

## Teachers' Knowledge About the Use of Artificial Intelligence in Learning for Blind Special Educational Needs Students

Norzuraina Mohd Nor<sup>1</sup>, Siti Mastura Baharudin<sup>2\*</sup>, Mohd Norazmi Nordin<sup>3</sup>, Heng Han Kok<sup>4</sup>, Roslieza Rosli<sup>5</sup>, Firkhan Ali Hamid Ali<sup>6</sup>

<sup>1</sup>Universiti Pendidikan Sultan Idris, Perak, Malaysia

<sup>2</sup>Pusat Pengajian Ilmu Pendidikan, Universiti Sains Malaysia

<sup>3</sup>Faculty of Education, Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

<sup>4</sup>Department of Finance & Accounting, FAME, New Era University College, Malaysia

<sup>5</sup>Fakulti Sains Sosial Gunaan, Pusat Pengajian Antropologi dan Dakwah, Universiti Sultan Zainal Abidin, Terengganu, Malaysia

<sup>6</sup>Fakulti Sains Komputer dan Teknologi Maklumat, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia

### Abstract

This review article explores the current state of teachers' knowledge regarding the application of artificial intelligence (AI) in educational settings for students with visual impairments. It highlights the potential of AI technologies to enhance learning experiences and outcomes for blind students while examining the challenges and barriers that educators face in implementing these technologies. By synthesizing existing literature, this article aims to provide recommendations for professional development and policy changes that can support teachers in effectively using AI to benefit students with special educational needs (SEN).

### 1. Introduction

Artificial intelligence (AI) is revolutionizing education by providing innovative solutions to enhance learning experiences for all students, including those with special educational needs (SEN). For blind students, AI offers unique opportunities to create accessible learning environments through personalized instruction and adaptive technologies (Zhang & Lu, 2020). However, the successful integration of AI in education largely depends on teachers' knowledge and understanding of these technologies. This article reviews the current literature on teachers' knowledge of AI applications for blind students, identifies gaps in understanding, and proposes strategies for improving educators' competencies in this area.

### 2. Understanding Artificial Intelligence in Education

#### 2.1 Definition and Types of AI

Artificial intelligence encompasses a range of technologies designed to simulate human intelligence, including machine learning, natural language processing, and computer vision (Russell & Norvig, 2020). In educational contexts, AI can provide personalized learning experiences, automate administrative tasks, and enhance accessibility for students with disabilities. Tools such as AI-driven tutoring systems, speech recognition software, and smart content creation platforms can significantly impact the learning outcomes for blind students (Al-Azawei et al., 2019). Understanding the different types of AI technologies is crucial for teachers to effectively incorporate them into their teaching practices.

#### 2.2 Potential Benefits for Blind Students

The use of AI in education can greatly benefit blind students by providing tailored learning experiences and improving accessibility. For instance, AI-powered applications can convert text to speech, recognize objects, and offer real-time feedback on students' work (Zhang & Lu, 2020). These technologies facilitate independent learning and enable students to engage with educational content in a way that suits their individual needs. Furthermore, AI can help teachers monitor student progress and adjust instruction based on real-time data, ensuring that blind students receive the support they need to succeed (Liu et al., 2021).

### 3. Teachers' Knowledge of AI

#### 3.1 Current Levels of Awareness

Despite the potential benefits of AI in education, many teachers lack sufficient knowledge about these technologies and their applications for students with SEN. Research indicates that educators often have limited understanding of AI tools and their functionalities, which can hinder effective implementation in the classroom (Hwang et al., 2021). This gap in knowledge may stem from a lack of training opportunities and resources focused on AI in education, leaving teachers unprepared to leverage these technologies to support blind students.

#### 3.2 Barriers to Knowledge Acquisition

Several barriers contribute to the inadequate knowledge of AI among teachers. These include limited access to professional development opportunities, insufficient institutional support, and a lack of familiarity with the specific needs of blind students (Al-Azawei et al., 2019). Additionally, the rapid pace of technological advancements can make it challenging for educators to stay informed about the latest AI tools and their applications. Addressing these barriers is essential for empowering teachers to integrate AI into their teaching practices effectively.

