

# The Internalization of AI in Enhancing Learning Accessibility for Students with Special Needs at Nurul Ilmi Junior High School

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**Abstract:** This research aims to explore how the internalization of artificial intelligence (AI) can enhance learning accessibility for students with special needs. The research method used is a qualitative approach with a case study design, which allows the researchers to gain an in-depth understanding of AI implementation in an inclusive education context. Data collection was conducted through in-depth interviews with teachers, students, and parents, as well as direct observation of the use of AI tools in the classroom. Data were also gathered through document analysis related to educational policies and best practices in inclusive education. Data analysis was carried out using thematic analysis techniques, where the main themes were identified and classified based on participants' responses. Preliminary results indicate that AI internalization facilitates material adaptation, enhances student interaction, and provides faster feedback. Students with special needs reported increased motivation and engagement in learning, while teachers felt more supported in managing the diversity of student needs. This research is expected to provide recommendations for more effective AI implementation in the context of inclusive education.

**Keywords:** Artificial Intelligence, accessibility, inclusive education, students with special needs, qualitative research.

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## Introduction

In today's digital era, artificial intelligence (AI) is increasingly playing an important role in various aspects of life, including in the world of education. Based on the opening of the 1945 Constitution, the Indonesian nation has one goal, namely to educate the nation. Every citizen has the right to receive an education. This is in accordance with Law No. 20 of 2003 which states that all citizens have the right to receive an education, including children with special needs (Afif et al., 2021)

The ever-evolving capabilities of AI provide a lot of potential to be implemented as a tool in the learning process. One of the greatest potentials is in increasing the accessibility of learning for students with special needs. AI not only functions as an additional tool, but can also be deeply integrated (internalized) to design adaptive, creative,

innovative and inclusive learning systems (Effendi, 2019).

Students with special needs often face various challenges in accessing equal education, be it physical, sensory, or cognitive barriers. These challenges hinder their learning process and have the potential to widen the gap in academic achievement between students with special needs and other students. The use of AI technology can support the teaching and learning process and make it easier for educators to deliver learning materials. In this context, AI is present as a potential solution to overcome these barriers, providing better access to students with special needs through various specially designed applications. For example, through speech recognition, natural language processing, and visual recognition, AI can help overcome the sensory and motor limitations often faced by students with disabilities (Aldriyan & Amini, 2020)

According to Eviani Damastuti, assistive technology is one of the alternative choices of AI that is suitable for use by students with special needs. Assistive technology is indeed designed in such a way as to make it easier for students with special needs to carry out activities both inside and outside of learning activities. Thus, this assistive technology can be used as a bridge for students with special needs to participate in learning activities, so that they can easily and more independently during the learning process (Rosita & Rochyadi, 2020).

The use of assistive technology is indeed good for helping students with special needs in following the learning process. However, there are several disadvantages to the use of this assistive technology, first, educators must really master the use of assistive technology, master the strategies and methods in its use so that students can understand the delivery of the material that has been given by the teacher (Lutfio et al., 2023). Second, the cost of assistive technology is quite high so that not all schools can afford it. Third, some assistive technologies that are connected to the internet are vulnerable to cyber threats and data privacy issues.

In the application of AI technology as a learning medium for students with special needs, extra consideration and attention are needed in choosing the type of technology to be used. This is because each child with special needs certainly has different characteristics from each other, both in terms of physical, emotional, mental, intellectual and social. Thus, the author is interested in studying and knowing more deeply how effective AI technology is in improving accessibility, experience and perception of teachers and students towards AI, as well as the obstacles and opportunities in the application of AI at SMP IT Nurul Ilmi.

## Materials and Methods

### Study area

The location of this research is at SMP IT Nurul Ilmi, Deli Serdang Regency, North Sumatra.



Figure 1. SMP IT Nurul Ilmi.

## Procedures

### Research Design

This study uses a qualitative research method with a case study approach. This study was chosen to illustrate how AI can be internalized in learning systems to improve accessibility for students with special needs.

### Population and Sample

The population was taken from students with special needs in schools that have or are new to using AI-based technology at SMP IT Nurul Ilmi. Samples were taken from around 10 students with various types of special needs and 5 accompanying teachers or inclusion teachers involved in the implementation of the technology.

