LEVERAGING TECHNOLOGY IN SCIENTIFIC WRITING: STUDENTS' PERCEPTION

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Abstract: This study explores students' perceptions of leveraging technology in scientific writing. A descriptive qualitative research design was employed, utilizing a Likert scale survey administered via Google Form to collect data from 108 respondents, consisting of 76 females and 32 males. The majority of respondents were between 18-24 years old, with representation from various study programs at universities in Indonesia. Findings reveal a high level of perceived importance and effectiveness of technology in scientific writing, with most respondents expressing comfort and confidence in utilizing technological tools for editing, revising, citation management, and time management tasks. The study underscores the pivotal role of technology in enhancing students' writing skills and academic success in the digital age.

Keywords: Scientific Writing; Students' Perception; Technology.

INTRODUCTION

Scientific writing is one step of the academic research process where scientists communicate thoughts, experiences, observations, applications/testing and so on as a solution to identified scientific problems by following the general rules of text genres and all the principles of academic writing (Akkaya & Aydın, 2018). To be able to write academically, good writing skills are required. The results of students' academic writing are a manifestation of their creativity and knowledge in the form of papers, theses, research proposals, and so on (Listyotami & Reznani, 2022). Scientific writing plays a vital role in higher education as it influences the creation, transmission, and use of knowledge (Latifah & Nasrullah, 2024). It is intended to express a set of knowledge on a particular topic (Namira et al., 2021).

In the academic world, scientific work is used as a measuring tool for academic achievement in several courses. Lecturers often assign students to write scientific articles

based on research and scientific studies. Moreover, at the end of the study period, a student is required to make a final assignment in the form of a research report. Scientific work has different forms according to its function, such as papers, journals, theses, theses and dissertations (Pollock, 2020). Scientific work is a form of writing that must be produced by students as one of the requirements for graduation at the undergraduate, master's and doctoral levels (Supriyana et al., 2019).

The great demand for students to write shows that students have absolute mastery of writing skills and producing written work (Arianty et al., 2022). Thus, students' ability to write scientific papers in higher education should not be in doubt. However, the reality is that there are still many obstacles faced by students in writing scientific papers. It was proven by the result of interview with students who have graduated with a Bachelor's, Master's, or Doctorate degree, the average similarity in their writing is above 50%. Most of them need to make revisions at least 5 times before their work passes the similarity check. This is because writing is a complex skill and difficult to master (Agdia & Syafei, 2020), (Giglio & da Costa, 2023) so that in practice students often encounter obstacles in writing scientific papers (Suprapto et al., 2022). One of the obstacles faced by students is paraphrasing, synthesizing and summarizing (Algrenita & Listiyani, 2021). Aprianto et al. (2024) arged that paraphrasing aims to encourage students to creatively develop their writing skills.

Weakness in paraphrasing is a common problem faced by many students and can lead to the risk of plagiarism if not handled properly. Moreover, Asmanda & Hafizh (2021) stated that One ways to ovoid plagiarism is by paraphrasing. The issue of plagiarism and EFL students' difficulties in writing course appeared to be still the challenging task for teachers (Ariyanti & Anam, 2021). When students cite references without properly paraphrasing or simply copying the text directly, this can lead to a high level of similarity when checked by plagiarism detection software such as Turnitin or Grammarly (Sinaga, 2018), (Permana et al., 2022). Plagiarism is a part of the broader category of Academic Dishonesty (AD) (Roe & Perkins, 2022), (Widhiani et al., 2022).

Advancements in technology have streamlined the research process, allowing scientists to collect and analyze vast amounts of data with unprecedented efficiency. Technology can be an effective tool to help students paraphrase and reduce the risk of plagiarism (U. Andayani & Hasbana, 2019), (Ariyanti & Anam, 2021), (Widhiani et al., 2022). A number of studies in the context of the importance of paraphrasing and technology in academic writing to decrease plagiarism have been conducted researchers worldwide among them are Sinaga (2018), U. Andayani & Hasbana (2019), Widhiani et al. (2022), Permana et al. (2022) who researched the effectiveness of Turnitin software as an anti-plagiarism checker tool that can be used to detect, anticipate and prevent acts of plagiarism in the academic environment. Another reseracher like Giglio & da Costa (2023) conducted research on the use of AI-based technology called Grammarly (app.grammarly.com) and Paperpal (www. paperpal.com). These two AIs help correct grammatical and spelling errors, resulting in better quality writing. Furthermore, (Fitria, 2021a), (Ariyanti & Anam, 2021), (Syahnaz & Fithriani, 2023) conducted research on the use of QuillBot is an online application to paraphrase writing, avoid plagiarism, summarize long sentences and improve grammar to be more precise and look professional.

