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Generative AI in Everyday Academic Work: An Exploratory Survey of Usage Patterns, Perceived Effectiveness, and Concerns among Indonesian University Students

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Abstract: Background. Generative artificial intelligence (generative AI) tools have diffused rapidly into university study, yet, in the literature reviewed for this study, most empirical evidence concerns designed interventions or Western student populations. How students in Southeast Asia draw on these tools in unsupervised, self-directed academic work is sparsely documented in that literature.

Objective. This exploratory study describes self-reported generative AI use, perceived effectiveness, and the benefits and concerns articulated by university students, primarily in Indonesia.

Methods. A cross-sectional online survey was administered via Google Forms in June 2026. Twenty-four students accessed the survey; one declined consent, yielding 23 analysable cases (21 Indonesian, 2 Chinese). The instrument comprised seven usage-frequency items referring generically to “AI tools” and seven perceived-effectiveness items, both on five-point Likert scales ($\alpha = .92$ across the 14 items), and two open-ended questions. Analysis was restricted to descriptive statistics, one descriptive correlation coefficient (not interpreted inferentially), and reflexive thematic analysis. No inferential group comparison was attempted.

Results. Students reported using generative AI most often to understand difficult course materials ($M = 3.65$, $SD = 1.27$) and to brainstorm ideas or generate explanations ($M = 3.52$, $SD = 1.16$), and least often as part of a daily study routine ($M = 2.65$, $SD = 1.15$). Perceived effectiveness was highest for comprehension ($M = 3.61$, $SD = 1.34$) and lowest for overall learning achievement ($M = 3.00$, $SD = 1.13$). The two composite scores correlated at $r = .87$ in this sample; because both derive from a single instrument at one occasion, the coefficient is reported descriptively and is not interpreted as evidence of a relationship between distinct constructs. Thematic analysis of the open responses identified time efficiency (27% of 22 respondents) as the most frequently reported benefit, with personalized tutoring, brainstorming support, and improved comprehension each cited by 18% of 22 respondents. The most frequently reported concern was over-reliance diminishing independent thinking (37% of 19 respondents), followed by doubts about the accuracy of AI output (26% of 19 respondents) and difficulty formulating effective prompts (16% of 19 respondents).

Conclusions. Within the limits of a very small convenience sample, the findings describe generative AI used as a task-specific aid concentrated at points of comprehension difficulty rather than as a constant study companion, alongside widely voiced apprehension about dependence. The results are exploratory and descriptive, intended to generate rather than test hypotheses; if replicated in larger samples, they would suggest that AI literacy provision, instruction in prompting, and assessment designs that keep students cognitively engaged merit examination, and they indicate directions for adequately powered confirmatory research.

Keywords: generative artificial intelligence; higher education; Indonesia; over-reliance; exploratory survey; descriptive study; self-reported use.

I. INTRODUCTION

Artificial intelligence in education has moved from a specialist research interest to a mainstream feature of university study within a very short period. Bibliometric evidence indicates that the field attracted comparatively little attention before 2017 and expanded sharply thereafter, organising around adaptive learning and personalized tutoring, intelligent assessment, profiling and prediction, and emerging applications (Wang et al., 2024). The public release of general-purpose conversational systems (generative AI) accelerated that trajectory further, placing tools with broad linguistic and reasoning capability directly in students' hands without institutional mediation. Reviews of the current generation of tools describe uptake across teaching, learning, and administration, together with persistent uncertainty about how their effects should be evaluated (Luo et al., 2025; Younas et al., 2025). In this paper, "AI" denotes generative AI unless the wider AI-in-education literature is being discussed.

