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PATTERNS OF UTILIZING AI–ASSISTED TOOLS AMONG EFL STUDENTS: NEED SURVEYS FOR ASSESSMENT MODEL DEVELOPMENT

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Abstract
This study explores patterns of AI-tool utilization among Indonesian EFL students, as preliminary data for assessment-model development. Using a convenience sampling technique, this study involved 208 university students of various year levels. A questionnaire was developed based on technology acceptance model (TAM) frameworks to collect data through Google Form, covering aspects of knowledge and use of AI tools in completing tasks, frequency of AI use and friendliness levels, reasons for using AI tools, ease of using AI tools, and desire to use AI tools. The results reveal that the participants had basic knowledge of AI but a significant number of participants admitted not knowing AI tools, suggesting the need for more education and awareness about AI. Grammarly and Google Translate were the most familiar and frequently used applications. Our findings also reveal strong relationships between perceived ease of use (PEoU) and perceived usefulness (PU) and between PU and technology acceptance (TA), implying how TAM frameworks may predict willingness to use technology-assisted or AI applications and the actual utilization. As most research participants were teacher candidates, it becomes clear that integrating AI-assisted learning content and activities appears essential as their experiences in their teacher education may influence the way they teach in the future.

Keywords: AI-assisted writing tool, ease of technology use, EFL student, technology acceptance model, technology usefulness

Introduction
Technology has been commonly utilized in education and learning. In learning to write, Evmenova and Regan (2019) indicate that technology can

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increase learners' confidence in the writing stages of prewriting, drafting, revising, proofreading, and publishing. According to Feng et al. (2016), technology can facilitate teachers in creating a more successful classroom environment. The integration of technology has inspired the emergence of new learning strategies and methods. Therefore, teachers are expected to make use of technology in teaching as many studies have shown that learners tend to understand teaching content better when integrated with technology (Al-Labadi & Sant, 2021).

The utilization of artificial intelligence (AI) in developing English essays is not new in the context of English as a foreign language (EFL) learning. Some recent AI tools in writing development are Quillbot, WordTune, Jenni, ChatGPT, Paperpal, Copy.ai, and Essay Writer (Marzuki et al., 2023). Chat GPT, for example, is a sophisticated model of text construction (Schulman et al., 2022). In fact, according to Anson and Straume (2022), it can generate weighted texts with very minimal human intervention. By using AI-assisted tools, Indonesian EFL students may be more confident in producing English writing output and may have the opportunity to improve their writing performance. Regarding feedback, Marzuki et al. (2023) state that with AI writing tools, students can receive immediate feedback and assistance, improving their writing skills faster.

This rapid development in the field of ChatGPT-type AI has posed great challenges in the assessment and evaluation of EFL students' English writing proficiency. Being aware of this phenomenon, it is necessary to develop assessment and evaluation procedures that are in line with this progressive technological advancement. The most salient problem in the EFL field is that the development and updating of assessment and evaluation procedures is not as fast as the development of learning strategies. Assessment and evaluation procedures are rarely revised and evaluated. The literature review suggests that a quantitative research approach is suitable for generalizing the effects of AI on the assessment and evaluation of EFL essays and student performance (Anson & Straume, 2022; Nguyen, 2023; Sevcikova, 2018). Thus, the gap between the development of learning strategies and methods with the assessment and evaluation system implies the need to incorporate digital technology in the English essay assessment model to align with the sophistication of AI. Therefore, the urgency of this research is shown through the formulation of the following problems: (1) What AI-assisted tools are utilized by Indonesian EFL students in producing English essays; (2) How can a reliable assessment system be developed to assess AI-assisted English essays?

The two research problems are dealt with a two-year research and development project covering two stages, namely the research stage in the first year and the development stage in the second year. In other words, this research project has been inspired by pieces of empirical evidence on the use of AI in essay development by EFL learners, and the research stage specifically aims to explore the various AI-assisted tools used by Indonesian EFL students in producing English essays. From such data, an assessment model will be developed in the development stage, which will later be tested for reliability and validity through review by experts and limited and wider-scale trials. Overall, the benefits of this research are the production of an AI-assisted EFL essay writing procedure or model as well as an AI-assisted essay assessment and evaluation model for global use that can accurately reflect EFL students' actual writing skills. What is presented in this

article is the results of the first-year research stage, that is, the needs-assessment survey, which aims to portray the patterns of AI-tool utilization among Indonesian EFL students in accomplishing English tasks.

Utilization of technology in learning writing skills

Producing an effective piece of writing requires the use of the right vocabulary, meaningful sentences, and the right order in stringing (Nasser, 2018). Therefore, students need to be facilitated in learning to choose words and expressions that are appropriate to a certain genre (Ulugbek & Anora, 2019). They generally start writing by planning to find ideas, then organizing those ideas, starting to draft, reviewing, revising and editing to improve the quality of the writing before arriving at the final version (Martínez et al., 2020). However, there is often very limited time available to produce a written piece. Therefore, writing lessons should start considering the importance of technology (Wong et al., 2022; Wu, 2022; Yuniar et al., 2019).

Recent research has documented that technology can overcome various writing difficulties of EFL students. Using technology in writing classes helps EFL students utilize it as a learning tool for paragraph writing (Alsmari, 2019; Pardede, 2020). Technology has become a medium for online language learning that can overcome the problems of teachers and learners, especially those related to the development of writing skills. Various technology platforms have been introduced to facilitate learning such as real-time feedback, collaborative editing, and plagiarism checks.

Artificial intelligence (AI) and the learning of English writing

One of the advanced AIs in the field of writing is ChatGPT, which originated from OpenAI. This tool is an AI-based language-learning model that is currently widely utilized for text generation (Schulman et al, 2022). ChatGPT is supposed to be able to produce customized texts with minimal human intervention (Anson & Straume, 2022) which challenges the purpose of testing and evaluating English for foreign learners (EFL). Can existing assessment systems accurately represent learner proficiency? Essay Generator (www.essaysoft.net), for example, offers a plagiarism detection system by collating rewritten sentences and replacing phrases with alternative words (Anson & Straume, 2022; Sevcikova, 2018). In contrast, Generative Pre-trained Transformer-3 (GPT-3) is much more advanced, which has led to some learning institutions using handwritten essays. However, this can be considered a step backwards in education. AI-assisted writing tools are significantly evolving, and steps should be taken to enable the development of harmonized and relevant educational policies.

