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IMPLEMENTATION OF GENERATIVE ARTIFICIAL INTELLIGENCE AS CO-CREATOR TO ASSIST STUDENTS IN RESEARCH PROPOSAL WRITING

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Abstract
The development of Generative Artificial Intelligence (GenAI) technology has opened up new opportunities in the field of education, serving as a collaborative partner in the learning process. This study aims to explore the implementation of GenAI as a co-creator in assisting students in writing research proposals and students' responses to the implementation. This study is descriptive-qualitative research. The research subjects are students taking the Research Proposal course in the odd semester of 2025/2026 in the Economics Education Study Program, Sanata Dharma University. Data collection techniques include interviews and questionnaires. Result of this research are: 1) students use GenAI platforms such as ChatGPT, Claude, and Google Gemini as co-creators in various stages of research proposal writing, ranging from finding ideas, developing background, literature review, to proposal finalization; 2) Students have positive responses regarding the implementation of GenAI to assist students in writing research proposals. The positive responses are students feeling assisted in writing research proposals, students feeling confident and self-assured, students being able to write research proposals with better quality, and students having enough time to finish proposal. This research contributes to developing innovative learning that integrates artificial intelligence in education, while providing practical recommendations for educational institutions in adopting GenAI technology.

Keywords: co-creator, generative artificial intelligence, research proposal, students' responses

Introduction

The development of artificial intelligence (AI) technology based on Large Language Models (LLMs) has entered a transformative phase that substantially changes the landscape of knowledge production, academic practices, and the representation of human intellect. Since the introduction of GPT-3 in 2020 and followed by advanced models such as GPT-4, GPT-4.1, Gemini 1.5/2.0, Claude 3.x, and Copilot, generative AI (GenAI) has become one of the most disruptive technologies of the modern era (UNESCO, 2023; OECD, 2023). Not only functioning as a language processing tool, GenAI now acts as a collaborative agent capable of reasoning, composing arguments, providing methodological

justifications, generating literature syntheses, and reshaping the structure of academic discourse with near-human coherence.

In higher education, GenAI's ability to produce scientific text quickly and adaptively introduces a new paradigm into academic writing. Research proposal writing—which has traditionally been understood as a high-level cognitive process involving problem formulation, literature analysis, construction of theoretical frameworks, and methodological development (Creswell & Creswell, 2018)—is now subject to renegotiation due to the presence of GenAI as a co-creator. This phenomenon triggers an epistemological shift in how students understand, structure, and execute the research process.

Across various regions, studies show that students use GenAI in multiple stages of academic writing: from idea generation, topic exploration, formulation of research questions, drafting the background, literature search, methodological design, instrument development, to language revision and paraphrasing (Kasneci et al., 2023; Kohnke & Moorhouse, 2023). Pedagogically, this indicates that GenAI functions as a cognitive amplifier that enhances users' intellectual capacities (Daugherty & Wilson, 2018). However, this role simultaneously raises serious ethical and epistemic issues, including plagiarism, AI-generated hallucinations, computational bias, loss of human agency, and threats to academic integrity (Floridi & Chiriatti, 2020).

Conceptually, the use of GenAI in research proposal writing can be analyzed through the Technology Acceptance Model (TAM). Two principal constructs in TAM—Perceived Usefulness and Perceived Ease of Use (Davis, 1989)—are relevant to explaining students' motivations to integrate AI into academic writing. Recent research reports that students tend to accept GenAI when they perceive the tool as useful in speeding up writing, improving argument clarity, reducing cognitive load, and supporting literature structuring (Holmes et al., 2022). Nevertheless, this acceptance does not stand alone; it is influenced by perceived risks, such as plagiarism concerns, inaccuracies, and public or institutional perceptions about the legitimacy of GenAI usage (UNESCO, 2023).

Alternatively, theoretical approaches position GenAI not merely as a digital aid but as a partner in knowledge construction. The augmented intelligence paradigm emphasizes a symbiotic human–AI partnership in which AI expands cognitive capacity while still requiring supervision, epistemic control, and human verification (Shneiderman, 2020). Therefore, using AI in proposal writing is not only a technological issue but also an epistemological one that reshapes knowledge practices.

Challenges are more apparent in the Indonesian student context. Limited information literacy, lack of research experience, administrative academic burdens, and insufficient access to adequate academic guidance might make proposal writing a difficult process. The presence of GenAI becomes both an opportunity and a threat: on one hand, it can accelerate and improve writing quality; on the other, it can undermine authorship integrity if used without critical understanding.

