

English Pre-Service Teachers' Ability to Use Artificial Intelligence-Based Application in Reading Comprehension

Rully Agung Yudhiantara^{1*}, Hamdan Sugilar²

¹Department of English Education, Faculty of Education and Teacher Training

²Department of Mathematics Education, Faculty of Education and Teacher Training.

Universitas Islam Negeri Sunan Gunung Djati, Indonesia

Jalan A.H Nasution No. 105, Cipadung, Cibiru, Kota Bandung, Jawa Barat 40614

Submission Track:

Received: August 9, 2023

Revised: December 16, 2023

Accepted: December 30, 2023

Keywords:

Artificial Intelligence, Application, Reading Comprehension

*Corresponding Author:

rully.agung@uinsgd.ac.id

Copyright@2023 (author/s)

Abstract: This research article delves into the exploration of English pre-service teachers' proficiency in utilizing an artificial intelligence-based application, specifically Quillbot, to enhance reading comprehension within the context of English for Islamic studies. Qualitative data are derived from questionnaire, learning tasks and focus group discussions, which delve into students' perspectives on artificial intelligence for language learning and language teaching. The results indicate that English pre-service teachers adeptly harnessed Quillbot to paraphrase text from articles, effectively enhancing reading comprehension. Beyond paraphrasing, students demonstrated their analytical skills by subjecting Quillbot's output to grammar analysis. Moreover, the study showcased participants' comprehension abilities as they crafted questions and answers rooted in the article's content. Ultimately, the findings underscore the participants' favorable outlook on AI tools for facilitating language learning and teaching, accentuating the positive stance of English pre-service teachers toward integrating AI technologies into language education.



This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license

INTRODUCTION

In recent years, the integration of technology, particularly artificial intelligence-based applications, has brought about remarkable transformations in various sectors, including education (Hennessy et al., 2007). Language learning, being one of the foundational pillars of education, has experienced a paradigm shift with the advent of digital tools (Chubko et al., 2020). Artificial intelligence (AI)-based applications have been developed to help several tasks particularly in industrial sector. In education sector, researchers have increasingly recognized the potential of technology particularly artificial intelligence-based application to assist learning (Ertel, 2017). AI has attracted scholars in education concerning the potential, challenges and threat in education (Jagadesh Kumar, 2023).

The significance of incorporating technology in education has been extensively explored in the academic realm (McCoy & Lynam, 2022). Various platform can be used to teach language including youtube (Fachriyah & Perwitasari, n.d.) and other social media

platforms like twitter (Yudhiantara, 2017) and Instagram (Yudhiantara & Nuryantini, 2019). The integration of technology in language learning can lead to improved student engagement, enhanced language proficiency, and greater autonomy in the learning process (Kwangsawad, 2019).

Artificial intelligence (AI)-driven applications have been introduced within the realm of education, attracting significant scholarly interest, especially in higher education settings (Kohnke et al., 2023). Among AI-based language tools, Quillbot has garnered attention due to its potential in aiding students with tasks related to grammar, vocabulary, and paraphrasing (Fitria, 2021). The application holds promise for assisting language learners in addressing educational assignments furnished by language educators, proving particularly advantageous in refining writing and reading proficiencies. The integration of Quillbot aligns seamlessly with language instructors' efforts to enhance language learning experiences, emphasizing its pertinence in augmenting reading comprehension—a relationship established by the positive correlation between advanced writing skills and improved reading comprehension abilities. The introduction contains the purpose of the study and why you are conducting the study. The main section of an article should start with an introductory section which provides more details about the paper's purposes, motivation, research methods and findings. The introduction should be relatively nontechnical, yet clear enough for an informed reader to understand the manuscript's contribution.

Scholars have extensively explored the applications of AI across various domains, with education being a focal point. In a qualitative interpretive study, Kohnke et al., (2023) aimed to discern the essential digital competencies and pedagogical expertise required by educators to effectively integrate generative AI into educational practices. Furthermore, the study offered valuable insights into shaping professional development programs, which are tailored to address the challenges and reservations tied to the incorporation of AI in language learning. In this context, the significance of digital literacy for language instructors is underscored as it equips them with the requisite skills and knowledge to adeptly harness AI tools in the realm of language education (Khokhar, 2016)

Reactions to AI-driven applications exhibit diversity among educators. Certain instructors embrace these tools, displaying a readiness to learn and harness the advantages of AI for educational purposes (Jagadesh Kumar, 2023). Conversely, a significant number of educators harbor concerns and apprehensions surrounding AI. An examination was conducted to elucidate teachers' apprehensions and reservations regarding the integration of artificial intelligence within higher education. The study delved into educators' cognizance of AI, their inclination to incorporate AI in their teaching practices, concerns related to equity and accountability, and the gaps in their familiarity with artificial intelligence, as well as the resources accessible for engaging with AI in pedagogical approaches (McGrath et al., 2023).