AI writing tools such as ChatGPT (Nguyen, 2023) and Jenni.ai (Pinzolits, 2023) appear to be able to adequately provide accurate references and reports on a theory but may be less capable of presenting countless fundamental concepts. However, a study also discusses the cautions that the users have to take when referring to the citations and references created by ChatGPT, Jenni ai or other AI writing tools because the citations and references are in fact fake (Day, 2023). This suggests that human intellect in accessing the constructs and points of essay writing should not be overlooked. While many reject the use of AI in academic writing, Le (2023) suggests otherwise, asserting the proposition that the human ability to

analyze, synthesize and critically evaluate can be used in conjunction with various AI-based tools that should be treated as mere aids. This is because AI lacks the systematic reasoning ability to compose multi-paragraph essays that require precise and detailed information (Le, 2023; Nguyen, 2023). Day (2023) adds that although problems like fake citations or references are identified with the use of the technology, it is unlikely for the technology to disappear. Thus, subject matter expertise is required to remove incorrect information. In other words, if ChatGPT fails to deliver the accuracy of basic concepts, then its weakness in expressing critical ideas can be accommodated by setting up a reliable assessment and evaluation system.

A conceptually untested suggestion on how to manage the impact of AI on education was proposed by Tate et al. (2023). They target three stakeholders affected by the widespread use of AI in education, namely teachers, policy makers, and researchers. First, teachers should help EFL/ESL learners to benefit from the use of AI. They should create an understanding of the impact of AI, facilitate access and navigation to AI tools, teach good stimulation skills, teach how to reinforce the accuracy of AI output, and integrate pedagogical skills if AI tools are used in pre-service teacher education. Second, policymakers should pay attention to the importance of pedagogical aspects and update policies to accommodate AI in education. Large-scale assessment processes also need to consider how to respond to new AI-assisted writing outcomes. It is also essential to recognize and manage the new digital divide. Tate et al. (2023) further encourage researchers to explore how best to integrate ChatGPT and other AI tools into writing and utilize them as tools that can facilitate teaching or learning complex STEM topics. GPT-4 and Google systems are under construction, which makes these findings require constant updating (Anson & Straume, 2022). This statement is supported by Dehouche (2021), who states that anti-plagiarism software such as Turnitin cannot detect AI-based texts. He further explained that testing GPT-3 through AI Dungeon in generating academic essays, academic presentations, and ideas, shows that the GPT-3 engine is reliable in understanding natural language instructions and can produce credible content. Furthermore, he mentioned that every time a text sample is submitted to a plagiarism detection service (https://plagiarismdetector.net), the results on the degree of authenticity of the text are relatively good.

Method

This overall research project employed a research and development design (Creswell, 2008; Creswell, 2009), planned to be executed for two years. This first-year research adopted a descriptive quantitative research design using survey techniques to analyze the needs for an assessment model. The results of the first-year research would later be used as the basis for developing a prototype of the assessment model, which would be examined for validity and reliability through expert review and limited trials as well as trials on a wider scale in the second year of the research project.

The research instrument in this survey study involved a questionnaire. The questionnaire was developed in reference to the theoretical framework of the Technology Acceptance Model (TAM) proposed by Davis (1989), which was later elaborated by Davis and Venkatesh (1996). The framework has been widely

referred to in research dealing with technology utilization as it can potentially provide empirical data becoming fundamental determinants of technology use (Davis,1989; Davis & Venkatesh, 1996), covering the constructs of Perceived Ease of Use (PEoU), Perceived Usefulness (PU), and Technology Acceptance (TA). Referring to the TAM framework, the questionnaire was developed to eventually cover six sections to elicit information about: (1) respondents' background, (2) respondents' knowledge and use of AI tools in completing tasks, (3) respondents' opinions about frequency of AI use and ease of use or friendliness levels, (4) respondents' reasons for using AI tools in completing English tasks, (5) respondents' opinions about the ease of using AI tools in completing English tasks, and (6) respondents' desire to use AI tools in completing English tasks. The first section had six items on demographic data of the participants; the second section contained three questions related to knowledge of AI tools and various types of AI tools used; whereas in the third section, there were 11 questions about frequency of AI use and friendliness level. The fourth section consisted of eight items on reasons for using the AI tools; the fifth section covered seven items about ease; and the sixth section comprised five questions about willingness to use the AI tools. In other words, there were 40 questions that the participants had to respond to in about 20 minutes. The questionnaire items were developed in English as the survey research targeted students from English departments of accessible universities in Indonesia. The potential respondents were assumed to be able to understand and respond to the questionnaire items in English.

The initial draft of the instrument was moderated by means of review by two expert validators selected for their expertise in the field of technology in English language teaching. An instrument review rubric was provided, covering the aspects of content clarity as well as language use. Besides, the draft underwent a limited trial to 10 students. The 10 students did not give much feedback on the initial version of the instrument. They only pointed out that many of the AI tools mentioned in the items were unfamiliar to them. Meanwhile, the comments from the expert validators served as valuable inputs for the improvement of the questionnaire items, related to the answer choices, the use of more appropriate or more frequently used words, and the use of sentence structures. An example of a change suggested by the experts was in the student study status. The study status should not have been written only as freshman/1st year, sophomore/2nd year, junior/3rd year and senior/4th year, but information about batch year should have been provided, thus becoming freshman/1st year/cohort 2022, sophomore/2nd year/cohort 2021, junior/3rd year/cohort 2020 and senior/4th year/cohort 2019 and before, to ensure there was no error in writing the origin of the student's study batch. Another example of feedback was related to the second part, where there were options that required respondents to match a particular AI-assisted application (e.g., Language Tool, Jarvis, Turnitin, Perplexity, etc.) with its corresponding function (writing, grammar, plagiarism, etc.). It was suggested that the *statement "AI, like ChatGPT, makes brainstorming for English writing essays easier"* be changed to a more specific AI tool such *as "A chatbot, like ChatGPT, makes brainstorming for English writing essays easier*".

