

Post-Graduate Students' Perceptions of Quillbot Utilization in English Academic Writing Class

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Abstract

Academic writing is currently a worldwide concern. A plethora of studies on academic writing difficulties in higher education has been conducted. With the advancement of technology, the challenges of academic writing can be alleviated by using Quillbot, an artificial intelligence (AI)-powered digital tool. However, research on using Quillbot in post-graduate academic writing classrooms is still limited, and little is known about how students perceive it. This study investigates how post-graduate students view Quillbot as a digital tool for English academic writing. This study employed a qualitative case study design by involving 20 post-graduate students majoring in English education who were already familiar with Quillbot to participate. In investigating the participants' perspectives, a questionnaire and semi-structured interview were used as the instruments for data collection. The findings reveal that the post-graduate students in this study responded positively to using Quillbot to assist them in improving the quality of their writing. Furthermore, the use of Quillbot was found to have three benefits: enhancing students' positive attitudes toward writing, providing a variety of user-friendly writing features, and aiding students' language development. This study implies that AI-powered technology like Quillbot in writing, particularly in academic writing, has a significant role in creating high-quality writing for students.

Keywords: Academic writing, Artificial Intelligence (AI), Digital tool, Indonesia, Post-graduate student.

1. INTRODUCTION

Academic writing is one of the most important genres of writing to practice, as it is regarded as an inherent part of the English-learning process and applies to the study of any other subjects in which English is the international language. Thus, by publishing academic writing, people will become aware of our interests, and our network will grow (Abdulkareem, 2013; Al Badi, 2015; Belcher et al., 2016; Chou, 2011). In certain countries, such as the United States, academic writing is taught from sixth to twelfth grade to improve students' high levels of analytical writing skills and academic language fluency. As a result, they have set a high goal for children to produce precise, logical, and well-developed text from an early age (Maamuujav, Olson, & Chung, 2021). Similar policies exist in Indonesia; however, academic writing is only much practised by students in higher education (HE). Higher education students, particularly those at the postgraduate level, are more likely to have academic writing assignments than those at the undergraduate level; they must manage more specific and complex academic writing assignments, such as scholarly articles, international conferences, proposals, and theses (Lin & Morrison, 2002). In addition, as a graduation requirement, government policy and institutional norms require postgraduate students to publish scholarly articles in internationally renowned scientific journals (Darmalaksana, 2017). Minister of Research, Technology, and Higher Education of the Republic of Indonesia Regulation Number 50 of 2018 on National Standards for Higher Education stipulates that "postgraduate students must prepare a thesis or other equivalent form and publish papers in an accredited scientific journal or an internationally recognized journal."

As a writing genre, academic writing is arduous and complex because it requires students to engage in critical thinking and high-quality writing skills (Lin & Morrison, 2021). Furthermore, it involves a number of aspects that are considered the foundation of successful academic writing (Al Badi, 2015). Academic writing, thus, is not as straightforward as we might assume. It takes a complex process that integrates disparate ideas, synthesizes perspectives, and extends theory, necessitating higher-level construction skills and perspective-taking, in addition to more significant concern for accuracy, voice, and audience (Lavelle & Bushrow, 2007). Therefore, writing academic essays is extremely difficult for many post-graduate students.

The mastery of academic writing skills has become a global concern. In Lebanon, for instance, teachers reportedly consider EFL students' academic writing lacking (Bacha, 2012). Similarly, university students in Malaysia are still unable to grasp the new and different academic expectations in their academic writing practice and adapt to the appropriate academic requirements for their academic writing (Kaur & Shakila, 2007; Sidhu & Kaur, 2009). Additionally, research on academic writing has grown and attracted the attention of scholars worldwide, with the majority of studies focusing on students' difficulties in writing academic essays (e.g., Hyland, 2016; Lin & Morrison, 2021). In the context of Indonesian EFL learning, these difficulties relate to grammar, cohesion, coherence, and organization (Ariyanti et al. in Drivoka, 2021). Other researchers investigated students' academic writing needs, strategies, and processes (e.g., AlHassan, & David, 2015; Fatimah, 2021).

With the proliferation of technology, the aforementioned challenges in academic writing can be alleviated through its utilization. As a result of the development of modern technology, almost all learning processes now incorporate technology (Fithriani, 2018) and the study of digital technology in the learning process becomes more crucial. Software developers are compelled to design and create computer-based applications (apps). As a consequence of the high demand for technology, beginning with automated writing evaluation (AWE), automated essay scoring (AES), and automated written corrective feedback (AWCF), the development of these technologies has been accelerated (Nazari et al., 2021). Currently, it is possible to combine all three computer-based applications into a single application known as a digital tool that offers Artificial Intelligence (AI) (Koltovskaia, 2020). The term artificial intelligence (AI) refers to a machine that replicates and traces human intelligence processes such as learning, reasoning, and self-correction through the combination of multiple applications such as AWE, AES, and AWCF (Popenici & Kerr, 2017) that allow students to edit, check and organize their writing within an application. One popular digital tool aided by AI is *Quillbot*.