### Data collection

The data in this study were collected through in-depth interview methods with teachers, students, and parents to understand the application, effectiveness, and challenges of AI technology in the learning process.

### Research Instruments

Interviews were conducted with teachers, students, and parents by asking questions that had been designed to explore experiences, perceptions, and obstacles in the use of AI, including aspects of increasing accessibility experienced by students.

### Data analysis

The data obtained were analyzed using thematic analysis methods to identify key themes or patterns of AI implementation in learning accessibility. This analysis focuses on the effectiveness of AI technology in improving

accessibility, teachers' and students' experiences and perceptions of AI, and the obstacles and opportunities that exist in implementing AI in special education settings.

## Results and Discussion

### Improving Access to Learning Materials

The application of AI technology in education for students with special needs has brought significant improvements in the accessibility and availability of learning materials. With AI, learning materials can be dynamically adjusted based on each student's unique needs, such as learning style, physical or cognitive limitations, so that each student has a more individualized and inclusive learning experience. For example, AI can convert text to speech for students who are blind or provide sign language translation for students who are deaf. AI technology also enables the use of adaptive algorithms that analyze students' progress and challenges in real time, helping educators adjust materials and provide timely interventions according to student needs. Furthermore, AI-based tools can make it easier for teachers to design interactive learning materials, such as augmented reality (AR) and virtual reality (VR)-based learning applications that create practical simulations, and engage students in learning in a more interesting and effective way. All of this not only increases access to materials, but also encourages active participation, increased motivation, and development of independence for students with special needs in the learning process. Ultimately, AI technology plays an important role in opening up more equal and adequate educational opportunities, so that students with special needs have the same opportunity to reach their maximum potential.

### Personalization of Learning

AI enables personalization of learning by providing tailored materials based on individual student needs and abilities. AI-based systems can analyze students' abilities and learning development over time and recommend the most appropriate materials. At SMP IT Nurul Ilmi, this

approach helps teachers provide more relevant learning for students with special needs.

### Social Emotional Development

The use of AI technology in the learning process for students with special needs has great potential to support their social-emotional development. AI technology allows the adaptation of learning materials and interaction methods according to the needs and abilities of students, for example adjusting the way of communication for students with autism or using simple language for children with intellectual disabilities. This more personalized approach can help them feel more supported, which contributes to increased self-confidence and comfort in social interactions.

AI can also provide safe simulations of social situations to practice communication skills, empathy, and collaboration with others. Through AI-based conversations or games, students with special needs can learn to recognize facial expressions, body language, and verbal responses that help in real-life interactions.

Students with special needs often experience anxiety when interacting with others. With friendly and responsive AI technology, students can feel more comfortable because they are interacting in a more predictable environment. AI technology can record and analyze students' behavioral patterns and emotional responses over time, so teachers or therapists can gain deeper insights into the student's social-emotional development. This allows for more appropriate and effective interventions based on each individual's needs. Overall, AI supports students with special needs by providing an adaptive, safe, and supportive learning environment, which is essential for their social-emotional development.

### Discussion

The implementation of AI at SMP IT Nurul Ilmi in supporting students with special needs has a positive impact on learning accessibility. AI technology allows for the delivery of more adaptive, responsive, and inclusive materials, which is very beneficial for students with special needs. This study shows that the internalization of AI not only makes it easier for students to learn,

but also helps teachers in designing more personalized learning based on individual needs. However, there are several challenges in implementing this technology. The first challenge is the availability of resources, both in terms of costs and experts who understand how AI works in inclusive education. In addition, intensive training is needed for teachers so that they are familiar with the system and are able to optimize the use of AI effectively. This study underlines the importance of collaboration between schools, technology developers, and parents in ensuring the success of AI implementation for inclusive education in Indonesia. The recommendation of this study is the need for further studies on the long-term effectiveness of AI technology and the development of policies to support the sustainable implementation of AI in inclusive schools.

### Conclusions

The use of AI at SMP IT Nurul Ilmi has been proven to increase accessibility of learning for students with special needs, making the learning process more inclusive, adaptive, and personal. The use of this technology not only has the

potential to change the way students with special needs access education, but also encourages equality in obtaining optimal learning rights. Thus, the implementation of AI in special education environments must be supported in order to create equal educational opportunities for all students.

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