Although global studies on GenAI use in higher education are rapidly expanding, there is a gap in micro-level research, particularly on how Indonesian students concretely utilize GenAI at different stages of research proposal writing. Additionally, there is a lack of studies that evaluate student perceptions using a comprehensive instrument encompassing usefulness, ease of use, collaboration

quality, ethical concerns, skill development, technical challenges, and long-term usage intentions.

Based on these conditions, this study was designed to provide an in-depth understanding of (a) patterns of GenAI use as an assistant and co-creator in students' research proposal writing, (b) student perceptions regarding usefulness, ease, challenges, risks, and ethical implications of GenAI use, (c) epistemological dynamics that emerge when students use GenAI during scientific reasoning, and (d) policy recommendations for ethical, safe, and productive GenAI integration in higher education. This approach is relevant because it contributes both theoretically and practically to understanding how generative technologies affect contemporary academic practices and how educational institutions can respond strategically to this phenomenon.

Method

This methodology section is organized to provide a comprehensive overview of the research design, participant characteristics, data collection instruments, and analytical procedures used. The explanations below summarize our prior discussions in full, complete form, and without condensation.

Research Design

This study uses an exploratory–descriptive mixed design, combining:

a. A quantitative descriptive approach, used to analyze numerical patterns from questionnaire responses, compute mean scores for each dimension, and examine the distribution of AI usage by students in the context of research proposal writing.
b. A qualitative thematic approach, used to explore students' subjective experiences regarding benefits, challenges, ethical perceptions, and their recommendations for using GenAI as a co-creator in academic writing.

This combined approach was chosen to capture the complexity of GenAI usage that is not only technical but also epistemological and ethical. The integrative model also allows the researcher to understand dynamics at the behavioral usage level, cognitive perception (Perceived Usefulness & Perceived Ease of Use), and value reflection (Academic Integrity Concerns).

Research Participants

Participants consisted of nine students from the Economics Education Study Program who were enrolled in the Research Proposal Writing course during the odd semester of the 2025/2026 academic year. All students had empirical experience using GenAI for academic purposes, particularly related to research proposal writing. Although the sample size is small, the research design is not intended for population generalization but to deeply explore the phenomenon of GenAI use in a specific learning context.

Research Instruments

The main instrument used was a structured questionnaire that comprehensively covered several key components, including information on the use of AI, students' perceptions of AI, and open-ended questions regarding the use of AI. The information on the use of AI covered the platforms used (ChatGPT,

Gemini, Copilot, and others), the frequency of use, and the academic activities assisted by AI.

The questionnaire in this study used a 1-5 Likert scale. This questionnaire was used to obtain information about students' perceptions of the use of AI in writing thesis proposals. These perceptions included the following seven components.

1. Perceived Usefulness (PU): measures the extent to which AI is considered helpful in accelerating, simplifying, or improving the research proposal writing process.
2. Perceived Ease of Use (PEOU): assesses ease of using AI platforms, learning prompts, and operating the system.
3. Collaboration Quality (CQ): evaluates the quality of human–AI interaction, including relevance of AI suggestions, context understanding, and adaptability to instructions.
4. Academic Integrity Concerns (AIC): assesses student concerns about plagiarism, originality, ethical AI use, and the risk of academic misconduct.
5. Learning & Skill Development (LSD): assesses the degree AI supports student learning, understanding methodology, proposal structure, and enhancing academic thinking.
6. Challenges & Barriers (CB): identifies technical and cognitive obstacles, such as AI hallucinations, source verification, access limitations, and subscription costs.
7. Future Intention to Use (INT): measures students' intention to continue using AI in future academic activities.

To delve into personal narratives, the instrument also included essay questions about the greatest benefits students perceived from AI use, difficulties or challenges they experienced, and recommendations for better AI usage in academic environments.

Instrument Validation

The instrument was developed based on current literature on AI use in education (Kasneci et al., 2023; Holmes et al., 2022) and the theoretical constructs of the Technology Acceptance Model (Davis, 1989). Internal consistency was estimated based on theoretical category structure rather than statistical testing, consistent with the exploratory nature of the study.

