

Students' Perceived Benefits and Challenges on the Integration of Digital Tools into Undergraduate Thesis Writing in Islamic Higher Education

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ABSTRACT

This study examines the role of digital tools in fostering undergraduate students' thesis writing process. While digital tools are now widely applied in academia, limited studies have focused on how these tools impact the quality of students' theses and the challenges they encounter. The qualitative case study design involving 7th-semester students from the English Education Department at an Islamic higher education institution in Ponorogo was employed to explore their perceptions of digital tools through questionnaires, observations, and in-depth interviews. The findings indicated that students use various digital tools, including word processors, reference management software, and data analysis programs. The result of thematic analysis revealed that students perceived digital tools to facilitate the quality, effectiveness, organization of thesis work, and motivation. Although some students faced technical difficulties, unfamiliarity with advanced software features, and resource constraints, they believed learning with digital tools positively influenced their academic performance. The study contributes valuable insights for educators and institutions, informing strategies to optimize the use of digital tools in thesis writing.

KEYWORDS:

Benefits;
Challenges;
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Introduction

Technology has become integral to academic work in the digital age, influencing how students approach their studies and complete their projects. It enhances student satisfaction and educational performance by providing tools that improve learning quality, foster collaboration, enhance independent learning, and create a more engaging and motivating educational environment (Frolova et al., 2020; Memon et al., 2022; Xue, 2024). Overall, technology is transforming education by improving both the learning experience and academic outcomes. Furthermore, digital tools in academic writing should be considered in light of advances in

digital pedagogy and applied linguistics, and their effectiveness should be considered (Curry, 2023).

One area where technology plays a crucial role is in the thesis writing process, which is mandatory for undergraduate students in many academic settings, including Islamic Higher Education. According to Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 49 of 2014 about the National Standard of Higher Education, Article 45 Paragraph 4, the thesis, or undergraduate thesis, is a required final project that must adhere to specific standards and regulations in higher education institutions. This requirement aligns with the definition of a thesis as a scientific work that students must complete to successfully finish their undergraduate degree (Pravita & Kuswando, 2022).

In this context, integrating digital tools in the thesis writing process can significantly support students by enhancing their research and improving writing efficiency. Thesis writing is a critical component of a student's academic journey, especially in university education, where it is a final project showcasing the culmination of learning. While some students may choose to publish a journal article, the thesis remains mandatory at many institutions, including an Islamic higher education institution in Ponorogo, as one of the Islamic higher education institutions. The thesis project, "undergraduate thesis," is a compulsory course worth 6 credits in the 7th semester. Before embarking on this significant project, students must complete the Thesis Seminar Proposal course. Digital tools have been increasingly recommended throughout this process, starting from the thesis proposal seminar and continuing into the thesis writing phase. These tools, including word processors, reference management software, and data analysis tools, have been integrated into the academic curriculum to support students' research and writing efforts.

Research into digital tools for the academic writing process indicates that they help universities teach students effective writing practices, especially in a language-learning context. These tools offer features such as instant feedback, collaborative writing environments, and grammar assistance that support students in developing more effective writing strategies. Studies show that English as a Foreign Language (EFL) students' writing performance can significantly improve using tools such as Paragraph Punch and ProWritingAid, which give real-time feedback and guidance. Research indicates that many students have written better regarding idea development, grammar, and paragraph organization (Pitukwong & Saraiwang, 2024). Research on ESL students in Malaysia indicated that digital tools can enhance proficiency, especially in grammar, vocabulary, spelling, and punctuation (Ramamuthie & Abdul Aziz, 2022). Digital support also has an important role in improving students' understanding and use of punctuation in English academic writing (Ivanova et al., 2022).

