Leveraging AI-Powered Tools in Academic Writing and Research: Insights from English Faculty Members in Indonesia

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***Abstract*—This research explores using Artificial Intelligence (AI)-powered tools by English faculty members in academic writing and research. It identifies the most commonly used tools, the objectives behind their adoption, and the challenges users face. A mixed-method research design was employed, incorporating both quantitative and qualitative data. The study's subjects were 16 English faculty members from various regions in Indonesia, selected based on their experience in publishing research articles. Data were collected using questionnaires, interviews, and Focus Group Discussions (FGD). Data analysis involved descriptive statistical analysis for quantitative data and thematic analysis for qualitative data. The findings reveal that tools such as QuillBot, ChatGPT, and Grammarly are frequently used by faculty members, primarily for purposes like conceptualizing and planning research, organizing and crafting content, performing literature reviews and integration, handling and interpreting data, offering assistance with editing, reviewing, and publication, and also enabling communication, engagement, and maintaining ethical standards. However, significant challenges were identified, including concerns about academic integrity, bias in AI-powered tools, and issues related to personalized learning. These challenges highlight the need to develop technical skills among faculty and ensure the ethical use of AI-powered tools in academic writing and research. The implications of this research suggest that while AI-powered tools can enhance the efficiency and quality of academic writing and research, it is crucial to address ethical concerns and potential biases to maintain the integrity of scholarly work.**

***Keywords*—Artificial Intelligence (AI)-powered tools, academic writing, faculty members, mix-method, research**

I. Introduction

The utilization of technology in education and learning has become indispensable. Integrating technology in the classroom significantly enhances English as a Foreign Language (EFL) students' confidence by allowing them to practice English interactively and independently [1]. Technology is crucial in creating a more effective classroom environment because it can offer various learning resources and tools to facilitate learning [2]. Teachers can leverage technology to develop new learning strategies and methods tailored to students' needs and abilities, including language applications, e-learning platforms, and digital communication tools [3]. Consequently, integrating technology in EFL learning is essential for students to comprehend the material better, as numerous studies have demonstrated that learners tend to grasp teaching content more effectively when technology is applied [4].

Building on the broader utilization of technology, integrating Artificial Intelligence (AI)-powered tools in EFL represents a significant innovation. AI-powered tools can deliver individualized and flexible educational experiences suited to the specific requirements of every student [5]. Many students use AI-powered tools such as Duolingo, Grammarly, and Rosetta Stone to improve their English skills [6]. ChatGPT, a popular AI-powered tool, offers numerous benefits to English learners, including explanations of grammar rules, interactive conversation practice, and vocabulary and phrase clarification [7]. Additionally, teachers can utilize AI-powered tools like Turnitin to check the originality of students' written work, Canva to create engaging visual teaching materials, and Quizlet to manage interactive flashcards [8]. By incorporating AI-powered tools, students and teachers can enhance learning efficiency, deepen their understanding of the material, and make learning more enjoyable and interactive.

Despite the growing use of AI-powered tools in academic writing and research, there remains limited understanding of how English faculty members, particularly in specific educational contexts like Indonesia, are incorporating these technologies into their professional practices. While existing studies have focused on the role of AI-powered tools in improving student learning outcomes [9–12], fewer have critically examined the integration of AI-powered tools in faculty-driven academic tasks such as research productivity and scholarly writing. This gap in the literature is significant, as AI-powered tools have the potential to transform the way faculty members approach writing, editing, data analysis, and publication processes.

The widespread use of AI-powered tools by EFL students and teachers has led to diverse perspectives on the evolution of these technologies. While some express great enthusiasm for their implementation [13], others voice concerns about their impact on academic integrity, such as the risk of plagiarism and the potential stifling of original writing skills [14]. These concerns are particularly relevant as some researchers suggest that trust in writers may diminish with increased AI-powered tools' involvement in the writing process due to the perception that the work produced may be more influenced by technology than by the writer's creativity. Additionally, the ethical implications of using AI-powered tools in educational settings are significant, necessitating strict ethical validation to prevent potential misuse, such as

the spread of inaccurate information or data manipulation [15]. Integrating AI-powered tools also raises concerns about the possible displacement of human labor, such as replacing teachers' roles in providing feedback or teaching certain materials with AI technology [16]. Therefore, this study provides a critical analysis of how English faculty members practically integrate AI-powered tools into their research and teaching practices, exploring both the opportunities and the challenges they face.

Several recent studies have discussed integrating AI-powered tools in the ELT context. AI-powered tools, such as speech recognition, grammar correction, and chatbots, have been implemented in ELT, positively impacting students' academic progress [17]. Additionally, AI-powered tools such as linear remedial drills and grading cloze exercises serve as assistive catalysts in ELT, helping teachers deliver effective language instruction [18]. While these studies provide valuable insights, they often lack a critical examination of the methodologies and theoretical frameworks employed, limiting the generalizability and applicability of their findings. Integrating these tools into ELT necessitates acquiring new skills and competencies by ELT practitioners, who must adapt to new technologies to remain relevant and use AI-powered tools to enhance their teaching practices [19]. An earlier study investigates the usage patterns of AI-powered tools among Indonesian EFL learners as initial data for creating assessment models. The findings indicate that while participants had a fundamental understanding of AI-powered tools, many acknowledged their lack of familiarity, highlighting the need for increased education and awareness about them. In the writing context, a study explored students' opinions on the advantages and disadvantages of Automated Writing Evaluation (AWE) [20]. Another study investigated the variation in students' perceptions of AWE based on their skill levels [21]. The findings show that AWE consistently offers positive outcomes across different studies. Nonetheless, these studies often fail to address how these tools can be systematically integrated into faculty members' teaching and research practices, leaving a critical gap in understanding the broader implications of AI in academic settings.

