

Optimizing Efficiency, Effectiveness, and Quality of Scholarly Output through Artificial Intelligence

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Abstract. *Undergraduate students at the Faculty of Tarbiyah and Teacher Training, State Islamic University Kiai Haji Achmad Siddiq Jember frequently encounter difficulties in preparing thesis proposals, including weak problem formulation, misalignment between research topics and theoretical frameworks, limited academic literacy, and inadequate reference management. At the same time, the rapid development of Artificial Intelligence (AI) tools presents both opportunities and ethical challenges in academic writing. This community engagement program aimed to strengthen students' competencies in using AI ethically and effectively to support the preparation of research proposals. The program involved 35 undergraduate students and was conducted over four weeks using a service-learning model integrated with transformative learning principles. The activities were implemented through three stages: interactive workshops (IN), AI-assisted proposal development (OUT), and proposal presentation and reflection (IN). Program evaluation employed proposal completion records, observations, and a Likert-scale questionnaire measuring effectiveness, efficiency, and writing quality. The results show that 31 of 35 students (89%) successfully produced AI-assisted research proposals, while 4 students (11%) did not complete their proposals. Questionnaire findings indicate that 71% of students strongly agreed that AI improved writing effectiveness, 77% strongly agreed that it increased efficiency, and 63% strongly agreed that it enhanced writing quality. These findings indicate that structured training enables students to use AI as a supportive academic tool while maintaining ethical awareness and academic integrity in scholarly writing.*

Katakunci: *Penulisan Akademik, Kecerdasan Buatan; Skripsi, Pengabdian Masyarakat; Pendidikan Transformatif.*

Abstrak. *Mahasiswa sarjana di Fakultas Tarbiyah dan Ilmu Keguruan Universitas Islam Negeri Kiai Haji Achmad Siddiq Jember masih menghadapi berbagai kesulitan dalam penyusunan proposal skripsi, seperti lemahnya perumusan masalah, ketidaksesuaian antara topik penelitian dan kerangka teoretis, keterbatasan literasi akademik, serta pengelolaan referensi yang belum optimal. Di sisi lain, perkembangan pesat teknologi Artificial Intelligence (AI) menghadirkan peluang sekaligus tantangan etis dalam penulisan karya ilmiah. Program pengabdian kepada masyarakat ini bertujuan untuk meningkatkan kompetensi mahasiswa dalam memanfaatkan AI secara etis dan efektif dalam penyusunan proposal penelitian.*

Kegiatan ini melibatkan 35 mahasiswa sarjana dan dilaksanakan selama empat minggu dengan menggunakan model *service-learning* yang dipadukan dengan prinsip pembelajaran transformatif. Program dilaksanakan melalui tiga tahapan, yaitu lokakarya interaktif (IN), penyusunan proposal berbantuan AI (OUT), serta presentasi dan refleksi proposal (IN). Evaluasi program dilakukan melalui dokumentasi penyelesaian proposal, observasi kegiatan, serta kuesioner skala Likert yang mengukur aspek efektivitas, efisiensi, dan kualitas penulisan. Hasil kegiatan menunjukkan bahwa 31 dari 35 mahasiswa (89%) berhasil menyusun proposal penelitian berbantuan AI, sedangkan 4 mahasiswa (11%) belum menyelesaikan proposalnya. Hasil kuesioner menunjukkan bahwa 71% mahasiswa sangat setuju bahwa AI meningkatkan efektivitas penulisan, 77% sangat setuju bahwa AI meningkatkan efisiensi, dan 63% sangat setuju bahwa AI meningkatkan kualitas penulisan akademik. Temuan ini menunjukkan bahwa pelatihan yang terstruktur mampu membantu mahasiswa memanfaatkan AI sebagai alat pendukung dalam penulisan ilmiah dengan tetap menjaga etika dan integritas akademik.

1 Introduction

Scientific writing constitutes a fundamental element of academic life in higher education, as students are expected not only to complete final projects and research proposals but also to produce texts that are systematic, argumentative, and aligned with scholarly standards (Lin et al., 2023). However, numerous studies indicate that students still encounter persistent difficulties in academic writing, particularly in organizing arguments, aligning theoretical frameworks with research problems, designing appropriate methodologies, and applying formal academic language (Gupta et al., 2022). At the same time, the rapid development of digital technology has significantly expanded opportunities for improving human resource capacity and academic competencies in higher education (M. Alenezi et al., 2023). These developments require educational institutions to strengthen students' digital literacy by providing adequate technological access and training in digital skills (F. Alenezi, 2025). Nevertheless, digital literacy alone does not automatically resolve the challenges of academic writing. Recent advancements in Artificial Intelligence (AI) have introduced new possibilities for supporting academic writing processes, such as

generating ideas, refining language, and assisting with literature exploration (Alqahtani et al., 2023). Despite these opportunities, the integration of AI into academic writing practices remains underexplored, particularly in terms of how students can utilize AI responsibly and effectively to enhance the quality of their scholarly work (Khalifa & Albadawy, 2024a). This gap highlights the need for structured educational interventions that guide students in integrating AI into academic writing while maintaining critical thinking and academic integrity (Amini et al., 2025).