The realm of education is gradually embracing AI, and the optimal approach to this acceptance involves acquiring the knowledge of how to harness the advantages that AI offers for educational purposes. Academics have documented endeavors aimed at introducing and integrating AI into educational contexts. These endeavors encompass a range of studies, one of which identifies distinct ethical principles unique to K-12 education, namely: Pedagogical Appropriateness, Children's Rights, AI Literacy, and Teacher Well-being (Adams et al., 2023); Another study explores the competencies essential for attaining

artificial intelligence literacy within Nigerian secondary schools, highlighting the significance of collaborative efforts and the role of human-tool interaction in achieving AI literacy through course content (Sanusi et al., 2022). In addition, scholars have examined the Applications of AI in Education (AIED) and scrutinized how AI technologies have been seamlessly integrated across the vital educational domains of learning, teaching, assessment, and administration (Chiu et al., 2023)

In the specific realm of English for Islamic studies, limited investigation has been carried out concerning the impact of digital literacy and AI tools on the enhancement of reading comprehension. Given that language learning within this domain revolves around comprehending intricate Islamic concepts and texts in English, comprehending the potential technological assistance in facilitating students' grasp of these complexities is crucial. Previous scholarly inquiries into the amalgamation of technology, digital literacy, and language learning have provided the groundwork for comprehending how AI-driven applications can potentially enrich students' reading comprehension abilities (Fitria, 2021).

Nonetheless, despite the substantial body of research exploring the integration of technology, particularly AI, into language learning, there exists a scarcity of studies that explicitly delve into students' engagement with AI for enhancing reading comprehension within the specialized context of English for Islamic studies. The current investigation directs its focus towards English pre-service teachers who are enrolled in the English for Islamic studies course—an integral domain that encompasses the comprehension of English texts elucidating Islamic doctrines and teachings (Islam & Islam, 2019). Within this study, one specific AI-powered application, namely Quillbot, is seamlessly integrated into the language learning process to enhance reading comprehension. This study strives to bridge the existing research gap by scrutinizing how English pre-service teachers specializing in Islamic studies utilize Quillbot to augment reading comprehension, how they assess the outcomes generated by the Quillbot application, and their perspectives on the role of AI in language learning and language teaching.

METHOD

This study is qualitative in nature (Creswell, 2014). It explores English pre-service teachers' experience in utilizing computer applications, with a specific focus on the AI tool Quillbot. Data were collected using questionnaire, observation, language learning task, and focus group discussion (Barrett & Twycross, 2018). The study comprised participants currently enrolled in their 6th semester, pursuing the course "English for Islamic studies." This particular group was chosen as they represent a cohort of students with a certain level of language proficiency and familiarity with the subject matter.

The data collection process involved several stages to gather comprehensive insights into the participants' experiences and abilities. Firstly, the questionnaire was distributed to explore their knowledge on AI and Quillbot application. questionnaires were distributed among the participants to capture their perceptions and attitudes towards using artificial intelligence tools in language learning. The questionnaires aimed to delve into their experiences with Quillbot, their perceived strengths and limitations, and their overall satisfaction with the application. Secondly, classroom observations were conducted during the course where Quillbot was introduced to accomplish the task. This allowed researchers

to observe the students' interactions with the application and their engagement in reading comprehension tasks.

To assess the students' ability in using Quillbot, and their ability to analyze grammar aspect of the Quillbot result, reading comprehension task was administered. In this task, there are three sections to accomplish. Section one required students to use Quillbot to paraphrase the text from the article. In section two, students are required to perform their ability to analyze the grammar aspect from Quillbot results. To demonstrate their reading comprehension, section three requires students to write questions and answers based on the information from the text. Last technique to collect the data is a focus group discussion. It was conducted to corroborate the findings from questionnaire regarding students' knowledge on AI, Quillbot strength and weakness and the importance of AI for language learning and language teaching.

The data analysis process followed a systematic approach, incorporating multiple stages to ensure rigor and validity. Initially, data reduction techniques were employed to organize and manage the vast amount of collected data. This involved categorizing and summarizing the questionnaire responses, observations, reading comprehension task, and focus group discussions. Next, the data presentation phase involved presenting the findings in a clear and comprehensible manner. During the data conclusion phase, the researchers interpreted the results and drew meaningful insights from the collected data. The proficiency of pre-service teachers in utilizing Quillbot and their ability to analyze its outputs were thoroughly examined. The focus group discussions provided valuable qualitative data, shedding light on the participants' opinions regarding AI and Quillbot application in language learning and language teaching in the context of English for Islamic studies. Overall, the data analysis process provided valuable evidence regarding the participants' experiences and attitudes towards using computer applications specifically AI application Quillbot, for reading comprehension in the course of English for Islamic studies.