While research on AI-powered tools in education is growing, particularly in the context of technology integration in teaching and learning, limited attention has been given to how English faculty members, especially in specific contexts like Indonesia, use AI-powered tools to enhance research productivity and academic writing. Therefore, this study aims to provide a comprehensive analysis of how English faculty members in Indonesia integrate these tools into their research and writing workflows, identifying the specific opportunities and challenges they encounter. This study aims to fill this gap by critically examining the use of AI-powered tools by English faculty members, focusing on their objectives, challenges, and the broader academic implications of such integration. Based on this gap, the following research questions arise:

1) What AI-powered tools are commonly used by English faculty members for academic writing and research?
2) What objectives do English faculty members aim to achieve by adopting AI-powered tools for academic writing and research purposes?
3) What challenges do English faculty members face in utilizing AI-powered tools for academic writing and research?

II. Literature Review

A. AI-Powered Tools in Academic Writing and Research

The use of AI-powered tools in academic writing and research has gained significant momentum, with a variety of tools being utilized for diverse purposes. ChatGPT, developed by OpenAI, is one of the most popular AI-powered tools, capable of generating text across various genres, including essays, blog posts, and academic papers, with minimal human intervention [22, 23]. Similarly, Quillbot is widely used for paraphrasing, allowing users to rephrase sentences effectively, often as a strategy to avoid plagiarism detection [24]. Jenni.ai is another AI-powered tool frequently used by writers to generate relevant and informative text [13]. This tool offers substantial advantages in terms of efficiency, enabling users to quickly generate and edit content. Other cutting-edge tools such as GPT-4o and Gemini, from OpenAI and Google respectively, are continuously being updated to further enhance their capabilities in research and writing processes [25].

The primary objective of integrating AI-powered tools into academic writing and research is to enhance efficiency and streamline the writing process. These tools assist in generating content, checking grammar, and providing instant feedback, which can significantly reduce the time spent on drafting and revising manuscripts [26]. AI-powered tools like ChatGPT and Quillbot also allow researchers to focus on higher-level cognitive tasks by automating routine functions such as paraphrasing, summarizing, and grammar correction [8]. For academic writing, tools like Turnitin are essential for maintaining originality by detecting AI-generated text and potential plagiarism, supporting research integrity. In addition, these tools are intended to aid researchers in overcoming writer's block and accelerating the brainstorming process, which is particularly useful for generating ideas and structuring complex arguments.

Despite the advantages, there are notable challenges in the use of AI-powered tools. One significant issue is the accuracy and reliability of generated content, as studies have found that tools like ChatGPT and Jenni.ai can produce erroneous or misleading information, including invalid citations and references [27]. These errors underscore the necessity of human oversight, as reliance solely on AI can lead to academic integrity concerns. Furthermore, excessive dependence on AI-powered tools may inhibit critical thinking and creativity, which are crucial components of academic writing. Ethical concerns also arise, with some educators questioning the use of these tools as a form of academic dishonesty, particularly if students use them to generate entire essays or research papers without proper attribution [28]. The ethical implications of AI-powered tools extend to the broader academic community, as researchers must be cautious in ensuring that these tools are used to complement, rather than replace, the human cognitive process in research and writing [29].

B. Faculty Perceptions of AI-Powered Tools in Academic Practice

The integration of AI-powered tools into academic practice has garnered increased attention, particularly as these technologies become more prevalent in higher education. Faculty perceptions play a critical role in determining the success of AI-powered tools implementation in academic settings. Several studies have shown that while faculty members recognize the potential benefits of these tools, such as improving efficiency in academic writing and research, they often express concerns regarding their practical integration. For example, educators acknowledged that AI-powered tools could streamline tasks like proofreading, data analysis, and feedback generation [9]. However, they also raised concerns about the tools' accuracy and the potential for over-reliance, which could reduce critical thinking and creativity in the academic writing process. Similarly, previous research has shown that while educators appreciate the efficiency of AI-powered tools in providing timely feedback and automating repetitive tasks, they remain cautious about the long-term effects, particularly concerning academic integrity and the potential diminishing of human expertise [30].

Additionally, perceptions of AI-powered tools are influenced by factors such as technological infrastructure, accessibility, and the level of training provided to faculty. English faculty members in regions with limited technological resources faced challenges in effectively adopting AI-powered tools, often resulting in underutilization or frustration [13]. Moreover, faculty who lacked sufficient training in AI-powered tools reported feeling overwhelmed or hesitant to incorporate these tools into their research practices [16]. Despite these challenges, many faculty members see AI-powered tools as a valuable aid in managing growing workloads and improving research productivity. Meanwhile, the key to fostering positive perceptions of AI-powered tools in academia lies in providing faculty with adequate support, resources, and opportunities for professional development [19]. This will enable them to maximize the potential of AI-powered tools while addressing concerns about ethical use and the balance between human creativity and machine assistance.