Those previous research focused on the effectiveness of various technology AI in

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helping students in composing scientific writing. While this research focuses on the students' perception on the use of various paraphrasing technology in helping them to avoid plagiarism of scientific writing and the obstacles they face in applying those technology. Therefore, the objectives of this research are to describe the students' perception on the use of paraphrasing technology on students' scientific writing avoiding plagiarism and the obstacles they found in applying them.

METHOD

This study employs a descriptive qualitative research design to explore students' perceptions of leveraging technology in scientific writing. The research aims to gain an in-depth understanding of students' attitudes, experiences, and challenges related to the utilization of technology in their scientific writing endeavors.

A total of 108 respondents participated in filling out the survey consisting of 76 females and 32 males. Among them, 10 respondents were over 40 years old, 8 were aged 25-30, and 7 were aged 31-40, while the majority of respondents, totaling 83 individuals, were between 18-24 years old. The respondents at the time of data collection were students from various study programs at universities in Indonesia, including Suryakancana University, Pamulang University, Sriwijaya State Polytechnic, Indonesian University of Education, Subang University, Muhammadiyah University Jakarta, UNINDRA, Banten Jaya University, Open University, Kuningan University, Syekh Nurjati Cirebon State Islamic Institute, Raden Intan Lampung State Islamic University, Panca Sakti University, and SMH Banten State Islamic University. On average, the respondents were currently working on their research proposals and final projects (theses or dissertations).

The data was collected through a survey administered via Google Form, featuring Likert scale questions to gauge participants' agreement or disagreement with statements regarding their use of technology in scientific writing. The survey was distributed to a sample of undergraduate and graduate students from various academic disciplines. The data obtained from the survey was analyzed thematically to identify recurring patterns, themes, and perspectives among participants.

RESULT AND DISCUSSION
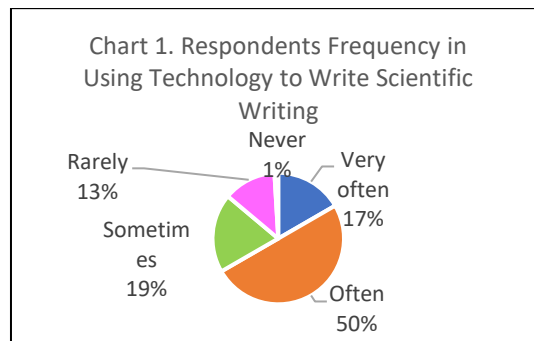**Students' Frequency in Using Technology to Write Scientific Writing**

Image 1

The data in Image 1 illustrates the frequency of respondents' utilization of technology for scientific writing. The findings indicate a prevalent reliance on technology among respondents for scientific writing, underscoring its central role in contemporary academic practices. The majority of respondents reported either frequent or occasional usage of technology for this purpose, reflecting a widespread integration of digital tools into the writing process. This suggests that technology offers numerous benefits, such as enhanced efficiency, access to resources, and opportunities for collaboration (Vali, 2022), (Adomako & Nguyen, 2023), (Zamiri & Esmaeili, 2024).

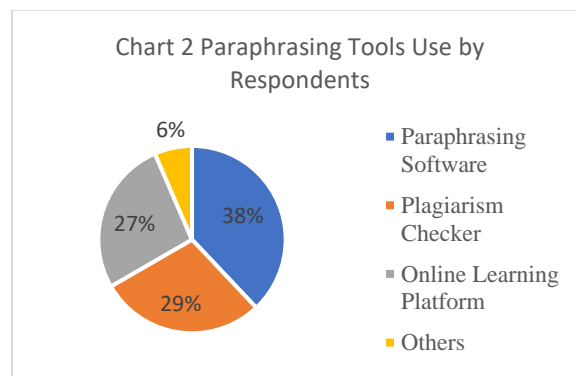**Paraphrasing Tools Use by Respondents**

Image 2

This data in Image 2 illustrates the usage patterns of paraphrasing tools among respondents, focusing on the types of tools employed. Firstly, the preference for paraphrasing software, chosen by a significant proportion of respondents, underscores its perceived value in academic writing. This invites exploration into the effectiveness of such software and its integration into educational practices. Additionally, the popularity of plagiarism checkers reflects a strong emphasis on academic integrity, prompting discussions on the importance of originality and the efficacy of plagiarism detection tools. There are several tools to check plagiarisn, such as Turn it in (U. Andayani & Hasbana, 2019), (Permana et al., 2022), (Widhiani et al., 2022). The utilization of online learning platforms for paraphrasing purposes indicates the evolving nature of academic resources and learning environments, sparking discussions on the benefits and challenges of online learning in supporting writing skills development (Drivoka Sulistyaningrum, 2021), (Syahnaz & Fithriani, 2023) such as QuillBot (Fitria, 2021b), (Latifah & Nasrullah, 2024).