Data Sources and Collection Procedure

Data were obtained from the questionnaire that was collected from participants, observation of GenAI utilization in class activities, supporting documentation, and students' reflective notes. The data collection stages included:

1. Distribution of the questionnaire to all students in the relevant course.
2. Initial briefing on research objectives and ethical participation.
3. Collection of data via a digital questionnaire platform.
4. Processing responses in Excel for further analysis.
5. Compilation of descriptive and thematic results.

All participants gave voluntary informed consent.

Data Analysis Techniques

In this study, descriptive data analysis was carried out quantitatively and qualitatively. Quantitative descriptive analysis will be performed through calculation of mean scores for each dimension, graphical analysis: distribution of platforms used, frequency of AI use, comparison of means by dimension, and interpretation of patterns using TAM, previous literature, and local context. Whereas, the qualitative descriptive analysis was carried out using thematic content analysis with the following steps: (1) Repeated reading of all open responses, (2) Identifying important semantic units, (3) Coding initial themes (benefits, challenges, ethics, recommendations), (4) Grouping codes into higher-level thematic categories, (5) Composing comprehensive interpretive narratives based on augmented intelligence theory and AI ethics frameworks. Analysis was conducted without condensing explanations or simplifying meanings, in accordance with your request.

Data Validity and Credibility

To ensure data quality, the following approaches were used:

1. Method triangulation: integrating quantitative and qualitative data.
2. Theoretical triangulation: employing TAM, augmented intelligence, and AI ethics frameworks.
3. Critical reflection: unpacking student biases in AI use.
4. Peer debriefing (informal): consulting preliminary results with colleagues.

Methodological Limitations

The study has the following limitations: (1) Small number of participants (n = 9), (2) context limited to a single study program, (3) evaluative instruments not subjected to formal statistical validity testing, and (4) interpretations are contextual and non-generalizable. Nevertheless, for exploratory research, depth of narrative constitutes the study's primary strength.

Findings and Discussion

This section presents an in-depth analysis of patterns of Generative AI (GenAI) use by students, their perceptions regarding benefits and challenges, and the epistemological and ethical dynamics that arise. All results below are comprehensive syntheses of questionnaire data collected through the "AI Questionnaire (Responses).xlsx" file and conceptual elaborations grounded in relevant theory.

Patterns of GenAI Use by Students

Based on questionnaire responses, students used various GenAI platforms to support research proposal writing.

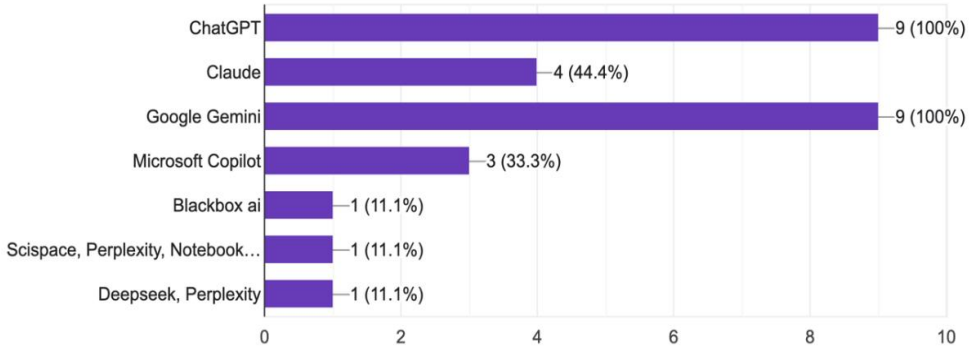

Figure 1. Platform Distribution

Based on Fig.1, ChatGPT is the dominant and most frequently used platform, Google Gemini as a secondary platform, Microsoft Copilot as an auxiliary tool, and some students used more than one platform interchangeably. This aligns with global findings that ChatGPT has the highest user penetration among students due to model stability, ease of access, and relatively advanced reasoning capabilities (Kasneci et al., 2023). Epistemologically, preference for certain platforms indicates that students begin to form epistemic trust toward particular AI systems—that is, they perceive certain systems as more credible, accurate, and easier to direct. In academic contexts, such epistemic trust can influence whether students accept or reject AI-supplied suggestions.

Based on the questionnaire results, students varied in terms of frequency of use of generative AI, as shown in Fig 2. Based on Fig 2, some students used AI daily, others 3–4 times per week, some 1–2 times per week, and others rarely. This result correlated with the level of difficulty students faced, the stage of proposal writing (initial phases tend to be most intensive), digital literacy skills, and students' readiness to use AI as a co-creator. Students who used AI daily were generally in active drafting phases and relied on AI for brainstorming, clarifying concepts, and language refinement.