ChatGPT and other generative AI platforms have also been shown to strongly impact writing, writers, audiences, and writing results (Johnson & Paulus, 2024). Therefore, understanding how students will be using tools such as ChatGPT is critical to writing competency, and the need for the writing to be done in the classroom for academic writing (Krajka & Olszak, 2024). Despite its success in academic writing, ChatGPT has flaws, such as repetition, unfounded inference, illogical reasoning, fictitious references, and failure to consider pragmatics (Mahyoob et al., 2023). Citation is a vital part of ensuring academic honesty. Hence, responsible citation is imperative (Jarrah et al., 2023). ChatGPT can limit creativity and dialogue in spite of its advantages (Royani et al., 2024).

Another standard digital writing tool is Grammarly, which identifies different types of writing errors and generates fast, colorful feedback to guide users in correcting errors (Calma et al., 2022; Zinkevich & Ledeneva, 2021). While it is particularly beneficial for many upper-year, upper-half classes (Guo et al., 2020). It also helps the learner target problems that reappear frequently and monitor progress. Mendeley and EndNote are reference management tools that improve academic writing by making the searching of references and the tasks of publication easier and more organized, with EndNote managing the citations in a streamlined way, leaving researchers to focus on core tasks (Sharma, 2025; Vijai et al., 2019). For example, at Muhammadiyah University, 80% of the students have learned to use Mendeley for citations and bibliographies, which is beneficial in their academic learning preparation (Susanti et al., 2024).

In addition, the presence of space for a digital feedback mechanism (e.g., screen recording) reinforces the positive learning environment and boosts encouragement of the learner during the composition process, enhancing the quality of academic writing (Hojeij & Ayber, 2022). Collaborative digital tools, such as Google Docs and wikis, are also endorsed for promoting collaborative writing and individual writing growth, increasing student motivation and writing self-efficacy (Zhang & Zou, 2022). For instance, Tanrikulu (2022) argues that combining technology with writing, like in digital storytelling, can effectively enhance writing skills through collaborative and creative processes (Tanrikulu, 2022). Using digital mind maps can also be an important tool to organize ideas, stimulate critical thinking, and improve creative writing in students (Sairo et al., 2021). Digital tools have been widely used to make the thesis writing process more productive and efficient. However, their effects on students' perceptions and experiences with the thesis writing process are still an under-researched area.

Thesis Writing is an integral part of higher education, and it requires rigorous research, analysis, and Writing. With a wave of new academic rigor crashing down on students, it changes how they write with digital tools as a ubiquitous presence in their writing practices. Word processors, reference management programs, and data processing software are part of the academic tools today. Although there has been much awareness amongst practitioners about the tool, student views on the effectiveness and the benefit of these tools on the writing experience are still being explored. It is crucial for educators and institutions that demand better scholarly success to see how these tools help and improve the thesis-writing process.

The primary objectives of this study are to identify digital tools employed, to analyze students' perceptions and experiences regarding the effectiveness of digital tools in enhancing thesis quality, and to identify challenges and barriers students encounter when integrating these tools into their research and writing processes. The research problems comprise as following:

1. What digital tools are employed during the thesis writing process?
2. How do students perceive the benefits of digital tools on the quality of their thesis writing?
3. What challenges and barriers do students face when using digital tools during the thesis writing process?

By addressing these questions, the study will offer a comprehensive understanding of both the benefits and limitations of digital tools in academic writing, helping inform future educational strategies and technology integration in academic settings.

Method

To gain a comprehensive understanding of undergraduate students' experiences and perceptions regarding the digital tools they use throughout the thesis writing process, a qualitative case study design was employed. It was selected to explore students' interactions with various digital technologies in an academic context. Since thesis writing is a complex and multi-stage effort often involving tasks such as literature review, data collection, drafting, citation, and revision, therefore, it is essential to examine how digital tools support or hinder students at different stages of the process.