The Effectiveness of Technology in Paraphrasing

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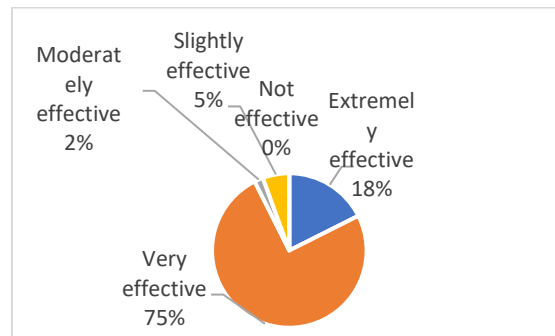Vol. 2, No. 1, pg. 79-88
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Image 3

The data in Image 3 presents insights into the perceived effectiveness of technology in paraphrasing among respondents. In short, the data reflects a positive perception of technology's role in supporting paraphrasing activities among the respondents. Some previous research prooved the effectiveness of technology in supporting paraphrasing practice, among them are Ariyanti & Anam (2021), Aprianto et al. (2024).

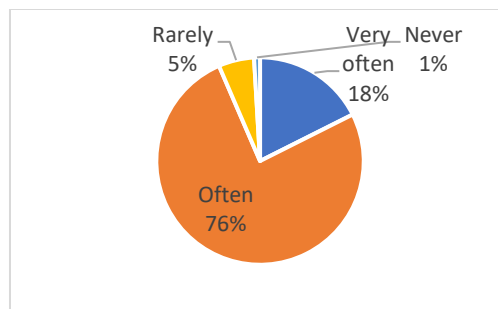**Participants Frequency in Using Referencing Software on Their Citation**

Image 4

The datain Chart 4 presents the frequency of participants' usage of referencing software for their citations. The data highlights the widespread adoption and importance of referencing software among participants in managing and organizing their academic citations effectively. This demonstrates a recognition of the benefits of using such software in ensuring accurate and properly formatted citations, contributing to the overall integrity and quality of scholarly work (Risparyanto, 2020).

The Obstacle in Finding Appropriate Technology for Scientific Writing

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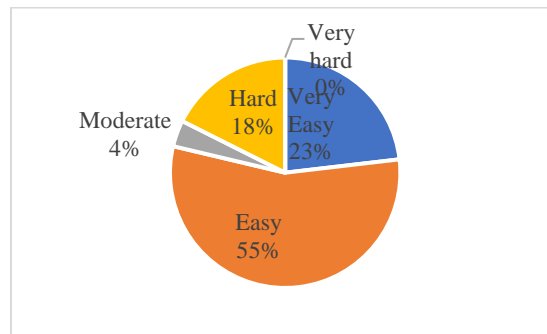Vol. 2, No. 1, pg. 79-88
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Image 5

The data in Image 5 outlines participants' perceptions of the difficulty in finding appropriate technology for scientific writing. Overall, the data reveals a range of perceptions regarding the ease of finding appropriate technology for scientific writing, with the majority of participants expressing confidence or minimal difficulty in this regard. However, the presence of respondents who find it hard underscores potential obstacles or complexities associated with navigating the landscape of available technological tools for scientific writing (Dergaa et al., 2023), (Imran & Almusharraf, 2023), (Salvagno et al., 2023). This highlights the importance of providing support and resources to assist individuals in selecting and utilizing suitable technology effectively in their academic endeavors.

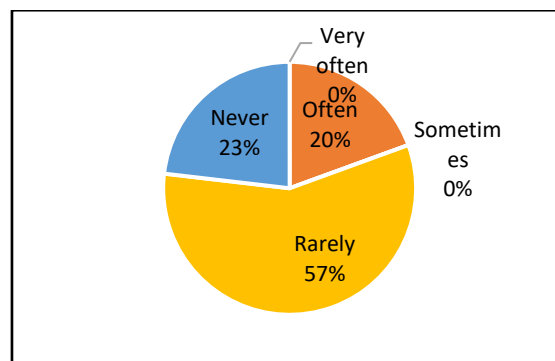**Technical Issues in Applying Technology in Scientific Writing**

Image 6

The data indicates the frequency of technical issues encountered by participants when applying technology in scientific writing. Overall, the data highlights the varied experiences of participants regarding technical issues in scientific writing, with a significant portion encountering them occasionally or frequently. This underscores the importance of addressing technical challenges to ensure a smooth and efficient writing process, thereby enhancing productivity and minimizing disruptions. It also emphasizes the need for continued support and training in utilizing technology effectively to mitigate potential technical hurdles in scientific writing endeavors.