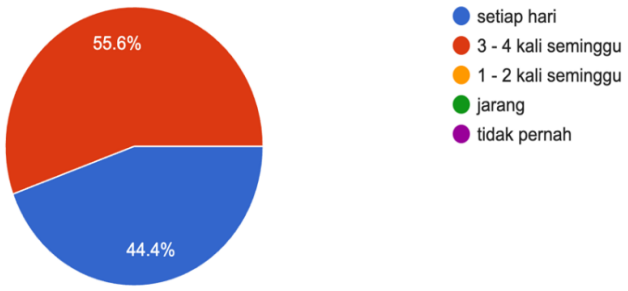

Figure 2. Frequency of GenAI Use

Quantitative Analysis by Instrument Dimensions

This section presents quantitative results across seven primary dimensions. The first result of the questionnaire was about the use of generative AI in preparing final project or thesis proposals. The results of this questionnaire showed that students used generative AI to brainstorm research ideas, formulate problem

backgrounds and research questions, conduct literature reviews, develop theoretical frameworks, design research methodologies, improve sentence structure, check grammar, paraphrase or reword, and create proposal outlines. These results are shown in Figure 3, where the highest mean is the use of generative AI to improve sentence structure (4.33) and the lowest mean is its use to formulate research questions (3.00).

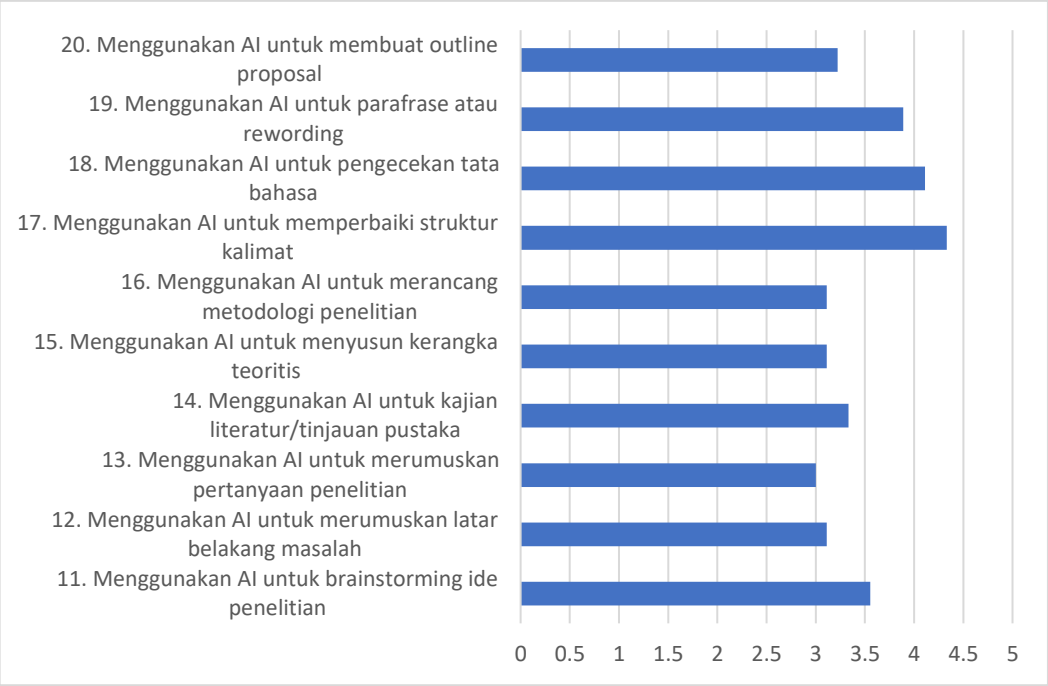

Figure 3. The Use of Generative AI in Writing Thesis Proposals

Perceived Usefulness (PU)

Based on the questionnaire results, the perceived usefulness of generative AI is shown in Fig 4. These results are based on 5 questions about perceived usefulness that were given, and we obtained a mean of 3.53, with the highest mean on Generative AI simplifies the process of brainstorming research ideas (4.00).

