

Artificial Intelligence in English Language Teaching: A Study of English Teachers' TPACK

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Abstrak

Penggunaan AI dalam pendidikan bahasa telah banyak dibahas terutama dalam mengidentifikasi kemampuan guru dalam memanfaatkan AI dalam pengajaran bahasa serta bagaimana guru memandang pentingnya penggunaan AI. Untuk menjawab kebutuhan tersebut, peneliti menggunakan instrumen survei TPACK dan wawancara semi terstruktur untuk menilai kemampuan 6 dosen bahasa Inggris dalam menggunakan AIED di Universitas Islam Ahmad Dahlan. Temuan menunjukkan bahwa ada beberapa tantangan yang dihadapi oleh pengguna AIED dalam pembelajaran bahasa Inggris seperti, (1) terbatasnya pengetahuan teknologi, (2) kurangnya pelatihan, (3) terbatasnya akses terhadap sumber daya teknologi, (4) tingkat keterampilan siswa, (5) kendala kebijakan dan administratif, serta (6) perubahan dan kebutuhan kurikulum. Secara keseluruhan, penerapan AIED dalam pengajaran bahasa Inggris di UIAD berpotensi meningkatkan hasil pembelajaran secara signifikan bagi pembelajar bahasa Inggris dengan memberikan pengalaman belajar yang dipersonalisasi, adaptif, dan menarik yang didukung oleh wawasan berbasis data dan perbaikan berkelanjutan.

Kata Kunci: Kecerdasan Buatan, Pengajaran Bahasa Inggris, TPACK.

Abstract

The use of AI in language education has been widely discussed especially in identifying the teachers' ability in utilizing AI in language teaching as well as how teachers perceive the utilization of AI are significant. To address these needs, the researchers used a TPACK survey instrument and semi-structured interview to assess 6 English teachers' ability to use AIED at Islamic University of Ahmad Dahlan. Findings show that there are several challenges faced by the users of AIED in English language courses such as (1) limited technological knowledge, (2) lack of training, (3) limited access to technological resources, (4) student skill levels, (5) policy and administrative constraints, as well as (6) curriculum changes and needs. Overall, the application of AIED in language teaching in UIAD has the potential to significantly enhance learning outcomes for English learners by providing personalized, adaptive, and engaging learning experiences supported by data-driven insights and continuous improvement.

Keywords: Artificial Intelligence, English language teaching, TPACK

INTRODUCTION

Technology usage in language learning has become popular in the 21st century. 21st century is a fast-paced digital world. Researching, communicating and even online job application across the world via computer or cell phone is something that very familiar in this era (Almanar n.d.). It provides countless opportunities and benefitting many countries (Suharti and Sutikno 2019). According to Fauzi et al. (2023), Advancements in technology over the past few decades have profoundly impacted multiple facets of human life.¹ One of the newest technology that has gained considerable attention is Artificial Intelligence in Education (AIED) (Rusmiyanto et al. 2023). *Artificial intelligence* is a computer science dedicated to

helping humans solve cognitive problems (Chassignol et al. 2018). The use of AI in language education has been widely discussed in the literature, and the majority of the studies show that AI positively supports language learning (Huang et al. 2023). According to (Chen et al. 2021), AI promotes language learners' active participation and positive learning outcomes. Learning language with AI also improves students' learning motivation (Chen et al. 2022). In addition, (Gamper and Knapp 2002) state that teachers commonly apply AI as User Modeling, Natural Language Processing (NLP), Natural Language Generation (NLG), Automated Speech Recognition (ASR), and Machine Translation in the teaching process.

The studies explained above address the potential use of AI to develop learners' language proficiency. Meanwhile, the issues about AIED users' voices, including educators still need to be thoroughly discussed, which is only several studies investigating the issues. For example, a study by (Pokrivcakova 2019) shows that most teachers are reluctant to use ICT in their classrooms for some reasons—first, the level of teachers' ICT skills. Second, there is a need for more information and experience in ICT integration (Pokrivcakova 2019). It becomes a crucial issue that requires addressing to effectively use AIED (Huang et al. 2023). Therefore, a future study investigating the voice of English teachers is needed.