To gather data from prospective research participants, the revised version of the questionnaire was distributed online through Google Forms, reaching out to various networking accesses of English language teachers at the university level in

Indonesia. Such a system of inviting participation to our research reflects a convenience sampling technique, where involvement in the research was indeed voluntary. After opening the Google Form for four weeks, we received 208 responses. More detailed information about the research subjects can be seen in Table 1. From the table, it can be identified that most of the students (74%) are female and that 43% of them live in urban areas. In terms of the status of the study time, our data indicates quite a balanced proportion of freshmen (29%), sophomores (24%), and juniors (33%) participating in our study, whereas seniors show the least number of participation (14%).

Table 1. Research subjects

	Aspects	Characteristics	Amount	Percentage
1.	Gender	1. Male	55	26%
		2. Female	153	74%
2.	Residential location	1. Urban	90	43%
		2. Periphery	69	33%
		3. Rural	49	24%
3.	Current student status	1. First year students	61	29%
		2. Second year students	49	24%
		3. Third year students	69	33%
		4. Fourth year students	29	14%
4.	Study programme	1. English Education	156	75%
		2. English Language and Literature	47	23%
		3. Others.	5	2%

The data collected were then analyzed descriptively to capture the patterns of AI tool utilization among English language students. In more details, the analyses yield findings related to the respondents' knowledge and use of AI tools, frequency of AI use and friendliness levels, reasons for using AI tools, ease of using AI tools, and willingness to use AI tools in completing English tasks.

Findings and Discussion

The findings of this study are presented based on the focused sections in the questionnaire referring to TAM frameworks, namely knowledge and use of AI tools in completing English tasks, opinions about the frequency of use and friendliness levels, reasons for using AI tools in completing English tasks, opinions about the ease of using AI tools in completing English tasks, and desire to use AI tools in completing English tasks.

Knowledge and sse of AI tools

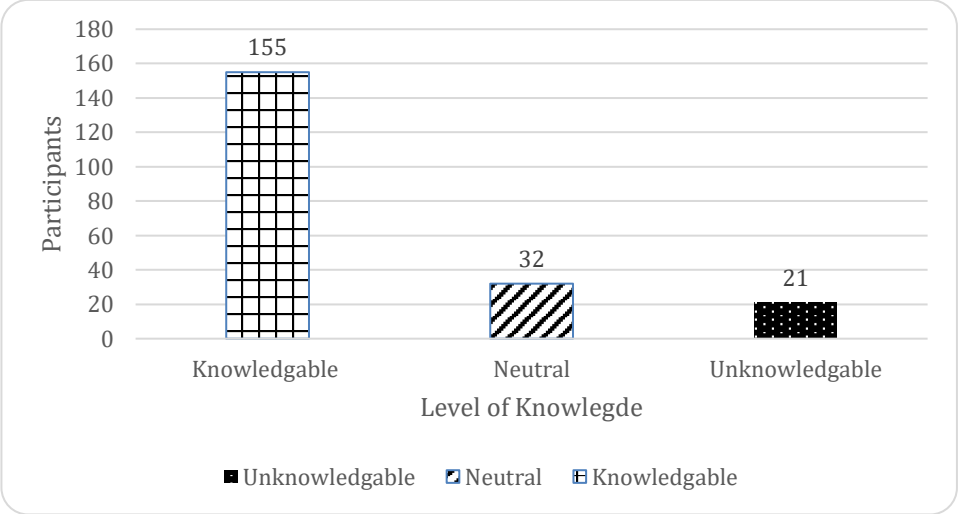

Figure 1. Knowledge of AI tools

The line graph in Figure 1 shows the percentages of the participants who had a certain level of knowledge of AI tools. The figure shows that most of the participants admitted being knowledgeable about AI-related tools. Overall, Figure 1 indicates that most participants had a basic knowledge of AI, but there were a significant number of participants who had no knowledge of AI at all. This suggests that there is a need for more education and awareness about AI.

When scrutinized further, the raw data reveals the participants' use of the various types of tools as can be seen in Figure 2.

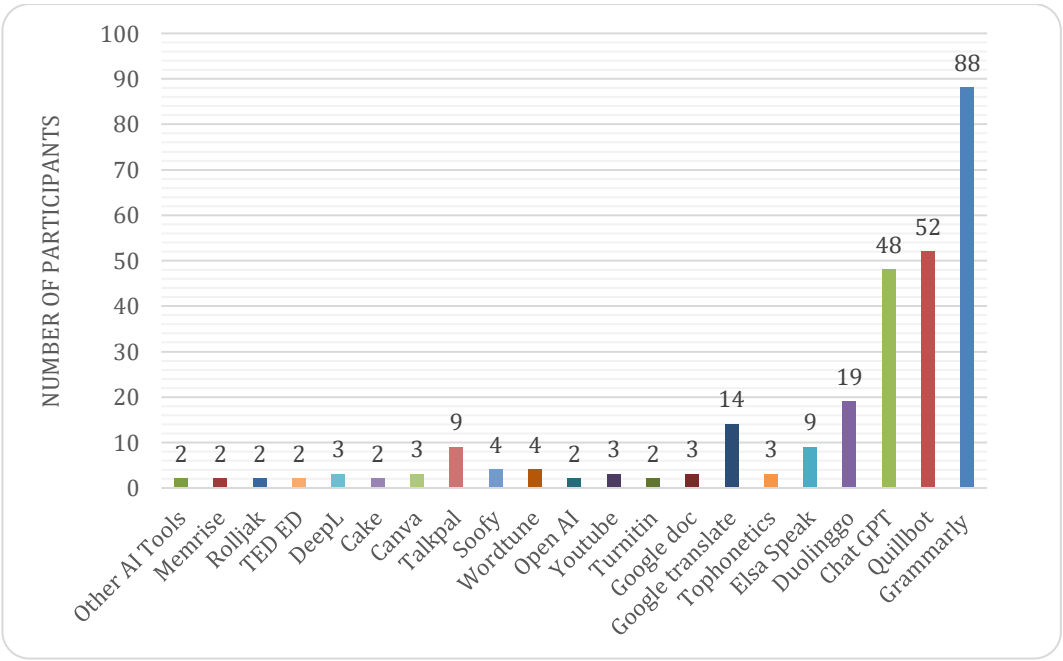

Figure 2. Types of AI tools used

Our data in Figure 2 shows the number of participants who used different types of AI tools. The most common type of AI tool used was Grammarly (88

participants), followed by Quill Bot (52 participants) and ChatGPT (48 participants). There were several least common types of AI tools utilized, some of which were Turnitin, Memrise and Rolljak. Surprisingly, Turnitin, a popular AI for plagiarism checker, appears the least used among the participants, which in fact can detect the use of Quill Bot and ChatGPT, popularly used among the participants. This demands attention. Overall, Figure 2 suggests that a wide variety of AI tools were being used by the participants. This implies that AI is becoming increasingly integrated into EFL students' everyday life related to task accomplishment.