RESULT AND DISCUSSION

This research collected information to meet the goals of the current study. The collected information revealed five main findings: initially, the utilization of the Quillbot application by English pre-service teachers; next, their competence in evaluating the grammatical results produced by the Quillbot application; third, their skill in writing questionnaire and answers based on the information from the text; fourth, their viewpoints regarding applications based on artificial intelligence, notably emphasizing Quillbot's utility in language teaching and learning.

1. English pre-service teachers' performance to use Quillbot to accomplish reading comprehension

This research obtained information through a task assigned to students within the framework of the English for Islamic studies course. The task evaluated students' proficiency in employing Quillbot to paraphrase sentences extracted from the assigned text. The outcomes generated by Quillbot were transcribed into a table, juxtaposing the original sentences from the text on the left and the corresponding Quillbot-generated paraphrased versions on the right column. An illustration of a student's task is depicted in Figure 1 below.

Nama : Aulia Nurhasanah

Nim : 1202040020

Kelas : PBI-6A

Converging Islamic and religious norms in Indonesia's state life plurality

No	Sentence taken from the article	Paraphrase version from Quillbot
1	Living together as a society entails establishing cooperative relationships to meet the living needs.	To address the demands of society as a whole, cooperative connections must be established.
2	Additionally, there are disputes and rivalries between people or groups.	There are also conflicts and competitions between individuals or groups.
3	Legal history holds that society shapes and molds law. The most esteemed legal scholar in history, F.C. von Savigny, asserted that jurisprudence came after customs and traditions as the origin of law.	According to legal history, law grows and develops from society. F.C. von Savigny, the most meritorious expert in the history of law, stated that law began as customs and traditions, followed by jurisprudence.
4	Law, according to Savigny, is inextricably linked to strong social engagement. Its name, <i>volkgeist</i> , translates to "law is the soul of the nation."	Savigny identified law as inseparable from intense social interaction. It is called <i>volkgeist</i> , meaning that law is the nation's soul.

Figure 1. . Student's work to use Quillbot application to paraphrase text in the task

Figure 1 illustrates a table comprising of a pair of columns. The left column contains sentences extracted from the journal article, while the right column displays the paraphrased outcomes produced by Quillbot. This representation highlights the student's proficiency in utilizing the Quillbot artificial intelligence-based application to complete a language learning assignment.

In terms of the students' capacity to utilize the Quillbot AI-based application, the information gathered from the questionnaire aligns with the findings from the document of learning task . Various inquiries were posed to the students, assessing their understanding of AI. Their responses to the survey pertaining to Quillbot utilization reflect their competence in operating this application.

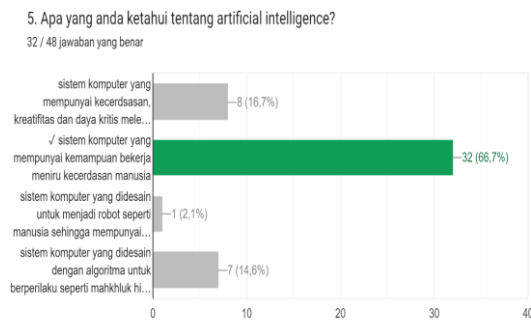


Figure 2. students' responses regarding their knowledge on AI

Derived from the findings depicted in Figure 2, it is evident that students possess a sound understanding of AI, with a notable 66% of students demonstrating proficient knowledge on AI. Conversely, a portion of students display less adeptness in comprehending artificial intelligence. This discrepancy arises from their familiarity with the term, yet not actively seeking sources to fully grasp its concepts.

Another query within the questionnaire inquired about various applications rooted in artificial intelligence that aid in enhancing language learning endeavors. This question garnered numerous replies from students, detailing a range of applications they have encountered and utilized to facilitate language learning. The compilation of their responses is depicted in Figure 3.

6. Sebutkan aplikasi-aplikasi berbasis artificial intelligence yang pernah atau biasa anda gunakan dalam belajar bahasa Inggris?