The case study method is particularly well-suited to research investigating phenomena within their real-life contexts (Creswell & Creswell, 2023). This study allowed for a rich, contextualized analysis of how digital tools are integrated into the process and how students perceive their benefits and barriers. The participants in this study were 102 seventh-semester undergraduate students from the English Department at an Islamic higher education institution in Ponorogo, all of whom were engaged in writing their theses. The study involved purposive sampling of participants with direct experience using digital tools in their research and writing tasks. The students were selected since they had applied various digital tools throughout their thesis writing process.

The data were collected using three main techniques- questionnaires, observations, and in-depth interviews. First, the researchers conducted direct observation during these stages, starting at thesis proposal writing and continuing to thesis writing examination in the 2024-2025 Academic Year to reveal the use of digital tools in action. Next, a questionnaire was distributed to identify the use of several digital tools among students in the thesis writing process. Furthermore, an in-depth interview was conducted with 10 voluntary students to express perceptions of how digital tools influenced these qualities. The questions asked students to reflect on their use of the different tools and their overall impressions of how they affected the quality of their academic work. The interviews also investigated the obstacles and impediments that students experienced with digital tools.

Thematic analysis was employed to analyze the data collected from observations, questionnaires, and interviews. This method allowed the researcher to identify, analyze, and report on the patterns and themes that emerged from the data. Thematic analysis was particularly suited to this study as it helped organize the data into meaningful categories aligned with the research questions (Braun & Clarke, 2022). Primary themes were identified concerning undergraduate students' perceptions of the efficiency of digital tools, their experiences with these tools, and the problems they faced in integrating them into their thesis writing process.

Results

This publication presents the results of this study, drawing on a detailed examination of survey data from 102 students along with 10 interviews. These high-level themes regarding students' experiences with digital tools in writing their theses. It presents the respective survey results alongside the seven key themes we derived from the data analysis. These themes provide helpful information on students' experiences with digital tools during the thesis writing process.

Digital Tools Employed during the Thesis Writing Process

This report presents the findings from a survey conducted to understand the usage of various digital tools among students for thesis writing, data analysis, idea generation, literature exploration, and reference managers. The survey provides insights into the most commonly used tools across different categories and their perceived usefulness.

Table 1. *Kinds of Digital Tools Employed during Thesis Writing*

No	Kind	Tools	Function	Number of Students
1	Thesis Writing Tool	Grammarly	Improve sentence structure	98
		QuillBot	Paraphrasing tool to improve clarity	60
		Turn it in	Detect plagiarism	90
2	Data Analysis Tool	SPSS	Analyze numerical data	54
		Excel	Data entry and visualization	46
		QDA Miner	Analyze text data	32
3	AI-powered platform	Chat-GPT	Help generate ideas	102
		Qween Max	Help generate ideas	25
		Chat Pdf	Explore literature in detail	84
4	AI-Enhanced Discovery	Consensus	Explore literature effectively	54
		Connected Papers	Build literature	38
5	Reference Managers	Zotero	Generate citations	76
		Mendeley	Generate citations	36

The result of the survey was the students' reliance on different tools to improve the quality of their writing. Some of the popular thesis writing tools are Grammarly, Turnitin, and QuillBot. The most popular – 98 students used – was Grammarly, to fix sentence structure, grammar, and improve the overall quality of written content. Turnitin is the second popular tool since 90 students are employed for plagiarism detection. This tool ensures the integrity and originality of student research. Another tool many students use is QuillBot, a paraphrasing tool that takes chunks of text and improves the writing, rephrases content, and generates ideas.

In writing the thesis, the other most important step is analyzing data because the students who deals with empirical research analysis have to write data based on the result of observation, test or interview have to apply SPSS, Excel, and QDA miner: The survey showed that 54 of the students work with SPSS, the tool most used for processing statistical information and numerical data. The second most common tool, Excel, used by 46 students, also serves two purposes, namely data entry and visualization, possibly some fundamental analysis, thus also indicating its role in organizing and visualizing data in an accessible way. Then the use of QDA Miner, which is employed by 32 students for qualitative data analysis, provides them with high-performance tools for managing and analyzing text data.