Level of frequency of use and AI friendliness

Table 2 shows the level of frequency of use of various AI tools by the participants. At the 'never' level, Articoloo, Perplexity, Turnitin Feedback Studio, and Chatbot were the AI tools that most students never used, and only a few participants always used these AIs.

Table 2. Level of frequency of use

AI	Never	Rarely	Sometimes	Often	Always
Grammarly	10	18	61	88	31
Turnitin	65	56	51	32	4
Language tool	109	30	43	21	5
Articoloo	165	22	17	3	1
Google Translate	3	9	35	89	72
Google Docs Voice Typing	75	58	44	25	6
Turnitin Feedback Studio	131	35	29	11	2
ChatGPT	73	33	49	41	12
Perplexity	153	29	21	5	0
Chatbot	123	43	32	6	4

Furthermore, the findings in Table 2 indicate that at the 'always' level, only two AIs were used by the participants, namely Grammarly and Google Translate. This implies that these two AIs are the most frequently used of all AIs, which implies that Grammarly and Google Translate appear the most familiar AI tools among the participants. The results of previous research stated that Grammarly was used by students to point out vocabulary, punctuation, hyphenation, and others before students submitted their assignments (Thi et al., 2023). When students are interested and understand how to use ChatGPT well, they might use the AI in their daily life (Liu & Ma, 2023), which in our study is not yet evident.

In terms of AI friendliness, Figure 3 shows data about the friendliness level of each machine device commonly used by the participants. The figure reflects the number of the participants admitting whether the tools were friendly or not to users. Overall, all platforms appear easy to use but with different levels of friendliness.

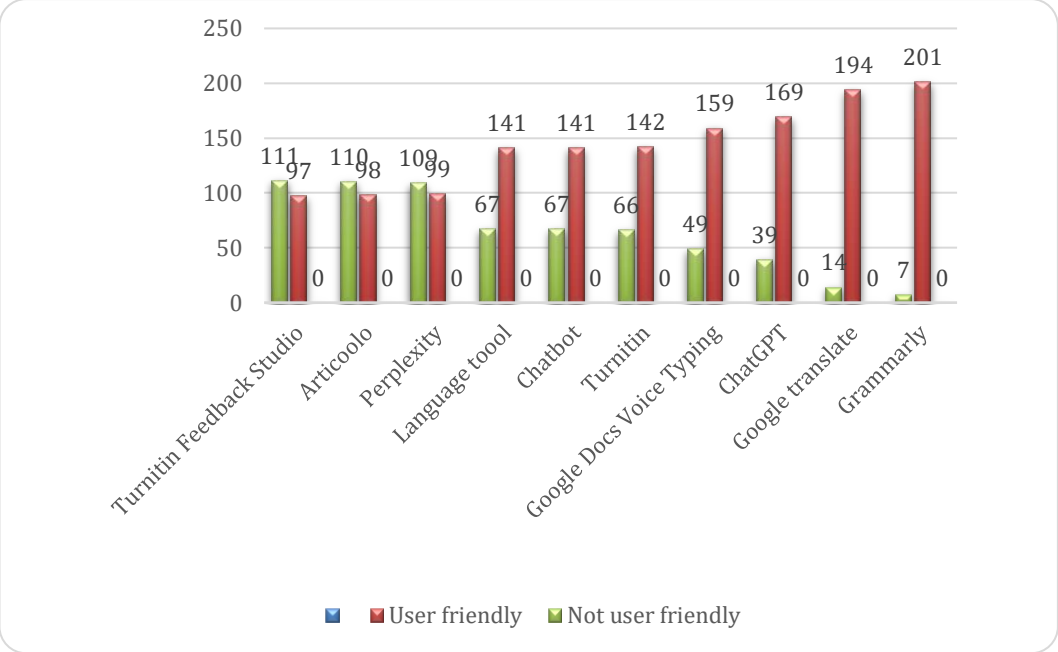

Figure 3. AI friendliness level

In the first rank, the most user-friendly AI is Grammarly. Grammarly is an application used to edit writing according to sentence structure, which in this study was ranked first by 201 participants, whereas only seven participants found Grammarly not easy to use. This result is in accordance with previous research which states that students can use Grammarly without the need for an explanation of how to use it (Fahmi & Cahyono, 2021), and students feel that the Grammarly display is easy to understand (Prasetya & Raharjo, 2023). In the second position, Google Translate was also considered easy to use by the participants. Google Translate does not give many options to users in improving their sentences. The data trends between Grammarly and Google Translate are similar. Besides, it is interesting to note that Grammarly and Google Translate, which were found to be the most frequently used by the participants, were also considered the most user-friendly. In the next ranks, Chat GPT and Google Docs Voice Typing in their opinions were quite easy, and less than 50 participants found both tools not friendly.

As with other AI tools, the level of difficulty in using AI increased based on the type of application. Previously, less than 100 students found AI apps easy to use, whereas in the other applications, more than 100 students felt that Perplexity, Articoolo, and Turnitin Feedback Studio were less easy to use than the previous applications. Such findings are very likely related to the results in the frequency of use presented in Table 2, where most students stated that they 'never' used Perplexity, Articoolo and Turnitin Feedback Studio, and therefore they considered that the three AI tools were 'not easy to use'.