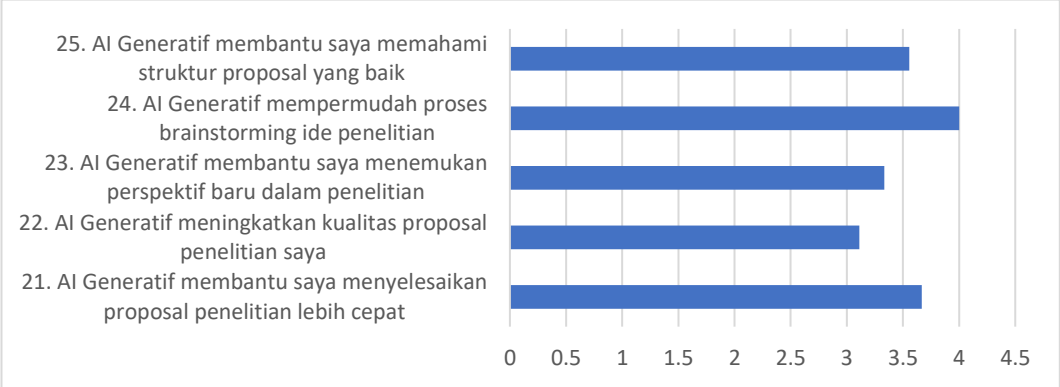

Figure 4. Perceived Usefulness of Generative AI

Students rated GenAI positively in terms of usefulness: AI speeds up writing, clarifies argument structure, provides alternative formulations, offers examples of theoretical frameworks or methodologies, and guides students when they experience idea blocks. From a TAM perspective (Davis, 1989), high PU suggests that GenAI is perceived as a performance-enhancing tool. Technologies perceived to improve user performance typically see higher adoption and long-term usage intentions—this is reflected in the relatively high Future Intention scores.

Perceived Ease of Use (PEOU)

Based on the questionnaire results, the perceived ease of use of generative AI is shown in Fig 5. These results are based on 5 questions about perceived ease of use that were given, and we obtained a mean of 3.64, with the highest mean on Generative AI being easy to learn and use (4,11).

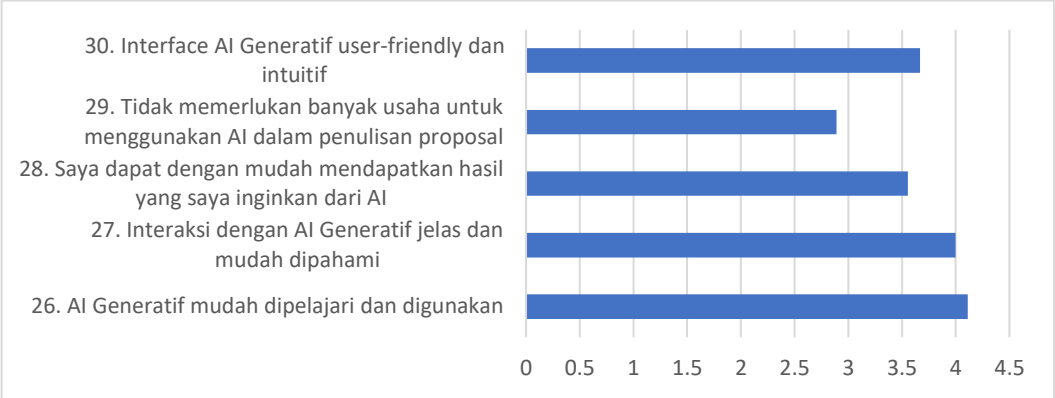

Figure 5. Perceived Ease of Use of Generative AI

Students considered GenAI easy to use due to intuitive interfaces, responsiveness to natural language, lack of specialized technical requirements, ability to follow stepwise instructions, and 24/7 availability. Increased PEOU reduces cognitive load associated with task execution, potentially allowing students to focus more on understanding scientific content rather than the technicalities of writing.

Collaboration Quality (CQ)

Based on the questionnaire results, the collaboration quality of generative AI is shown in Fig 6. These results are based on 5 questions about perceived ease of use that were given, and we obtained a mean of 3.47, with the highest mean on Generative AI drives my creativity in writing proposals (3.77).

