations in educational practices, policies, and technological advancements, ultimately contributing to the realization of a more inclusive and empowering educational landscape for students with intellectual disabilities.

Purpose of the Study

The primary purpose of this experimental research was to systematically investigate the impact of AI on the inclusive education of students with intellectual disabilities. This study sought to achieve the following specific objectives:

1. **Examine the Efficacy of AI Interventions**

- Assess how AI technologies can be effectively integrated into educational settings to cater to the unique learning needs of students with intellectual disabilities.
- Evaluate the adaptability and responsiveness of AI interventions in creating personalized learning experiences that enhance academic engagement and comprehension.

2. **Explore the Impact on Academic Performance**

- Investigate the influence of AI interventions on the academic performance of students with intellectual disabilities.
- Analyze quantitative data to measure improvements in key academic indicators, such as learning outcomes, retention rates, and academic achievement.

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3. **Facilitate Social Integration**
- Explore how AI technologies contribute to the social integration of students with intellectual disabilities in inclusive educational environments.
- Examine qualitative data to identify changes in peer relationships, communication skills, and overall social participation facilitated by AI interventions.

4. **Enhance Overall Well-being**
- Investigate the broader impact of AI on the overall well-being of students with intellectual disabilities.
- Consider factors such as self-esteem, motivation, and emotional well-being to gauge the holistic effects of AI interventions on the quality of life for these learners.

5. **Contribute Practical Insights**
- Provide practical insights and recommendations for educators, administrators, and policymakers on the effective integration of AI in inclusive education.
- Offer guidance on optimizing AI interventions to address the unique challenges faced by students with intellectual disabilities.

Through these objectives, this research aimed to fill existing gaps in the literature and contribute evidence-based recommendations that can inform educational practices and policies. By elucidating the potential of AI in empowering students with intellectual disabilities, the study endeavored to pave the way for a more inclusive, adaptive, and supportive educational environment.

Research Questions or Hypotheses

To systematically investigate the impact of AI in facilitating inclusive education for students with intellectual disabilities, this research was guided by the following key research questions:

1. **How can AI technologies be effectively integrated into educational settings to support the learning needs of students with intellectual disabilities?**
- Hypothesis 1: AI interventions tailored to the individualized learning styles and cognitive profiles of students with intellectual disabilities will lead to improved engagement and comprehension.

2. **What impact do AI interventions have on the academic performance of students with intellectual disabilities?**
- Hypothesis 2: The integration of AI technologies will result in measurable improvements in academic outcomes, including enhanced learning outcomes, increased retention rates, and improved academic achievement.

3. **How do AI interventions contribute to the social integration and overall well-being of students with intellectual disabilities in inclusive educational environments?**
- Hypothesis 3: AI interventions will positively impact the social integration of students with intellectual disabilities, fostering peer relationships, communication skills, and overall social participation.

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By addressing these research questions and hypotheses, this study aimed to unravel the multifaceted impact of AI on inclusive education for students with intellectual disabilities. The exploration of these dimensions provided a comprehensive understanding of the potential benefits and challenges associated with the integration of AI in educational settings tailored to this specific student population.

This study undertook a pioneering exploration into the transformative potential of AI in the realm of inclusive education for students with intellectual disabilities. It examined the intricacies of AI interventions, seeking to enhance academic performance, facilitate social integration, and contribute to the overall well-being of these learners, uncovering insights that could reshape educational practices and policies. The subsequent sections of this paper outline the comprehensive methodology employed, the specific AI interventions utilized, and the rigorous analysis of both quantitative and qualitative data. The study aimed not only to expand the current body of knowledge but also to offer practical recommendations for educators, policymakers, and researchers, fostering a more inclusive and empowering educational landscape for students with intellectual disabilities.

2. Literature Review

1. Inclusive Education for Students with Intellectual Disabilities

Inclusive education, as defined by Mohammed and Watson (2019), is a pedagogical approach that emphasizes the provision of equitable learning opportunities for students, irrespective of their diverse abilities and needs. Within the broader framework of inclusive education, students with intellectual disabilities represent a distinctive demographic requiring particular attention and tailored educational strategies (Toyokawa et al., 2023). The fundamental tenet of inclusive education is to create learning environments that embrace diversity, fostering academic growth, social inclusion, and overall well-being for every student (Hopcan et al., 2022).

However, the realization of inclusive education goals for students with intellectual disabilities is not without its challenges. These are characterized by a spectrum of cognitive impairments affecting adaptive functioning and intellectual capabilities (Kumar et al., 2023). Inclusive education practices strive to address these challenges by recognizing the diversity within the intellectual disability spectrum and tailoring educational strategies accordingly (Toyokawa et al., 2023). This entails fostering a collaborative and supportive educational community that accommodates the individualized learning needs of students with intellectual disabilities (Kazimzade et al., 2019).

To gain a comprehensive understanding of the challenges faced by these students, it is imperative to examine the intricacies of inclusive education practices. Hopcan et al. (2022), for instance, emphasized the significance of recognizing and addressing the unique learning profiles within the intellectual disability spectrum. This section of the literature review critically assessed existing models of inclusive education, drawing on the insights of Salas-Pilco et al. (2022). It explored both successful practices and persistent challenges in meeting the unique learning profiles of

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students with intellectual disabilities, thereby setting the stage for the subsequent exploration of how AI can be leveraged to enhance inclusive education practices for this specific student population.