Within the sphere of academic writing, particularly in preparing research proposals, Artificial Intelligence (AI) has increasingly been utilized as a tool capable of generating, paraphrasing, analyzing, and refining texts with considerable speed and precision (Khalifa & Albadawy, 2024b). Applications such as ChatGPT, Copilot, Grammarly, and QuillBot can assist students in structuring proposals, generating alternative problem statements, improving syntactic accuracy, and identifying potential plagiarism more efficiently than traditional manual methods (Sanz-Tejeda et al., 2026).

From a cognitive learning perspective, AI can function as a scaffolding tool that supports students in organizing ideas, exploring relevant literature, and refining their arguments during the writing process. In addition, AI-generated suggestions may stimulate metacognitive reflection, enabling students to evaluate and revise their reasoning through iterative feedback loops (Li & Wilson, 2025). However, it is important to distinguish between assistive AI use and generative substitution. Assistive use positions AI as a supportive instrument that enhances students' analytical thinking and writing development, while generative substitution occurs when AI replaces the student's intellectual effort by producing complete texts without critical engagement (Liu et al., 2023). Therefore, the educational challenge lies not only in adopting AI tools but also in guiding students to employ them as cognitive supports rather than substitutes for scholarly thinking.

Nevertheless, the integration of Artificial Intelligence (AI) into academic contexts raises several concerns that can be understood through multiple analytical dimensions. From an ethical perspective, the

use of AI may lead to risks such as plagiarism, academic misconduct, and violations of academic integrity if students rely excessively on automatically generated texts (Cheng et al., 2025). From a pedagogical perspective, the uncritical adoption of AI may reduce students' engagement in the learning process and weaken the development of independent writing skills (Soliha & Fadila, 2025). From a cognitive perspective, excessive dependence on AI may limit students' critical thinking and analytical abilities when they rely on generated answers without reflective evaluation (Suryanto et al., 2025). Finally, from an epistemological perspective, AI-generated information may shape students' understanding of knowledge production, potentially encouraging superficial comprehension rather than deeper scholarly inquiry (Jose et al., 2025).

These concerns are also reflected in preliminary findings from the Faculty of Tarbiyah and Teacher Training (FTIK), where a preliminary semi-structured interview involving 10 undergraduate students was conducted in June 2025. The interviews revealed that many students tended to use AI primarily as a shortcut for completing assignments, presentations, and discussions rather than as a tool for exploring references, developing ideas, or strengthening academic arguments. Such patterns indicate that AI is often positioned as a substitute for students' intellectual engagement rather than as a supportive academic resource. This situation highlights the importance of guiding students to use AI responsibly and critically within the academic writing process.

In Islamic higher education, these challenges are compounded by the expectation that students cultivate critical thinking while simultaneously upholding Islamic principles (Sahin, 2018), including integrity, honesty, and scholarly accountability (Khairuldin et al., 2024). Addressing these opportunities and challenges requires an approach that integrates AI wisely into learning processes (Berisha Qehaja, 2025). Transformative education offers such an approach, encouraging shifts in students' perspectives through reflection, experiential learning, and problem-solving. In the context of AI, transformative education emphasizes not only technical proficiency but also the ability to critically

assess, interpret, and utilize AI-generated information in an academically sound manner (Jogezai et al., 2025).

This community service initiative is designed to address these challenges by implementing a structured program that integrates AI literacy training with academic writing development. The service adopts a service-learning model combined with transformative education principles, aiming to improve students' ability to utilize Artificial Intelligence (AI) ethically and effectively in preparing undergraduate research proposals. The program is implemented through a staged learning design consisting of interactive workshops, guided mentoring sessions on AI-assisted proposal writing, and presentation-based academic reflection. Through this design, students are not only introduced to AI tools for academic writing but are also guided to critically evaluate and refine AI-generated outputs in accordance with scholarly standards and academic integrity. The novelty of this community service lies in the integration of AI-assisted academic writing training with transformative learning approaches, which encourages students to shift their perspective from using AI as a shortcut toward using it as a cognitive support tool for idea development, literature exploration, and research design. Unlike conventional academic writing workshops that primarily focus on technical writing skills, this program emphasizes ethical AI use, prompt literacy, and reflective academic engagement, enabling students to develop both digital competence and critical thinking in the process of preparing research proposals.

