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The Adaptation of Assistive Technology in Inclusive Education: an Analysis of Recent Trends in Teaching English

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ABSTRACT

This study explores the adaptation of assistive technology (AT) in inclusive education, particularly in the context of teaching English as a Foreign Language (EFL). It aims to examine how assistive tools are implemented in inclusive schools, the challenges experienced by educators, and the extent to which such technologies influence student learning outcomes. The research was conducted at SLB Negeri 08 Jakarta and SLB Negeri 11 Jakarta. A qualitative descriptive method was employed, utilizing interviews and documentation as the primary data collection techniques. Data analysis was supported by Natural Language Processing (NLP) tools to identify recurring patterns and thematic categories. The findings reveal that assistive technology plays a crucial role in facilitating communication, enhancing comprehension, and improving accessibility for students with special needs. SLB Negeri 08 predominantly used simple visual aids for learners with intellectual disabilities, whereas SLB Negeri 11 integrated digital tools such as Chromebooks and LCD projectors to support students with hearing impairments. Despite its benefits, several challenges were identified, including limited infrastructure, insufficient teacher training, and varying levels of digital literacy among educators. Nevertheless, the use of assistive technology significantly increases student engagement, builds confidence, and strengthens inclusive participation within the classroom. Overall, this study highlights that assistive technology functions not only as an instructional aid but also as a transformative mechanism that helps bridge educational gaps and promotes equity in inclusive learning environments.

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INTRODUCTION

Education is a set of activities or communications coherently designed and organized to achieve predetermined learning objectives or complete a specific series of educational tasks over a sustained period. These objectives include enhancing knowledge, skills, and competencies in personal, civic, social, and/or professional contexts. Educational activities are intentional actions involving communication to bring about learning changes (UNESCO, 2012). According to the International Standard Classification of Education (ISCED) 2011

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document published by UNESCO, there are various types of education: Formal Education, which is structured, hierarchical, and typically officially recognized by the state, such as primary, secondary, and higher education; Non-formal Education, which is also organized and structured but usually falls outside the formal education system, such as vocational training, skills courses, or community education; and Informal Education, which is unstructured, not always intentional, and occurs in daily life, for example, learning at home, in the environment, or through social experiences.

Inclusive education falls under both formal and non-formal education. Inclusive education can be applied at all levels and types of education recognized by ISCED, with the goal of ensuring equal and non-discriminatory access.

Inclusive education is a system that accepts all students, including those with disabilities, by providing accessibility in learning, curriculum, and school facilities, also every child has the right to learn together in the same environment without discrimination (UNICEF, 2017) . This vision is further supported by Sustainable Development Goal 4 (SDG 4), which emphasize the importance of providing inclusive and equitable quality education and promoting lifelong learning opportunities for everyone. Indonesia, in alignment with global standards, has enacted policies supporting inclusive education, this is evident in the enactment of Law Number 19 of 2011, which ratifies the Convention on the Rights of Persons with Disabilities, and Law Number 8 of 2016 concerning Persons with Disabilities, though practical implementation remains inconsistent.

Globally, the rise of educational technology (EdTech) has catalyzed innovations in inclusive EFL instruction. Digital platforms now offer multimodal learning resources, real-time feedback, and individualized scaffolding that align with Universal Design for Learning (UDL) principles. Assistive tools have become integral to these platforms, expanding the possibilities for students with special needs to participate in language classrooms without stigma or disadvantage (Chambers, 2020; Ramadani, 2024).

Although assistive technology has seen worldwide development, there is still a noticeable absence of research tailored to the specific Indonesian context regarding its use in inclusive EFL settings. This investigation endeavours to fill this void by examining the experiences, understandings, and difficulties faced by teachers who utilize AT in inclusive English language classrooms.

METHODS

The present study adopted a qualitative descriptive design to explore how assistive technology is adapted and implemented in inclusive English classrooms. This approach was chosen because it allows the researcher to capture authentic experiences, natural classroom interactions, and context-specific teaching practices used by teachers who work with learners with diverse disabilities. Rather than testing hypotheses, the study aims to understand meanings, patterns, and challenges that emerge from daily pedagogical activities.

The research was carried out in two public special schools in Jakarta that formally provide inclusive English instruction for students with hearing impairments and multiple disabilities. These settings were selected purposefully based on their active use of both low-

tech and high-tech assistive tools in language learning. Conducting the study in natural school environments enabled the researcher to observe real classroom behaviors, teacher decision-making, and the practical constraints that shape technology integration.

The participants consisted of English teachers who were directly responsible for planning and delivering lessons using assistive technology. They were selected because they possess firsthand knowledge of pedagogical strategies, classroom adaptations, and the ways in which students respond to various tools. Participation was voluntary, and each teacher provided informed consent prior to data collection. Ethical considerations were maintained throughout the research to ensure confidentiality and respect for the school community.