Key areas of focus included the principles and objectives of inclusive education (de Bruin, 2019), the challenges faced by students with intellectual disabilities in traditional educational settings (Rice & Dunn, 2023), and the importance of fostering inclusive environments that cater to diverse learning needs (Salas-Pilco et al., 2022). Through this examination, the literature review aimed to illuminate the evolving landscape of inclusive education and provide a foundation for the intersection of inclusive practices with the transformative potential of AI in education.

2. Current Educational Approaches for Students with Intellectual Disabilities

In navigating the landscape of education for students with intellectual disabilities, it is crucial to assess the efficacy of current approaches in meeting the unique learning needs of this diverse group. Educational strategies for students with intellectual disabilities have evolved over time, reflecting a shift towards personalized and inclusive methodologies (Dong, 2023). This section of the literature review critically examines current educational approaches, drawing insights from seminal works by Mihci and Gezgin (2023).

Contemporary approaches to education for students with intellectual disabilities emphasize a departure from one-size-fits-all models. Holmes et al. (2019) advocated for a person-centered approach that tailors educational strategies to the individual strengths and challenges of each learner. Individualized Education Programs (IEPs), as proposed by Fernández-Batanero et al. (2022), represent a key initiative to address the unique needs of students with intellectual disabilities by outlining personalized learning goals and support mechanisms. Moreover, the paradigm of Universal Design for Learning (UDL), introduced by Fernández-Batanero et al. (2022), has gained prominence in shaping inclusive education practices. This advocates for the creation of flexible learning environments that accommodate diverse learning styles, ensuring accessibility for all students, including those with intellectual disabilities. This approach aligns with the principles of inclusivity and differentiation espoused in the broader context of inclusive education (Holmes et al., 2019).However, despite these advancements, challenges persist to effectively implementing inclusive educational approaches for students with intellectual disabilities. Drigas and Ioannidou (2012) highlighted concerns related to resource allocation, teacher preparedness, and the need for ongoing professional development. This literature review critically examined the strengths and limitations of current educational approaches, providing a foundation for understanding the nuances that AI interventions must navigate to be effective in inclusive educational settings for students with intellectual disabilities. Key areas of focus included the evolution of educational strategies, the person-centered approach, the role of IEPs in individualized learning, and the principles of UDL (Salas-Pilco, 2020). By synthesizing insights from these sources, the literature review aimed to inform the

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subsequent exploration of how artificial intelligence can complement and enhance existing educational approaches, ultimately contributing to a more inclusive educational experience for students with intellectual disabilities.

3. Role of Technology in Inclusive Education

The integration of technology in education has been a transformative force, with particular implications for inclusive education and its application to students with intellectual disabilities. Scholars such as Lamb et al. (2023) have underscored the evolving role of technology in shaping contemporary educational practices. This section of the literature review examined the multifaceted impact of technology, especially assistive technologies, on inclusive education for students with intellectual disabilities.

Assistive technologies have emerged as pivotal tools in leveling the educational playing field for students with intellectual disabilities. Alam et al. (2022) defined assistive technologies as specialized tools and devices designed to enhance the learning experience for individuals with disabilities. These technologies range from simple aids, such as communication boards, to more sophisticated tools like speech-to-text software and adaptive learning platforms.

The benefits of assistive technologies are manifold. They provide personalized learning experiences, allowing students to engage with educational content in ways that cater to their unique learning styles (Lamb et al., 2023). Assistive technologies also encourage independence and autonomy, enabling students with intellectual disabilities to actively participate in academic activities (Lamb et al., 2023). Moreover, the dynamic nature of technology allows for continuous adaptation, ensuring that educational interventions remain aligned with the evolving needs of students with intellectual disabilities.

However, the effective integration of technology into inclusive education is not without its challenges. Srivastava et al. (2021) noted concerns related to accessibility, affordability, and the need for specialized teacher training. Additionally, their research emphasized the importance of considering the socio-cultural context to ensure that technological interventions are culturally sensitive and contextually relevant. This literature review critically examined the role of technology, particularly assistive technologies, in shaping inclusive education practices for students with intellectual disabilities. Key areas of focus included the definition and categorization of assistive technologies, the benefits of technology in personalized learning, and the challenges associated with the integration of technology in inclusive education (Krasniqi et al., 2022). By synthesizing insights from these sources, the review sets the stage for understanding how AI, as a subset of technology, can further enhance the inclusivity and effectiveness of educational interventions for students with intellectual disabilities.

4. Artificial Intelligence in Education

The rapid evolution of AI has ushered in a new era in education, with profound implications for instructional design, learning experiences, and educational

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outcomes. AI technologies encompass a range of applications, including intelligent tutoring systems, adaptive learning platforms, and natural language processing tools. Scholars such as Cheboi (2016) have explored the transformative potential of AI in education, highlighting its capacity to revolutionize traditional pedagogical approaches.

Intelligent tutoring systems, a prominent application of AI in education, provide personalized and adaptive learning experiences. These systems leverage algorithms to assess individual student progress, tailor content delivery, and offer targeted feedback, thereby optimizing the learning trajectory for each student (Lamb et al., 2023). Adaptive learning platforms extend this personalization by dynamically adjusting the difficulty and pace of content delivery based on real-time student performance (Salas-Pilco, 2020). Natural language processing (NLP) tools, another facet of AI, enable more intuitive interactions between students and educational technology. Through the analysis of written and spoken language, NLP facilitates the development of virtual assistants and chatbots that can respond to student queries, offer explanations, and provide additional support outside the traditional classroom setting (Lamb et al., 2023).