Numerous studies have examined AWE applications and their effectiveness for academic writing (Ariyanti, 2021; Zhang, 2020). However, there is limited research on using technology powered by AI as a digital tool to improve the academic writing of postgraduate students. In order to fill this empirical gap, this study aims to determine how graduate students view *Quillbot* as a digital tool for academic writing. This study will specifically examine how graduate students perceive the value of *Quillbot* as an academic writing tool. The findings of this study are intended to assist in putting English as a Foreign Language (EFL) learning and instruction in Indonesia on the right track from the students' perspective and based on what they have learnt.

2. LITERATURE REVIEW

2.1 English Academic Writing in Postgraduate Level

Academic writing is demanding at practically all levels of higher education, but especially for post-graduate students, who must publish scholarly pieces in internationally renowned scientific journals as a graduation requirement (Darmalaksana, 2017). Academic writing is distinct from any other writing genres taught in middle and high schools. In academic writing, the writer must consider the following: the writing must be structured, formal, and objective and the terminology employed is frequently abstract and technical (Taylor, 2009). Academic writing is typically composed of those with a high level of education, including post-graduate students, doctorate candidates, and researchers. Academic writing is also done to publish articles and present conferences attended by academics from around the world (e.g., Bailey, 2003; Thais & Zawachi, 2006; Paquot, 2010). However, academic writing is a challenging endeavor since authors must be able to think critically and possess excellent writing skills (Lin & Morrison, 2021). In addition, academic writing involves several factors that are regarded as the foundation of academic writing success (Al Badi, 2015). Due to the complexity of academic writing, many students find it challenging to compose a piece on this particular genre (Lavelle & Bushrow, 2007).

This challenge has stimulated extensive research, prompting writing interventions in higher education. As a consequence, researchers around the globe have focused their

investigation on diverse issues related to academic writing. Lin and Morrison (2021) and Hyland (2016) explored students' disabilities and challenges in academic writing as research at universities in Hong Kong. Other studies conducted in some universities in Indonesia and the United Kingdom investigated students' need, strategy and journey in enduring academic writing that focuses on undergraduate students and doctoral students (Fatimah, 2018; Keumala, 2019; Odena & Burgess, 2017) and the effectiveness of formulaic sequences in augmenting L2 learners' academic writing skills (Al Hassan & David, 2015).

2.2 Digital Tool in Academic Writing Classroom

Due to changing circumstances, there are a variety of methods for teaching and learning English in the present era (Strang, 2005). According to Lynch (2018), modern teaching and learning can be accomplished by incorporating technology, such as digital tools, because the children being taught today are "digital natives," i.e., members of the younger generation who were born after the development of technology (Fithriani, 2021). In addition, Skolverket (2016) reckons that using digital tools contributes to students' general comprehension of English courses and their personal learning process. However, it is challenging for teachers to incorporate digital tools since they are "Digital Immigrants," or individuals who were not born in the digital age and must adjust to technology (Fithriani, 2021). That is why many students master and integrate technology into their learning, especially when learning English. In the beginning, technology expanded from what was initially an application with a single function, such as automated writing evaluation (AWE), automated essay scoring (AES), and automated written corrective feedback (AWCF). Nevertheless, nowadays, those applications can be integrated into one application known as digital writing tools powered by AI and available on mobile devices. This app can assist students in learning and developing writing skills (Nazari et al., 2021).

Artificial intelligence (AI) is an umbrella term to describe an automated device that can behave in human intelligence processes such as learning, reasoning, and self-correction (Popenici & Kerr, 2017). One of the most important goals for AI is to design automated devices that can analyse the environment and do a task as humans do. With technological advances, new teaching and learning experiences in assessment, tutoring, content generation, and feedback for teachers and students can be developed into technology powered by AI. One application that offers a product that uses AI is *Quillbot*. *Quillbot* is one of the most popular applications known as a paraphrasing tool. *Quillbot* offers a product that uses AI to suggest paraphrases, grammatical checkers, summarizing, and even plagiarism detectors (Dale, 2020). *Quillbot* provides a solution by helping paraphrase when teachers and students do not have the idea to paraphrase writing manually (Kusuma, 2020). The use of this tool is simple. *Quillbot* rewrites texts after we write or paste the texts and then press the Paraphrase button (Kinga & Gupta, 2021). Not only that, *Quillbot* also provides automated writing evaluation (AWE) on the grammar checker features. This application has been trusted to help students, writers, bloggers, teaching staff, etc. (Chapelle & Sauro, 2019).