III. Materials and Methods

This study utilized a mixed-method research design, which entails the collection, analysis, and integration of both quantitative and qualitative data within a single investigation to understand the research problem [30] comprehensively. Specifically, an explanatory sequential design was employed, where quantitative data collection and analysis were followed by qualitative data collection and analysis to further explain and interpret the quantitative findings. The main methods for gathering data included surveys, interviews, and Focus Group Discussion (FGD). Surveys collected quantitative data, whereas interviews and focus groups yielded qualitative insights.

A purposive sampling strategy was employed to select participants who were English faculty members with a record of publishing research articles in national or international journals. A total of 16 English faculty members from various regions across Indonesia participated in this study. They were from Maluku, South Sulawesi, South Kalimantan, West Kalimantan, East Java, Centra Java, West Java, Lampung, and South Sumatera. Participants were recruited through professional networks and academic conferences to ensure diverse representation. The inclusion criteria required participants to hold a minimum of a master's degree, have teaching experience in English as a foreign language, and demonstrate a willingness to participate in the study. Invitations were sent through targeted communications within professional circles to ensure that all invited individuals met these criteria. This sampling strategy enhances the credibility and generalizability of the findings. The breakdown of participants by region, gender, age, qualification, and teaching experience is provided in Table 1, ensuring that readers can better understand the demographic diversity of the sample.

Table 1. Demographic information of participants

Respondent	Age (Years)	Gender	Qualification	Teaching Experience
R1	35	Female	Ph.D.	10
R2	34	Female	Master	8
R3	32	Male	Master	6
R4	48	Male	Master	15
R5	39	Male	Master	16
R6	35	Male	Master	9
R7	39	Male	Master	14
R8	31	Female	Ph.D.	3
R9	36	Female	Master	9
R10	35	Male	Master	8
R11	49	Female	Master	10
R12	35	Female	Master	11
R13	36	Male	Master	9
R14	38	Male	Ph.D.	10
R15	40	Female	Master	12
R16	35	Female	Master	9

The researcher used three instruments in this study: FGD, interviews, and questionnaires. Data collection was performed through in-person interactions in Malang, East Java. The questionnaire was administered online to ensure broad participation and was adopted from previous research to collect quantitative data [8, 28]. Sample items from the questionnaire include questions such as, "How often do you use AI-powered tools in your academic writing and research?" with options ranging from Never, Rarely, Sometimes, Often, to Always. Another item asks, "Which of the following AI-powered tools are you familiar with?" providing options like ChatGPT, Grammarly, QuillBot, Perplexity, Turnitin, Publish or Perish, and Others. Meanwhile, interviews and FGD were conducted to collect the qualitative data. Interviews were conducted face-to-face, while FGDs were organized in small groups to facilitate detailed discussions. Various pertinent scholarly sources were reviewed to develop appropriate interview questions [13, 24]. Sample interview questions included asking participants to describe how AI-powered tools have impacted their academic writing process, as well as what challenges they have encountered when using AI-powered tools for research. The FGD guidelines referred to the study by Mahapatra (2024) [31]. Sample items from the FGDs include questions such as, "In what ways have AI-powered tools, such as

ChatGPT or Grammarly, influenced your academic writing and research processes?" and "What are the common challenges or concerns you face when using AI-powered tools in your work?" The research team obtained ethical clearance from Research and Community Services (RCS) STKIP PGRI Bandar Lampung before collecting the research data.

After data collection was finalized, the researchers analyzed the research findings. Quantitative data were presented using descriptive statistical analysis, while qualitative data were examined through thematic analysis, as outlined by Braun *et al.* (2014) [32]. This dual approach allowed for a comprehensive understanding of the research problem by integrating numerical and thematic insights. The findings were then compared with existing literature to identify trends, patterns, and potential gaps in the current body of knowledge.

IV. Result and Discussion

A. Various Types of AI-Powered Tools Utilized by EFL Faculty Members

The findings of this research address the first research question, which was based on data from the questionnaires, interviews, and FGDs. This data included knowledge and usage of AI-powered tools, types of AI-powered tools, frequency of use, reasons for using AI chatbots, and opinions about their ease of use.

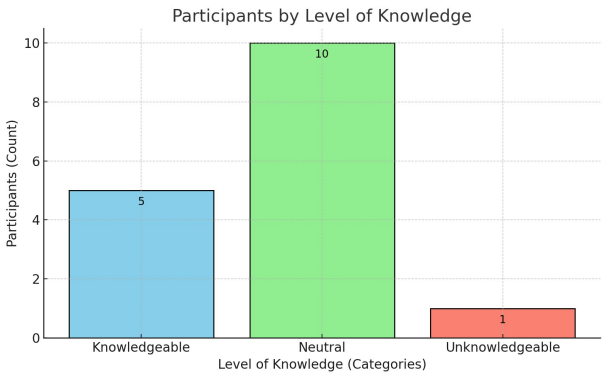

Fig. 1. Knowledge of AI-powered tools.

Fig. 1 shows the distribution of participants under three categories: Knowledgeable, Neutral, and Unknowledgeable. The "Knowledgeable" category features 5 respondents, meaning this group has high expertise with AI-powered tools in research and academic writing. The second category is the "Neutral," made up of the largest group with 10 respondents; it comprises people with moderate knowledge about AI-powered tools. Lastly, in the "Unknowledgeable" category, only 1 respondent showed the minimum level of knowledge from this group. Findings from FGDs corroborated these results, as participants in the 'Neutral' category expressed familiarity due to frequent use of intuitive tools like ChatGPT and Grammarly for quick writing tasks. A study affirmed this current finding, indicating that most participants acknowledged having familiarity with AI-powered tools due to their ease of use [33]. This familiarity is primarily attributed to the intuitive interfaces and user-friendly design, which facilitate smooth interaction and reduce the learning curve for new users.