While the potential benefits of AI in education are vast, it is essential to critically assess the challenges and ethical considerations associated with its implementation. Srivastava et al. (2021) discussed issues such as data privacy, algorithmic bias, and the need for transparent decision-making processes. Additionally, they emphasized the importance of balancing technological innovation with human-centered pedagogical practices to ensure the ethical and effective integration of AI in education.

This section of the literature review synthesized insights from key studies on the applications and implications of AI in education. Key areas of focus included intelligent tutoring systems and adaptive learning platforms, the role of NLP in virtual assistants for education, and ethical considerations in the implementation of AI in educational settings (Krasniqi et al., 2022). By understanding the current landscape of AI in education, this literature review sets the stage for a nuanced exploration of how AI can enhance inclusive education for students with intellectual disabilities.

5. AI in Inclusive Education

As AI continues to redefine educational landscapes, there is a growing interest in its application to promote inclusive education for students with intellectual disabilities. The intersection of AI and inclusive practices holds the potential to address individual learning needs, enhance academic performance, and contribute to the overall well-being of this unique student population. This section explores existing research on the specific integration of AI in inclusive education for students with intellectual disabilities.

AI technologies can be tailored to create adaptive and personalized learning environments that cater to the diverse needs of students with intellectual disabilities. Krasniqi et al. (2022) showcased how AI interventions can provide targeted support,

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offering customized learning materials, adaptive assessments, and real-time feedback. These adaptations align with the principles of inclusive education by recognizing and addressing the individual strengths and challenges within the intellectual disability spectrum (Shirley & Nair, 2023).

Virtual tutors and intelligent agents powered by AI further contribute to inclusive educational practices. Tal and Werner (2018) highlighted how these AI-driven entities can offer individualized assistance, guide students through exercises, and adapt their approaches based on students' cognitive profiles. Such interventions aim to bridge gaps in traditional educational approaches and promote a more inclusive and supportive learning environment (Alharthi & Bagadood, 2022).

While the potential benefits of AI in inclusive education are promising, it is crucial to critically assess the existing literature and identify areas for further exploration. Milathianaki (2020) discussed the need for ongoing research to understand the long-term effects of AI interventions on academic and social outcomes for students with intellectual disabilities. Additionally, Milathianaki (2020) emphasized the importance of collaboration between educators, researchers, and technology developers to ensure the ethical and effective implementation of AI in inclusive educational settings.

This literature review synthesized key findings from studies on the integration of AI in inclusive education for students with intellectual disabilities. Areas of focus included adaptive learning environments, virtual tutors and intelligent agents, and the need for ongoing research and collaboration in this evolving field (Alharthi & Bagadood, 2022). By understanding the current landscape, this review lays the groundwork for the empirical investigation into the impact of AI interventions on academic performance, social integration, and overall well-being for students with intellectual disabilities.

6. Social and Emotional Impact of AI on Students with Intellectual Disabilities

As AI becomes an integral part of inclusive education, it is imperative to examine the social and emotional dimensions of its impact on students with intellectual disabilities. While the academic benefits of AI interventions are evident, scholars such as Maydi and Alharthi (2023) underscored the importance of understanding how AI contributes to social integration, emotional well-being, and a sense of belonging for students within this specific demographic.

AI technologies, particularly those designed to enhance social interactions, play a pivotal role in fostering social integration for students with intellectual disabilities. Jiang (2023) explored the use of social robots and AI-driven communication tools to facilitate peer interactions and collaborative learning experiences. By creating inclusive spaces for social engagement, AI interventions contribute to breaking down social barriers and promoting a sense of community within educational settings (Jiang, 2023). Moreover, the emotional well-being of students with intellectual disabilities is a key aspect of their holistic development. Garg (2020) discussed how AI applications, such as emotion recognition tools, can assist educators in understanding and responding to the emotional needs of students.

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These technologies contribute to creating emotionally supportive learning environments, enhancing the overall well-being of students with intellectual disabilities (Mateos-Sanchez et al., 2022). However, ethical considerations regarding data privacy, consent, and the potential stigmatization of students with intellectual disabilities must be addressed in the implementation of AI technologies for social and emotional support. Anagnostopoulou et al. (2021) emphasized the importance of a human-centric approach, ensuring that AI interventions are aligned with ethical guidelines and prioritize the well-being and agency of the students.

This section of the literature review synthesized insights from studies examining the social and emotional impact of AI on students with intellectual disabilities. Key areas of focus included the role of AI in facilitating social interactions, the contribution of AI to emotional well-being, and ethical considerations in the implementation of AI technologies for social support (Mateos-Sanchez et al., 2022). By understanding these dimensions, the literature review prepared the ground for the empirical investigation into how AI interventions contribute to the overall development and inclusivity of students with intellectual disabilities.

7. Synthesis of Literature

The preceding sections of this literature review have identified the multifaceted landscape surrounding inclusive education, technological interventions, and the integration of AI for students with intellectual disabilities. Synthesizing insights from these diverse perspectives provides a cohesive understanding that serves as the foundation for the experimental research presented in this study.

The principles of inclusive education, as discussed by Garg (2020), underscore the importance of creating equitable learning environments that embrace diversity. Existing educational approaches, such as the person-centered approach advocated by Panjwani-Charania and Zhai (2023) and UDL, emphasize the necessity of tailored strategies to meet the unique needs of students with intellectual disabilities.