2 Method

The community service program was conducted at the Faculty of Tarbiyah and Teacher Training, State Islamic University Kiai Haji Achmad Siddiq Jember, involving 35 undergraduate students from various study programs. The program aimed to enhance students' ability to utilize Artificial Intelligence (AI) ethically and effectively in preparing research proposals. Initial planning began with preliminary interviews to identify students' experiences, strengths, and limitations in using AI for academic writing. Based on these findings, the program adopted a structured service-learning approach implemented through sequential stages: Pra-

IN–OUT–IN–Post. The Pra stage focused on needs assessment and introducing the objectives and scope of AI use in academic writing.

The first IN stage consisted of interactive workshops covering AI fundamentals, prompt construction techniques, research methodology, and academic ethics. The OUT stage allowed students to independently develop research proposals using AI tools such as ChatGPT, Grammarly, QuillBot, and Zotero/Mendeley AI with online mentoring support. In the second IN stage, students presented their AI-assisted proposals and received academic feedback. Finally, the Post stage involved a Focus Group Discussion (FGD) to evaluate the program’s implementation and outcomes. The overall stages of the program are illustrated in Figure 1.

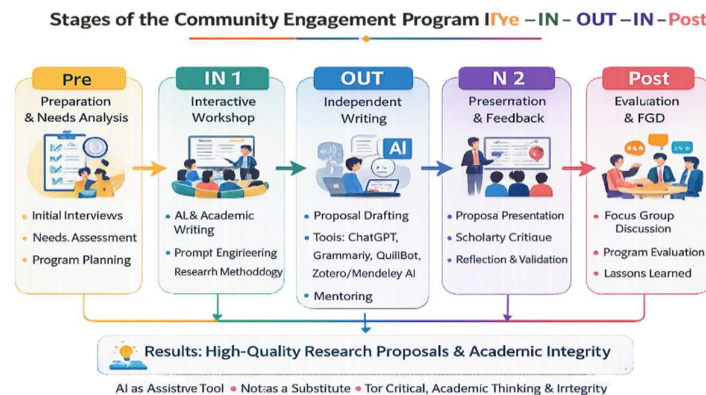


Figure 1. Stages in Community Service

The community service program was implemented through a structured sequence of stages designed to strengthen students’ competencies in utilizing Artificial Intelligence (AI) ethically and effectively in preparing research proposals. The first stage, Pre (Preparation and Needs Analysis), focused on identifying students’ initial conditions regarding AI use in academic writing through preliminary interviews and needs assessment. The findings from this stage were used to design a program that addressed students’ actual academic challenges. The program then proceeded to the first IN stage (Interactive Workshop), where participants attended face-to-face training sessions covering the fundamentals of AI in academic writing, prompt engineering techniques, research methodology, and academic ethics.

This stage aimed to equip students with both conceptual understanding and practical skills in using AI responsibly as a supportive tool in scholarly writing. The next stage, OUT (Independent Writing), allowed students to apply the knowledge gained during the workshop by independently drafting their research proposals using AI-based tools such as ChatGPT, Grammarly, QuillBot, and reference management tools like Zotero or Mendeley AI. During this phase, facilitators provided online mentoring to guide students in refining their ideas, improving methodological coherence, and ensuring academic integrity. The program then continued to the second IN stage (Presentation and Feedback), where students presented their AI-assisted proposals and received scholarly critiques, enabling reflection and revision of their work. Finally, the Post stage (Evaluation and Focus Group Discussion) was conducted to assess the overall effectiveness of the program, gather participants' feedback, and identify lessons learned. Through these stages, the program aimed to produce high-quality research proposals while encouraging responsible and reflective use of AI in academic writing.

3 Results

The outcomes of the program can be classified into two categories: tangible results in the form of research proposals, and intangible results reflected in students' feedback on the program's implementation. Of the 35 participants, 31 students (89%) successfully produced AI-assisted proposals, while 4 students (11%) were unable to complete their work. Those who did not finish generally demonstrated limited comprehension of research methodology, lacked the ability to formulate precise prompts, and showed low engagement during group discussions.