Fig. 2 illustrates the usage distribution of various AI-powered tools among participants for writing research articles. The most commonly used tool is QuillBot, with 11 respondents indicating its use. ChatGPT follows closely with 8 users. Grammarly is also popular, utilized by 7 participants. Perplexity is employed by 6 respondents, while Turnitin and Connected Papers are each used by 4 participants. Other tools, such as Humata, Publish or Perish, Gemini, VOSViewers, NVivo, Scite, Consensus, and Semantic Scholar, were used by 2 to 3 participants. Tools like Jenni.AI, Google Translate, and Chatpdf are less commonly used, with only 1 respondent each. Notably, no participants used Hemingway Editor, SciSummary, or Cordis AI. This distribution highlights a preference for a few specific AI-powered tools, with QuillBot and ChatGPT being the most favored among the participants. The FGDs revealed that participants preferred these tools due to their ability to simplify complex writing tasks, as well as their advanced features such as paraphrasing, error correction, and data synthesis, which are not present in less frequently used tools. Prior studies support this finding, asserting that Quillbot and ChatGPT are the most widely used AI-powered tools because they enhance participants' grammatical and syntactical accuracy by offering immediate feedback to students [7, 34]. Meanwhile, findings from other research contradict this study's results, indicating that Google Translate is considered as one of the most widely used AI-powered tools [35].

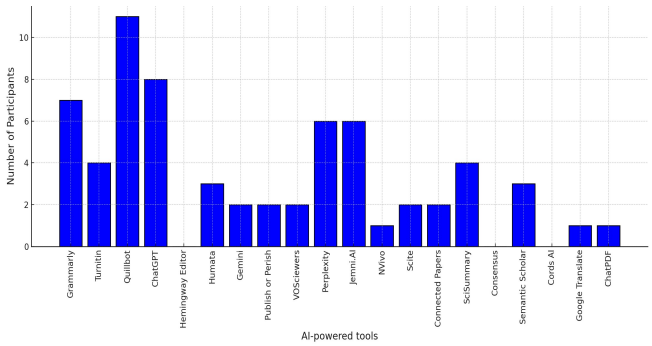

Fig. 2. Types of AI-powered tools used.

Table 2. Level of frequency of use

AI-powered tools	Never	Rarely	Sometimes	Often	Always
QuillBot	1	2	2	2	9
ChatGPT	1	1	1	3	10
Grammarly	1	2	3	3	7
Perplexity	2	2	2	4	6
Turnitin	3	3	3	3	4
Connected Papers	3	3	3	4	3
Humata	2	3	3	5	3
Publish or Perish	5	5	3	3	0
Consensus	5	4	4	3	0

Table 2 provides a detailed overview of how often English faculty members utilize AI-powered tools. The tools evaluated include QuillBot, ChatGPT, Grammarly, Perplexity, Turnitin, Connected Papers, Humata, Publish or Perish, and Consensus, with their usage frequency categorized into five levels: Never, Rarely, Sometimes, Often, and Always. ChatGPT emerges as the most frequently used tool, with the highest "Always" usage count of 10, indicating a strong preference among users. QuillBot and Grammarly also show significant usage, with 9 and 7 users indicating they

"Always" use these tools. During FGDs, participants noted that the high frequency of using ChatGPT and Quillbot is due to their versatility and effectiveness in improving both the content and language quality of research papers, particularly for non-native English speakers. Some prior research supports this current finding, indicating that certain scholars utilize Quillbot, ChatGPT, and Grammarly as proofreading tools to correct grammatical errors [8, 13]. Perplexity and Humata follow, with many users often and always using them. On the other hand, Publish or Perish and Consensus appear to be the least popular, with no users reporting "Always" using them and a higher proportion indicating they never use these tools. This distribution highlights the varying levels of reliance on different AI-powered tools, with some being integral to users' routines while others are used sparingly or not at all.

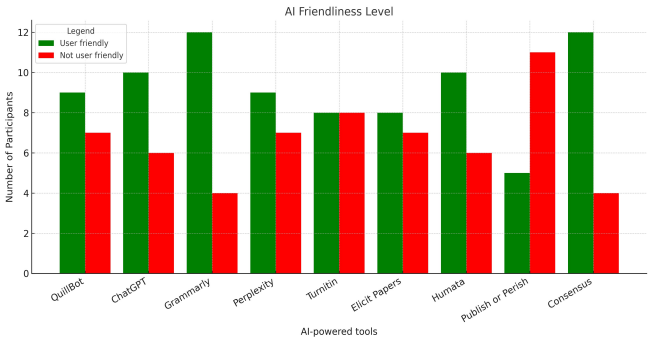

Fig. 3. AI-powered friendliness level.