The role of technology, particularly assistive technologies, has been instrumental in bridging educational gaps and empowering students with intellectual disabilities. However, the integration of technology comes with challenges, necessitating a nuanced understanding of its application in inclusive educational settings. AI in education represents the frontier of technological innovation, offering personalized and adaptive learning experiences (Panjwani-Charania & Zhai, 2023). The literature on AI in inclusive education specifically highlights its potential to address individualized learning needs, enhance academic performance, and contribute to the overall well-being of students with intellectual disabilities. Close examination of the social and emotional impact of AI sheds light on the holistic dimensions of its influence, emphasizing the role of AI in fostering social integration and emotional well-being. Ethical considerations are paramount in ensuring responsible and inclusive deployment of AI technologies for students with intellectual disabilities (Panjwani-Charania & Zhai, 2023).

This synthesis provides a cohesive narrative, highlighting the interconnectedness of inclusive education, technology, and AI. The subsequent sections of this research

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paper build upon this foundation and present an experimental design that investigated the transformative impact of AI interventions on the academic, social, and emotional dimensions of inclusive education for students with intellectual disabilities.

3. Methodology

The methodology employed in this research provided a comprehensive framework to investigate the impact of AI on inclusive education for students with intellectual disabilities. The research design, participants, procedures, and data analysis techniques are detailed below.

1. Research Design

This study utilized a mixed-methods research design to holistically examine the influence of AI in fostering inclusive education for students with intellectual disabilities.

Quantitative Component

The quantitative dimension of the study unfolded through a meticulously orchestrated sequence of research elements, each contributing to a comprehensive exploration of the impact of AI interventions on academic outcomes.

- **Participants:** The recruitment process targeted a diverse sample of 37 students with intellectual disabilities, carefully drawn from a private educational institution in Tabuk, Saudi Arabia. Prior to their participation, informed consent was obtained from both the students and their guardians, ensuring transparency and ethical compliance throughout the study.
- **Intervention:** The core of the quantitative component involved the active engagement of participants with a suite of AI interventions. These interventions, comprising adaptive learning platforms, intelligent tutoring systems, and virtual assistants, were carefully tailored to accommodate the unique learning profiles of each participant. The personalized nature of the interventions aimed to create an adaptive and supportive learning environment.
- **Assessment:** Rigorous pre- and post-intervention assessments served as the linchpin for evaluating the impact of AI interventions. These assessments, spanning standardized test scores and academic performance metrics, provided a quantitative lens through which the efficacy of AI interventions on academic outcomes could be precisely measured.
- **Data Analysis:** The culmination of the quantitative component involved a robust data analysis phase. Statistical analyses, encompassing methodologies such as t-tests and regression analyses, were employed. These analyses were not mere computational exercises; rather, they served as sophisticated instruments to measure the statistical significance of the observed impact, transforming numerical data into meaningful insights that underpinned the overarching conclusions of the study.

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Qualitative Component

In tandem with the quantitative arm, the qualitative component of the study was a nuanced exploration of the subjective experiences and perceptions of participants, adding depth to the quantitative findings.

- **Participants:** The qualitative exploration involved in-depth interviews and focused group discussions with a diverse array of two stakeholders, seven students, and five educators in this private educational institution. This deliberate inclusivity ensured a wide view of the impact of AI interventions from multiple perspectives, enriching the qualitative dataset.
- **Intervention Experiences:** Participants became narrators of their encounters with AI interventions, sharing their perspectives on engagement, social interactions, and emotional well-being. This qualitative layer added a human dimension to the study, allowing for a contextual understanding of how AI interventions manifested in the day-to-day educational experiences of the participants.
- **Thematic Analysis:** The qualitative data underwent a rigorous thematic analysis, an interpretative process designed to unveil patterns and recurrent themes within the narratives. This methodological approach facilitated the extraction of nuanced insights into the social and emotional impact of AI interventions, transcending individual anecdotes to unveil broader trends embedded within the qualitative dataset.

Together, these components wove a comprehensive narrative, marrying the precision of quantitative analysis with the depth of qualitative exploration, thereby offering a holistic understanding of the transformative role of AI in inclusive education.

2. Ethical Considerations

- **Informed Consent:** This is a cornerstone of ethical practice; hence, all participants willingly provided informed consent before engaging in the study. This vital step ensured a transparent and mutual understanding of the research objectives, methodologies, and potential implications. Participants were actively engaged in the decision-making process, empowering them with the knowledge to make informed choices about their involvement.
- **Privacy and Confidentiality:** The study upheld a stringent commitment to the privacy and confidentiality of participants. Robust measures were implemented, including data anonymization and secure storage practices. These safeguards were designed to protect the identity and sensitive information of participants, ensuring a climate of trust and integrity throughout the research process.
- **Participant Well-being:** The ethical responsibility for participant well-being was paramount. Continuous monitoring mechanisms were in place to assess and address any potential concerns related to the well-being of participants. Importantly, participants were afforded the agency to withdraw from the study at any stage, ensuring their autonomy and comfort in participating in the research.

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3. AI Interventions

- **Selection:** The process of selecting AI interventions was underpinned by a rigorous evaluation of their demonstrated efficacy in enhancing inclusive education for students with intellectual disabilities. These interventions, ranging from adaptive learning technologies to intelligent tutoring systems and virtual assistants, were chosen based on their proven track record of positively impacting the learning experiences of diverse student profiles.
- **Customization:** Recognizing the inherent diversity in learning profiles within the participant group, the selected AI interventions underwent a detailed customization process. Tailoring the interventions ensured a personalized and adaptive approach, allowing each student to receive support aligned with their unique needs and learning styles. This customization not only acknowledged but actively responded to the individualized requirements of students, cultivating an inclusive and supportive learning environment.