Students now use these systems for a wide span of academic tasks: clarifying unfamiliar concepts, generating ideas, checking and revising written work, and, in some cases, producing assessed work in whole or in part. The pedagogical evidence is correspondingly mixed. A systematic review of AI-based learning tools in higher education found generally positive effects on cognitive knowledge acquisition and affective outcomes, but markedly variable effects on the development of cognitive processes and skills (Luo et al., 2025). Where learners engage critically with AI-generated feedback, gains in writing quality and metacognitive awareness have been observed; where output is accepted without interrogation, comparable gains do not appear (Teng, 2025a, 2025b). Reviews of the wider field caution that reliance on AI-driven support may displace the effortful processing through which durable understanding is constructed (Mallik & Gangopadhyay, 2023), and note that the evidence base itself remains fragmented, with a minority of primary studies reporting standardised effect sizes (Memari & Ruggles, 2025, preprint).

A gap follows from the shape of this literature. In the literature reviewed for this study, much of the evidence derives from designed interventions, controlled comparisons, or instructor-mediated implementations. That literature says considerably less about unsupervised, self-directed use: what students actually do with these tools when no assignment specifies their role, at which points in the academic task cycle they reach for them, and how they themselves appraise the trade-offs. It contains little survey evidence of this kind for Southeast Asian higher education generally or for Indonesia in particular. Understanding baseline patterns of self-directed use is a precondition for designing proportionate institutional responses.

The present study addresses that gap descriptively. It reports an exploratory cross-sectional survey of 23 university students, 21 of them Indonesian, covering how frequently they use AI for specified academic activities, how effective they judge that use to be, and what they identify as its principal benefits and drawbacks. Three research questions guide the analysis:

RQ1. How frequently do university students report using AI tools across specified academic activities, including comprehension support, assignment completion, brainstorming, error checking, and daily study?

RQ2. How effective do students perceive AI use to be for learning efficiency, assignment quality, comprehension, academic performance, and confidence?

RQ3. What benefits and concerns do students articulate when reflecting on their own AI use?

A descriptive coefficient for the covariation between the two composite scores is also reported, without inferential interpretation. No research question addresses cross-national comparison: the two Chinese participants recruited contribute to the pooled figures but are not reported separately.

The study's contribution is modest and deliberately bounded. As an exploratory descriptive survey, it is designed to characterise self-reported use and to generate hypotheses for confirmatory work, not to test them, and its claims are confined to the sample described. It supplies an early, transparently reported description of self-directed AI use among Indonesian university students, pairs Likert-scale data with the students' own accounts of benefit and risk, and documents a specific difficulty, formulating effective prompts, that appears infrequently in the literature reviewed for this study. Given the sample size, the findings are offered as hypotheses for confirmatory work rather than as estimates of population parameters.

II. LITERATURE REVIEW

A. Generative AI in Higher Education

Research on artificial intelligence in education long predates generative systems, encompassing intelligent tutoring, learning analytics, automated assessment, and predictive modelling of student outcomes (Wang et al., 2024). What distinguishes the present phase is accessibility. Earlier applications were typically institutional deployments encountered by students within a course; general-purpose conversational systems are adopted by students directly, outside any curricular frame, and can be applied to essentially any academic task. Recent reviews of tools including ChatGPT, DeepSeek, and Gemini in higher education document broad functional coverage alongside unresolved questions about assessment integrity, equity of access, and quality assurance (Younas et al., 2025).

This shift from institutionally mediated to student-initiated use is what makes descriptive evidence about actual usage patterns valuable: institutions are responding to behaviour they have not systematically observed.

B. Benefits and Opportunities

The case for AI as an educational resource rests on three claims. The first concerns personalization: conversational systems can adapt explanations to a stated level of understanding and supply immediate feedback, functions that human instruction cannot deliver at scale (Wang et al., 2024). The second concerns efficiency: by absorbing routine or low-value operations, AI may free attention for higher-order work.

The third concerns access: students who lack ready recourse to office hours, tutoring, or a supportive peer group gain a source of on-demand explanation. Empirical support is real but qualified. Luo et al. (2025), reviewing 63 peer-reviewed studies of AI-based learning tools in higher education, found that such tools generally improved cognitive knowledge acquisition and affective outcomes, while their effects on cognitive process and skill development varied substantially across studies. The benefit, in other words, appears more robust for acquiring and clarifying content than for developing capability.