Fig. 3 illustrates the user-friendliness of various AI-powered tools, with green bars representing users who find the tools user-friendly and red bars representing those who do not. The tools evaluated include QuillBot, ChatGPT, Grammarly, Perplexity, Turnitin, Connected Papers, Humata, Publish or Perish, and Consensus. Grammarly and Consensus are rated the most user-friendly, with 12 users each indicating a positive experience and only 4 users each reporting otherwise. Grammarly enhances writing quality and style [21], while Consensus provides efficient access to and synthesis of academic research [36]. These features make them valuable tools for improving their writing and research capabilities. The integration of data from FGDs revealed that many participants appreciated the tools for their simplicity and effectiveness in delivering high-quality writing, especially in time-sensitive contexts. ChatGPT also scores highly, with 10 users finding it user-friendly and 6 users not. Humata and QuillBot have more users finding them user-friendly (10 and 9, respectively) than not (6 and 7, respectively). Perplexity and Turnitin have equal numbers of users, finding them user-friendly and not user-friendly (9 user-friendly vs. 7 not for Perplexity, and 8 user-friendly vs. 8 not for Turnitin). Connected Papers also has a balanced perception, with 7 users finding it user-friendly and 7 not. Publish or Perish, however, is perceived as less user-friendly, with 11 users indicating a negative experience compared to 5 who find it user-friendly. This chart highlights the varying levels of user-friendliness perceived by users across different AI-powered tools.

B. The Objectives of Adopting AI-Powered Tools in the Process of Writing Research Articles

In this section, the researchers present the findings from the second research question, which pertains to the respondents' purposes for adopting AI-powered tools when writing research articles. The findings are based on an integration of data from surveys, interviews, and FGDs, which revealed six main themes related to the objectives of adopting AI-powered tools for academic writing and research. These main themes can be seen in Fig. 4.

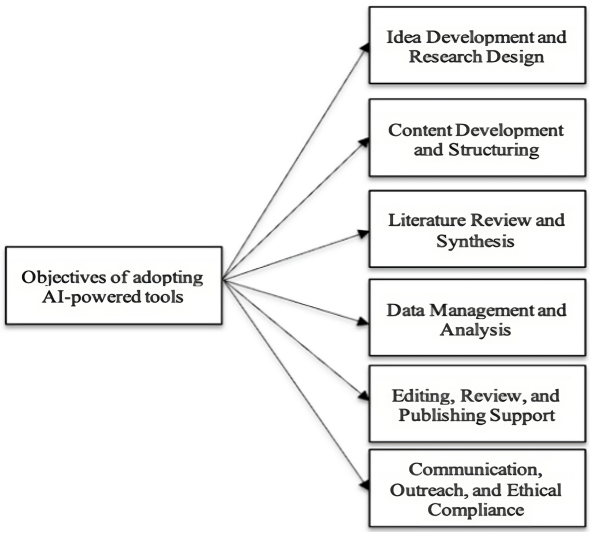

Fig. 4. Objectives of adopting AI-powered tools.

According to Table 3, a faculty member stated that idea development and research design are among the objectives of adopting AI-powered tools for academic writing and research. Respondent 1 (R1) added a statement that supports this conclusion:

"I use AI-powered tools for brainstorming research topics and designing the research methodology. This helps improve my efficiency in working and writing scientific articles".

Data from FGDs also supported this finding, highlighting that faculty members frequently utilize AI-powered tools to streamline the brainstorming process, which is especially helpful when dealing with multidisciplinary research topics. The use of AI-powered tools in developing ideas and designing research has significantly changed the context of EFL research. AI-powered tools' algorithms can assist researchers in the brainstorming process by providing data sourced from studies across various disciplines, historical data, and current trends [37]. For example, AI-powered tools can identify research gaps related to using digital technology in EFL for non-native speakers. These insights can guide research teams to investigate how implementing AI-powered tools can improve students' digital literacy—an area that may be underexplored [12]. This finding is consistent with earlier research that highlighted the time-saving advantages of AI-powered tools in performing literature reviews and generating research ideas [38]. However, it contrasts with other studies that noted, although AI-powered tools are helpful for scanning literature, they offer limited capabilities in delivering deeper analytical insights—an issue not commonly mentioned in the current study [28]. The FGDs reinforced this, as participants shared experiences where AI-powered tools helped identify unexplored areas in EFL

research, especially in emerging topics like digital literacy and AI in education. Furthermore, AI-powered tools play a crucial role in identifying gaps in the literature. Researchers can detect research gaps with AI-powered tools that scan through thousands of documents, revealing neglected areas. In the topic of gamification, for instance, AI-powered tools can highlight the limited research on the effectiveness of AI-based educational games in boosting student motivation in English language classrooms [39]. Survey respondents and interviewees consistently noted this advantage, highlighting how AI-powered toolsreduced time spent on manual literature reviews and increased focus on critical analysis. The impact of AI-powered tools also extends to research planning. EFL faculty members can utilize AI-powered tools to recommend methodologies suitable for their research questions or background. In studies examining language use in digital media, AI-powered tools might suggest a content analysis approach to gain comprehensive insights [40]. This was further echoed in FGDs, where faculty members expressed appreciation for AI-powered tools that provide methodological suggestions tailored to specific research contexts.

Table 3. Objectives of adopting AI-powered tools

No	AI-powered tools	Idea development and research design	Content development and structuring	Literature review and synthesis	Data management and analysis	Editing, review and publishing support	Communication, outreach, and ethical compliance
1	QuillBot		✓			✓	
2	ChatGPT	✓	✓	✓	✓	✓	✓
3	Grammarly		✓			✓	
4	Perplexity	✓	✓	✓			
5	Turnitin					✓	✓
6	Connected Paper	✓		✓			
7	Humata	✓		✓	✓		
8	Publish or Perish	✓		✓			
9	Consensus	✓		✓			
10	Semantic Scholars	✓	✓	✓			

Content Development and Structuring emerged as another significant objective of adopting AI-powered tools. R2 reinforced this by:

"When I obtain initial research data, AI-powered tools can provide me with ideas to develop research analysis. This is crucial for overcoming writer's block in academic writing and research".