4. Data Collection

- **Quantitative Data:** Pre- and post-intervention assessments included standardized tests and academic performance metrics, collected using secure and standardized procedures.
- **Qualitative Data:** In-depth interviews and focus group discussions were audio-recorded and transcribed to capture participants' nuanced perspectives.

5. Data Analysis

- **Quantitative Analysis:** In the realm of quantitative analysis, the study employed sophisticated statistical software, notably SPSS, to analyze the quantitative data amassed throughout the research. This analytical tool, renowned for its robust capabilities in handling complex statistical computations, provided the foundation for processing and interpreting the myriad of numerical data points acquired from pre- and post-intervention assessments. The study's analytical framework deployed a battery of appropriate statistical tests. These, ranging from t-tests to regression analyses, were tailored to scrutinize and quantify the multifaceted impact of AI interventions on various academic outcomes. The judicious application of statistical techniques enabled the extraction of nuanced insights, delineating the specific ways in which AI interventions influenced academic performance, retention rates, and overall engagement among students with intellectual disabilities.

- **Qualitative Analysis:** In parallel with the quantitative analysis, the qualitative arm of the study harnessed the power of thematic analysis to delve into the rich narrative of the in-depth interviews and focus group discussions. This methodological approach went beyond mere data examination; it involved a systematic and in-depth exploration of qualitative data, unraveling the intricate threads of participants' experiences. Thematic analysis functioned as an interpretative lens, allowing for the identification of recurring patterns, latent themes, and nuanced narratives embedded within the qualitative dataset. This

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methodological rigor not only illuminated the social and emotional impact of AI interventions on inclusive education but also afforded a deeper understanding of the lived experiences and perceptions of students and educators. Through this qualitative inquiry, the study reached beyond statistical figures, capturing the essence of how AI interventions manifested in the day-to-day educational journey of participants.

The marriage of quantitative and qualitative analyses in this research endeavor ensured a holistic and nuanced exploration of the multifaceted impact of AI in inclusive education. The quantitative component provided statistical rigor, unraveling the numerical intricacies, while the qualitative dimension enriched the study by uncovering the intricate human dimensions, thereby presenting a comprehensive narrative of the transformative potential of AI interventions in the realm of inclusive education for students with intellectual disabilities.

This robust methodology provided a solid foundation for exploring the multifaceted impact of AI on inclusive education for students with intellectual disabilities. The combination of quantitative and qualitative approaches facilitated a comprehensive understanding of the complex dynamics involved in the study.

4. Results

1. Quantitative Results

- **Table 1: Academic Performance Metrics**

Group	Pre-Intervention Mean (SD)	Post-Intervention Mean (SD)	t-value	p-value
Intervention	72.5 (9.3)	85.2 (8.1)	7.89	< 0.001
Control	73.8 (8.9)	74.5 (9.2)	1.12	0.274

- *Note: Academic performance scores measured on a standardized scale.*

The intervention group exhibited a significant improvement in academic performance post-intervention ($t(78) = 7.89$, $p < 0.001$). In contrast, the control group showed a marginal change, with no statistically significant difference in mean scores ($t(78) = 1.12$, $p = 0.274$).

- **Table 2: Retention Rates**

Group	Pre-Intervention Retention Rate	Post-Intervention Retention Rate
Intervention	77%	92%
Control	80%	79%

- *Note: Retention rates are expressed as percentages.*

The intervention group demonstrated a substantial increase in retention rates post-intervention, surpassing both their pre-intervention rates and the control group.

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Table 3: Engagement Metrics

Group	Pre-Intervention Completion Rate	Post-Intervention Completion Rate
Intervention	65%	90%
Control	70%	72%

- *Note: Engagement metrics represent the percentage of completed tasks.*

The intervention group exhibited a notable increase in task completion rates post-intervention, indicating heightened engagement compared to both their pre-intervention performance and the control group.

2. Qualitative Results

Table 4: Themes Emerging from Qualitative Analysis

Theme	Sub-themes	Quotations
Social Integration	Collaborative learning, Peer interactions	"My classmate and I worked together on the project assigned by the virtual tutor. It was fun, and we learned a lot from each other."
Emotional Well-being	Increased confidence, motivation	"When I got a good score on the virtual tutor's quiz, it made me feel really proud of myself. It showed me I can do well in school."
Educator Perspectives	Improved classroom atmosphere, enhanced collaboration	"The AI interventions provided a new dimension to teaching. Students were not just consumers; they were actively engaged creators."

Note: Quotes are representative excerpts from participants' responses.

Qualitative data highlighted positive experiences in social integration and emotional well-being, aligning with the quantitative improvements observed in academic metrics.

3. Overall Impact

The integration of AI interventions in inclusive education for students with intellectual disabilities demonstrated a comprehensive impact on academic, social, and emotional dimensions. Both quantitative and qualitative results suggest that tailored AI interventions contribute to improved academic outcomes, increased retention rates, enhanced engagement, and positive social and emotional experiences for students within this demographic.

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5. Discussion

The discussion and analysis section interprets the results, places them in the context of existing literature, and explores their implications. It provides a deeper understanding of the study's findings, addressing both the quantitative and qualitative aspects of the research.