3. RESEARCH METHODS

3.1 Research Design

This research employed a qualitative case study approach. Baxter & Jack (2008) define qualitative case studies as a research method that facilitates the exploration of a phenomenon in its context through the use of multiple data sources, ensuring that the problem is not explored from a single perspective but from multiple perspectives, which will reveal the phenomenon's many facets. It is consistent with the purpose of the study, which is to investigate the perceptions of post-graduate students regarding the use of *Quillbot* as an academic writing aid.

3.2 Participants

This research was conducted at a state university in North Sumatra. Twenty postgraduate students of magister level majoring in English education were recruited to participate in this study. In accordance with the study's objective, participants were selected using a purposive sampling technique. In this case, the criterion that the selected participants needed to fulfil was their familiarity with using *Quillbot* to write academic papers.

3.3 Instruments

This study's data came from two sources: questionnaires and semi-structured interviews. The questionnaire was distributed through a Google form that consists of closed-ended questions using the four-Likert scale (Strongly agree, agree, disagree, and strongly disagree). The researchers developed questions for a semi-structured interview based on the questionnaire responses. The purpose of the in-depth interview was to dig for additional information regarding the respondents' questionnaire responses. Four participants participated in the interview session. The interview was audio-recorded with the participant's consent. The recordings were then transcribed verbatim prior to the data analysis phase.

3.4 Data Analysis

The data obtained from the questionnaire's closed-ended questions were quantitatively analyzed using a frequency count. The transcriptions of participants' responses to the interview were qualitatively analyzed using thematic content analysis, which aimed to answer research questions by identifying themes through three coding stages (Terrel as cited in Fithriani et al., 2019). At the beginning of the coding process, essential quotes and passages were manually coded with coloured pencils.

The initial findings were then documented as a guide for the subsequent data analysis phase. In the second step, all essential quotes and passages from the first set of findings were coded and put into categories temporarily at the sentence level. During the last stage of coding, the results from this stage were looked at again. Before categories and subcategories could be adequately saturated, this procedure was iterative.

4. FINDINGS AND DISCUSSION

4.1. Postgraduate Students' Demographics Regarding the Use of Digital Writing Tools

The 20 postgraduate students (15 females and 5 males) who participated in this study were English education majors. According to the questionnaire results, they are familiar with various digital tools that can be used to assist them in writing academic works. However, among the various digital tools currently available, a majority of postgraduate students frequently used *Quillbot* to assist them in writing their article (Academic writing) assignment (n=14) compared to other digital tools such as *Grammarly*, *Turnitin*, and *Mendeley*. (look at figure 1 for details).

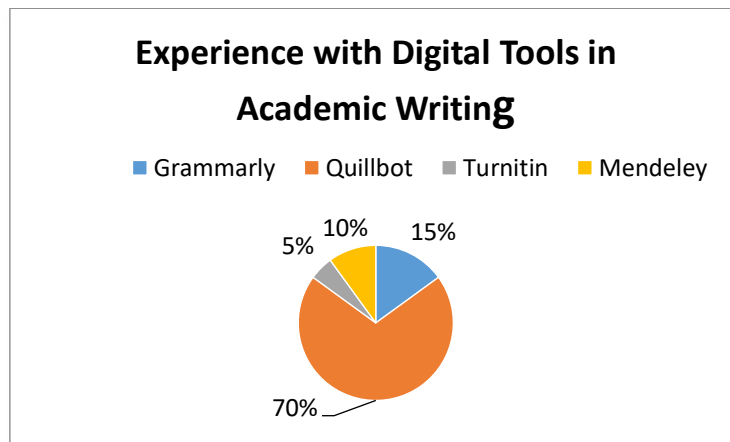


Fig. 1. Post-graduates' experience with digital tool

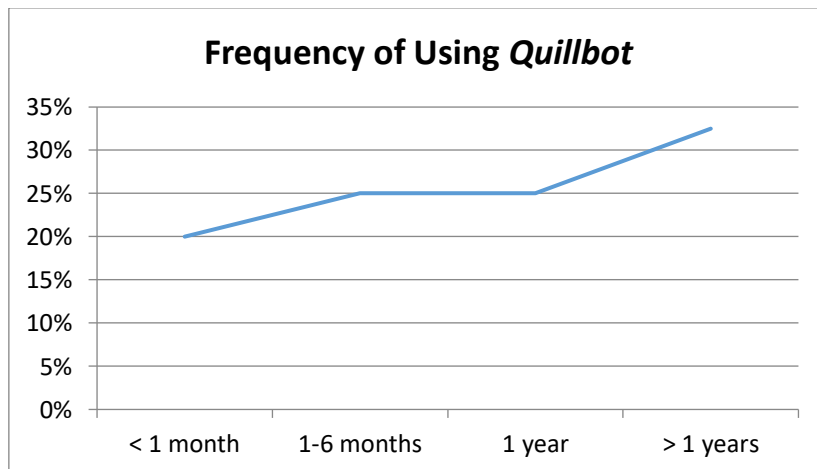


Fig. 2. The frequency of participants' using *Quillbot*

This is also supported by data from a questionnaire regarding the frequency of using *Quillbot* in academic writing. The majority of postgraduate students have used *Quillbot* for a considerable amount of time, as seen in the figure that was just presented