C. Risks, Over-Reliance, and Cognitive Offloading

The counterargument holds that substituting AI output for one's own processing removes the effortful engagement through which understanding is built. Mallik and Gangopadhyay (2023), reviewing nearly two hundred studies across two decades of AI in education, identify the displacement of student effort as a recurring concern across both the planning and delivery phases of education. The mechanism usually invoked is cognitive offloading: the transfer of cognitive work to an external resource, which reduces immediate demand but may also reduce what the learner retains and can subsequently transfer.

Evidence on the mediating role of student behaviour is more direct. Teng (2025a) found that EFL writers' metacognitive awareness shaped both how they used ChatGPT feedback and what they gained from it. In a companion study of forty undergraduates, Teng (2025b) reported that observed behaviour ranged from copying text from ChatGPT verbatim to using it effectively for writing feedback, with metacognitive awareness, critical thinking, and cognitive effort distinguishing the two. This finding is central to the present study's framing: the same tool, in the same task, produced different outcomes depending on how students engaged with it. It follows that measures of usage frequency alone cannot establish educational impact.

It should be noted that the evidence base supporting either position remains uneven. Memari and Ruggles (2025), synthesising 258 studies of AI in elementary STEM education, report that only about a third included standardised effect sizes and that ecosystems and evaluation practices are fragmented. Their review concerns a different educational stage and is cited here only as evidence about the state of the literature, not about university students.

D. AI Use in the Indonesian and Southeast Asian Context

Adoption of educational technology is shaped by infrastructure, pedagogical tradition, and regulatory environment, and criteria for selecting AI tools accordingly vary across institutional settings (Madanchian & Taherdoost, 2025). Indonesian higher education is characterised by rapid mobile-first digitisation and institutional guidance on AI use that is still developing (Madanchian & Taherdoost, 2025). These conditions plausibly produce usage patterns that differ from those documented in the settings represented in the literature reviewed for this study. The literature reviewed for this study contains little systematic survey evidence on self-directed AI use among Indonesian university students, and the present study is intended as an early descriptive contribution rather than a definitive account of the national picture.

E. Research Gap

Three gaps motivate the study, each defined relative to the literature reviewed for this study. First, evidence about self-directed, unsupervised AI use is thin relative to evidence about designed interventions, yet self-directed use is plausibly the modality most students inhabit. Second, survey evidence there is concentrated in a small number of national contexts, leaving Indonesian and wider Southeast Asian higher education unrepresented. Third, quantitative usage measures are rarely paired with students' own articulations of benefit and risk, although the literature reviewed above suggests that the quality of engagement, rather than its frequency, is what carries educational consequence. The present study addresses all three, within the limits imposed by a small exploratory sample.

III. METHOD

A. Research Design

The study employed a cross-sectional survey design combining closed-ended Likert items with two open-ended questions. The design is exploratory and descriptive: it was intended to characterise reported behaviour and perception within an accessible population, not to estimate population parameters, test hypotheses, or compare groups. No a priori power analysis was conducted, because no inferential test was planned; the sample size was determined by the number of eligible respondents reachable through the researcher's networks within the data collection window. The study does not test a theoretical framework; the research questions are addressed descriptively, by reporting what respondents rated and wrote.

B. Participants and Sampling

Participants were recruited by convenience sampling through social media platforms (WhatsApp and WeChat) and institutional mailing lists. Eligibility required current enrolment in an undergraduate or postgraduate programme, self-reported use of AI tools for academic purposes at least occasionally, and residence in Indonesia or China at the time of completion.

Twenty-four students accessed the survey. One declined consent at the first item and was excluded from all analyses, leaving 23 analysable cases. Of these, 21 resided in Indonesia and 2 in China. The responses of the two Chinese respondents contribute to the pooled Total figures and appear in the item-level matrix (Appendix B), but they are not tabulated or described separately, because $n = 2$ cannot support estimation. The study is accordingly framed as an account of Indonesian students.