The FGD discussions revealed similar sentiments, particularly emphasizing the use of AI-powered tools like ChatGPT to generate outlines and draft sections, which saves time and enhances productivity. This finding emerged from a thematic analysis conducted by the researchers.

In the second finding, AI-powered tools are essential for enhancing the quality and efficiency of content creation and organization in research. In this study, respondents stated that they gained ideas for developing research findings based on the AI-powered tools' ability to provide predictive text and auto-completion features. For instance, ChatGPT can improve academic writing and research efficiency by enhancing writing style, developing frameworks, and providing research idea suggestions [41]. Additionally, AI-powered tools can assist EFL faculty members in articulating complex data more efficiently. However, caution is necessary to prevent the misuse of AI-powered tools in generating fake scientific articles, thereby preserving academic integrity [42]. AI-powered tools also contribute to organizing research content. For example, in articles about ELT, AI-powered tools can suggest an optimal structure following the IMRaD format. Additionally, EFL faculty members can use these tools to analyze the emotional tone, allowing them to adjust the content's tone to suit the target audience. In journal manuscripts, AI-powered tools can ensure an academic and formal tone, thereby increasing the chances of publication acceptance [43]. Although AI-powered tools can assist EFL faculty members in developing content, the credibility and integrity of academic writing must be upheld in their use. Therefore, transparency in the use of AI-powered tools is crucial in the scientific research landscape within the field of EFL. Survey data supported this, showing that 75% of respondents believed that AI-powered tools improved the organization of their research papers, thereby making them more publishable.

Literature Review and Synthesis were identified as the third objective of adopting AI-powered tools. This was supported by R3, who stated:

"I used ChatGPT to help develop a comprehensive overview of existing research".

Data from FGDs also confirmed that AI-powered tools assist significantly in synthesizing large volumes of literature, which many participants found particularly useful for developing comprehensive reviews. These tools can facilitate the analysis of information from existing literature and synthesize findings into a coherent summary. AI-powered tools can process and analyze large volumes of data, aiding in the creation of detailed and up-to-date literature reviews [44]. Extensive data in the scientific literature can be semantically analyzed and extracted by AI-powered tools. Tools like ChatGPT can analyze large volumes of data and generate high-quality content, although careful supervision is needed to prevent the creation of misleading material. EFL faculty members can also use AI-powered tools to synthesize literature. For example, GPT-4 can extract data and

information from abstracts and full-text research articles to create summary tables and conduct comparative analyses. This feature can help writers comprehend complex information. While AI-powered tools offer many benefits in academic writing, such as efficient literature synthesis, it is essential to consider ethics and maintain the authenticity of the study. AI-powered tools in literature synthesis should be approached cautiously to ensure academic integrity and the accuracy of the synthesized content [42]. Data Management and Analysis was another key objective of this study. R4 supported this argument by stating:

"In my opinion, ChatGPT is an overpowered AI-powered tool. I can ask ChatGPT to analyze quantitative data, such as descriptive analysis, inferential statistics, parametric tests, regression, and correlation. ChatGPT integrates with Python to perform these analyses".

This perspective was echoed in FGDs, where participants emphasized how AI-powered tools help with both quantitative and qualitative data analysis, thereby broadening their research capabilities and enhancing data-driven decision-making. In this current research, EFL faculty members use AI-powered tools to interpret complex data. ChatGPT, as an AI language model, can analyze quantitative data. With GPT-4, users can upload Comma Separated Values (CSV) data and use prompts for descriptive, inferential, parametric, regression, and correlation analysis. This tool also provides visualizations through tables and graphs, facilitating academic writing and research. This was further supported by survey data, where over 60% of respondents indicated that AI-powered tools significantly reduced the time and complexity involved in data analysis. In qualitative data analysis, NVivo is a useful AI-powered tool for managing, analyzing, and uncovering insights from qualitative data [45]. This tool allows researchers to categorize, code, and identify themes in textual data, such as interview transcripts or survey responses. NVivo recognizes patterns, explores relationships among themes, and provides qualitative data visualizations for deeper interpretation. EFL faculty members can use AI-powered tools to interpret data to generate more accurate decisions and findings. These tools can also manage data for systematic reviews and simplify data management in complex research projects [46]. A previous study supports this current finding, showing that ChatGPT excels in text-to-speech conversion, especially in handling big data [47].

EFL faculty members utilize AI-powered tools for editing, review, and publishing support. This finding emerged from a thematic analysis conducted by the researchers. R5 supported this conclusion by stating:

"In this modern era, it feels like I have a personal assistant for proofreading and editing my papers. The AI-powered tools I commonly use are Grammarly, Quillbot, and ChatGPT".