Considering the potential use of AIED in language teaching and the issue of its application, this current study aims to address the gap within the literature. The teachers' perception/belief and ICT skills in using AIED in English Language Teaching will be explored in this study. Taking Indonesia as a research context is significant. It is because of the movement of the education system in Indonesia from traditional to modern education (Hastungkara and Triastuti 2019). In the late years, some subjects in High schools and universities in Indonesia have been taught through E-learning (Priyahita 2020).

AI application in language learning has been studied more frequently by researchers. Based on the literature review study by (Huang et al. 2023) the publication number arises significantly in the late year, accounting for 209 articles published between 2015 and 2019. This indicates that researchers' interest in AI in Education (AIED) is increasing. In addition, most of the AIED studies are done in United State Context, followed by Taiwan, Canada, United Kingdom, Japan, Germany, Greece, China, Australia, Hong Kong, New Zealand, Singapore, France, Turkey, and Spain (Song and Wang 2020), however, studies conducted in the region of South East Asia remain limited, which is only Singapore, noted in the literature (Calvo et al., 2010)(Song and Wang 2020)). Therefore, future investigation of the AIED application in the region is called for.

Furthermore, published studies focus on AIED software to facilitate/develop four language skills (writing, speaking, listening, reading), where AI-enhanced writing gained more attention (Calvo et al. 2010). AI was used to help the student to develop their writing competencies via Automatic Writing Evaluation (AWE) and Intelligence Tutoring Software (ITS) (Lee et al. 2015). ITS is also used in teaching reading. AIED with Natural Speech recognition (NSR) intelligence is used in speaking and listening skills. The AI can answer students' questions helping to enhance their speaking and listening skills (Ayedoun, Hayashi, and Seta 2019). Furthermore, AIED with ITS characteristics develops students' English vocabulary and grammar. This AIED can correct grammatical errors and suggest new related words or phrases, which are helpful for the students (Chen et al. 2022).

However, some issues need to be addressed in terms of the use of AI in language learning. Firstly, the reliability of AIED. Lee et al. (2015). doubted the accuracy of AI in evaluating the subjective feature of natural language. Secondly, social issues, such as data security and privacy, must be addressed by provoking AIED ethics (Zhang and Aslan 2021). Additionally, the users are reluctant, and low technological competencies also become a

consideration in the successful use of AIED in language learning (Huang et al. 2023). In that sense, assessing and developing teachers' technological skills through training is crucial in order to maximize the use of AI in language learning (Huang et al. 2023).

In order to assess the technological skill of teachers, a framework called Technological, Pedagogical, and Content Knowledge (TPACK) has been introduced. This framework was first sounded by (Mishra and Koehler 2006), TPACK studies conducted in Indonesia have discussed the technological skill of English teachers (Koh, Chai, and Natarajan 2018). The studies discussed the English teachers' TPACK in general. Although some investigations were done to explore Teachers' TPACK for specific language skills such as writing (Surayya and Asrobi 2020). and specific online apps such as WhatsApp (Tyarakanita, Nurkamto, and Drahati 2021), however, English Teacher's TPACK in using AIED is not well researched. Thus, a future study to explore the topic is needed in order to enrich the literature in the field of TPACK research in Indonesia.

This study aims to investigate ability and perception of English teachers in Islamic University of Ahmad Dahlan Sinjai in terms of the use AIED in classroom. In order to investigate those issues, research questions were proposed as follows:

1. What are challenges in using AIED in English classrooms?
2. How does the application of AIED in language teaching contribute to the learning outcomes of English learners?

To answer the formulated research questions above, this study can enrich the literature in the AIED release. In addition, the research gaps in the teacher agency, voice, and perception also be addressed by this current study. Regarding the High Education setting, this current study expected to contribute to the TPACK literature by investigating the ability of English teachers to incorporate AIED in language teaching, especially in Islamic University of Ahmad Dahlan Sinjai.

RESEARCH METHOD

This study used a qualitative design. A TPACK survey instrument adapted from (Chai et al. 2017) used to assess English teachers' ability to use AIED in their classrooms. The survey method is one of the research instruments that can evaluate participants' abilities (Bryman 2016). A semi-structured interview also used to investigate the challenges and learning outcomes. According to (Bryman 2016) a semi-structured interview is the standard way to gain more in-depth information from research participants. 6 (six) English teachers in English Education Study Program at Islamic University of Ahmad Dahlan selected using total sampling to participate in this study.

