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Digital Technology-Assisted Deep Learning in Language Classes: Exploring EFL Teachers' Perspectives of Students with Disabilities

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Abstract:

Although numerous studies have investigated digital technology-assisted deep learning in English as a foreign language (EFL) classes, only a few were conducted for students with disabilities. This study aims to explain teachers' perceptions regarding technology-assisted deep learning in English learning. This study employed a qualitative case study with six EFL teachers of the special schools in Indonesia. Data were collected through semi-structured interviews. Teachers' responses towards attitudes, perceived benefits, and challenges of digital technology-enhanced deep learning practices were analyzed through a thematic analysis. Findings revealed that EFL teachers had positive attitudes towards digital technology-assisted deep learning in language classes. It was also found that digital technology-assisted deep learning supported students' learning autonomy and engagement. However, the results of the study identified several challenges such as lack of suitable digital materials and technical constraints in classroom settings. The findings highlight that digital technology-assisted deep learning is a potential learning model to enhance students' autonomous learning for special education.

Keywords: *Digital Technology, Deep Learning, Language Classes, Teachers' Perspectives*

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Introduction

In language learning, students with disabilities frequently face several barriers in acquiring and producing language effectively. These barriers may cover learning autonomy, limited vocabulary mastery, and problems with learning concentration (Khotimah et al., 2019). Such difficulties obstruct students' ability to take part actively in the learning process, and affect their language achievement. These challenges arise in English as a foreign language (EFL) settings because students with disabilities experience both their limitations and the complexities of learning a new language simultaneously. Hence, innovative learning model are required to support their classroom learning atmosphere.

The integration of technology and pedagogy into language instruction is a promising model to be implemented. Digital technology offers students with various ways to learn and practice language, while deep learning provides more personalized and inclusive learning model which considers characteristics and needs of students in language classes (Aguiar-Castillo et al., 2021). Digital technology-assisted deep learning can enhance accessibility, enjoyment, and chances for students with disabilities that traditional learning methods cannot deliver.

Deep learning is a learning approach which emphasizes on three main principles, namely mindful, meaningful, and joyful learning. As compared to surface learning, deep learning has been acknowledged as effective pedagogical framework since it focuses on critical thinking, problem-solving, and deep understanding rather than memorization. Deep learning is a learning approach and learning outcome where the students achieve deep learning outcomes through deep learning processes (Marton & Saljo, 1976). Previous studies have shown that the benefits of deep learning are in terms of enhancing student autonomy, collaboration and high order thinking skills (Chen, 2019; Lin & Chen, 2020). Deep learning approach has been proved to develop language competence and digital literacy, making it a suitable approach for matching different levels and needs of various students.

When deep learning is combined with digital technology, it results in better learning outcomes among students. Digital technology-supported deep learning provides multimodal learning media such as text, audio, picture, video, and interactive game which accommodate diverse language proficiency and learning styles. Studies have highlighted the benefits of digital technology-supported deep learning in increasing student participation in classroom learning, motivation, and language acquisition (Cui & Yu, 2019; Zhan, 2021). For students with disabilities, this teaching model creates more accessible learning experiences which reduce learning barriers and trigger them to learn at their own pace.

Although a lot of studies on deep learning and technology-supported instruction have been carried out, limited attention has been paid to how EFL teachers perceive technology-assisted deep learning for students with disabilities. Most studies focus on students in general schools and emphasize on either pedagogy or technology separately (Jiang, 2022). This study intends to fill in this gap in relation to seek teachers' perceptions toward digital technology-assisted deep learning practices for special students.

This study attempts to answer the following research questions:

1. What are students' attitudes toward digital technology-assisted deep learning practices in language classes?
2. What benefits do EFL students with disabilities perceive from participating in digital technology-assisted deep learning in language classes?
3. What challenges do EFL students with disabilities face when engaging in digital technology-supported deep learning in language classes?

Methods

This study employed a qualitative case study. The participants were six EFL teachers of the special schools in Central Java Province, Indonesia. They experienced as English teachers for students with disabilities for more than five years. Some schools were private institutions while others are public. The teachers were chosen based on their teaching experiences and their involvement in using digital technology in EFL classroom practices.

The instruments were semi-structured interviews focusing on three main indicators. The interviews were employed to describe participants' perspectives of the implementation of technology-enhanced deep learning. The indicators were related to teachers' attitudes, perceived benefits, and challenges faced in language practices. The flexibility of semi-structured interviews allowed the researcher to obtain deeper understanding from the teachers and capture their authentic perspectives.

Prior to the data collection, informed consent was obtained to ensure ethical compliance and to guarantee that participants' personal identities and information remained confidential throughout the research. Data were collected face to face by interviewing the respondents. The interviews were carried out in a conversational and supportive manner to encourage respondents to share their beliefs and experiences in detail. Each session lasted approximately 40 to 50 minutes, all participants' responses were recorded to ensure validity and reliability in the data analysis process.

Thematic analysis was employed to explain teachers' perceptions toward attitudes, benefits, and challenges of digital technology-enhanced deep learning practices. This method was used to identify, categorize, and interpret recurring themes emerging from the interview results. The data were transcribed, coded, and analyzed to answer the research questions. Furthermore, triangulation and member checking were employed to ensure the trustworthiness and validity of the findings. Triangulation was conducted by comparing emerging themes across participants and employing multiple data sources. Member checking was carried out by sharing the interview results with the participants, allowing them to confirm the accuracy of the interpretations. These procedures improved credibility of the research results and avoided from bias.