In the end, all AIs were found to be user-friendly with different levels of friendliness for each AI. With these results, Grammarly's interface can be used as a reference to improve the friendliness of applications that can help students by providing many help options.

Reasons for using AI

Figure 4 presents information about the reasons for using AI tools, which can be divided into several categories.

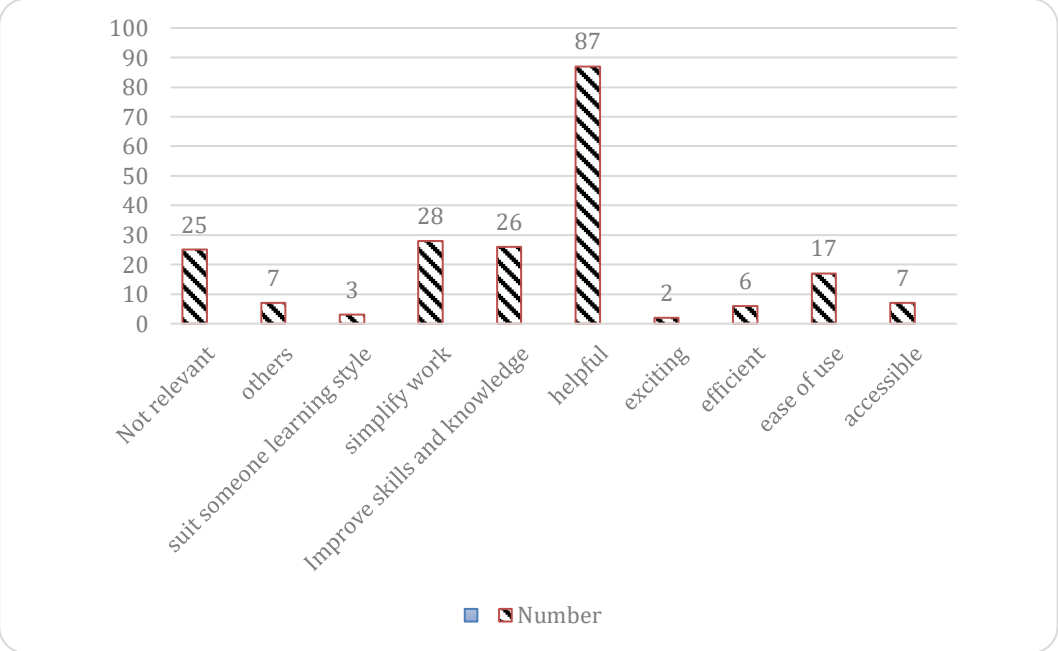

Figure 4. Reasons for using AI tools

From the analysis, it can be seen that being helpful is the most frequent factor underlying the use of AI (87 respondents), with its representation on the graph significantly surpassing the other categories. AI tools appear to offer valuable functionalities and resources that help students work on their tasks and assignments. In addition, 'Simplify work' and 'Improve skills and knowledge' were also the top reasons for using AI tools. In other words, AI tools make tasks more straightforward to understand, manage and execute. At the same time, with AI tools, users can engage in self-development activities and refine their capabilities over time. 'Ease of use' also received a large number of votes from the respondents. This indicates that AI tools are designed to enable users to navigate and utilize them with minimal effort. These indicate users' preference for AI functions that increase convenience, knowledge, and speed of task completion. This finding is in line with the findings from previous studies (Fyfe, 2023; Liu & Ma, 2023; Ma & Liu, 2004) where if users or learners feel that an application is helpful or useful in doing their tasks, then they will tend to use it.

Although not receiving as many responses as the previous categories, the other reasons for using AI tools are due to their access and efficiency. A total of 15 respondents chose the categories because they thought that AI tools were readily available and easy to use and reduced time and effort when completing tasks. Additionally, there were a few responses categorizing the AI tool as 'Exciting' and 'Suit someone's learning style'. Only a few participants (a total of 5 participants) thought that AI tools made them enthusiastic or intrigued. AI tools also cater to diverse learning preferences since they offer different functionalities.

However, 25 participants chose 'Not relevant'. Some chose not to write anything to answer the questions, and others provided irrelevant answers. These suggest that some of the respondents may find the topic irrelevant or uninteresting. The presence of irrelevant perceptions insinuates the potential challenges of AI tools within the demographics surveyed.

In summary, the data illustrates a strong inclination towards AI tools being perceived as advantageous in performing various tasks, with other considerations, such as excitement or suitability with students' learning styles, being less influential. Together, these findings align with the previous studies (Marzuki et al., 2023; Yang, 2022) because integrating AI into education brings new quality to both learning and teaching and can stimulate interactive communication in a target language.

Level of AI-tool easiness

Figure 5 shows PEoU by the respondents regarding five AI tools: Chatbot, Articoolo, Quillbot, Grammarly and Questionwell. Overall, it can be seen that of the five AI tools, Grammarly is the AI tool that is perceived to be the easiest to operate. Many participants strongly agreed or agreed with the statement that Grammarly makes checking English grammar easier. Grammarly was followed by Quilbot, Chatbot, Questionwell and Articoolo.