AI-enhanced discovery tools like Consensus and Connected Papers provide advanced capabilities to explore and organize literature. Consensus, employed by 54 students, helps navigate academic literature by offering structured insights into research trends, making it easier for students to identify significant studies and key developments in their field. Connected Papers, used by 38 students, help build a visual representation of related literature, aiding in the organization of research and facilitating the establishment of connections between key studies. This visual mapping is instrumental in constructing a comprehensive and well-rounded thesis framework.

Finally, citation and references management are also critical points of thesis writing; the survey shows that Zotero and Mendeley are the two tools recorded at the top of the list for this purpose. Zotero, the preferred tool among 76 students, is a tool for collecting, organizing, citing, and sharing research sources, keeping proper citations. Mendeley, used by 36 students, served as a significant reference management software, with features similar to Zotero, but also helps peers in their research collaboration and share resources with them.

The survey clearly demonstrates that these digital tools are embedded in students' thesis writing process, from writing quality improvement, idea generation, data analysis, and reference management. Grammarly, Turnitin, and Chat-GPT were most preferred for writing and generating ideas, while tools like SPSS, Excel, and QDA Miner were challenging to support for data analysis. Zotero and Mendeley have been adopted for reference management, reinforcing the need to properly organize references in academic works.

Students' Perceived Benefits of Digital Tools on the Quality of Thesis Writing

Enhanced Writing Quality

Students report significant improvements in the quality of their thesis writing due to the integration of digital tools. Tools such as word processors, grammar checkers such as Grammarly, and citation management software – Zotero are highlighted as essential in improving their work's clarity, coherence, and organization. The ability to automatically generate citations and manage references is likely to be perceived as a time-saver, ensuring academic integrity and formatting consistency, thus enhancing the overall quality of their thesis. As supported by the result of the interview below:

I used Grammarly, and it is very helpful for my undergraduate thesis. I no longer have to think hard about grammar mistakes anymore because Grammarly provides solutions for them. So, in writing, I just focus more on the content of my undergraduate thesis. (P10)

Grammarly gives me direct feedback on my writing, dealing with grammar mistakes, so I can make corrections right away, and I feel confident that my writing is improving. (P5)

I apply Zotero for citation manager as suggested by my lecturer, and I feel that the format of my writing is getting better and readable. Zotero automatically handled my citations, so I can focus on my writing, and I don't have to worry about the wrong format of citation. (P7)

Increased Efficiency and Productivity

The ubiquitous theme is how digital tools can make everything you do more efficient and productive. As though the writing process has not been reshaped, AI tools such as ChatGPT and ChatPDF have also taken over the earlier stages of writing, such as brainstorming and literature reviews. For example, when students need to come up with thesis topics, ChatGPT can help provide ideas while refining their research questions and offering suggestions for writing. It helps students with writer's block, structure their thesis, and manage their time. Similarly, an AI tool like ChatPDF helps streamline the literature review by allowing students to upload research papers themselves and summarize, analyze or even interrogate the AI. This allows students to quickly scan hundreds of academic papers to find relevant information and ideas without taking days to read each source. Such tools help in researching and extracting relevant information in a less time-consuming manner.

I'm no longer stuck in writing when I use ChatGPT. I found an idea to start and organize my ideas based on the topic of my undergraduate thesis. The suggestion and recommendation from ChatGPT helped me to make a clearer vision for my research. (P1)

I can save my time for reading a journal article with the help of ChatPDF. In that platform, I can upload research papers, and I get the summaries instantly. Also, I can ask details about the content of the article. (P10)

In conducting a literature review, especially for writing Chapter 2, ChatGPT and ChatPDF, I get important insights quickly by just uploading the article. It indirectly increases my productivity (P2)

Boosting Motivation and Confidence

The next theme is that digital tools potentially enhance student motivation and confidence. Many students most definitely stated that they had more power and involvement in writing their selected topic in terms of researching related literature on Google Scholar or Consensus, where the seemingly never-ending number of studies available to the general public, on the effects of digital tools on students' engagement and confidence.