Editing support, review, and publishing are the main objectives of using AI-powered tools in academic writing and research, ensuring clarity, coherence, and quality of academic output. FGDs confirmed that these tools are invaluable for non-native English speakers, as they help refine language quality, coherence, and adherence to journal submission standards. AI-powered tools like ChatGPT, Grammarly, and Quillbot are used to proofread and edit manuscripts, enhancing grammar and writing style, which is particularly helpful for non-native English speakers [13]. These tools can assist EFL faculty members in identifying writing errors making manuscripts more explicit, concise, and effective in conveying complex scientific ideas. Additionally, AI-powered tools can generate summaries and ensure that critical findings are documented, aiding writers in generating and refining their ideas for further development [48]. Meanwhile, peer review response and manuscript tracking are two features of AI-powered tools that support manuscript publication. However, transparency in using AI-powered tools in academic writing and research is crucial and should be disclosed by authors in this context. When authors receive reviewer feedback, they can use AI-powered tools to respond to comments more efficiently. This is a crucial aspect of the revision and resubmission process [49]. Integrating AI-powered tools into editing, reviewing, and publishing support helps produce high-quality research that meets evolving academic standards. However, a previous study claimed that using these tools ethically and transparently is essential for preserving the integrity and originality of scientific research [25].

"In publishing scientific research, a crucial rule is to check for plagiarism as a measure of academic integrity. I utilize AI-powered tools to detect plagiarism, ensuring that the research is plagiarism-free and maintains the necessary credibility".

EFL faculty members utilize AI-powered tools for communication, outreach, and ethical compliance to disseminate research findings and uphold ethical standards in academic writing and research. These objectives can be achieved through these tools for language translation and increased accessibility. They assist in analyzing writing styles, enabling authors to maintain consistency and alignment with academic standards. This is crucial for ensuring the resulting work reaches a broad audience, including teachers, students, researchers, and stakeholders. Moreover, the language translation capabilities of AI-powered tools can overcome linguistic barriers, allowing ELT research to be accessed globally and fostering international collaboration [50]. At the same time, ethical compliance aspects, such as plagiarism detection and ethical risk assessment in research, remain a primary focus for EFL faculty members using AI-powered tools in academic writing and research. For instance, the use of ChatGPT as a Large Language Model (LLM) must be critically evaluated to maintain scientific integrity [51]. Therefore, using AI-powered tools in this context enhances academic writing quality while ensuring adherence to ethical standards.

C. Challenges English Faculty Members Face Using AI-Powered Tools for Writing and Research

This study examined recent research on the challenges of

using AI-powered tools in academic writing and research to address the third research question. Key issues include ethics and academic integrity, bias in AI-powered tools, and personalized learning. Findings from FGDs provided a deeper understanding of these challenges, especially around the concerns related to ethics, transparency, and the potential misuse of AI-generated content. Ethics and Academic Integrity are among the main challenges highlighted by R7:

"As a faculty member who uses AI-powered tools for research and publication, I face ethical challenges, particularly ensuring that my work remains original and free from plagiarism. Additionally, I feel the need to continuously improve my technical skills to use these tools effectively while considering the transparency and reliability of this technology in my research".

According to an interview from R7 above, academic ethics and integrity are the challenges they face when using AI-powered tools in academic writing and research. Meanwhile, the FGDs underscored that while AI-powered tools are beneficial, there is a prevalent concern about unintentional plagiarism and the authenticity of AI-generated content. Participants emphasized the need for clear guidelines and training on ethical AI-powered tools use. A previous study discussed the ethical challenges of using AI-powered tools in scientific research, including implications for the ownership of research outcomes and publication ethics [52]. These findings align with another research, highlighting the potential for plagiarism and the difficulty distinguishing between the original work of researchers and AI-generated content, such as that produced by ChatGPT [53]. However, unlike previous studies that primarily focus on intentional plagiarism or ethical misuse of AI-powered tools, this study brings attention to unintentional plagiarism, which occurs when faculty members unknowingly incorporate AI-generated text into their work. This finding adds a new layer to the ethical dilemma, emphasizing the need for researchers to be more vigilant in distinguishing between their contributions and AI-generated content. It is essential to ensure security and transparency in the predictions made by AI-powered tools before implementing this technology in real-world research applications [54]. The findings highlight the need to consider ethics and privacy when implementing AI-powered tools in scientific publications [55]. These considerations highlight the necessity for AI-powered tools and systems to provide accurate predictions and transparent explanations behind the results. It is asserted that EFL faculty members need to enhance their technical skills to effectively integrate artificial intelligence into the research process [56]. Unlike previous research that suggests AI-powered tools boost creativity by alleviating researchers from routine tasks [27], the present study found that an over-reliance on technology may actually impede creativity and innovation in research [57].

Bias in AI-powered tools emerged as another challenge, as stated by R8:

"I encounter challenges with potential data and algorithm bias, which may affect the accuracy of my findings. I'm also concerned that AI's cognitive bias could impact the objectivity and fairness of my research".

FGDs and survey responses highlighted that bias in AI-powered tools can lead to skewed research outcomes, especially when AI training data does not represent diverse contexts or perspectives. Three main types of bias are identified: bias in data input, algorithmic bias, and cognitive bias. Firstly, bias in data input occurs when the data used to train AI-powered tools does not adequately represent the needed diversity, leading to inaccurate or harmful outcomes. This issue is mirrored in the work of others who also address ethical concerns and the inherent biases within AI-powered tools algorithms [58]. Secondly, the algorithms of AI-powered tools themselves can contain biases. If not carefully managed, these biases can perpetuate and exacerbate existing inequalities, creating a complex cycle to break. The research emphasizes the need for diligent oversight and transparency in data sources and algorithmic decision-making. Those developing and using AI-powered tools in scientific research must be cognizant of the origins of their data and ensure the clarity of the processes behind algorithmic decisions [52]. Additionally, the study highlights "cognitive bias," where AI-powered tools may present information distortedly, akin to subjective human perceptions. This underscores the complexities involved in crafting genuinely unbiased AI-powered tools and systems. Therefore, this research provides a thorough understanding of the essential challenges that must be addressed to ensure the ethical use of AI-powered tools in scientific research.