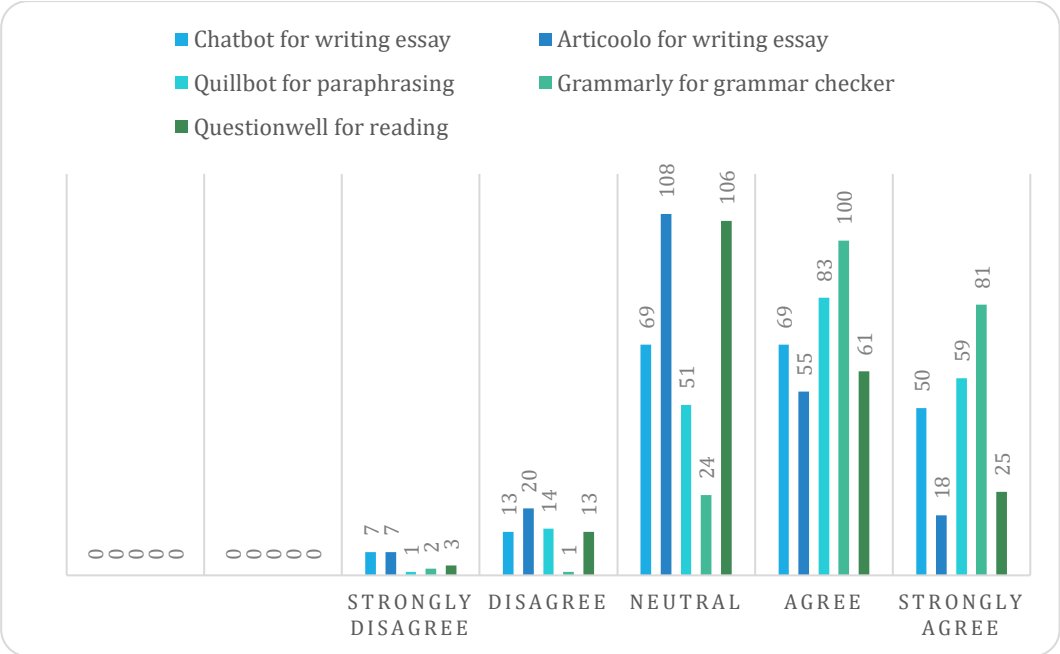

Figure 5. Levels of AI-tool easiness

Grammarly, which can be accessed at https://www.grammarly.com/, is known as a tool that can help check grammar and writing by providing suggestions related to grammar correction and writing style directly. The respondents may have chosen Grammarly over the other AI tools for several reasons. Firstly, they may have been more familiar with Grammarly than with other AI tools from their writing classes, as also evidenced from our data about the respondents' AI knowledge. Secondly, it is likely that the interface of Grammarly was quite simple, offering easy-to-understand features and fast responses in providing grammar correction

suggestions compared to other AI tools. Thirdly, Grammarly seems to provide more grammar feedback and writing mechanics than teachers or lecturers, so Grammarly was considered by the participants easier to use than other AI tools such as Quillbot, ChatGPT, Questionwell and Articoolo. Fourthly, from the functions that can be read on the web of each AI tool, Quillbot, ChatGPT, Questionwell and Articoolo also have different functions from Grammarly. Quillbolt (https://quillbot.com/) is used to help users paraphrase and/or write better, faster and smarter. ChatGPT (https://chat.openai.com/) is a chatbot with a conversational AI interface developed by OpenAI. Questionwell (https://www.questionwell.org/) is a platform that makes educators' work easier with its ability to generate a series of questions related to any subject matter, and Articoolo (http://articoolo.com/) is aimed at helping writers create textual content by making the creation process faster, more cost-effective, and more fun. From these functions, it can be seen that Grammarly is more popular than the other AI tools because its functions are closest to the respondents who were early to late semester students.

Our findings confirm the previous research findings that among the three constructs of TAM, PEoU, PU, and TA, the relationship between PEoU and PU and between PU and TA are both strong, while the relationship between PEoU and TA is weak (Liu & Ma, 2023; Ma & Liu, 2004). Grammarly is considered an AI tool that is easy to use as well as useful, which enables Grammarly to become an AI tool that is accepted among students. Articoolo can be seen from the survey results as an AI-assisted tool that is considered not very easy to use, so it is considered not very useful. When examined further, Quillbot and ChatGPT are ranked second and third in the rankings in Figure 5. The finding regarding ChatGPT is in line with the research findings of Liu and Ma (2023), revealing that ChatGPT is popular among university students because of its potential as a powerful language learning tool that students should utilize in order to participate creatively and productively in class and outside of class.

Willingness to use AI

Figure 6 shows that Grammarly topped the rank as the AI tool that most of the participants were willing to use. The majority of participants were neutral compared to the other four samples of AI tools in language learning (Quillbot, ChatGPT, Questionwell, and Articoolo). No students strongly disagreed with the use of Grammarly and Quillbot. Only a few disagreed to use the five sampled AI tools, and fewer strongly disagreed with the use of Articoolo, ChatGPT and Questionwell. This shows that most of the participants expressed their willingness to use AI in English language learning according to their needs to master English language skills and components. Therefore, it can be concluded that the participants had the intention to use Grammarly to check the grammar accuracy of their writing and Quilbot to help them with their writing paraphrases.