(Figure 2). There are a total of 20 postgraduate students, and it can be seen that 6 of them have had experience with *Quillbot* for "> 1 year." Another 5 of the total have experience with *Quillbot* for "1 year," and the same number, 5, out of the 20 postgraduate students, have experience with *Quillbot* for "1-6 months." Meanwhile, only four of the twenty total students were "one-month" newcomers to using *Quillbot*. From this data, it could be concluded that the postgraduate students in this study have, on average, used *Quillbot* frequently since starting their postgraduate studies because all of the participants in this study are postgraduate students in their second semester, which means that they have been postgraduate students for one year. One of the factors influencing this is the academic writing requirements imposed on postgraduate students by their lecturers. These findings align with Lin and Morrison's (2002) statement asserting that university students, especially graduate students, have more demanding academic writing responsibilities than undergraduates; they must manage more specific and complex writing assignments, such as articles, international conferences, proposals, and theses.

Table 1. Postgraduate students' perception of *Quillbot* usage

No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1	<i>Quillbot</i> is an easily accessible digital tool	45%	40%	10%	5%
2	<i>Quillbot's</i> features greatly assist me in academic writing	50%	40%	5%	5%
3	The <i>Quillbot</i> application is effective because it includes several features that can help me improve the quality of my writing	55%	35%	15%	-
4	The <i>Quillbot</i> application encourages me to write and reduces my writing anxiety.	35%	50%	5%	10%
5	Using the <i>Quillbot</i> application boosts my confidence towards my writing.	30%	60%	5%	5%
6	By using the <i>Quillbot</i> application my writing skills in organizing text have improved.	40%	55%	-	5%
7	Unconsciously, my vocabulary particularly the terms used in academic writing have increased.	60%	35%	5%	-
8	Using the <i>Quillbot</i> application to write academic essays has improved my grammar skills	20%	60%	10%	10%
9	I prefer <i>Quillbot</i> over other apps	30%	55%	10%	5%
10	I can write efficiently and my writing get better results when I use the <i>Quillbot</i> app	60%	35%	5%	-

The data in Table 1 indicates that most of the postgraduate students (n=9) strongly agreed, and some (n=8) agreed that *Quillbot* is an easily accessible digital tool, which means

that the majority of the participants (n=17) out of 20 participants in total gave a positive response to this statement, even though there are still very few (n=2) who stated disagree and one person who stated strongly disagree. In general, the first statement stating "*Quillbot* is an easily accessible digital tool" is acceptable and approved by the students. It is then followed by the second statement, which states that the features in *Quillbot* greatly assist postgraduate students in academic writing. This statement elicited the responses that half of the study participants (n=10) strongly agreed and eight participants agreed, while 2 participants gave negative responses: one stated disagree and the other stated strongly disagree. However, it can be concluded that *Quillbot's* features can assist postgraduate students with academic writing, as more than 75 per cent of participants responded positively.

Most or even more than half of (n=20) participants responded positively to the third statement regarding the effectiveness of the *Quillbot* as a result of its various features. This was broken down into (n=11) participants who strongly agreed and (n=7) participants who agreed with this statement. Then, the fourth statement regarding one of the benefits of using the *Quillbot* is to encourage students to write and reduce anxiety about writing receives a reasonably positive response; as many as (n = 7) chose to agree and as many as (n = 10) choose strongly agree, and as few as (n = 10) =1) and (n=2) chose to disagree; therefore, the majority of participants agreed with the statement.

The fifth statement says that *Quillbot's* application increases post-graduate students' confidence in their writing. According to the table above, more than half of the participants responded positively, with (n=6) agreeing and (n=12) strongly agreeing. Although (n=2) participants disagreed and strongly disagreed, this did not affect the statement because the number was small compared to the number of participants who agreed. Regarding the sixth statement, the findings show that by using the *Quillbot* application, post-graduate students writing skills in organizing text have improved and are agreed. This is evidenced from the questionnaire results where (n = 8) participants agreed, then (n = 11) participants stated firmly agreed, and only 1 participant strongly disagreed about this statement. In the 7th statement, there are (n=12) participants who agree and (n=7) participants who state "strongly agree" with the statement that "*Quillbot* can also improve the participant's English vocabulary, especially in terms of academic terms. 100% of participants almost support this statement.