Data were gathered through semi-structured interviews that invited teachers to share their experiences, classroom practices, and reflections on the benefits and difficulties associated with assistive technology. The flexibility of this interview format encouraged participants to speak openly while allowing the researcher to probe deeply into topics that emerged spontaneously during the conversation. Interviews were conducted in a quiet and comfortable space within the school to maintain convenience and authenticity.

Classroom observations were also conducted to document the actual use of assistive tools during English lessons. These observations provided insights into how technology interacts with student behavior, lesson flow, and teacher improvisation. The researcher noted how students engaged with visual supports, auditory aids, and tactile materials, as well as how teachers adjusted their strategies when encountering technical or instructional difficulties.

Documentation served as an additional source of data, including teaching materials, lesson plans, visual aids, and school policies related to inclusive education. These documents enriched the understanding of how assistive technology was conceptually framed within the school and how it aligned with curriculum expectations. Collecting multiple forms of evidence ensured that the analysis did not rely solely on interview narratives.

All collected data were analyzed inductively through thematic analysis. The researcher repeatedly read interview transcripts, observation notes, and documents to identify recurring patterns, significant statements, and emerging themes. Natural Language Processing tools supported the process by assisting in keyword mapping and highlighting linguistic patterns, although the interpretive judgment remained fully grounded in human analysis. The combination of manual and digital techniques strengthened the credibility and depth of the findings.

To ensure trustworthiness, the study incorporated prolonged engagement in the field, methodological triangulation, and member checking with participating teachers. These strategies enhanced the accuracy of interpretations and reduced potential researcher bias. By grounding the analysis in multiple sources and validating interpretations with participants, the research aimed to present a reliable and contextually rich account of assistive technology use in inclusive English classrooms.

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RESULTS AND DISCUSSION

The Use of Assistive Technology in Inclusive English Classroom

The study found distinct practices between the two schools:

1. SLB Negeri 08 Jakarta used low-tech assistive tools such as picture cards, visual schedules, and communication boards for students with intellectual disabilities. These aids supported vocabulary building, comprehension, and sentence construction.
2. SLB Negeri 11 Jakarta utilized high-tech devices including Chromebooks, LCD projectors, and digital learning software for students with hearing impairments. Teachers used these to display subtitles, visual cues, and multimedia materials, enhancing comprehension and engagement.

These findings demonstrate that assistive technology is adaptable to different types of disabilities. Teachers selected tools that best matched students' learning styles, abilities, and classroom needs.

Challenges in the implementation of Assistive Technology

Teachers at both schools reported several common barriers:

1. Limited infrastructure: The availability of assistive devices was inadequate for all students.
2. Lack of teacher training: Many teachers lacked sufficient knowledge and confidence in integrating digital tools into English lessons.
3. Low student digital literacy: Some students found it difficult to operate technological tools independently.
4. Maintenance and funding: The cost and upkeep of devices posed additional challenges.

Despite these obstacles, teachers demonstrated high adaptability by modifying their teaching methods and creating alternative aids when devices were unavailable. This flexibility highlights teachers' creativity in maintaining inclusive learning conditions.

Impact of Assistive Technology on Learning Outcomes

The implementation of assistive technology positively impacted students' motivation, participation, and comprehension. Students with hearing impairments, for instance, showed improved reading and vocabulary skills when using visual media. Meanwhile, students with intellectual disabilities benefited from repetitive and visual-based aids that reinforced language structures.

Teachers noted increased confidence and interaction among students, demonstrating that AT promotes inclusivity and self-efficacy. The findings align with the idea that learning technologies not only assist in comprehension but also enhance students' overall engagement and sense of belonging

Discussion

The results emphasize that assistive technology contributes to equal learning opportunities. The adaptive use of AT bridges gaps between learners' needs and curriculum goals. However, sustainable success requires continued teacher training, adequate resources, and institutional support. The integration of technology must be aligned with pedagogical strategies that respect diversity and foster autonomy among students.

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CONCLUSION

This study demonstrates that the integration of assistive technology in inclusive English classrooms plays a meaningful role in creating more equitable learning environments for students with diverse disabilities. Through the perspectives of teachers and observations of classroom practices, the research reveals that technology can expand access to instruction, enhance engagement through multimodal learning, and help students participate with greater confidence. Visual aids, auditory enhancements, and interactive tools allow learners to process language input in ways that align with their individual needs, supporting both comprehension and motivation. At the same time, the findings highlight that successful implementation requires more than simply providing devices. Teachers encounter practical barriers related to limited training opportunities, inconsistent tool availability, and variations in students' digital readiness. These challenges underline the importance of sustained professional development, supportive school leadership, and adaptive teaching approaches that acknowledge the complexities of inclusive education. Overall, the study affirms that assistive technology has the potential to strengthen inclusive English pedagogy when supported by thoughtful planning, collaborative problem solving, and a commitment to accessibility. The conclusions contribute to a deeper understanding of how technology can be meaningfully integrated into language instruction for learners with special needs, while also pointing to the need for broader institutional support and future research that expands beyond the present context.