Demographic coverage is incomplete. Year of study was recorded for 22 of the 23 analysable cases, and responses to the open-ended field-of-study item were not retained in the exported dataset in a form permitting reliable categorisation; consequently neither variable is reported as a breakdown. Gender was not collected because the pilot prioritised brevity and the variable was not central to the exploratory questions. These omissions are limitations of the instrument and are acknowledged in Section 5.7.

C. Research Instrument

The questionnaire contained 20 items in four sections. Section A collected consent and three demographic items (country of residence, field of study, year of study). Section B comprised seven items measuring the reported frequency of AI use on a five-point scale (1 = Never, 5 = Always), covering general frequency, weekly time investment, comprehension support, assignment completion, brainstorming, error checking, and integration into daily study. Section C comprised seven items measuring perceived effectiveness on a parallel five-point agreement scale (1 = Strongly Disagree, 5 = Strongly Agree), covering efficiency, assignment quality, comprehension, academic performance, confidence, output quality, and overall learning achievement. Section D posed two open-ended questions on the greatest challenge and the greatest benefit of AI use in learning. The instrument referred to "AI tools" (items B1, B2 and B7) or to "AI" (items B3–B6) generically; the qualifier "generative" did not appear in any item. The survey introduction defined AI as "generative AI tools such as ChatGPT, DeepSeek, or Gemini," so respondents encountered that definition before completing the items; "generative AI" is used in this paper as the working label. Respondents' application of that definition to individual items was not separately checked. The full instrument appears in Appendix A.

Face validity was established through review by two educational technology researchers. Internal consistency across the 14 Likert items was high (Cronbach's $\alpha = .92$). This value is reported for completeness, but it should be read with caution rather than as straightforward evidence of instrument quality; the interpretive difficulty it raises is addressed in Section 5.7. The survey was administered in English, with Bahasa Indonesia and Chinese translations available on request.

D. Data Collection Procedure

The survey was hosted on Google Forms and distributed by link through WhatsApp group chats and WeChat contacts during a two-week window in June 2026. Respondents read an information and consent statement before proceeding; those who consented completed all items anonymously. Mean completion time was approximately 8 to 12 minutes. No reminders were issued and no compensation was offered.

E. Data Analysis

Quantitative data were analysed in Microsoft Excel. Item-level means and standard deviations were computed for the full analytic sample and, descriptively, by country of residence. All standard deviations are sample standard deviations ($n - 1$). Composite scores were computed as the unweighted mean of the seven items in each scale for each respondent. Cronbach's alpha was computed across all 14 Likert items.

A single Pearson correlation was computed between the two composite scores and is reported descriptively. Because both composites derive from one instrument completed at one occasion, the coefficient cannot be interpreted as evidence of a relationship between distinct constructs, and the design precludes inference about direction of influence (see Section 5.7). No independent-samples test, effect size, or other inferential comparison between the Indonesian and Chinese subgroups was computed, as the subgroup sizes make any such statistic uninterpretable.

Open-ended responses were analysed using reflexive thematic analysis (Braun & Clarke, 2006). Responses were read repeatedly, coded inductively, and grouped into themes. A response could be assigned to more than one theme where it raised more than one issue, so theme percentages sum to more than 100. Denominators were set separately for each question: 22 respondents supplied a benefit response, and 19 supplied a substantive concern. One participant left both open items blank; a second left the concern item blank; and two participants answered the concern item with an explicit denial of any concern (“Tidak ada” and “Nothing”). These four cases are excluded from the concern denominator, since retaining them would understate the prevalence of each theme among those who reported a concern. Coding was performed by a single researcher. No second coder, member checking, or formal reliability assessment was conducted. Five of the nine concern themes rest on a single response; these are reported for completeness and should not be read as prevalence estimates. An audit trail linking each response to its assigned theme is available from the author.

F. Ethical Considerations

The study was approved by the institutional review board of Nanjing University of Information Science & Technology (NUIST). Participation was voluntary and uncompensated, avoiding any inducement. Responses were collected anonymously; no personally identifying information was requested or recorded. Informed consent was obtained through an explicit agreement item preceding the questionnaire, and the single respondent who declined was excluded from every analysis reported here. Verbatim open-ended responses are quoted without participant identifiers.