Furthermore, as many as (n=4) participants agreed with the statement "*Quillbot* application to write academic essays has improved post graduate students' grammar skills", and (n=12) stated strongly agreed with this statement, which means there are (n=16) participants gave a good response and the rest were only less than a quarter of participants who disagreed with this statement, so this statement is valid in this context. The following statement was that as many as (n = 6) agreed and (n=11) strongly agreed that they prefer to use *Quillbot* over other digital tools. This means that this statement is valid because more than three-quarters agree with this statement. Last but not least, using the *Quillbot* application can write efficiently and get high-quality results. This statement received an outstanding response. It can be proven from the table above reporting that more than half and almost all of them agreed with this statement (n=12) plus (n=7), and only one person disagreed with this statement.

Based on the questionnaire results displayed in Table 1, the researchers contacted four participants for in-depth interviews to learn more about their perceptions of *Quillbot's* use in academic writing. The four individuals were chosen based on their responses to the questionnaire, which met the author's requirements. The results of the interviews will be elaborated on a theme-by-theme basis and supported with one of the participant's answers attached using anonymity.

4.2 The Perceptions Of Post Graduate Students Regarding The Merit Of Using Quillbot For Academic Writing

Regarding the students' perceptions of the use of *Quillbot* as digital tools in academic writing, the researchers identified three significant themes related to the benefits of using *Quillbot* in academic writing for post-graduate students, namely: enhancing students' positive attitude in writing, providing a variety of user-friendly writing features and assisting the students' language development.

Theme One: Enhancing students' positive attitude in writing

Based on the data from the two sources, most participants found that using *Quillbot* can enhance their positive attitude in writing. In addition to reducing their writing anxiety, they reported that using *Quillbot* in their academic writing increased their confidence in the quality of their writing, as evidenced by the following excerpts:

“Since I used Quillbot to write articles for my collage assignment, I have become more confident and less overthinking of my writing, both in terms of grammar and content. Before using Quillbot I was often unsure of what I was writing. Now, I also prefer to read the writing that I have made because it looks neat both in terms of language and structure. I feel like native writing” (Excerpt 1, Interview)

“When the semester began, I had no idea where to begin when it came to academic writing. Because a body note is required for academic writing, and I only copy and paste, my academic writing is identified as having a high level of plagiarism. As a result, I become frustrated and lazy when I try to write an academic paper. This app made me happy and made me enjoy the writing process because it helps us paraphrase our writing by changing words through synonyms, writing structure, and other means.” (Excerpt 2, Interview)

They also reported that using the *Quillbot* application for academic writing inspired them to write and made them feel more enthusiastic about writing because this application could be used as a reference for feedback. According to Honeycut (as cited in Pahlevi 2020), feedback given on an online platform can lead students to actively participate in the writing process because it gives them access to revise and engage in their writing. This, in

turn, results in substantial participation, interaction, and engagement on the student's part in the learning process. This finding is in line with Zimmerman & Labuhn's (2012) argument that the most significant contributions of digital tools powered by AI in education are to increase student engagement and improve achievement, motivation, and self-regulation. Students may find it easier to learn through online platforms, which may also result in more active students writing more and more. This is due to the fact that student involvement in the learning process is inextricably linked to the student's motivation, allowing them to experience positive affect and continue their practice with perseverance and confidence (Mandernach, 2009). Conversely, language learners who lack study motivation struggle to acquire proficiency during the learning process (Yuwinda & Insani, 2018). It is in line with Dulay et al. (1982), who argued that the less motivated a language learner is, the less successful he or she will be in the long run. In this burgeoning era, we can integrate technology into the language-learning process to increase students' motivation, particularly during the writing process. According to the findings of Ariyanti & Anam (2021), using various forms of technology in language learning and instruction helps students feel less anxious and more motivated. The conclusions that can be drawn from the empirical findings are that the more that students use technology in their learning process, the greater the possibility for them to develop their creativity, which in turn leads to an enhanced desire to study. Thus, Kelleher et al. (as cited in Meysarah, 2018) have also proved that integrating information and communication technology (ICT) into the educational process framework can re-engage students within the context of the learning process. In this particular case, the application of technology that AI, such as Quillbot drive, has been revealed to significantly contribute to the improvement of students' positive attitudes throughout the process of academic writing.