The intangible outcomes, namely students' perceptions, were collected through questionnaires. Regarding the enhancement of effectiveness, 25 students strongly agreed and 10 agreed. For efficiency, 27 strongly agreed, 6 agreed, and 2 remained neutral. In terms of quality of writing, 22 strongly agreed, 11 agreed, and 2 expressed neutrality. These findings can be further illustrated through tables and graphical representations.

Table 1. Students' Responses

Aspect	Strongly Agree	Agree	Neutral	Total
Effectiveness	25	10	0	35
Efficiency	27	6	2	35
Quality	22	11	2	35

Source of Data. Likert-Scale Questionnaire of 35 Community Service Participants

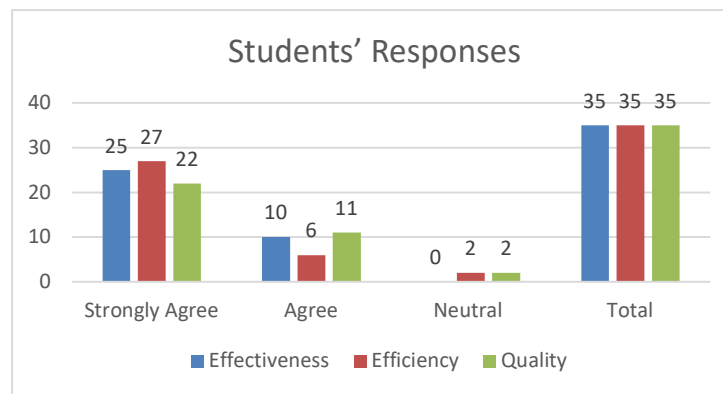


Diagram 1. Responses of 35 Students

The results indicate that the majority of participants experienced positive outcomes from the program. Regarding tangible outputs, 89% of students successfully produced AI-assisted research proposals, suggesting that the program's structured learning design effectively supported students throughout the research writing process. This success can be attributed to several factors, including the use of interactive learning strategies during workshops, continuous mentoring during the independent writing stage, and the integration of AI-based tools such as ChatGPT, Grammarly, and QuillBot, which helped students generate ideas, refine language, and organize their proposals more systematically. The combination of workshops, guided practice, and iterative feedback enabled students to gradually improve their understanding of research design and academic writing while using AI as a supportive cognitive tool rather than a substitute for intellectual work.

However, the 11% of students who were unable to complete their proposals highlight important challenges that extend beyond individual

skill limitations. While some participants struggled with research methodology and prompt construction, broader structural factors may also have influenced these outcomes. Differences in digital literacy levels, limited access to reliable devices or internet connectivity, time constraints related to academic workload, and varying levels of prior research experience may have affected students' ability to fully benefit from the program. Considering these factors provides a more balanced evaluation of the program's outcomes and suggests that future initiatives should incorporate additional support mechanisms, such as extended mentoring, digital literacy training, and flexible learning schedules, to ensure more inclusive participation and learning outcomes.

For the intangible outcomes, students' perceptions indicate generally positive responses toward the program. Questionnaire results show that most participants agreed that the program improved the effectiveness, efficiency, and quality of their academic writing. Specifically, 71% of students strongly agreed that the program increased writing effectiveness, 77% strongly agreed that it improved efficiency, and 63% strongly agreed that it enhanced writing quality. These perceptions were further supported by observable improvements in the structure and coherence of the research proposals produced during the program. Using a rubric-based evaluation that considered elements such as clarity of research problems, alignment between theoretical framework and methodology, and academic writing conventions, most proposals demonstrated clearer organization and more systematic argumentation compared to the initial drafts produced during the early stages of the program. This triangulation between participants' perceptions and the quality of the written outputs strengthens the validity of the program's outcomes.

However, the limited number of neutral or negative responses also requires careful interpretation. While the overall satisfaction level suggests that the program was well received, it is possible that some participants may have felt hesitant to express criticism due to social or academic dynamics between students and facilitators. Such conditions may introduce response bias, particularly in educational evaluation contexts where participants tend to provide favorable feedback.

Therefore, future evaluations should incorporate additional assessment strategies, such as pre- and post-program writing assessments, anonymous feedback mechanisms, and independent rubric-based evaluations, to provide a more comprehensive and objective understanding of the program's impact on students' academic writing skills.

4 Discussion

The application of Artificial Intelligence (AI) in research proposal preparation has been widely recognized for its potential to enhance several aspects of academic work, particularly efficiency, quality improvement, and methodological innovation. In terms of efficiency, AI tools enable researchers to accelerate various stages of the research process, such as generating literature summaries, identifying relevant publications, and organizing research ideas more systematically. These capabilities reduce the time required for preliminary research activities and support more structured planning of research proposals.