48 jawaban

Quillbot, Grammarly
Grammarly
Quillbot
Online transkrip, Paraphrase AI
Duolingo, Rosetta Stone, HelloTalk, Grammarly, Quillbot, etc.
ChatGPT, google translate, grammarly, quillbot
openAI/chatGPT

Figure 3. Students' responses on some AI-based applications that they have used

From the insights they provided, it becomes evident that AI-driven applications are not unfamiliar to them. Given their frequent online engagement and they encounter advertisements related to such applications. They have experimented with a range of applications, encompassing Grammarly, quillbot, Duolingo, paraphraser, and ChatGPT. Their hands-on experience with these tools underscores their proficiency in navigating digital applications to accomplish their language learning activities.

Within this investigation, the Quillbot application was selected to aid students in rephrasing sentences extracted from the journal article. The students have exhibited their familiarity with the Quillbot application, with a visual representation of their comprehension presented in Figure 4.

7. Apa yang anda ketahui tentang aplikasi Quillbot?

48 jawaban

Memudahkan untuk memparafrase sebuah teks
Aplikasi yang dapat membantu kita dalam penulisan. Quillbot juga menyediakan fitur parafrase dan rewriting, dapat merangkum paragraf, dapat mengganti dan memanipulasi kata, juga dapat memeriksa grammar dan spelling.
alat operasi untuk membantu
Quillbot adalah aplikasi yg membantu kita memparafrase paragraf
quillbot adalah web yang dapat digunakan untuk mengecek grammatikal, memparafrase, juga menerjemahkan dari satu bahasa ke bahasa yang lain.
Aplikasi yang didalamnya terdapat banyak fitur, salah satunya adalah pharaprse

Figure 4. Students' knowledge on Quillbot application

Derived from the data presented in Figure 4, it is observable that students have showcased their understanding of the Quillbot application. While a portion of students have indicated a modest level of familiarity, others have displayed a more comprehensive grasp of the application. One student elucidated that the application is versatile, assisting in writing tasks and providing functions such as paraphrasing, rewriting, summarizing paragraphs, and grammar and spelling checks. This particular response underscores a solid comprehension of the application.

2. Their competence in evaluating the grammatical results produced by the Quillbot application

The second findings concern English preservice teachers' ability to perform grammar analysis on the results from Quillbot application. The proficiency of students in assessing the grammatical outcomes generated by the Quillbot application reflects their ability to critically analyze and interpret the language enhancements suggested by the tool. This competence entails a meticulous examination of sentence structures, word choices, and overall coherence, enabling students to discern between accurately improved text and potential errors introduced by the automated process. A high level of competence in this aspect demonstrates their skill in discerning nuanced grammatical nuances and their capacity to make informed decisions about language refinement. One of the examples from students' work can be seen in figure 4 below.

D. Analyze the results of Quillbot in terms of GRAMMAR (Clause and subject). Apply the analysis on each sentence

No	Paraphrase version from Quillbot	Grammar
1.	Many research have been conducted to examine the dynamics of Islamic Sharia in Aceh.	Clause: Many studies have been conducted to examine the dynamics of Islamic Sharia in Aceh. Subject: Many researches Predicate: Have been conducted
2.	Arskal Salim, Hasni Basri Siregar, Moch. Nur Ichwan, and R. Micheal Feener explore the legal, sociological, and political concerns of instituting Islamic Sharia.	Clause: Arskal Salim, Hasni Basri Siregar, Moch. Nur Ichwan, and R. Micheal Feener explore the legal, sociological, and political concerns of instituting Islamic Sharia. Subject: Arskal Salim, Hasni Basri Siregar, Moch. Nur Ichwan, and R. Micheal Feener Predicate: Explore
3.	Their research stresses that the formalisation of Islamic Sharia is more than just desires for Acehnese.	Clause: Their research stresses that the formalization of Islamic Sharia is more than just desires for Acehnese. Subject: Their research Predicate: Stresses
4.	David Kloos investigated Muslims' experiences in one community in Banda Aceh where Islamic Sharia serves as a foundation for recovering and rising from slumps caused by	Clause: David Kloos investigated Muslims' experiences in one community in Banda Aceh where Islamic Sharia serves as a foundation for recovering and rising from slumps caused by tsunamis and political

Figure 5. students' ability to analyze grammar aspect from the result of Quillbot application

Derived from the information presented in Figure 4, it is evident that students have displayed their aptitude for scrutinizing the grammatical dimension of the Quillbot application's outcomes. The students dissected the sentences, focusing on elements like clauses and subject-predicate relationships. Those components are crucial in constructing a particular sentence. This underscores their capability to dissect the grammatical attributes within the Quillbot-generated results, showcasing a clear demonstration of their grammar analytical proficiency. Without proper knowledge on grammar, it is difficult for students to analyze subject, predicate and clause within a sentence.