Theme two: Providing a variety of user-friendly writing features

Another reason why *Quillbot* is superior to other writing software is that it offers a wide variety of user-friendly writing features that can improve the quality of students' writing, especially the academic writing of post-graduate students, as seen in the following:

“To me, Quillbot is the best tool for helping students enhance their academic writing. This is due to the fact that it contains many more features than others, such as a grammar checker, paraphrasing styles ranging from standard to expanded, and summarizing. Having everything I need in one app made easier for me than using multiple ones.” (Excerpt 3, Interview)

This discovery is also consistent with previous research conducted by Styati & Irawati (2020), who found that the use of technology with a variety of characteristics for writing components can significantly impact students' writing quality. Besides, according to Graddol (as cited in Maysarah, 2018), students in today's day and age are more eager to learn through incorporating technology that provides a plethora of features, in contrast to more traditional

teaching techniques. In particular, when it comes to the process of academic writing, the vast majority of students continue to struggle with issues relating to grammar, cohesion, coherence, and organization (Ariyanti & Mahakam, 2018; Pratiwi, 2015; Rahmatunisa, 2014 in Drivoka, 2021). This challenge can be made more manageable by allowing students to employ *Quillbot*, a well-known digital tool that is powered by AI, which develops the student's ability to edit, check, and organize their writing within an application, and it does all of these things very efficiently (Popenici & Kerr, 2017). The *Quillbot* application allows students to proofread, edit, and organize their writing and paraphrase, avoid plagiarism, shorten sentences, and accommodate proper grammar. As a result, *Quillbot* is considered one of the most useful online applications, and it is included in this category (Fitria, 2021). According to Zhao (2003), the effectiveness of technology is dependent not on the technology itself but on the efficiency with which its features may be accessible during the learning process. This argument is supported by several experts as well as prior studies. When it comes to writing in a foreign language, employing tools containing various functions has been demonstrated to be beneficial and successful, having favourable effects on both awareness and performance. (Choi, 2012; Styati & Irawati, 2020).

Theme three: Encouraging students' language development

The last benefit mentioned by the majority of post-graduate students was that their language development had increased unconsciously and deliberately. This improvement was evident not only in their writing abilities but also in their grammatical skills and vocabulary master, As shown in the following excerpts:

"When I use the Quillbot app to check my grammar, the parts of my writing that are marked as incorrect are highlighted in red. There, I studied the incorrect grammar. Passive statements, for example, must be followed with "to be + v3", so i noted the proper grammar in order to avoid repetition of errors in the future." (Excerpt 4, Interview)

"There is a paraphrase feature in Quillbot that allows it to rewrite sentences with different structures but with the same meaning. In most cases, this application also replaces some words with various synonyms, which we can choose from the suggested words, so that I unconsciously memorize the synonyms of the words. "Perception," for example, means the same as "perceive" and "view."" (Excerpt 5, Interview)

These findings confirm that AI-powered digital tools boost students' performance in academic writing and other disciplines (Voogt et al., 2018). According to Na & Chi (2017), online writing aids such as paraphrase tools can assist students in enhancing their vocabulary and grammar skills. By utilizing the synonyms offered by paraphrasing elements more academically and accurately, students can expand their vocabulary, particularly in academic terms (as illustrated in excerpt 5). Concurrently, using ICT has favoured the development of learners' metacognitive, cognitive, affective, and social

strategies while writing in technology-enhanced environments (Perez, 2018). Another study found that using Automatic Writing Feedback (AWE), which provides comments and suggestions, activates students' common sense, linguistic competence, and logic to correct their mistakes (Zaini, 2014). This application enables students to inspect their errors, identify incorrect writing patterns, and reformulate them, which subconsciously increases students' grammatical abilities (Hegelheimer & Lee, 2013). Students may be motivated to rewrite if they receive real-time feedback from technology (Moore & MacArthur, 2016). As a result, they are becoming accustomed to enjoying the process of writing more than the outcome. It is also consistent with prior studies (e.g., Zhang, 2017; Zhang & Hyland, 2018), which discovered that motivation boosted student engagement with AWE feedback during the writing process.

5. CONCLUSION

Academic writing is one of the most challenging and intricate forms of writing because it requires students to engage in critical thinking and to have excellent writing skills. Post-graduate students are frequently assigned academic writing assignments. As a result, academic writing has become a worldwide concern. Technology, such as digital tools, is one way to address this issue. *Quillbot* is an artificial intelligence-powered digital tool (AI). The majority of post-graduate students utilized *Quillbot* as an effective digital tool to assist them with academic research writing. Consistent with the findings of this study, which indicated that the majority of post-graduate students felt that the employment of *Quillbot* was effective in enhancing their academic writing. In other words, the post-graduate students had a favourable view of the *Quillbot* application as a digital aid for producing high-quality academic writing. This study recommends that EFL writing instructors incorporate this tool into their English language instruction, specifically within the writing classroom. Due to the limited scope of this study's topic, it is suggested that future research be focused on other aspects of *Quillbot*, such as the effects and challenges associated with using *Quillbot* in academic research writing.