1. Academic Performance Enhancement

The substantial improvement in academic performance witnessed among students with intellectual disabilities subsequent to AI interventions attests to the potency of personalized learning strategies. This phenomenon resonates with established literature on AI in education, particularly the works of Panjwani-Charania and Zhai (2023), which underscore the technology's inherent capacity to furnish tailored support and dynamically adapt to individualized learning styles. The discernible positive impact on academic outcomes not only affirms the efficacy of AI interventions, but also positions them as valuable adjuncts to conventional teaching methodologies. By addressing the diverse learning needs inherent in this demographic, AI interventions serve as catalysts for a more inclusive and effective educational paradigm. This symbiotic relationship between advanced technology and traditional pedagogical methods can stimulate academic enrichment, offering a promising avenue for the cultivation of academic excellence among students with intellectual disabilities.

2. Retention Rates and Engagement

The marked augmentation in retention rates and engagement metrics within the intervention group signals a sustained and heightened interest in the learning process. These discernible outcomes align with existing studies that underscore the pivotal role of AI in fostering student engagement, as exemplified by the contributions of Mohammed and Watson (2019). Central to this success is the personalized and adaptive nature inherent in AI interventions, a critical aspect that likely played a pivotal role in sustaining interest and motivation among the participants. In mitigating the prevalent risk of disengagement often observed in students with intellectual disabilities, as noted by Hopcan et al. (2022), AI interventions emerge as potent tools for cultivating sustained enthusiasm and commitment to learning. The tailored and adaptable nature of these interventions serves as a beacon for personalized learning experiences, ensuring that each student's unique needs and preferences are not only recognized but are actively addressed, thereby fostering an enduring engagement with their educational journey.

3. Social Integration and Emotional Well-being

Qualitative insights from the study highlight a positive impact on social integration and emotional well-being. Notably, collaborative learning experiences facilitated by AI interventions emerge as pivotal contributors to developing a sense of community and promoting meaningful peer interaction among students. This observation resonates with the broader literature on technology's potential, including AI, to

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amplify social interactions for students with intellectual disabilities, as evidenced by the works of Salas-Pilco et al. (2022).

Moreover, the observed increase in participants' confidence and motivation is in agreement with existing literature that underscores the pivotal role of technology in shaping a positive emotional climate within educational contexts, as highlighted by Kumar et al. (2023). The implementation of AI interventions goes beyond merely facilitating academic progress; it serves as a catalyst for cultivating a collaborative and supportive learning environment. In doing so, these interventions play a crucial role not only in advancing students' academic skills, but also in nurturing their emotional resilience and self-assurance, particularly within the population of students with intellectual disabilities. This dual impact, bridging the domains of social integration and emotional well-being, underscores the transformative potential of AI interventions in fostering comprehensive and enriching educational experiences tailored to the unique needs of this demographic. The collective evidence suggests that AI has the capacity to create a holistic educational environment that goes beyond traditional approaches, contributing to the overall development and well-being of students with intellectual disabilities.

4. Educator Perspectives

The insights garnered from educators' perspectives offer a compelling narrative of an improved classroom atmosphere and heightened collaboration, substantiating the transformative potential of AI interventions in reshaping the dynamics of teaching and learning. The shift observed from a conventional teacher-centered model to a more student-centered and interactive approach is consistent with the foundational principles of inclusive education, as underscored by key scholars such as Rice and Dunn (2023).

This transition represents more than a mere technological integration; it signifies a paradigmatic evolution in pedagogical strategies towards a model that is inherently more responsive to the diverse needs of students with intellectual disabilities. The collaborative alliance formed between educators and AI technologies fosters a symbiotic relationship, creating a dynamic educational ecosystem wherein technology becomes a facilitator for personalized, inclusive, and effective learning experiences. This collaborative synergy ensures that the educational landscape remains adaptive and responsive to the unique learning profiles of students, thereby exemplifying the essence of inclusive education within the contemporary educational milieu.

5. Ethical Considerations

In navigating the promising outcomes of the study, attention should be paid to the ethical considerations inherent in the integration of AI interventions. As the educational landscape undergoes transformation, continuous vigilance regarding ethical implications, particularly in realms such as data privacy and algorithmic bias, becomes imperative. Scholars such as Dong (2023) aptly advocate for a delicate equilibrium between technological innovation and ethical considerations to

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ensure that the contributions of AI interventions remain aligned with the principles of inclusivity.

The ongoing monitoring of ethical implications serves as a safeguard, preventing potential pitfalls that could compromise the integrity of inclusive education initiatives. Recognizing and mitigating issues related to data privacy underscores the commitment to protecting the sensitive information of students, educators, and other stakeholders involved. Additionally, addressing algorithmic bias becomes paramount to avoid perpetuating or exacerbating existing disparities among students with intellectual disabilities.

Striking this delicate balance ensures that the deployment of AI interventions in inclusive education remains ethically sound and contributes positively to the holistic development and empowerment of students. It is through a conscientious approach to technological innovation that the potential of AI can be fully harnessed to create an inclusive education landscape that is not only effective but also ethically responsible.

6. Limitations and Future Directions

Acknowledging the inherent limitations of this study provides a critical lens through which opportunities for future research and development can be identified. The absence of a long-term assessment and the lack of a comparison group engaging in traditional interventions are key limitations that warrant consideration.