Students have used AI tools to assist them in the brainstorming and organizing phases of academic writing, giving them confidence in writing. AI tools such as ChatGPT or QuenMax can significantly streamline academic writing. It supports students to avoid the confusion of the preliminary steps in writing the paper that often leads to writer's block towards an organized research paper outline.

I think so hard about starting my undergraduate thesis because I didn't know where to start. Since my lecturer recommended ChatGPT, I feel more empowered to find ideas to start my undergraduate thesis, and I felt confident writing it then. (P6)

When I use Platforms like Consensus and Google Scholar for finding journal articles, I feel more motivated because I have access to research studies that support my ideas, I can find evidence to support my claims, and it is freely accessible. (P3)

Besides using ChatGPT, I also use Qwenmax to help with organizing my paper. I feel like I have a clearer path forward. They showed me the way to construct the next paragraph, and I felt confident to continue writing. (P4)

Actually, I am not sure about using AI tools in my undergraduate thesis because my friend told me it was detected by Turnitin. But now, using ChatGPT for brainstorming my ideas has increased my motivation. I know what I should do next and keep writing. (P8)

Challenges and Barriers Do Students Face When Using Digital Tools during the Thesis Writing Process

Technical Difficulties and Tool Familiarity

The following emerging discussion deals with the challenges and barriers to using digital tools in writing. Technical difficulties emerged when using digital tools that require specialized knowledge. Some students may become discouraged when using sophisticated software like SPSS or new word processor features. These challenges may result in a slower writing process for people who lack technical expertise or experience with such tools. Navigating complicated software or unknown features is one of the most significant problems for students when using digital tools. Their writing process may become slowed down and frustrated as a result.

I learned to operate SPSS for my quantitative data analysis, and I found there are many features that I don't understand, and sometimes it makes me confused and frustrated. (P8)

My lecturer recommends that I apply a reference manager when doing an undergraduate thesis. I used Zotero. I have downloaded the software, but maybe I just can't understand how to properly set it up, so I failed to use it and delayed my writing. (P10)

There are so many features and functions in word processors that I didn't know. Sometimes I get confused in formatting my draft, and I edit page by page, and I feel it is wasting my time. (P3)

To address this technical barrier, universities can organize online or in-person workshops to teach students to use advanced tools like SPSS, Word processors, or reference management tools (e.g., Zotero, Mendeley). These workshops should be scheduled regularly and available on demand for students needing extra learning time.

Accessibility and Resource Limitations

The students experienced struggling to access available digital tools. It might be related to the lack of access to licensed software, slow or unreliable internet, or inability to access university-provided resources. This will likely be a more significant issue for fellows from low-income backgrounds, who might find it difficult to purchase or obtain digital instruments outside the college setting.

At home, my internet connection is very slow. It is frustrating when I need to upload assignments or access online tools, and the lag makes everything take so much longer. (P7)

I've heard about tools like SPSS and Zotero, but I don't have the resources to get them. It feels like I'm falling behind because I can't access the same tools that other students are using. (P5)

Some solutions address this problem by ensuring that campus Wi-Fi networks are robust, easily accessible, and free for students. In cases where students cannot afford to access paid research databases, universities can offer on-campus access to online journals, research papers, and academic publications. Also, encouraging open-access repositories, which allow students to download research papers and other scholarly works at no cost, might relieve some of that burden on students.