The theoretical framework below explains the significance of this study:

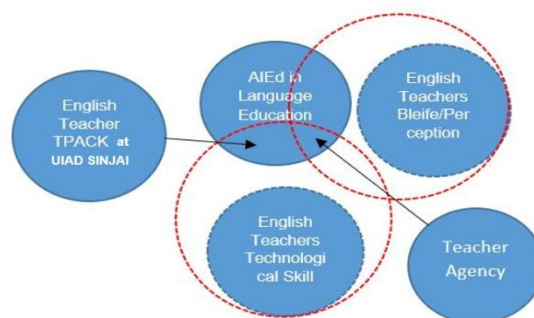


Figure 1. Theoretical Framework of AIED

The results also contribute practically. The finding of this study can be used by future researchers who are interested in the field of AIED. Additionally, educational stakeholders in Indonesia can consider the findings of this study to formulate an educational policy. Moreover, English teachers can use this study as a reference in integrating AIED into teaching practices.

RESULTS AND DISCUSSION

Interestingly, the challenges and risks of AI systems in ELT/L (English Language Teaching/Learning) were not as extensively reported as their benefits, with 67 percent of studies not mentioning any challenges. (Mlinarić, Horvat, and Šupak Smolčić 2017) states that this fact could be attributed to positive publication bias where researchers emphasize benefits or positive aspects rather than negatives. Anna Hart mentioned that while AI (Artificial Intelligence) offers numerous benefits for the education sector and shows great promise as a tool for children's learning, it is still an emerging technology and, consequently, presents several significant challenges to address (Hart 2023). Furthermore, according to (Crompton et al. 2024), there are four key areas of reported challenges, such as technology breakdowns, limited capabilities, fear, and standardizing language.

In line with statement above, the facts derived from observations and interviews with English language lecturers at UIAD campus regarding the challenges of using AIED in English language courses are: (1) Limited Technological Knowledge: Some lecturers and students may have limitations in understanding the available technology and the best ways to integrate it into English language learning. They may feel less confident or uncomfortable using certain technological tools. (2) Lack of Training: Inadequate training in the use of educational technology can be a barrier. Without sufficient training, lecturers may not have a thorough understanding of how to effectively integrate technology into English language learning. (3) Limited Access to Technological Resources: The campus does not provide adequate access to technological resources, such as hardware and software. This can make it difficult for lecturers and students to implement AIED in their learning. At UIAD campus, only a small fraction of students has laptops. (4) Student Skill Levels: The technological skill level of students can also affect the use of AIED by lecturers. If students have limited technological skills, teachers may find it difficult to use technology effectively in English language learning. (5) Policy and Administrative Constraints: Some campus policies or administrative constraints may limit lecturers' flexibility in using technology in teaching. For example, internet access restrictions, data privacy policies, or lack of administrative support can be barriers. (6) Curriculum Changes and Needs: Changes in the curriculum or evolving learning needs can make it difficult for lecturers to adapt the use of technology in English language learning effectively

Hart (2023) offered several solutions to some AI problems might exist during the learning process. She claimed that each solution aims to mitigate those issues by providing useful suggestions and considerations for effective usage of AI. The solutions include offering AI training, demonstrating effective AI usage to children, teaching internet safety, ensuring thorough fact-checking, encouraging creativity, and educating about potential biases.

The researchers found there are some solutions related to the challenges faced by English lecturers in using AIEd, based on the findings from existing sources: (1) Training and Professional Development: Conduct regular training and professional development sessions for lecturers on the use of educational technology. These trainings should include an understanding of various AIEd tools and the best practices for integrating them into English language learning. It highlights the necessity for English language teachers to be prepared to use AI ethically and effectively by providing them training provision and continuing professional development programs (Crompton et al. 2024). (2) Providing Technology Access: Ensure that the campus provides adequate access to technological resources, such as hardware and software. This may include device loan programs or subsidies for devices for lecturers and students in need. (3) Integrated Curriculum Development with Technology: Integrate technology into curriculum planning for English language courses. This can be done by including modules or activities that utilize AIEd to enhance learning. (4) Adequate Administrative Support: Establish campus policies that support the use of technology in teaching, and provide the necessary administrative support for technology implementation. This includes support in terms of internet access, appropriate data privacy policies, and the role of supporting administrative staff. (5) Interdisciplinary Collaboration: Encourage collaboration between English language lecturers and educational technology experts to exchange knowledge and experiences. This can help lecturers understand the best ways to use technology in the context of English language learning. (6) Development of Customizable Learning Plans: Develop customizable learning plans based on students' technology skill levels. Lecturers can devise different teaching strategies for students with varying levels of technological proficiency.