3. Their ability to write questions and answers based on the information from the text

This study explores English preservice teachers' reading comprehension by asking them to write question and answer based on the text they learn. The students' capacity to formulate questions and construct corresponding answers based on the information extracted from the text highlights their adeptness in comprehension and application. This ability signifies their skill in extracting key details, synthesizing knowledge, and structuring coherent inquiries that delve deeper into the subject matter. By crafting accurate responses that address the questions they pose, students not only demonstrate their grasp of the material but also showcase their analytical thinking and proficiency in articulating meaningful connections between concepts. This multifaceted skill set underscores their capability to

engage critically with the text and extract valuable insights, ultimately contributing to their overall mastery of the subject matter. One of the examples from students' work can be seen in figure 6.

Write 5 questions and answer

No.	Question	Answer
1	What did Arskal Salim, Hasni Basri Siregar, Moch. Nur Ichwan and R. Micheal Feener discussed?	Arskal Salim, ¹ Hasni Basri Siregar, ² Moch. Nur Ichwan, ³ and R. Micheal Feener ⁴ discuss the legal and sociological aspects and the politics of institutionalising Islamic sharia.
2	What are the results of their research?	Their research emphasises that the formalisation of Islamic sharia is not mere aspirations but collective identities of Acehese.
3	What did David Kloos study?	David Kloos investigated Muslims' experiences where Islamic sharia serves as a foundation for people to recover and rise up from setbacks brought on by political conflicts and tsunamis.
4	Where did David Kloos study his research?	David Kloos examined Muslims' experiences in one village in Banda Aceh where Islamic sharia functions as a basis for one to recover and rise up from slumps due to tsunami and political conflicts.
5	After the implementation of Islamic law, what did the academics see?	Other scholars have examined gender relations, cultural resistance, or religious relations after Islamic Sharia being

Figure 6. Student's work to write question and answer based on the information from the text

Figure 6 provides a compelling glimpse into a student's remarkable aptitude for comprehending the material they have learned. Through the skillful creation of questions and their corresponding answers, it becomes evident that this student has not only absorbed the information from the text but has also internalized its nuances. The formulation of probing questions implies a depth of engagement that goes beyond surface-level understanding. By thoughtfully constructing accurate and relevant answers to these questions, the student demonstrates the ability to synthesize and apply the knowledge gained. This process showcases a holistic grasp of the subject matter, underscoring their analytical prowess and illustrating their capacity to actively process and integrate new information.

4. Their viewpoints regarding AI and Quillbot Application for language learning and language teaching

In the previous section, the data on English preservice teachers' ability to use artificial intelligence based Quillbot application, their ability to analyze the result of application in terms of grammar and their reading comprehension by writing question and answer have been described. In this section, the data on English preservice teachers' opinion regarding the need for future language teachers to be able to perform artificial intelligence application for language learning and language teaching.

The exploration of students' perspectives on AI and the Quillbot application for both language learning and language teaching offers valuable insights into their evolving attitudes towards technology-driven educational tools. Through candidly sharing their viewpoints, students provide a window into their beliefs, apprehensions, and expectations regarding the role of AI in the realm of language teaching. This inquiry delves into how students perceive the Quillbot application's efficacy as a facilitator of language comprehension and communication. Their viewpoints shed light on the extent to which these technological advancements are perceived as beneficial aids or potential substitutes for traditional instructional methods. By capturing students' nuanced opinions on the integration of AI-driven tools like Quillbot, this investigation contributes to a deeper understanding of the

evolving educational landscape, informing educators and policymakers about the alignment between technological innovation and pedagogical objectives.

English pre-service teachers showcased their familiarity with artificial intelligence during the group discussion, where they expanded upon the responses provided in the questionnaire. A number of participants articulated their viewpoints, with one stating that "artificial intelligence proves advantageous in achieving tasks, particularly in educational and professional contexts," while another voiced support, highlighting that "artificial intelligence is indispensable for language acquisition. Students must possess the ability to navigate AI applications to address their learning requirements."

During the discussion, participants conveyed their encounters with numerous artificial intelligence-driven applications employed for language learning. Among the applications mentioned were Grammarly, Duolingo, Google Translate, and Quillbot. One student offered insight, sharing, "I often utilize Google Translate to convert text into English, particularly for tasks such as writing and translation in various courses." Another student chimed in, explaining, "Quillbot is handy for rephrasing sentences, and I do make additional revisions to ensure appropriateness."

In the discussion regarding Quillbot, a plethora of insights emerged. Students opined that Quillbot holds advantageous attributes for aiding language learning, proving particularly useful in tackling diverse assignments set by their lecturers in several courses such as writing, reading, and translation. One student provided an illustrative account, stating, "In my writing course, I rely on Quillbot to rephrase sentences. If the phrasing is accurate and fitting, I incorporate it. Occasionally, I do make slight modifications to certain words in the Quillbot-generated paraphrase."