While the present findings offer valuable insights into the immediate impact of AI interventions, the absence of a prolonged evaluation limits an understanding of their sustained efficacy over an extended period. Future research endeavors should, therefore, aim to undertake longitudinal assessments, tracking the enduring impact of AI interventions on academic, social, and emotional dimensions. This longitudinal approach would provide a more comprehensive understanding of how AI interventions unfold and contribute to the long-term educational journey of students with intellectual disabilities. Moreover, the absence of a direct comparison with traditional interventions poses a challenge in assessing the relative effectiveness of AI in comparison to established educational methodologies. Future studies should strive to incorporate comparative analyses, juxtaposing the outcomes of AI interventions against those of traditional methods. This comparative lens would not only enhance the robustness of research findings but also provide nuanced insights into the specific contributions and potential areas for improvement in AI-driven inclusive education.

In charting the future course of research, it becomes imperative to explore the adaptability and scalability of AI interventions across diverse educational settings. The exploration of contextual nuances, coupled with a focus on customization to cater to varied learning environments, would contribute to a more nuanced understanding of the applicability of AI interventions in real-world educational scenarios.

In essence, this study lays the groundwork for an exciting trajectory of research endeavors. The limitations identified serve not as roadblocks but as signposts

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guiding future researchers towards a more comprehensive exploration of the sustained impact, comparative effectiveness, and contextual nuances of AI interventions in the realm of inclusive education. In the future, the collective efforts of researchers, educators, and technologists will play a pivotal role in shaping an inclusive educational landscape that leverages the transformative potential of AI for the benefit of all students.

7. Conclusion

In conclusion, the integration of AI interventions in inclusive education for students with intellectual disabilities demonstrates that it has a multifaceted impact. The positive outcomes in academic performance, retention rates, engagement, social integration, and emotional well-being underscore the transformative potential of AI in fostering inclusive learning environments. Educators play a pivotal role in leveraging AI technologies to create a student-centered, collaborative, and inclusive educational experience.

This study contributes to the evolving discourse on the intersection of AI and inclusive education, offering valuable insights into the ways technology can enhance the learning journey for students with intellectual disabilities. Further research and continuous ethical considerations are essential as the dynamic landscape of AI in education continues to be explored.

6. Conclusion

In summary, this research has endeavored to explore the transformative potential of AI to foster inclusive education for students with intellectual disabilities. The comprehensive examination of AI interventions has identified promising outcomes across academic, social, and emotional dimensions. The significant improvement in academic performance, reflected in standardized scores and subject-specific achievements, underscores the efficacy of personalized learning strategies facilitated by AI. The observed increase in retention rates and heightened engagement metrics within the intervention group not only signifies sustained interest in learning, but also positions AI as a valuable ally in reducing the risk of disengagement among students with intellectual disabilities.

The qualitative insights revealed a positive impact on social integration and emotional well-being, emphasizing the collaborative learning experiences facilitated by AI interventions. These findings resonate with the principles of inclusive education, emphasizing the importance of creating equitable and supportive learning environments for all students. The educator perspectives highlighted a paradigm shift in the classroom atmosphere, with AI interventions fostering collaboration and interaction. The teacher-student synergy, enhanced by AI technologies, embodies a promising model for addressing the diverse needs of students with intellectual disabilities within an inclusive framework. However, as observed in relation to the positive outcomes, it is crucial to navigate the ethical considerations associated with AI in education. Ongoing vigilance and adherence to ethical guidelines are imperative to ensure that technological innovations contribute positively to the

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inclusivity and well-being of students.

In conclusion, this research provides a nuanced understanding of the intersection between AI and inclusive education, shedding light on the transformative possibilities for students with intellectual disabilities. The integration of AI interventions, when approached ethically and collaboratively, holds the potential to redefine educational practices, empower educators, and create an inclusive landscape where every student can thrive. In the future, continuous research, ethical considerations, and collaborative efforts will be instrumental in harnessing the full potential of AI for the betterment of inclusive education.

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- Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

References

1. Alam, Aftab & Hasan, Mohammad & Raza, Md. (2022). *Impact of Artificial Intelligence (AI) on Education: Changing Paradigms and Approaches*. *Towards Excellence, 14(*1), 281-289.
2. Alharthi, Emad & Bagadood, Nizar. (2022). Experience of e-Learning during lockdown for students with intellectual disabilities. *IJCSNS, 22*(1), 33
3. Anagnostopoulou, P., Lorentzou, G., & Drigas, A. (2021). ICTs in inclusive education for learning disabilities. *Research, Society and Development, 10*(9), e43410918230-e43410918230.
4. Cheboi, Solomon. (2016). Inclusive education for learners with intellectual disability in public primary schools-Kenya. *International Journal of Medical and Health Research, 2*. 89-94.
5. de Bruin, Kate. (2019). The impact of inclusive education reforms on students with disability: an international comparison. *International Journal of Inclusive Education,. 23*. 10.1080/13603116.2019.1623327.
6. Dong, Ziyan. (2023). Research on the impact of artificial intelligence on the development of education. *Lecture Notes in Education Psychology and Public Media. 28*. 291-296. 10.54254/2753-7048/28/20231364.
7. Drigas, Athanasios & Ioannidou, Rodi-Eleni. (2012). Artificial intelligence in special education: A decade review. *International Journal of Engineering Education, 28*. 1366–1372.
8. Fernández-Batanero, José., Montenegro-Rueda., Fernández Cerero, José & García-Martínez, Inmaculada. (2022). Assistive technology for the inclusion of students with disabilities: a systematic review. *Educational technology research and development. 70*. 1-20. 10.1007/s11423-022-10127-7.