Results and Discussion

Results

The present study intends to figure out EFL teachers' perspectives of the integration of technological tools and pedagogical frameworks in special education. Students with disabilities demonstrated generally positive attitudes toward digital technology-assisted deep learning practices. Teachers reported that students showed greater interest and motivation during lessons when technology-supported activities were implemented.

"Students have high interest and enthusiasm in learning English. They are learning English in an enjoyable manner because of using digital application with their mobiles" (Interview, EFL teacher 1).

"Students are motivated to learn English and digital tools provided in the application installed in their cellphones. The application also addresses students to work in groups" (Interview, EFL teacher 2).

Teachers highlighted that students were more motivated to participate, as the integration of multimedia features such as videos and interactive exercises made learning

more enjoyable. Also, teachers noted that the use of technology created a more inclusive learning environment, allowing students with different needs to feel more confident in joining language learning activities.

"Digital tools boost self-confidence in learning English. Students are willing to participate actively in the classroom" (Interview, EFL teacher 3).

"Many students intend to raise their hands and answer questions in the digital tools. They respond quickly for completing the tasks given by the teacher" (Interview, EFL teacher 4).

Digital technology-assisted deep learning fostered students' learning autonomy and engagement. Teachers monitored that students became more independent in exploring learning resources through technology, such as using online applications or interactive platforms.

"Students are dependent enough on doing their assignments. They could do the tasks without teacher' guidelines" (Interview, EFL teacher 5).

"With the teacher encouragement, students practice completing the tasks individually using their mobiles. They are autonomous for learning" (Interview, EFL teacher 6).

Participants indicated that technology encouraged active engagement, as students were willing to take more initiative in completing tasks and collaborating with peers. Teachers reported that digital tools allowed students to learn at their own pace, which not only improved their comprehension but also helped reduce anxiety when compared to traditional classroom methods.

"Students take part actively in answering the questions. They also want to collaborate with others" (Interview, EFL teacher 1).

"Students may learn English based on their English competences and learning styles. They manage their study equipped with mobile phones" (Interview, EFL teacher 2).

Despite these benefits, the study also identified several challenges faced by teachers in implementing technology-assisted deep learning. Participants emphasized the lack of suitable digital materials specifically designed for students with disabilities, which limited the effectiveness of classroom practices.

"I get many difficulties to provide suitable digital materials for learning. Adjusting the appropriate materials for student learning is a critical issue in special schools" (Interview, EFL teacher 3).

"I can get several sources from internet freely; however, many are not appropriate with student characteristics in learning" (Interview, EFL teacher 4).

Teachers reported experiencing technical constraints, such as unstable internet connections and limited access to devices, which disrupted the learning process. These conditions caused teachers in special schools need to upgrade their digital literacy skills.

"Internet connections seem to be the main problem for implementing digital tools in class. The school has not provided internet which cover all classrooms" (Interview, EFL teacher 5).

"Due to poor internet connection at school, students need to use their own internet facility. This causes more budget expenses for learning English" (Interview, EFL teacher 6).

Discussion

The findings reveal that students with disabilities show positive attitudes toward technology-assisted deep learning practices is consistent with prior studies emphasizing the motivational role of technology in inclusive classrooms. Previous research has shown that digital tools can increase learner confidence, reduce anxiety, and make learning more interactive for students with diverse needs (Kazanidis et al., 2019). Similarly, in language learning contexts, technology could enhance students' enjoyment and willingness to participate (Zhao & Qin, 2021). This study further supports the perspectives that when technology is combined with deep learning strategies, it not only engages students with disabilities but also fosters inclusivity and active involvement in EFL classrooms.

The results also portray that digital technology-assisted deep learning support students' autonomy and engagement, which aligns with prior findings that technology can facilitate learner-centered approaches (Wang, 2011). By allowing students to explore resources independently and progress at their own pace, technology encourages self-regulated learning, a key component of autonomy. Moreover, deep learning's focus on critical thinking and meaningful engagement is reinforced by technology-mediated practices, as seen in other studies that reported higher levels of collaboration and problem-solving in language learning environments (Chen, 2015). These outcomes highlight the potential of integrating technology with deep learning strategies to create sustainable and empowering learning experiences for students with disabilities.

Despite these benefits, the challenges identified in this study echo concerns raised in earlier research regarding the limitations of technology integration in special education settings. Studies have highlighted that the absence of appropriate digital materials tailored to students with disabilities often hinders effective implementation (Aderibigbe, 2021). Technical issues such as unstable internet and limited access to devices remain common barriers in many educational contexts (Tseng, 2020). Furthermore, teachers' limited digital literacy has been noted in several studies as a factor restricting the use of technology to its optimal potential (Esteban, 2020). These challenges underline the need for teacher professional development, building of disability-friendly digital resources, and improved infrastructure to guarantee that technology-assisted deep learning can be implemented optimally.

Conclusion

The findings of this study highlight that students with disabilities showed positive attitudes toward digital technology-assisted deep learning practices. The integration of technology not only enhanced students' motivation and participation but also supported their autonomy and engagement in language learning. However, the study also demonstrated several barriers, including the lack of suitable digital materials and technical constraints in classroom settings, which hampered optimal implementation. These results underline the potential of digital technology-assisted deep learning in fostering inclusive EFL classrooms although it also points to the need for systemic support to address existing barriers.

Regarding these findings, several suggestions can be implemented. For EFL teachers, there is a need to provide more specialized digital resources tailored to students with disabilities and to join training programs that develop teachers' digital literacy and pedagogical readiness. Policymakers should also prioritize improving infrastructure to ensure affordable access to technological equipments in special schools. For future

scholars, this study's limitation of employing only two special schools suggests the importance of conducting longitudinal studies with larger and more diverse samples.

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