"A challenge I encounter with AI-powered tools is the issue of personalized learning. For instance, I'm concerned about the privacy of the data collected by this technology. I fear the data I use could be publicly exposed, making me uneasy about relying on AI-powered tools for academic writing and research."

According to the interview from R9, using AI-powered tools in academic writing and research introduces several challenges, particularly in personalized learning. Meanwhile, Survey and FGD data showed that concerns about data privacy and security are prevalent among faculty members, who worry about potential breaches or misuse of sensitive research data. Personalized learning involves issues such as data privacy, accessibility, and resistance to technology [59]. Data privacy is a significant concern, as using AI-powered tools often involves collecting and processing personal information. Balancing the protection of individual privacy with the advantages offered by technology is essential. Accessibility also presents challenges; for AI-powered tools to be practical and provide personalized feedback, they must be accessible to all users, regardless of their background or needs. Developing inclusive solutions that empower every user is a unique challenge that must be addressed. Resistance to technology is another critical factor. Some individuals may feel uncomfortable or hesitant about relying on AI-powered tools, so addressing these concerns through communication and education is necessary. Additionally, concerns about the potential decline in critical thinking skills due to over-reliance

on AI-powered tools highlight the complexity of implementing personalized solutions [60]. These challenges require careful ethical and practical considerations to ensure that AI-powered tools in academic writing and research provide benefits while preserving research integrity and fostering the development of writers' skills.

V. Conclusion

This study explores the various types of AI-powered tools, the primary purposes for their use, and the main challenges EFL faculty members face in academic writing and research. The findings reveal that QuillBot, ChatGPT, Grammarly, Perplexity, Turnitin, Connected Papers, Humata, Publish or Perish, and Consensus are the AI-powered tools most frequently used by EFL faculty members in academic writing and research. These tools are primarily employed for conceptualizing and planning research, organizing and crafting content, performing literature reviews and integration, handling and interpreting data, assisting with editing, reviewing, and publication, and enabling communication, engagement, and maintaining ethical standards. On the other hand, ethics and academic integrity, bias in AI-powered tools, and personalized learning are identified as the main challenges faced by EFL faculty members in academic writing and research. The study's findings suggest that AI-powered tools can enhance the quality of academic writing and research for EFL faculty members.

The implications of these findings for faculty members suggest the need to balance the use of AI-powered tools with the development of traditional academic skills. Faculty members should leverage AI-powered tools to enhance their research writing and teaching effectiveness, while simultaneously maintaining critical academic competencies such as critical thinking, creativity, and ethical research practices. To achieve this balance, faculty members should use AI-powered tools as a complement to, rather than a replacement for, their intellectual efforts. For example, AI-powered tools can assist with literature reviews, editing, and organizing research, but faculty members must continue to engage deeply with the material, ensuring that their insights and analyses remain their own. This balance can be maintained by adopting a dual approach: relying on AI-powered tools for efficiency in repetitive tasks, while reserving tasks that require creativity and critical analysis for traditional academic practices. Faculty members must stay aware of ethical challenges like unintentional plagiarism and bias in AI-generated content, ensuring they use these tools responsibly in their academic work. By continually developing their skills and understanding of AI-powered tools, they can adapt to evolving educational contexts while maintaining academic integrity. Based on the findings presented in the study, one significant limitation is the relatively small sample size of 16 English faculty members from various regions in Indonesia. This small sample may not fully capture the diversity of experiences and perspectives on using AI-powered tools in academic writing across different educational settings and cultural contexts. A larger and more varied sample could provide a more comprehensive understanding of the challenges and opportunities AI-powered tools present in academic writing and research. Additionally, the study primarily focuses on the current tools and the immediate challenges faculty members face, which limits its scope in exploring long-term implications and emerging trends in AI-powered tools integration within academic research. While understanding the current tools and challenges is crucial, it is equally important to consider how these tools might evolve, how their use could change academic practices over time, and what new ethical concerns may arise with advancements in AI technology. Future research should aim to address these gaps by considering how AI-powered tools will impact academic writing skills, research methodologies, and scholarly publishing practices in the long term.

Future research could expand this study by including a more extensive and diverse sample involving faculty members from different countries and disciplines to gain a more comprehensive understanding. This would provide a broader perspective on the global landscape of AI-powered tools usage in academic writing and research. Additionally, future studies could explore the long-term impact of AI-powered tools on academic writing skills, the quality of published research, and evolving research methodologies. They could also delve deeper into the ethical implications of AI-powered tool integration, particularly concerning academic integrity issues, the potential for AI-driven biases in research outcomes, and the need for regulatory frameworks to manage these emerging challenges.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

E.N. is the main author of this scientific contribution, responsible for analyzing and interpreting the data, as well as writing the paper. A.M., G.D.A., P.W., T.H., and A.W. revised the draft and contributed to the final manuscript's conception and design. All authors have approved the final version.

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