By implementing these solutions, it is hoped that lecturers can overcome the challenges in using AIEd and improve the effectiveness of English language learning at UIAD.

The application of Artificial Intelligence in Education (AIEd) in language teaching offers several benefits that can contribute to the learning outcomes of English learners will be show in the diagram below:

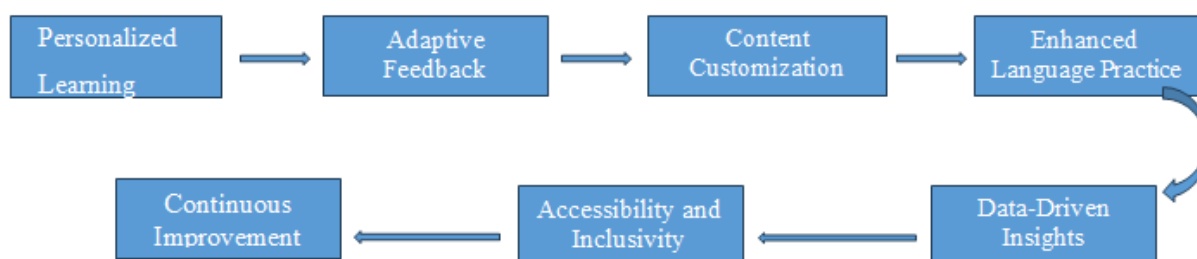


Figure 2. Diagram of AIEd

The application of Artificial Intelligence in Education (AIEd) in language teaching offers several benefits that can contribute to the learning outcomes of English learners: (1) Personalized Learning: can analyze individual learning patterns, preferences, and strengths, allowing for personalized learning experiences tailored to each student's needs. This

personalized approach helps students progress at their own pace, leading to more effective learning outcomes. (2) Adaptive Feedback: AIED powered language learning platforms can provide instant feedback on grammar, pronunciation, vocabulary usage, and sentence structure. This immediate feedback helps learners identify and correct mistakes in real-time, facilitating faster progress and deeper understanding. (3) Content Customization: AIED can dynamically adapt learning materials and activities based on students' performance and progress. This ensures that learners are consistently challenged at an appropriate level, keeping them engaged and motivated throughout their language learning journey. (4) Enhanced Language Practice: AIED platforms often incorporate interactive activities, simulations, and chatbots that provide learners with opportunities for immersive language practice. These interactive experiences simulate real-world language usage scenarios, allowing students to apply their knowledge and skills in authentic contexts. (5) Data-Driven Insights: AIED analytics tools can track and analyze learners' interactions with educational content, identifying areas of strength and weakness. Educators can use these insights to tailor instruction, provide targeted support, and intervene, when necessary, ultimately leading to improved learning outcomes. (6) Accessibility and Inclusivity: AIED-powered language learning platforms can be designed to accommodate diverse learning styles, preferences, and abilities. Features such as text-to-speech, translation assistance, and multi-modal content presentation make language learning more accessible to a wider range of learners, including those with disabilities or special needs. (7) Continuous Improvement: AIED can continuously learn from user data and feedback, allowing educational platforms to evolve and improve over time. This interactive process ensures that the learning experience remains relevant, effective, and up-to-date with advancements in language teaching pedagogy and technology.

Overall, the application of AIED in language teaching in UIAD has the potential to significantly enhance learning outcomes for English learners by providing personalized, adaptive, and engaging learning experiences supported by data-driven insights and continuous improvement.

CONCLUSION

The literature on AIED in language education has been discussed, and several research gaps have been investigated. First, a limited number of AIED studies are conducted in the south East Asian region. Second, the teacher agency (belief/perception) is not well-researched in the AIED literature. Third, the ability to explore English teacher ability to use AIED is also still limited. The formulation of research questions aims to fulfill the gaps within the literature. Therefore, the result of this study hopefully will serve theoretical as well as practical contributions to the effective use of AIED in English language teaching.

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