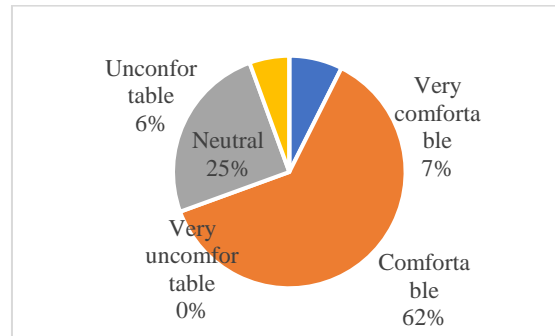**Comfort in Using Technology in Increasing Writing Quality**

Image 7

The data portrays participants' comfort levels in using technology to enhance the quality of their writing. Overall, the data highlights varying degrees of comfort among participants regarding the use of technology to enhance writing quality, with a majority feeling either comfortable or neutral about its role in this regard. This underscores the importance of promoting technological literacy and providing support to enhance participants' confidence and proficiency in utilizing technology effectively for improving writing quality.

The importance of technology in helping students manage time and meet deadlines in academic writing.
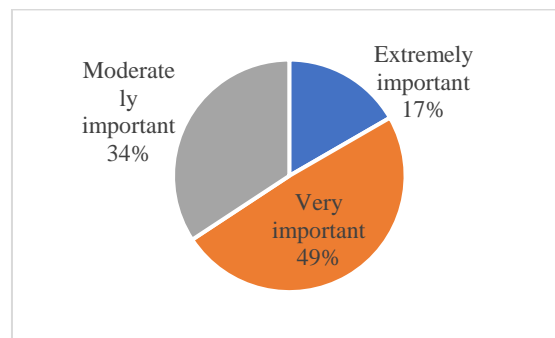

Image 8

The data illustrates participants' perceptions of the importance of technology in aiding students to manage time and meet deadlines in academic writing. Overall, the data highlights the indispensable nature of technology as a tool for enhancing students' ability to manage time efficiently and adhere to deadlines in the context of academic writing. This underscores the need for continued integration of technological resources and support mechanisms to empower students in optimizing their writing processes and meeting academic requirements effectively.

Technology helpfulness in editing and revising scientific writing

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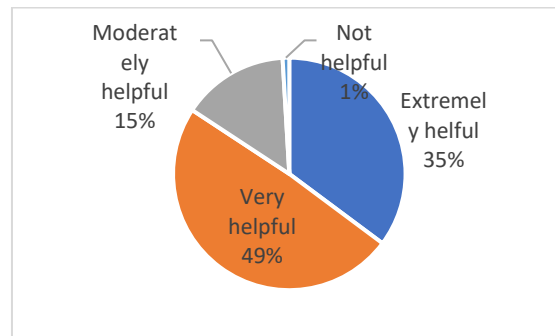Vol. 2, No. 1, pg. 79-88
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Image 9

The data reveals participants' perceptions of the helpfulness of technology in editing and revising scientific writing. Overall, the data underscores the pivotal role of technology as a valuable tool for enhancing the quality and effectiveness of scientific writing through its support in editing and revision processes. This highlights the importance of leveraging technological resources and tools to empower writers in refining their manuscripts and ensuring scholarly rigor and clarity in scientific communication.

CONCLUSION

The general conclusion drawn from these findings is that technology plays a crucial role in various aspects of scientific writing. Participants overwhelmingly perceive technology as beneficial and even essential for tasks such as paraphrasing, managing citations, improving writing quality, and editing and revising scientific manuscripts. Additionally, technology is regarded as instrumental in aiding time management, meeting deadlines, and overcoming technical obstacles in the writing process. These findings underscore the pervasive influence of technology in shaping contemporary academic practices, highlighting its capacity to streamline workflows, enhance productivity, and facilitate scholarly communication. As such, the integration of technology into academic writing processes is essential for empowering writers, optimizing their efficiency, and maintaining the integrity and quality of scholarly output in the digital age.

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