IV. RESULTS

A. Participant Characteristics

The analytic sample comprised 23 students, 21 residing in Indonesia and 2 in China (Table 1). Year of study and field of study are not reported as breakdowns for the reasons given in Section 3.2.

Table 1
Participant characteristics (N = 23)

Characteristic	n	%
Country of residence		
Indonesia	21	91.3
China	2	8.7
Total	23	100.0

Note. Year of study and field of study were incompletely recorded in the exported dataset and are not tabulated. Gender was not collected.

B. AI Usage Patterns

Reported usage is summarised in Table 2. Across the analytic sample, the most frequent application was comprehension support: using AI to understand difficult course materials returned the highest item mean ($M = 3.65$, $SD = 1.27$), followed by brainstorming ideas or generating explanations ($M = 3.52$, $SD = 1.16$) and general frequency of AI use ($M = 3.35$, $SD = 1.07$). Checking or correcting work before submission ($M = 3.26$, $SD = 0.96$) and completing written assignments ($M = 3.09$, $SD = 1.24$) occupied the middle of the distribution, with weekly time investment slightly lower ($M = 3.04$, $SD = 1.11$).

The lowest-rated item was reliance on AI as part of a daily study routine ($M = 2.65$, $SD = 1.15$), the only item to fall below the scale midpoint. The composite usage mean was 3.22 ($SD = 0.75$), indicating moderate overall engagement. The gap of one full scale point between comprehension support and daily integration is the clearest feature of the distribution and is taken up in Section 5.2.

Table 2
Mean reported AI usage by item (1 = Never, 5 = Always)

Usage item	Total (N = 23)	Indonesia (n = 21)
Understand difficult course materials	3.65 (1.27)	3.81 (1.17)
Brainstorm ideas / generate explanations	3.52 (1.16)	3.71 (1.01)
General frequency of AI use	3.35 (1.07)	3.57 (0.81)
Check or correct work before submission	3.26 (0.96)	3.24 (1.00)
Complete written assignments	3.09 (1.24)	3.24 (1.18)
Hours per week using AI	3.04 (1.11)	3.05 (1.12)
AI as part of daily study routine	2.65 (1.15)	2.81 (1.08)
Composite usage score	3.22 (0.75)	3.35 (0.66)

Note. Standard deviations in parentheses; sample standard deviations ($n - 1$). Items ordered by total mean. The composite is the mean of the seven reported-usage items per respondent. The Total column includes the two respondents residing in China, who are not tabulated separately ($n = 2$).

C. Perceived Effectiveness

Perceived effectiveness ratings are reported in Table 3. The highest-rated item was the statement that AI helps students understand learning materials more clearly ($M = 3.61$, $SD = 1.34$), the only item to exceed 3.50 and a result that parallels the usage data. Improved academic performance and increased confidence tied (both $M = 3.22$, $SD = 1.17$), followed by task efficiency ($M = 3.17$, $SD = 1.19$) and accurate, well-organised output ($M = 3.17$, $SD = 1.30$). Improved assignment quality received $M = 3.13$ ($SD = 1.22$). The lowest-rated item was the belief that overall learning achievement had increased through AI use ($M = 3.00$, $SD = 1.13$), exactly at the scale midpoint. The composite effectiveness mean was 3.22 ($SD = 0.93$). Ratings thus cluster narrowly around the neutral point, with one exception: students endorsed comprehension support more strongly than any broader claim about attainment. Standard deviations above 1.10 on every item indicate substantial disagreement among respondents in a sample of this size.