REFERENCES

- Abdulkareem, M. (2013). Investigation study of academic writing problems faced by Arab postgraduate students at Universiti Teknologi Malaysia (UTM). *Theory and Practice in Language Studies*, 3(9), 1552-1557.
- Al Badi, I. (2015). Academic writing difficulties of ESL learners. In *Proceedings of The West-East Institute International Conference 2015*, Barcelona, Spain.
- AlHassan, Lina; Wood, David (2015). *The effectiveness of focused instruction of formulaic sequences in augmenting L2 learners' academic writing skills: A quantitative research study*. *Journal of English for Academic Purposes*, 17(), 51–62. <https://doi.org/10.1016/j.jeap.2015.02.001>
- Ariyanti, A. (2021). Technology-Enhanced Paraphrasing Tool to Improve EFL Students' Writing Achievement and Enjoyment. *Journal of English Language Teaching and Linguistics*, 6(3), 715-726.

- Ariyanti, A., & Mahakam, W. G. (2018). EFL Students' Difficulties and Needs in Essay Writing, (January 2017). <https://doi.org/10.2991/iccte-17.2017.4>
- Bacha, N. N. (2012). Disciplinary writing in an EFL context from teachers' and students' perspectives. *International Journal of Business and Social Science* 3(2),233-256.
- Chou, L. (2011). An investigation of Taiwanese doctoral students' academic writing at a U.S. University. *Higher Education Studies*, 1(2), 47-60.
- Choy, S. C., & Lee, M. Y. (2012). Effects of Teaching Paraphrasing Skills to Students Learning Summary Writing in ESL. *Journal of Teaching and Learning*, 8(2). <https://doi.org/10.22329/jtl.v8i2.3145>
- Darmalaksana, W. (2017). Panduan publikasi ilmiah: Perangkat aplikasi, standar penulisan dan etika kepengarangan [Guide to scientific publication: Application devices, authorship ethics and standards]. *Jurnal Riset dan Inovasi*, 2, 24-42.
- Dörnyei, Z. (2007). *Research methods in applied linguistics: quantitative, qualitative, and mixed methodologies*. Oxford: Oxford University Press.
- Dulay, H., Burt, M., and Krashen, S. (1982). *Language Two*. Oxford: Oxford University Press.
- El Meysarah, C. (2018). The analysis of Purdue Online Writing Labs as second language writing support tools. *Journal of English Language Teaching and Linguistics*, 3(1), 11-19.
- Evans, S., & Morrison, B. (2018). Adjusting to higher education in Hong Kong: The influence of school medium of instruction. *International Journal of Bilingual Education and Bilingualism*, 21(8), 1016-1029.
- Fatihah, N. (2018). Students' Needs for Academic Writing at the English Education Department. *English Language Teaching Educational Journal*, 1(3), 161-175.
- Fithriani, R. (2021). The utilization of mobile-assisted gamification for vocabulary learning: Its efficacy and perceived benefits. *Computer Assisted Language Learning Electronic Journal (CALL-EJ)*, 22(3), 146-163.
- Fithriani, R., Rafida, T., & Siahaan, A. (2019). Integrating online blogging into EFL writing instruction: Exploring students' perceptions. In *UNNES International Conference on English Language Teaching, Literature, and Translation (ELTLT 2018)* (pp. 87-90). Atlantis Press. <https://dx.doi.org/10.2991/elslt-18.2019.17>
- 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>
- Hegelheimer, V Lee, J (2013) The role of technology in teaching and researching writing. In: Thomas M, Reinders H & Warschauer M (eds.), *Contemporary computer-assisted language learning*. New York: Bloomsbury, 287-302
- Hayati, R., Anggraini, H. W., & Jaya, H. P. (2021). ICT and Learning Attitude towards Students' Academic Paragraph Writing in College Level. *ENGLISH FRANCA: Academic Journal of English Language and Education*, 5(1), 149-168.
- Hinkel, E. (2011). What research on second language writing tells us and what it doesn't. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (vol. 2, pp. 523-538) Routledge.