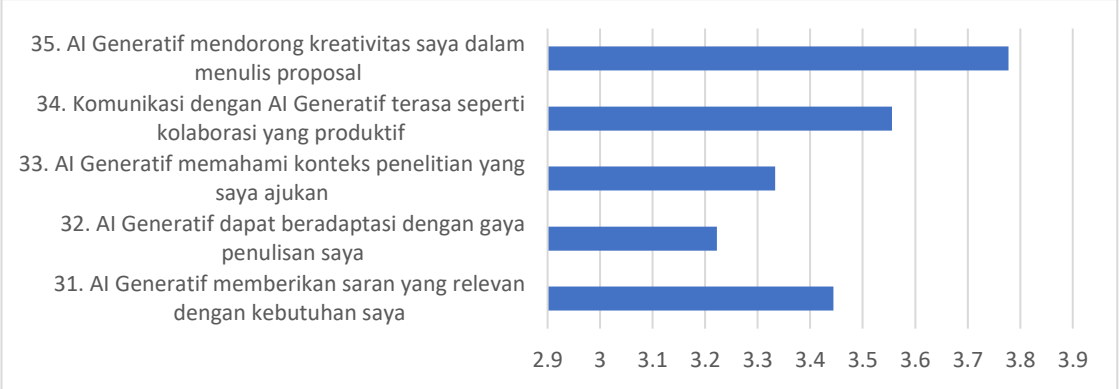

Figure 6. Collaboration Quality of Generative AI

This dimension assesses AI's role as a collaborative partner. Students reported that AI provides relevant suggestions, helps develop ideas, adapts to context changes, structures writing, and effectively improves writing style. However, important limitations were noted: AI often provides generic answers, may not fully grasp local research contexts, and struggles to incorporate real empirical data. Collaboration quality reflects co-agency between humans and AI, consistent with augmented intelligence concepts emphasizing symbiotic partnerships.

Academic Integrity Concerns (AIC)

Based on the questionnaire results, academic integrity concerns of generative AI are shown in Fig 7. These results are based on 5 questions about perceived ease of use that were given, and we obtained a mean of 3.91, with the highest mean on concerns that using AI is considered plagiarism and relying too much on AI, which will reduce students' writing skills (both 4.33).

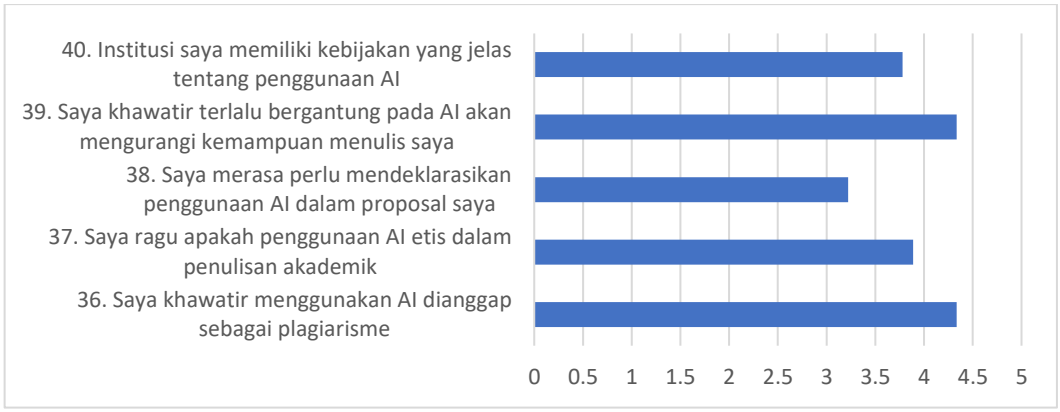

Figure 7. Academic Integrity Concerns of Generative AI

This dimension scored the highest. Students expressed strong concerns about plagiarism risks, uncertainty about permitted AI use, lack of procedures for declaring AI usage, producing work that may not be considered "their own," AI hallucinations, and potential scientific errors. This aligns with UNESCO (2023) warnings about GenAI threats to originality and knowledge integrity.

Learning and Skill Development (LSD)

Based on the questionnaire results, the Learning & Skill Development of generative AI is shown in Fig 8. These results are based on 5 questions about perceived ease of use that were given, and we obtained a mean of 3.62, with the highest mean on AI helping students in developing research skills (3.88).