Table 3
Mean perceived effectiveness by item (1 = Strongly Disagree, 5 = Strongly Agree)

Perceived effectiveness item	Total (N = 23)	Indonesia (n = 21)
AI helps me understand materials more clearly	3.61 (1.34)	3.86 (1.11)
My academic performance has improved	3.22 (1.17)	3.29 (1.10)
AI increases my confidence in completing tasks	3.22 (1.17)	3.38 (1.07)
AI helps me complete tasks more efficiently	3.17 (1.19)	3.38 (1.02)
AI produces accurate, well-organised results	3.17 (1.30)	3.33 (1.24)
AI improves the quality of my assignments	3.13 (1.22)	3.33 (1.06)
My overall learning achievement has increased	3.00 (1.13)	3.05 (1.07)
Composite effectiveness score	3.22 (0.93)	3.37 (0.81)

Note. Standard deviations in parentheses; sample standard deviations ($n - 1$). Items ordered by total mean. The composite is the mean of the seven effectiveness items per respondent. The Total column includes the two respondents residing in China, who are not tabulated separately ($n = 2$).

D. Descriptive Covariation Between the Composite Scores

The two composite scores covaried in this sample ($r = .87$, $N = 23$; $r = .82$ within the Indonesian subsample, $n = 21$). Because both composites derive from a single self-report instrument completed at one sitting, the coefficient cannot be interpreted as evidence of a relationship between distinct constructs, and it is reported only as a descriptive feature of the dataset. Common-method variance is a plausible partial account; the cross-sectional design precludes any inference about direction of influence; and a coefficient of this magnitude, alongside $\alpha = .92$ across items intended to measure two distinct constructs, may indicate that respondents did not differentiate between the constructs. No inference is drawn from it.

E. Perceived Benefits

Twenty-two participants answered the open-ended question on benefits; one left it blank. Six themes were identified (Table 4). Time efficiency and productivity was the most frequently occurring theme, present in the responses of 6 participants (27%). Students described faster completion and easier management of workload, one reporting that “my productivity has improved significantly due to AI-powered management and brainstorming,” another that work “becomes more efficient and organized and makes everything easier.”

Three themes each occurred in 4 responses (18%). Personalized tutoring and explanation captured descriptions of AI as an always-available, level-adjusting explainer: one participant characterised it as acting “like a personalized tutor, explaining difficult topics in simple ways whenever you need help,” while another valued “personalized, on-demand explanations and feedback” that “adapt to my learning pace.” Brainstorming and idea generation reflected use at the outset of extended work, including one student's account of using AI “to brainstorm when I writing my thesis.” Improved comprehension of complex material was expressed directly, as in “I understand difficult material more quickly” and, from a participant describing dense assigned reading, “AI can help me better comprehend them.”

Confidence building appeared in 2 responses (9%), most explicitly from a student who used AI to analyse presentation content and reported that this “gives me more confidence when delivering the presentation.” A single participant (5%) described a lowered barrier to beginning unfamiliar material, recorded as “lower learning threshold.”

Table 4
Themes in reported benefits of AI use ($n = 22$ respondents)

Theme	n	%	Illustrative response
Time efficiency and productivity	6	27	“My productivity has improved significantly due to AI-powered management and brainstorming”
Personalized tutoring and explanation	4	18	“It acts like a personalized tutor, explaining difficult topics in simple ways whenever you need help”
Brainstorming and idea generation	4	18	“AI help me to brainstorm when I writing my thesis”
Improved comprehension	4	18	“I understand difficult material more quickly”
Confidence building	2	9	“This gives me more confidence when delivering the presentation”
Lowered learning threshold	1	5	“Lower learning threshold”

Note. Percentages are of the 22 participants who answered the benefits question and sum to more than 100 because a response could contain more than one theme. Responses are quoted as submitted, without correction.

F. Perceived Concerns

Nineteen participants reported a substantive concern. Two further participants answered the question by denying any concern, and two left it blank; all four are excluded from the denominator. Nine themes were identified (Table 5).

Over-reliance leading to diminished independent thinking was the most frequently occurring theme, present in 7 responses (37%). Accounts were specific about the mechanism. One participant wrote that “students might stop thinking for themselves because they rely too much on getting instant answers from AI.” Another set out the concern at length: “Over-reliance on AI can weaken critical thinking and problem-solving skills. Learners may accept AI-generated answers without questioning their accuracy, bias, or logic, leading to superficial understanding and reduced ability to learn independently.” A third framed it as a question of balance, describing the challenge of “using AI as a tool to support learning rather than allowing it to replace the thinking, practice, and human interaction that are essential for deep understanding.”