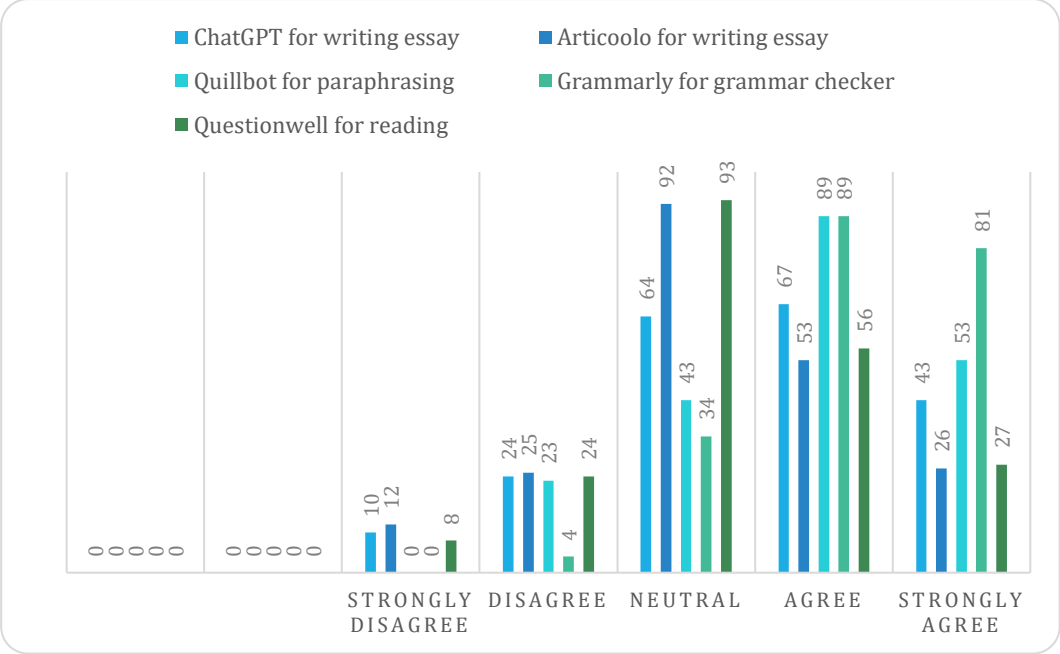

Figure 6. Willingness to use AI

Moreover, as most respondents were students of English language education programs, the need for enabling such pre-service teachers to design more effective learning becomes obvious in this ever-evolving digital landscape. The findings of this study are consistent with those of Yang (2022), who stated that AI-based chatbots can play a significant role as learning tools for stimulating interactive communication in a target language. Yang (2022) further revealed that AI chatbots can be helpful as teaching and learning aids for both teachers and students. Regarding assessment and diagnosis, Yang (2022) argued that when applying various learner data to chatbot technology, a guided approach is necessary to perform a conversation appropriate for learners' levels and characteristics. This finding also broadly supports the work of Tunjera and Chigona (2023), who explored the potential strategies for leveraging AI tools to enhance lesson planning and classroom activities in teacher training programs. The pre-service teachers under study were facilitated in creating engaging AI-based educational materials. Under their diverse context, they found that AI may bridge educational gaps in remote or disadvantaged places, thus providing access to better education in areas with limited teachers and resources.

In accordance with the present results, a previous study by Martono et al. (2023) has demonstrated that AI writing tools' feedback facilitated pre-service teachers' focuses on their arguments and quotations, which leads to decreased worry about writing errors on accuracy. They also indicated that using various intertextuality in argumentative writing could not be magically achieved with AI support (Martono et al., 2023). Furthermore, Figure 6 confirms the idea that if students take a positive attitude toward the usefulness of AI tools (Grammarly and Quillbot, in particular), they tend to demonstrate a higher level of behavioral intention or intention to use, which later positively and strongly predicts their actual use of these AI-powered tools in and outside of the classroom (Liu & Ma, 2023).

Overall, it can be concluded that this study supports and confirms previous studies and confirms the strength of TAM frameworks in predicting the desire to use technology-assisted or artificially intelligent applications and the actual use (Davis, 1989; Liu & Ma, 2023; Ma & Liu, 2004; Thi et al., 2023). Our findings reveal that most of the participants have basic knowledge of AI-related tools. However, more awareness development is needed as there are some participants who have no knowledge of AI at all. Furthermore, Grammarly and Google Translate have been found to be the most frequently used AI tools particularly because of being easy to use and understand (Fahmi & Cahyono, 2021; Prasetya & Raharjo, 2023). Additionally, our study shows that preferences for AI functions are based on the aspects of convenience, knowledge, and speed of task completion, parallel to the findings from previous studies (Fyfe, 2023; Liu & Ma, 2023; Ma & Liu, 2004). As also identified by Zhang et al. (2023), PEoU and PU can be used as primary considerations in projecting pre-service teachers' intention to use AI. This suggests that in the future, developers of technology-assisted or artificially intelligent applications should focus on functionality as well as application features that can help ease of use and acceptability for users, particularly pre-service teachers, who may have potential impacts on the learning outcomes of their future students.

Conclusion

The present study has examined the profile of AI utilization patterns among EFL university students, which will be used as the basis for the development of an assessment system. The participants generally have a basic knowledge of AI tools. However, a significant number of participants admitting not knowing AI tools at all suggest the need for more education and awareness about AI. Moreover, the most familiar AI tools among our subjects are Grammarly and Google Translate, which also happen to be the most frequently used applications. Our findings also reveal strong relationships between PEoU and PU and between PU and TA. This implies how TAM frameworks may predict willingness to use technology-assisted or artificially intelligent applications and the actual utilization. As most research participants were teacher candidates, it becomes clear that integrating AI-assisted learning content and activities appears essential considering that their experiences in their teacher education may influence the way they teach in the future.

Some limitations can be identified in this study. First, the study did not explore deeply the differences of utilization patterns among students of different batches even though it involved students of various year levels. Do senior students tend to use more AI tools in terms of frequency and types than freshmen do? Second, this study did not yet scrutinize how students coming from various areas of regency used AI tools differently. Can AI tools bridge the digital divide in various settings present in the country such as marginalized areas? Those are some issues that may be addressed in future research.

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References

Al-Labadi, L., & Sant, S. (2021). Enhance learning experience using technology in class. *Journal of Technology and Science Education*, *11*(1), 44–52. https://doi.org/10.3926/jotse.1050

Alsmari, N. A. (2019). Fostering EFL students' paragraph writing using Edmodo. *English Language Teaching*, *12*(10), 44-54. https://doi.org/10.5539/elt.v12n10p44

Anson, C., & Straume, I. (2022). Amazement and trepidation: Implications of AI-based natural language production for the teaching of writing. *Journal of Academic Writing*, *12*(1), 1–9. https://doi.org/10.18552/joaw.v12i1.820.

Creswell, W. J. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed). Upper Saddle River, NJ: Pearson International Edition.

Creswell, W. J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340. https://doi.org/10.2307/249008.

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*(1), 19-45. https://doi.org/10.1006/ijhc.1996.0040.

Day, T. (2023). A preliminary investigation of fake peer-reviewed citations and references generated by ChatGPT. *The Professional Geographer*, *75*(6), 1024–1027. https://doi.org/10.1080/00330124.2023.2190373.

Dehouche, N. (2021). Plagiarism in the age of massive generative pre-trained transformers (GPT-3). *Ethics in Science and Environmental Politics*, *21*, 17–23. https://doi.org/10.3354/esep00195.

Evmenova, A. S., & Regan, K. (2019). Supporting the writing process with technology for students with disabilities. *Intervention in School and Clinic*, *55*(2), 78–85. https://doi.org/10.1177/1053451219837636.

Fahmi, M. A., & Cahyono, B. Y. (2021). EFL students' perception on the use of Grammarly and teacher feedback. *JEES (Journal of English Educators Society)*, *6*(1), 18–25. https://doi.org/10.21070/jees.v6i1.849.