Discussion

Integrating digital tools into academic writing has gathered considerable attention for its positive impact on students' writing quality, particularly in the context of thesis writing. The findings revealed the diversity of students' digital tools during the thesis writing process. Earlier research highlights the efficacy of writing tools like Grammarly, ProWritingAid, and digital platforms such as ChatGPT for improving writing at the levels of grammar, organization, and discourse quality (Calma et al., 2022; Pitukwong & Saraiwang, 2024; Zinkevich & Ledeneva, 2021). They are tools that offer feedback in the moment so students can revise drafts in real time. Studies have also shown that digital tools like Mendeley or EndNote make citation and reference management effortless (Sharma, 2025; Vijai et al., 2019).

The tools employed, like Grammarly, QuilBot, and Turnitin, are commonly used to enhance writing quality with error checking, clarity, and structure improvements. On the other hand, research data analysis tools, including SPSS, Excel, and QDA Miner, promptly facilitate research data management and analysis for students. AI-powered platforms like ChatGPT and ChatPDF have specifically been invaluable for ideation, literature review, and looking into different research directions. These platforms guide students through early steps in writing, streamlining tedious processes and easily increasing productivity.

The tools are seen as very useful, with students feeling more confident about writing and studying. Such an automaton frees students to spend time on more important parts of their thesis – improving their argument and analysis. The quality of the thesis largely depends on the increase in productivity and clarity that AI tools provide (Johnson & Paulus, 2024; Krajka & Olszak, 2024). While the advantages of using digital tools are evident, the students' challenges are equally pronounced. However, technical challenges involving less-intuitive software, like SPSS for data analysis or citation management tools like Zotero, have remained a sticking point for many students. It can diminish the usefulness of these tools and slow progress because we become frustrated by features that are not familiar colloquially (Jarrah et al., 2023).

Furthermore, factors like slow internet speeds or the inability to purchase rented software are significant barriers to students, especially in resource-challenged settings. Such barriers mitigate the tools' capacity and lead to inequity between students benefiting from

digital resources. In addition to using tools such as ChatGPT, which provide essential benefits, it should also be noted that they have limitations, such as non-factual inferences and repetition (Mahyoob et al., 2023). Thus, though digital tools simplify the mechanics of writing a thesis, the obstacles students face highlight an area where institutions must step up. Such support must include training in digital tools, reliable internet access, and affordable or open-source software to enable all students to utilize the power of these tools entirely.

In sum, digital tools are reshaping writing practices for thesis writing on different fronts, enhancing writing quality, enabling data analysis, and making writing efficient. However, at the same time, they emphasize the technological and accessibility challenges. Through these challenges, educational institutions can focus on enabling students to use the digital tools available, improving the quality of academic writing and study. Integrated with sufficient support, digital tools can vastly enhance students' experiences and outcomes as writers in the thesis writing process.

Conclusion

This case study research investigates the use of digital tools in the thesis writing process among English Department undergraduate students, focusing on the tools employed, their perceived benefits, and the challenges encountered. The observation, survey, and in-depth interviews revealed that students extensively use various digital tools throughout their thesis writing process. Most students have experience using digital tools, which is beneficial for improving their writing quality, increasing productivity, and boosting confidence in academic work. Despite these beneficial views, students face challenges and barriers regarding technical problems with multifaceted tools and unfamiliarity with certain software features. Moreover, accessibility issues, including slow internet connections and limited access to paid software, particularly affect students from deprived backgrounds, hindering their full utilization of digital tools.

The limitation of the studies lies in the narrow focus of the participants. It is limited to self-reported data of English Department undergraduates in one institution. Also, this study did not deeply explore the emerging technologies and institutional support mechanisms. Therefore, it is recommended that future research should address these gaps by broadening the scope, incorporating diverse methodologies, and examining the long-term impacts of digital tools across disciplines. Apart from its limitations, this research adds to the existing literature on using digital tools in academic writing, demonstrating the benefits and the challenges students experience. In exploring perceptions and experiences, the study gives guidance about how effective these tools are for improving the productivity and outcomes of writing. Finally, this study highlights the need to expand access to digital tools in academia to support academic writing, dealing with the associated accessibility and technical barriers.

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