### 4. Professional Development and Training

#### 4.1 Importance of Training Programs

Professional development programs play a crucial role in enhancing teachers' knowledge and skills related to AI in education. These programs should focus on providing educators with practical, hands-on experiences with AI technologies, as well as guidance on how to apply these tools to support blind students (Hwang et al., 2021). Effective training programs can increase teachers' confidence in using AI and help them understand the unique needs of visually impaired students, ultimately leading to improved educational outcomes.

#### 4.2 Collaborative Learning Opportunities

Collaborative learning opportunities, such as workshops and peer mentoring, can further enhance teachers' understanding of AI in education. By working together, educators can share best practices, discuss challenges, and develop strategies for integrating AI technologies into their classrooms (Liu et al., 2021). These collaborative initiatives can foster a community of practice that encourages continuous learning and adaptation, enabling teachers to stay current with emerging AI tools and techniques.

## 5. Challenges in Implementing AI

### 5.1 Technical and Resource Limitations

Implementing AI technologies in educational settings for blind students presents several challenges. Technical limitations, such as inadequate infrastructure and access to devices, can hinder the effective use of AI tools in the classroom (Zhang & Lu, 2020). Additionally, schools may lack the necessary resources to provide ongoing support and training for teachers. Overcoming these challenges requires a coordinated effort from educational institutions, policymakers, and technology providers to ensure that AI tools are accessible and effective for all students.

### 5.2 Ethical Considerations

Ethical considerations also play a significant role in the implementation of AI in education. Concerns related to data privacy, bias in AI algorithms, and the potential for unequal access to technology must be addressed to ensure that all students benefit from AI applications (Russell & Norvig, 2020). Educators need to be aware of these ethical implications and be equipped to make informed decisions about the use of AI in their classrooms.

## 6. Policy Implications

### 6.1 Advocating for Inclusive Policies

To promote the effective use of AI for blind students, inclusive education policies must be established at local, national, and international levels. Policymakers should prioritize funding for AI technologies, training programs, and resources that support the unique needs of visually impaired students (Al-Azawei et al., 2019). Additionally, policies should encourage collaboration among educators, technology providers, and researchers to develop and implement best practices in AI education.

### 6.2 Enhancing Teacher Education Programs

Teacher education programs must integrate AI training into their curricula to prepare future educators for the challenges and opportunities of using AI in the classroom. This includes providing coursework focused on AI technologies, their applications for students with SEN, and strategies for fostering inclusive learning environments (Hwang et al., 2021). By equipping teachers with the knowledge and skills necessary to utilize AI effectively, educational institutions can create a more equitable learning landscape for blind students.

## 7. Conclusion

Teachers' knowledge about the use of artificial intelligence in learning for blind special educational needs students is crucial for fostering inclusive educational environments. While AI presents significant opportunities for enhancing learning experiences, gaps in teachers' understanding and challenges in implementation must be addressed. By investing in professional development, advocating for inclusive policies, and enhancing teacher education programs, stakeholders can ensure that educators are well-equipped to leverage AI technologies to benefit visually impaired students. Ultimately, a collaborative and informed approach will contribute to the successful integration of AI in education, promoting equity and accessibility for all learners.

## References

1. Al-Azawei, A., Serenelli, F., & Lundqvist, K. (2019). Usability and Accessibility of E-Learning Platforms: A Review of the Literature. *Educational Technology & Society*, 22(1), 54-65.
2. Hwang, G. J., Wang, S. Y., & Wu, P. H. (2021). Exploring Teachers' Knowledge and Skills in AI-Enhanced Learning Environments. *Journal of Educational Technology & Society*, 24(1), 95-108.
3. Liu, M., Wang, L., & Chen, H. (2021). The Role of Artificial Intelligence in Inclusive Education: Opportunities and Challenges. *International Journal of Inclusive Education*, 25(8), 866-878.
4. Russell, S., & Norvig, P. (2020). *Artificial Intelligence: A Modern Approach* (4th ed.). Pearson.
5. Zhang, X., & Lu, X. (2020). Applications of Artificial Intelligence in Education for Students with Disabilities: A Review. *Journal of Special Education Technology*, 35(2), 81-94.