Feng, H. H., Saricaoglu, A., & Chukharev-Hudilainen, E. (2016). Automated error detection for developing grammar proficiency of ESL learners. *CALICO Journal*, *33*(1), 49–70. https://doi.org/10.1558/cj.v33i1.26507.

Fyfe, P. (2023). How to cheat on your final paper: Assigning AI for student writing. *AI and Society*, *38*(4), 1395–1405. https://doi.org/10.1007/s00146-022-01397-z.

Le, T.-T. (2023). *A preliminary example of utilizing AI text generation to support academic writing: "Humans befriending their creations: some notes on the human-AI relationship."* https://doi.org/10.31219/osf.io/uyb2p.

Liu, G., & Ma, C. (2023). Measuring EFL learners' use of ChatGPT in informal digital learning of English based on the technology acceptance model. *Innovation in Language Learning and Teaching*, *18*(2), 125-138. https://doi.org/10.1080/17501229.2023.2240316

Ma, Q., & Liu. L. (2004). The technology acceptance model: A meta-analysis of empirical findings. *Journal of Organizational and End User Computing*, *16*(1), 59-72. http://www.idea-group.com

Martínez, J., López-Díaz, A., & Pérez, E. (2020). Escritura como proceso en la enseñanza de inglés como lengua extranjera. *RECIE. Revista Caribeña de Investigación Educativa*, *4*(1), 49–61. https://doi.org/10.32541/recie.2020.v4i1.pp49-61.

Martono, M., Drajati, N. A., Rochsantiningsih, D., & Wijaya, S. A. (2023). Intertextuality in pre-service teachers' argumentative essay in raising AI: Practices and beliefs. *Register Journal*, *16*(2), 186–206. https://doi.org/10.18326/register.v16i2.186-205.

Marzuki, M., Widiati, U., Rusdin, D., Darwin, D., & Indrawati, I. (2023). The impact of AI writing tools on the content and organization of students' writing: EFL teachers' perspective. *Cogent Education*, *10*(2), 1-17. https://doi.org/10.1080/2331186X.2023.2236469.

Nasser, S. M. (2018). Iraqi EFL students' difficulties in writing composition: An experimental study (University of Baghdad). *International Journal of English Linguistics*, *9*(1), 178-184. https://doi.org/10.5539/ijel.v9n1p178.

Nguyen, M. H. (2023). Academic writing and AI: Day-1 experiment. *Center for Open Science2023*.

Pardede, P. (2020). Secondary school students' perception of ICT use in EFL classroom. *JET (Journal of English Teaching)*, *6*(3), 246–259. https://doi.org/10.33541/jet.v6i3.2215.

Pinzolits, R. (2023). AI in academia: An overview of selected tools and their areas of application. *MAP Education and Humanities*, *4*, 37–50. https://doi.org/10.53880/2744-2373.2023.4.37.

Prasetya, R. E., & Raharjo, H. (2023). Enhancing English language writing skills: An evaluation of the efficacy of Grammarly application. *Journal of English Language Studies*, *8*(2), 320–338. https://jurnal.untirta.ac.id/index.php/JELS

Schulman, J., Zoph, B., Kim, C., Hilton, J., Menick, J., Weng, J., Uribe, J. F. C., Fedus, L., Metz, L., Pokorny, M., Lopes, R. G., Zhao, S., Vijayvergiya, A., Sigler, E., Perelman, A., Voss, C., Heaton, M., Parish, J., Cummings, R. N., Ryder, N. (2022). *ChatGPT: Optimizing language models for dialogue*. OpenAI.com. https://openai.com/blog/chatgpt/.

Sevcikova, B. L. (2018). Human versus automated essay scoring: A critical review. *Arab World English Journal*, *9*(2), 157–174. https://doi.org/10.24093/awej/vol9no2.11.

Tate, T., Doroudi, S., Ritchie, D., Xu, Y., & Warschauer, M. (2023). *Educational research and AI-generated writing: Confronting the coming Tsunami*.

Thi, N. K., Nikolov, M., & Simon, K. (2023). Higher-proficiency students' engagement with and uptake of teacher and Grammarly feedback in an EFL writing course. *Innovation in Language Learning and Teaching*, *17*(3), 690–705. https://doi.org/10.1080/17501229.2022.2122476.

Tunjera, N., & Chigona, A. (2023). Investigating effective ways to use artificial intelligence in teacher education. *Proceedings of the 22nd European Conference on e-Learning, ECEL*, 331–340. https://doi.org/10.34190/ecel.22.1.1625.

Ulugbek, J., & Anora, J. (2019). Methods of improvement of writing. *Journal of Foreign Language Teaching and Applied Linguistics*, *6*(3), 69-72. https://research.nu.edu.kz/ws/portalfiles/portal/17772320/Abdigapparova_Zh_2019_1_.pdf.

Wong, W. L., Muhammad, M. M., Chuah, K. P., Saimi, N., Ma'arop, A. H., & Elias, R. (2022). Did you run the telegram? Use of mobile spelling checker on academic writing. *Multilingual Academic Journal of Education and Social Sciences*, *10*(1), 1-19. https://doi.org/10.46886/majess/v10-i1/7379.

Wu, X. (2022). Dynamic evaluation of college English writing ability based on AI technology. *Journal of Intelligent Systems*, *31*(1), 298–309. https://doi.org/10.1515/jisys-2022-0020.

Yang, J. (2022). Perceptions of preservice teachers on AI chatbots in English education. *International Journal of Internet, Broadcasting and Communication*, *14*(1), 44-52, http://dx.doi.org/10.7236/IJIBC.2022.14.1.44.

Yuniar, R.F., Widiati, U., & Astuti, U. P. (2019). The effect of using Wattpad on process-genre approach towards writing achievement in tertiary level. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, *4*(7), 897–905. http://journal.um.ac.id/index.php/jptpp/.

Zhang, C., Schießl, J., Plößl, L., Hofmann, F., & Gläser-Zikuda, M. (2023). Acceptance of artificial intelligence among pre-service teachers: A multigroup analysis. *International Journal of Educational Technology in Higher Education*, *20*(1), 1-22. https://doi.org/10.1186/s41239-023-00420-7.