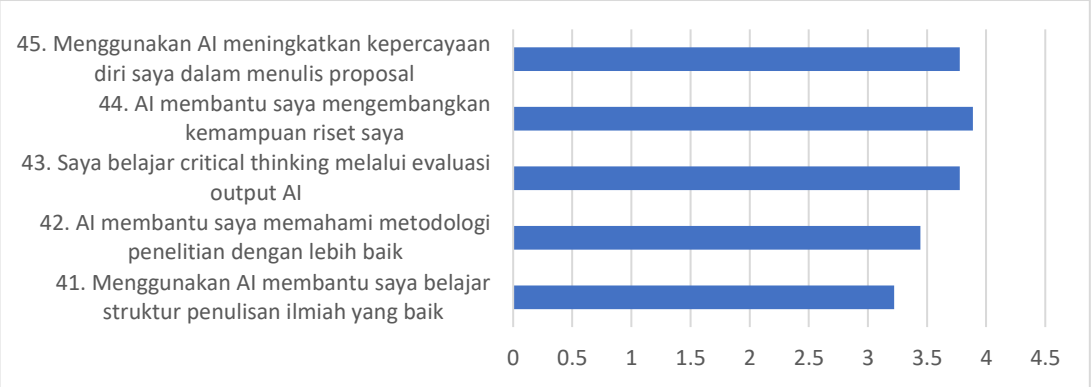

Figure 8. Learning & Skill Development of Generative AI

Students stated that GenAI helps them understand proposal structure, craft a solid background, differentiate between problem statements and research objectives, summarize literature, and improve grammar and academic style. Some students noted that evaluating AI outputs made them more metacognitive, since they had to verify AI suggestions, rephrase content for context, and compare outputs to primary literature. This supports findings by Holmes et al. (2022) that AI can strengthen learning when used as scaffolding.

Challenges & Barriers (CB)

Based on the questionnaire results, Challenges & Barriers of generative AI are shown in Fig 9. These results are based on 7 questions about perceived ease of use that were given, and we obtained a mean of 3.75, with the highest mean on premium AI subscription fees being too expensive (4.22).

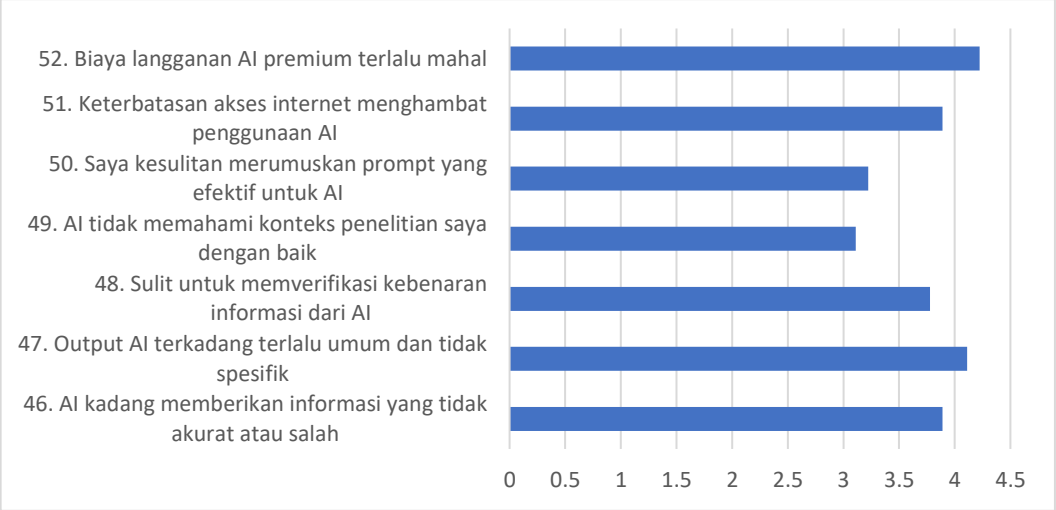

Figure 9. Challenges & Barriers of Generative AI

Students faced several obstacles as follows.

1. Technical: AI hallucinations, overly generic outputs, difficulty producing effective prompts, language and contextual bias, limited internet access, and subscription costs.
2. Epistemic: difficulty verifying sources, AI responses lacking reliable references, and inconsistent accuracy.
3. Ethical: uncertainty about AI usage boundaries, confusion over plagiarism, and fear of being accused of academic dishonesty by instructors.

High scores in this dimension indicate that AI adoption is not without conflict and requires mature digital literacy.

Future Intention to Use (INT)

Based on the questionnaire results, the collaboration quality of generative AI is shown in Fig 10. These results are based on 5 questions about perceived ease of use that were given, and we obtained a mean of 3.71, with the highest mean on students' desire to learn more about how to use AI effectively and students' expectations for the Institution to provide training on using AI (both 4.33).