REFERENCE

Ainscow, M. (2020). Promoting inclusion and equity in education: Lessons from international experiences. *Nordic Journal of Studies in Educational Policy, 6*(1), 7–16. https://doi.org/10.1080/20020317.2020.1729587

Albataineh, M., Warren, B., & Al-Bataineh, A. (2024). The effects of Chromebook use on student engagement. *International Journal of Technology in Education and Science, 8*(1), 138–151. https://doi.org/10.46328/ijtes.530

Chambers, D. (2020). Assistive technology supporting inclusive education: Existing and emerging trends. In *International Perspectives on Inclusive Education* (Vol. 14, pp. 1–16). https://doi.org/10.1108/S1479-363620200000014001

Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (Sixth ed.). SAGE Publications.

Davis, F. D., & Venkatesh, V. (1996). A critical assessment of potential measurement biases in the technology acceptance model: Three experiments. *International Journal of Human-Computer Studies, 45*.

Diah, L., Adnyani, S., & Munir, A. (2022). Augmentative and alternative communication for Autism Spectrum Disorders children's language and communication. *Parole: Journal of Linguistics and Education, 12*(2), 198–205. http://ejournal.undip.ac.id/index.php/parole

Hoogerwerf, E.-J., Mavrou, K., & Traina, I. (2021). *The role of assistive technology in fostering inclusive education: Strategies and tools to support change*. Routledge. https://www.routledge.com/

Keelor, J. L., Creaghead, N., Silbert, N., & Kraus, T. H. (2020). Text-to-speech technology: Enhancing reading comprehension for students with reading difficulty. *Assistive Technology Outcomes and Benefits, 14*. https://www.atia.org/atob

Kisanji, J. (1999). *Inclusive education in Namibia: The challenge for teacher education*. https://www.eenet.org.uk/resources/docs/hist_theorectic.doc

Klimova, B., & Zamborova, K. (2023). Use of assistive and adaptive technology in learning English as a foreign language: A systematic review. *Contemporary Educational Technology, 15*(4). https://doi.org/10.30935/cedtech/13787

Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal design for learning: Theory and practice*. CAST Publishing. http://udltheorypractice.cast.org

Natale, R., Sudduth, C., Dowling, M., Messiah, S., Nunez, C., & Schladant, M. (2020). The development of an assistive technology toolkit for early literacy instruction. *Assistive Technology Outcomes and Benefits*. https://www.atia.org/atob

Nurul Arifa, F. (2024). Tantangan dalam mewujudkan pendidikan inklusif. *Info Singkat, XVI*(3/I), 1–8. https://pusaka.dpr.go.id

Oliver, M. (2013). The social model of disability: Thirty years on. *Disability and Society, 28*(7), 1024–1026. https://doi.org/10.1080/09687599.2013.818773

Putriani, Z., & Kurniawan, R. (2016). Assistive technology in education: Screen magnifier. *IJIELT, 2*(1).

Ramadani, R. (2024). Enhancing English learning for special needs students through technology. *Asian Journal of Research in Computer Science, 17*(6), 126–134. https://doi.org/10.9734/ajrcos/2024/v17i6462

Seitz, S., Auer, P., Bellacicco, R., & Editors. (2023). *International perspectives on inclusive education: In the light of educational justice*. https://doi.org/10.25656/01:26652

Setiyadi, A. B. (2020). *Teaching English as a foreign language* (Second ed.).

UNESCO. (2012). *International standard classification of education: ISCED two thousand eleven*. UNESCO Institute for Statistics. https://uis.unesco.org/en/glossary-term/education

UNICEF. (2017). *Inclusive education: Including children with disabilities in quality learning*. https://www.unicef.org/eca/sites/unicef.org.eca/files/IE_summary_accessible_220917_0.pdf

UNICEF. (2022). *The use of assistive technology in education: A guide for teachers and schools*. https://www.unicef.org/eca/media/30671/file

United Nations. (2016). *Committee on the Rights of Persons with Disabilities: General Comment on inclusive education*. http://tbinternet.ohchr.org/_layouts/treatybodyexternal/Download.aspx?symbolno=CRPD/C/GC/4&Lang=en

Young, D. (2024). Identifying inclusive training needs with the inclusive practices in English language teaching observation scale. *Asia-Pacific Journal of Second and Foreign Language Education, 9*(1). https://doi.org/10.1186/s40862-024-00287-9