- Keumala, M., Firdani, F., Ismail, N. M., Ramadhani, H., & Idami, Z. (2019). Strategies Fashioned By Efl Students In Enduring Academic Writing. *Proceedings of EEIC*, 2, 42-49. <http://jurnal.unsyiah.ac.id/EEIC/article/view/14941>
- Lavelle, E., & Bushrow, K. (2007). Writing approaches of graduate students. *Educational Psychology*, 27(6), 807-822. <https://doi.org/10.1080/01443410701366001>
- Linda H.F. Lin; Bruce, M; (2021). Challenges in academic writing: Perspectives of Engineering faculty and L2 postgraduate research students. *English for Specific Purposes*, Vol 63(59-70). <https://doi.org/10.1016/j.esp.2021.03.004>.
- Maamuujav, U & Olson, C & Chung, H. (2021). Syntactic and lexical features of adolescent L2 students' academic writing, *Journal of Second Language Writing*, Volume 53, , <https://doi.org/10.1016/j.jslw.2021.100822>.
- Mandernach, B. J. (2009). Effect of instructor-personalized multimedia in the online classroom. *International Review of Research Open and Distance Learning*.
- Moore, N.S., MacArthur, C.A., 2016. Student use of automated essay evaluation technology during revision. *J. Writ. Res.* 8 (1), 149–175
- Na, C. Do, Xuan, N., & Chi, N. (2017). Paraphrasing in Academic Writing : a Case Study of Vietnamese Learners of English. *Language Educatio*, 8(1), 9–25.
- National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects*. Washington, DC: Author.
- Nazari, N., Shabbir, M. S., & Setiawan, R. (2021). Application of Artificial Intelligence powered digital writing assistant in higher education: randomized controlled trial. *Heliyon*, 7(5), e07014. <https://doi.org/10.1016/j.heliyon.2021.e07014>
- Pahlevi, M. R. (2020). Student-Teachers' Engagement in Mediated Writing Feedback: Narrative Inquiry. *Journal of English Language Teaching and Linguistics*, 5(3), 321.
- Pérez Cañado, M. L. (2018). Technology for teaching English as a foreign language (EFL) Writing. *The TESOL Encyclopedia of English Language Teaching*, 1-12. <https://doi.org/10.1002/9781118784235.eelt0439>
- Rodhiya, N., Wijayati, P. H., & Bukhori, H. A. (2020). Graduate Students' Knowledge about Plagiarism in Academic Writing. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 5(2), 235-242.
- Rahmatunisa, W. (2014). Problems Faced By Indonesian Efl Learners In Writing Argumentative Essay. *English Review: Journal of English Education*
- Singh, M. K. M. (2019). International graduate students' academic writing practices in Malaysia: Challenges and solutions. *Journal of International Students*, 5(1), 12-22.
- Strobl, Carola; Ailhaud, Emilie; Benetos, Kalliopi; Devitt, Ann; Kruse, Otto; Proske, Antje; Rapp, Christian (2018). *Digital support for academic writing: A review of technologies and pedagogies*. *Computers & Education*, (), S036013151830318X-. doi: <https://doi.org/10.1016/j.compedu.2018.12.005>
- Sträng, M.H. (red.) (2005). *Samspel för lärande: didaktiskt redskap för professionella lärare*. Lund: Studentlitteratur.
- Styati, E. W., & Irawati, L. (2020). The Effect of Graphic Organizers on ELT Students' Writing Quality. *Indonesian Journal of EFL and Linguistics*, 5(2), 279.

- Sulistyaningrum, S. D. (2021). Utilizing Online Paraphrasing Tools to Overcome Students' Paraphrasing Difficulties in Literature Reviews. *Journal of English Language Studies*, 6(2), 229-243.
- Wang, Meihui; Parr, Graham (2020). A Chinese doctoral student's experience of L2 English academic writing in Australia: Negotiating practices and identities. *Journal of English for Academic Purposes*, (), 100944– . <https://doi.org/10.1016/j.jeap.2020.100944>
- Yuwinda, Y., & Insani, S. (2018). Language Learning: What Factors May Influence It. *Journal of English Language Teaching and Linguistics*, 3(1), 1-10.
- Zaini, Amin; Mazdayasna, Golnar (2014). The Effect of Computer Assisted Language Learning on the Development of EFL Learners' Writing Skills. *Procedia - Social and Behavioral Sciences*, 98(), 1975–1982. <https://doi.org/10.1016/j.sbspro.2014.03.631>
- Zhang, Z. (2011). A nested model of academic writing approaches: Chinese international graduate students' views of English academic writing. *Language and Literacy*, 13(1), 39-59. <https://doi.org/10.20360/G27G6R>
- Zhang, Z. (2017). Student engagement with computer-generated feedback: A case study. *ELT Journal*, 71(3), 317–328.
- Zhang, Z., & Hyland, K. (2018). Student engagement with teacher and automated feedback on L2 writing. *Assessing Writing*, 36, 90–102
- Zimmerman, B. J., & Labuhn, A. S. (2012). Self-regulation of learning: Process approaches to personal development. *APA educational psychology handbook, Vol. 1. Theories, constructs, and critical issues* (pp. 399–425). <https://doi.org/10.1037/13273-014>