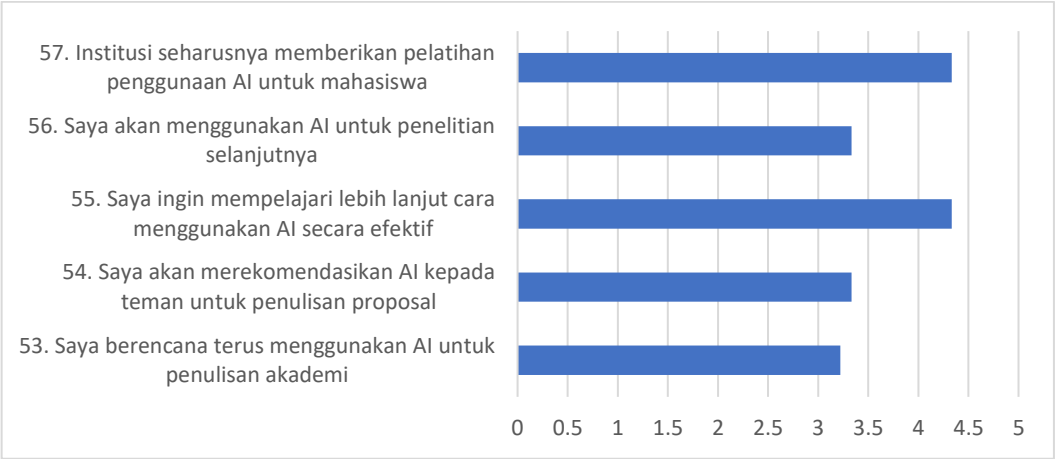

Figure 10. Future Intention to Use of Generative AI

Students intend to continue using AI, provided that there are institutional ethical guidelines, instruction in proper usage strategies, and that use does not breach academic rules. High INT suggests AI is being integrated into the modern academic ecosystem.

Thematic Discussion from Open-Ended Responses

Qualitative analysis of open responses produced three major themes.

Benefits of Generative AI

Based on students' response, students reported benefits including:

1. Faster ideation: AI helps map variables, propose alternative topics, and identify research gaps.
2. Easier background drafting: AI provides exemplar argumentative structures.
3. Language and academic style improvement: AI effectively corrects grammar and enhances coherence.

4. Reduced psychological barriers: AI alleviates writer's block and writing anxiety.
5. Faster revision cycles: AI suggestions help students improve drafts more rapidly.

Challenges in Using GenAI

Based on students' responses, they reported the challenges include:

1. AI hallucinations: seemingly convincing but factually incorrect answers.
2. Limited understanding of local context: AI has difficulty grasping Indonesia-specific situations or empirical realities.
3. Overreliance: fear that students may lose independent writing skills.
4. Unclear originality assurance: AI cannot transparently document its generation process.
5. Prompt engineering difficulty: outputs heavily depend on prompt quality.

Student Recommendations

Based on the responses from the questionnaire, students recommended that there should be official guidelines from the university regarding the use of AI, a statement on the use of AI as an ethical responsibility, training on AI literacy and its proper use, lecturers should be familiar with AI to supervise effectively, and AI should only be used as an aid, not a substitute for students' critical thinking.

Conclusion

This study examined how students utilize Generative AI (GenAI) as both an assistant and a co-creator in the research proposal writing process. Integrating quantitative and qualitative analyses provided a deep understanding of GenAI usage patterns, student perceptions of benefits and ease of use, ethical issues, and epistemological dynamics within higher education contexts.

Overall, GenAI has become a significant component of students' academic writing ecosystems. Students use AI not only for technical tasks like grammar correction and paragraph structuring but also for higher-order cognitive activities such as brainstorming research ideas, drafting backgrounds, formulating research questions, and understanding methodologies. GenAI thus acts as a cognitive amplifier, extending students' intellectual capacities and aiding in knowledge construction. However, effective and ethical use depends on critical, guided, and transparent implementation.

While this study offers preliminary insights, several limitations highlight the need for further investigation. The current data, limited by its scope, suggests that future work must prioritize expanded sample sizes and institutional diversity to validate these initial trends. Furthermore, current literature often relies on cross-sectional data; to truly understand the pedagogical implications, we need longitudinal research that observes the evolution of academic skills, alongside comparative studies distinguishing between users and non-users. Lastly, the practical solution to these challenges—education—remains under-researched; future inquiries should rigorously evaluate the effectiveness of AI-literacy interventions to determine best practices for integration.

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