Among the four language skills, participants find writing skill to be the most demanding aspect within their department. AI-driven applications like Quillbot prove advantageous in aiding their writing competency. During the discussion, various advantages of Quillbot for enhancing writing skills were deliberated upon. These advantages encompass the application's provision of diverse vocabularies or word choices when constructing sentences, its grammar correction feature, and its capability to summarize textual content.

After deliberating the advantages presented by the Quillbot application, participants were prompted to explore its limitations. Various drawbacks encountered by students were addressed. These concerns encompass the application's inability to comprehend context, occasional inaccuracies leading to confusion, inapplicability for lengthier texts, and a word count constraint of 125 words.

During the focused group discussion, participants elaborated on the significance of equipping future language teachers with technological competence, encompassing computer proficiency, application usage, and internet navigation skills. One student provided insights, stating, "A strong command of computers and the internet is vital for language teachers. Computers facilitate the design and formulation of lessons, while the internet serves as a crucial resource for adapting and selecting learning materials." The mastery of specific applications like Microsoft Word, Excel, and PowerPoint was highlighted as an essential requirement for language teachers."

Participants in the discussion reached a consensus regarding the necessity for candidate language teachers to possess the competence to effectively utilize the internet for

language teaching purposes. The advent of artificial intelligence-driven applications within the online sphere has proven notably beneficial, as participants attested. Student sentiments reflected this sentiment, with one stating, "Google Translate serves as a valuable tool for language learning, and its precision is continually improving." This collective viewpoint supports the notion of seamlessly integrating AI-powered applications into language education. Both students and instructors are encouraged to leverage these applications to enhance the overall teaching and learning experience.

In this section, the findings of the present study will be discussed with relevant literature and previous studies to offers insights into the implications of the study. Each finding in this study will be discussed. To end this section, limitation of the present study and suggestion for further study will be presented.

The first finding underscores the aptitude demonstrated by English pre-service teachers in employing the Quillbot application for paraphrasing sentences taken from scholarly journal text. This competence reflects their proficiency in harnessing AI-based tools to accomplish the task assigned in the course of Islamic studies. The ability to efficiently rephrase sentences through Quillbot suggests a promising avenue for fostering language fluency and articulation on the part of the students. The finding of the present study support previous study on Quillbot application. The application might serve to assist students in language learning (Fitria, 2021). The participants of the present study had no difficulty to navigate the application because they belong to digital natives(Prensky, 2001). The generation are glued to their gadget and spend their time regularly to access internet. Unlike their parents, they are more skillful to navigate internet and explore digital tools for entertainment and other purposes like education(Kesharwani, 2020).

The second finding accentuates the participants' engagement in analyzing the grammatical outcomes produced by the Quillbot application. In this context, grammar knowledge is important for language learner (Hodgson & Harris, 2021) needed to demonstrate their analytical skill. A good command of grammar knowledge may help them to be able to analyze the results from the application. Students have many sources to learn grammar from their gadget and access to internet (Wang & Smith, 2013) This analytical endeavor signifies a deeper level of interaction with AI-driven technology, where participants not only utilize the tool but also critically evaluate its suggestions. Passive users are not able to criticize the results from artificial intelligence. It takes a proper digital literacy on the part of students to be able to evaluate the results from AI application (Spante et al., 2018).

The third discovery illuminates the participants' capacity to craft coherent questions and corresponding answers derived from textual information in the research article. Research article represents a particular genre (Kurniawan & Sabila, 2021) The text is derived from scholarly journal in the field of Islamic studies. Participants in this study were able to demonstrate their comprehension in introduction section by writing questions and their answers. This ability is indicative of their comprehension and knowledge assimilation skills. The skill to extract relevant information and effectively formulate inquiries underscores their engagement with the material and their capability to apply it in a meaningful context (Anggia & Habók, 2023)

The fourth finding delves into the participants' viewpoints regarding artificial intelligence and the Quillbot application. Their perspectives highlight the recognition of AI's potential in language learning and language teaching (Jagadesh Kumar, 2023). The positive reception of tools like Quillbot emphasizes their perceived utility as aids in enhancing linguistic competence. This insight informs educators and curriculum developers about the integration of AI-driven technologies to fortify language instruction.