From the perspective of quality improvement, AI-assisted systems contribute to more accurate and coherent academic writing by refining language, improving argumentation, and ensuring better alignment between research components. Studies have shown that the integration of AI-based systems in research proposal management can improve accuracy and support more precise decision-making in academic research planning (Al-Surmi et al., 2022). In addition, methodological innovation has also emerged as an important benefit of AI integration. Generative AI tools encourage new approaches to research design and analytical thinking, enabling students to explore alternative methodological perspectives and strengthen the overall rigor of their proposals (Bahroun et al., 2023). Taken together, these findings indicate that AI should not be viewed merely as a technical writing tool but rather as a transformative resource that enhances research efficiency, improves academic quality, and stimulates methodological development in higher education (AlQhtani, 2025).

Previous discussions highlight that the use of Artificial Intelligence (AI) in academic writing brings both opportunities and challenges, creating a conceptual debate between AI as augmentation and AI as dependency. On the one hand, AI can function as an augmentation tool that supports students in organizing ideas, improving language accuracy, and accelerating the research writing process. On the other hand, excessive reliance on AI may lead to dependency, where students rely heavily on automatically generated outputs rather than engaging in critical thinking and independent academic work.

The potential risks of AI use in academic writing can be understood through several dimensions. From an academic perspective, overreliance on AI may weaken students' research skills and reduce their ability to develop original arguments. From a cognitive perspective, the use of AI-generated content without reflective evaluation may limit the development of analytical thinking. In addition, psychological challenges may arise when students feel pressured to adapt to rapidly evolving technologies in academic environments. Finally, from an ethical perspective, the misuse of AI can lead to issues such as plagiarism, reduced analytical rigor, and violations of academic integrity. These considerations highlight the importance of guiding students to use AI as a supportive academic tool that enhances learning while avoiding patterns of over-dependence.

Not all participants in the program expressed strong agreement regarding AI's benefits. Two students responded neutrally to aspects of efficiency and quality. Follow-up interviews revealed that these students—who also failed to complete their proposals—felt that AI did not automatically improve their work. Their limited grasp of research methodology hindered their ability to leverage AI effectively, resulting in no perceived acceleration or quality enhancement.

These findings underscore a dual reality: while many studies emphasize AI's potential to improve academic writing, recent research also highlights its problematic dimensions (FGD results, December 8, 2025). Das and Chen (2025) argue that AI use may weaken writing skills, reduce critical thinking, and compromise integrity. Afifah (2024) adds that AI can foster plagiarism, reduce reliability, and create ethical

dilemmas. Springer (Hsu, Hakouz, & Fotouhi, 2025) stresses the need for regulation, warning that dependency and ethical violations could undermine the credibility of academic proposals. Taken together, these studies illustrate that although AI offers substantial convenience, its risks—plagiarism, diminished reliability, weakened writing and critical thinking skills, ethical challenges, and integrity issues—must be carefully managed to safeguard academic quality.

5 Conclusion

Based on the findings of this community service program, the integration of Artificial Intelligence (AI) in academic writing activities can effectively support students in preparing research proposals and improving the efficiency, effectiveness, and quality of their scholarly writing. The majority of participants were able to utilize AI as a supportive tool to organize ideas, refine language, and structure research proposals more systematically while maintaining academic integrity. These findings indicate that AI has the potential to function as a complementary instrument in academic writing when accompanied by appropriate guidance and ethical awareness. Therefore, future programs are recommended to continue integrating AI into academic writing training while strengthening mentoring, methodological guidance, and digital literacy support to ensure that AI is used responsibly and contributes positively to students' academic development.

6 Acknowledgment

Gatitude is conveyed to the Dean of FTIK UIN Khas Jember for granting permission to carry out the community service program. The activity involved 35 students drawn from diverse study programs, including: 11 students from English Language Education (Tadris Bahasa Inggris), 4 students from Islamic Education (Pendidikan Agama Islam), 4 students from Arabic Language Education (Pendidikan Bahasa Arab), 3 students from Islamic Elementary Teacher Education (Pendidikan Guru Madrasah Ibtidaiyah), 5 students from Islamic Education Management (Manajemen Pendidikan Islam), 6 students from Natural Science

Education (Tadris Ilmu Pengetahuan Alam), and 2 students from Early Childhood Islamic Education (Pendidikan Islam Anak Usia Dini).

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