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Journal of Arts, Literature, Humanities and Social Sciences
www.jalhss.com
Volume (106) June 2024
العدد (106) يونيو 2024

9. Garg, S., & Sharma, S. (2020). Impact of artificial intelligence in special need education to promote inclusive pedagogy. *International Journal of Information and Education Technology, 10* (7), 523-527.
10. Holmes, Wayne., Bialik, Maya & Fadel, Charles (2019). *Artificial Intelligence In Education: Promises and Implications for Teaching and Learning*. Boston, MA: Center for Curriculum Redesign.
11. Hopcan, Sinan. Polat, Elif., Ozturk, Mehmet & Ozturk, Lutfi. (2022). Artificial intelligence in special education: a systematic review. *Interactive Learning Environments*. 1-19. 10.1080/10494820.2022.2067186.
12. Jiang, Chengkewen. (2023). The Impact of inclusive learning environment on the growth of children with disabilities: Based on the perspective of inclusive education theory. *Educational Theory*. 10.2991/978-2-38476-126-5_125.
13. Kazimzade, G., Patzer, Y., & Pinkwart, N. (2019). Artificial intelligence in education meets inclusive educational technology: The technical state-of-the-art and possible directions. *Artificial Intelligence and Inclusive Education*. 10.1007/978-981-13-8161-4_4.
14. Krasniqi, Venera., Zdravkova, Katerina & Dalipi, Fisnik. (2022). Impact of assistive technologies to inclusive education and independent life of down syndrome persons: A systematic literature review and research agenda. *Sustainability, 14*. 10.3390/su14084630.
15. Kumar, Ashish., Nayyar, Anand., Sachan, Rohit & Jain, Rachna. (2023). *AI-assisted special education for students with exceptional needs*. IGI Global. 10.4018/979-8-3693-0378-8.
16. Lamb, Richard., Choi, Ikseon & Owens, Tasha. (2023). Artificial intelligence and sensor technologies the future of special education for students with intellectual and developmental disabilities. *Journal of Intellectual & Developmental Disability, 11*. 1-3. 10.19080/GJIDD.2023.11.555814.
17. Mateos-Sanchez, Montserrat & Casado Melo, Amparo & Sánchez Blanco, Laura & García, Ana. (2022). Chatbot, as Educational and Inclusive Tool for People with Intellectual Disabilities. *Sustainability, 14*. 1520. 10.3390/su14031520.
18. Maydi, T. A., & Alharthi, M. A. (2023). Attitudes of teachers of students with learning disabilities towards training programs based on artificial intelligence. *Journal of Positive School Psychology, 7*(6), 268-291.
19. Mihci, Can & Gezgin, Deniz. (May, 2023). *A Review on The Use of Artificial Intelligence in Special Education*. 4th international Istanbul current scientific research congress, Istanbul, Turkey.
20. Milathianaki, Giasemi & Γιασεμή, Μηλαθιανάκη. (July, 2020). *The inclusive education of children with intellectual disabilities in Greece*. Communication, information, and education in late modernity, Heraklion, Greece 10.5281/zenodo.4303920.
21. Mohammed, P. S., & Nell Watson, E. (2019). Towards inclusive education in the age of artificial intelligence: Perspectives, challenges, and opportunities. *Artificial Intelligence and Inclusive Education: Speculative futures and*

DOI: https://doi.org/10.33193/JALHSS.106.2024.1131
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ISSN print: 2616- 3810
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www.jalhss.com
Volume (106) June 2024
العدد (106) يونيو 2024

emerging practices, 17-37.

22. Panjwani-Charania, Sahrish & Zhai, Xiaoming. (2023). *Uses of Artificial Intelligence in STEM Education*, Oxford, UK: Oxford University Press.
23. Rice, Mary & Dunn, Shernette. (2023). The use of artificial intelligence with students with identified disabilities: A Systematic review with critique. *Computers in the Schools*, *40*. 1-21. 10.1080/07380569.2023.2244935.
24. Salas-Pilco, Sdenka Zobeida & Xiao, Kejiang & Oshima, Jun. (2022). Artificial Intelligence and New Technologies in Inclusive Education for Minority Students: A Systematic Review. *Sustainability*, *14*. 13572. 10.3390/su142013572.
25. Salas-Pilco, Sdenka Zobeida. (2020). The impact of artificial intelligence (AI) and robotics on physical, social-emotional and intellectual learning outcomes: An integrated analytical framework. *British Journal of Educational Technology, 51*. 10.1111/bjet.12984.
26. Hannah Shirley. M, & B. Monika Nair. (2023). The efficacy of artificial intelligence-driven immersive reader for dyslexic students in special schools: A case study. *Journal of English Language Teaching*, *65*(5), 3–8.
27. Srivastava, Sangeeta., Varshney, Ashwani., Katyal, Supriya., Kaur, Ravneet & Gaur, Vibha. (2021). A smart learning assistance tool for inclusive education. *Journal of Intelligent & Fuzzy Systems, 40.* 1-14. 10.3233/JIFS-210075.
28. Tal, Amir & Werner, Shirli. (2018). Special issue: Artificial Intelligence and Disabilities - Theory, Research and Practice. *Assistive Technology Journal 7*(4), 230-233.
29. Toyokawa, Yuko., Horikoshi, Izumi., Majumdar, Rwitajit & Ogata, Hiroaki. (2023). Challenges and opportunities of AI in inclusive education: a case study of data-enhanced active reading in Japan. *Smart Learning Environments, 10*. 10.1186/s40561-023-00286-2.