The confluence of these findings accentuates the role of AI-based applications, such as Quillbot, in bolstering language education (Jagadesh Kumar, 2023). The demonstrated competencies suggest a broader integration of such technologies into language curricula, empowering both educators and learners. Language teachers are in the position to prepare and navigate the use of AI for language learning in higher education (Kohnke et al., 2023). Future research may delve deeper into the pedagogical strategies that effectively blend AI tools with traditional methodologies. Additionally, exploring the potential challenges or ethical considerations associated with AI integration could provide a comprehensive understanding of its holistic impact on language instruction (Ertel, 2017).

In focus group discussion, participants expressed their view on the importance of technological knowledge to develop their professionalism as language teachers. In the future, their Technological competence helps them to design online teaching materials and activities as well as to solve any contextual problems encountered (Tseng et al., 2019). This yields important insight for English teachers who are expected to improve the framework of TPACK namely, technology, pedagogy, and content knowledge (Su, 2023). To achieve TPACK competence, higher education should design and develop TPACK in their curriculum (Abubakir & Alshaboul, 2023).

This study not only sheds light on English pre-service teachers' interaction with AI-based language tools but also underscores the transformative potential of such tools in enhancing language learning and teaching methodologies. The findings contribute to the evolving discourse on technology in this context, AI and their benefits in education to empower the next generation of language teachers particularly in the framework of TPACK. This study has some limitations. It was conducted with small number of participants and the method used is qualitative. Further study is recommended to use larger sample and quantitative approach in investigating the issue.

CONCLUSION

This study aimed to explore English pre-service teachers' experience with the AI-based application Quillbot, their competence in analyzing grammatical aspect generated by Quillbot, their ability in generating questions and answers derived from textual information to demonstrate their reading comprehension, and their perspectives on the role of AI, particularly Quillbot, in language learning and teaching. The results indicate that English pre-service teachers adeptly harnessed Quillbot to paraphrase text from articles, effectively enhancing reading comprehension. Beyond paraphrasing, students demonstrated their analytical skills by analyzing and evaluating Quillbot's output in terms of grammar analysis. Moreover, the study showcased participants' comprehension abilities as they crafted questions and answers taken from the article's content. Ultimately, the findings underscore the participants' favorable outlook on AI tools for facilitating language learning and

teaching, accentuating the positive stance of English pre-service teachers toward integrating AI technologies into language education.

REFERENCES

- Abubakir, H., & Alshaboul, Y. (2023). Unravelling EFL teachers' mastery of TPACK: Technological pedagogical and content knowledge in writing classes. *Heliyon*, 9(6), e17348. <https://doi.org/10.1016/j.heliyon.2023.e17348>
- Abubakir, H., & Alshaboul, Y. (2023). Unravelling EFL teachers' mastery of TPACK: Technological pedagogical and content knowledge in writing classes. *Heliyon*, 9(6), e17348. <https://doi.org/10.1016/j.heliyon.2023.e17348>
- Adams, C., Pente, P., Lerner, G., & Rockwell, G. (2023). Ethical principles for artificial intelligence in K-12 education. *Computers and Education: Artificial Intelligence*, 4. <https://doi.org/10.1016/j.caeai.2023.100131>
- Anggia, H., & Habók, A. (2023). Textual complexity adjustments to the English reading comprehension test for undergraduate EFL students. *Heliyon*, 9(1). <https://doi.org/10.1016/j.heliyon.2023.e12891>
- Barrett, D., & Twycross, A. (2018). Data collection in qualitative research. *Evidence-Based Nursing*, 21(3), 63–64. <https://doi.org/10.1136/eb-2018-102939>
- Chiu, T. K. F., Xia, Q., Zhou, X., Chai, C. S., & Cheng, M. (2023). Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, 4. <https://doi.org/10.1016/j.caeai.2022.100118>
- Chubko, N., Morris, J. E., McKinnon, D. H., Slater, E. V., & Lummis, G. W. (2020). Digital storytelling as a disciplinary literacy enhancement tool for EFL students. *Educational Technology Research and Development*, 68(6), 3587–3604. <https://doi.org/10.1007/s11423-020-09833-x>
- Creswell, J. W. (2014). *Research Design Qualitative, Quantitative and Mixed Methods Approaches* (F. Edition, Ed.). SAGE.
- Ertel, W. (2017). *Introduction to Artificial Intelligence (Undergraduate Topics in Computer Science)*.
- Fachriyah, E., & Perwitasari, E. (n.d.). *Loquen: English Studies Journal Blended learning via YouTube media to Motivate EFL learners on speaking skill*. <https://doi.org/10.32678/loquen.v13i01>
- Fitria, T. N. (2021). QuillBot as an online tool: Students' alternative in paraphrasing and rewriting of English writing. *Englisia: Journal of Language, Education, and Humanities*, 9(1), 183. <https://doi.org/10.22373/ej.v9i1.10233>
- Hennessy, S., Wishart, J., Whitelock, D., Deane, R., Brawn, R., McFarlane, A., Ruthven, K., & Winterbottom, M. (2007). Pedagogical approaches for technology-integrated. *COMPUTERS & EDUCATION*, 48, 137–152. <https://doi.org/10.1016/j.compedu.2006.02.004>
- Hodgson, J., & Harris, A. (2021). Make grammar great again? *English in Education*, 55(3), 208–221. <https://doi.org/10.1080/04250494.2021.1943225>
- Islam, D., & Islam, O. F. I. (2019). *The 19th Annual International Conference on Islamic Studies (AICIS) 2019*.
- Jagadeesh Kumar, M. (2023). Artificial Intelligence in Education: Are we ready? In *IETE*

- Technical Review (Institution of Electronics and Telecommunication Engineers, India)* (Vol. 40, Issue 2, pp. 153–154). Taylor and Francis Ltd.
<https://doi.org/10.1080/02564602.2023.2207916>
- Kesharwani, A. (2020). Do (how) digital natives adopt a new technology differently than digital immigrants? A longitudinal study. *Information and Management*, 57(2), 103170.
<https://doi.org/10.1016/j.im.2019.103170>
- Khokhar, A. S. (2016). Digital Literacy. *International Journal of Digital Literacy and Digital Competence*. <https://doi.org/10.4018/ijdlldc.2016070101>
- Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). Exploring generative artificial intelligence preparedness among university language instructors: A case study. *Computers and Education: Artificial Intelligence*, 5. <https://doi.org/10.1016/j.caeai.2023.100156>
- Kurniawan, E., & Sabila, N. A. A. (2021). Another look at the rhetorical moves and linguistic realizations in international and Indonesian journal articles: A case of tourism research article abstracts. *Indonesian Journal of Applied Linguistics*, 11(2), 318–329.
<https://doi.org/10.17509/ijal.v11i2.32055>
- Kwangsawad, T. (2019). University Students' Perceptions of MALL in EFL Classes. *Studies in English Language Teaching*, 7(1), 75. <https://doi.org/10.22158/selt.v7n1p75>
- McCoy, S., & Lynam, A. M. (2022). How field experience shapes pre-service primary teachers' technology integration knowledge and practice. *Teacher Development*, 26(4), 567–586. <https://doi.org/10.1080/13664530.2022.2074086>
- McGrath, C., Cerratto Pargman, T., Juth, N., & Palmgren, P. J. (2023). University teachers' perceptions of responsibility and artificial intelligence in higher education - An experimental philosophical study. *Computers and Education: Artificial Intelligence*, 4. <https://doi.org/10.1016/j.caeai.2023.100139>
- Prensky, M. (2001). Digital Natives, Digital Immigrants Part 2: Do They Really Think Differently? *On the Horizon*, 9(6), 1–6. <https://doi.org/10.1108/10748120110424843>
- Sanusi, I. T., Olaleye, S. A., Agbo, F. J., & Chiu, T. K. F. (2022). The role of learners' competencies in artificial intelligence education. *Computers and Education: Artificial Intelligence*, 3. <https://doi.org/10.1016/j.caeai.2022.100098>
- Spante, M., Hashemi, S. S., Lundin, M., & Algers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Education*, 5(1), 1–21. <https://doi.org/10.1080/2331186X.2018.1519143>
- Su, Y. (2023). Delving into EFL teachers' digital literacy and professional identity in the pandemic era: Technological Pedagogical Content Knowledge (TPACK) framework. *Heliyon*, 9(6). <https://doi.org/10.1016/j.heliyon.2023.e16361>
- Tseng, J. J., Cheng, Y. S., & Yeh, H. N. (2019). How pre-service English teachers enact TPACK in the context of web-conferencing teaching: A design thinking approach. *Computers and Education*, 128, 171–182. <https://doi.org/10.1016/j.compedu.2018.09.022>
- Wang, S., & Smith, S. (2013). Reading and grammar learning through mobile phones. *Language Learning & Technology*, 17(3), 117–134.
- Yudhiantara, R. A. (2017). Twitter for Educational Activities in Islamic Higher Education , Why Not? *IJET*, 6(1), 89–101.
http://ijet.uinsby.ac.id/index.php/jurnalpbi/article/view/38/pdf_18
- Yudhiantara, R. A., & Nuryantini, A. Y. (2019). Promoting mobile collaborative language

learning in Islamic higher education. *Journal on English as a Foreign Language*.
<https://doi.org/10.23971/jefl.v9i1.961>