Doubts about the accuracy and reliability of AI output formed the second theme, present in 5 responses (26%). One participant stated simply that they were “not sure about the validity of information AI gave”; another described a compensating routine: “AI is always prone to errors, so when I use it, I can't be 100% confident in its results. I have to recheck it myself.”

Difficulty formulating effective prompts appeared in 3 responses (16%), making it the third most frequent concern. One participant identified the challenge as “finding the right prompt for academic purposes”; another described an iterative cost: “Sometimes AI doesn't fully understand what I'm saying, so I have to repeat my requests to it over and over again. This is very time-consuming.”

Access and availability constraints, including intermittent connectivity and free-tier usage limits, appeared in 2 responses (11%).

Five further themes were each raised by a single participant (5%): academic ethics, where one respondent identified the risk of “copying AI results without understanding the material, which has the potential to violate academic ethics”; loss of motivation to learn; privacy and safety; the capability limits of current systems on technical tasks; and the absence of deep interaction and human guidance. Given a denominator of 19, these single mentions are reported for completeness and should not be read as prevalence estimates.

Table 5
Themes in reported concerns about AI use ($n = 19$ respondents)

Theme	n	%	Illustrative response
Over-reliance and reduced independent thinking	7	37	“Students might stop thinking for themselves because they rely too much on getting instant answers from AI”
Accuracy and reliability of output	5	26	“Not sure about the validity of information AI gave”
Difficulty formulating prompts	3	16	“Finding the right prompt for academic purposes”
Access and availability	2	11	“When there's no Internet, I can't use AI”
Academic ethics	1	5	“Copying AI results without understanding the material, which has the potential to violate academic ethics”
Loss of motivation to learn	1	5	“Loss of motivation and no effort to learn if not used appropriately”
Privacy and safety	1	5	“Privacy and safety”
Capability limits of current systems	1	5	“Some AI can't generate their own logic and algorithm it self”
Absence of human interaction	1	5	“Lack of deep interaction and human guidance”

Note. Percentages are of the 19 participants who reported a substantive concern; two participants who explicitly denied having a concern and two who left the item blank are excluded. Percentages sum to more than 100 because a response could contain more than one theme. Themes with $n = 1$ are reported for completeness and should not be read as prevalence estimates (see Section 3.5). Responses are quoted as submitted, without correction

V. DISCUSSION

A. Principal Findings

Three findings emerge from this exploratory dataset. First, reported AI use concentrates on comprehension support and idea generation and falls away sharply at daily routine integration, a difference of one full scale point between the highest and lowest items (see Section 5.2 for a caveat on the wording of item B7). Second, students endorse AI's contribution to understanding material more readily than its contribution to their overall learning achievement, which sits precisely at the neutral midpoint. Third, the concern most frequently articulated in students' own words, by more than a third of those reporting any concern, is that reliance on AI erodes independent thinking — voiced by the same respondents who describe substantial benefits. Each finding is descriptive and derives from 23 respondents; none should be read as an estimate of prevalence in any wider population.

B. Interpretation of AI Usage Patterns

The distribution of reported usage across items is uneven in an interpretable way. AI is reported as most heavily used where new material must first be understood and where ideas must be generated, and least used as an ambient feature of everyday study. Item B7 (“I rely on AI tools as part of my daily study routine”) contains the word “rely,” which may carry a negative connotation independent of actual behaviour. The low endorsement of this item relative to B3 may partly reflect wording rather than behaviour. This possibility cannot be excluded with the present data. B7 also differs from B3 in referring to a daily routine rather than a specific academic task, so the difference between them cannot be attributed to wording alone.

This pattern requires a qualification. One possible reading is that students turn to AI at the points where they feel most stuck, a statement about experienced difficulty that cannot be tested here. More importantly, the pattern should not be described as evidence that students are self-regulating their AI use. Self-regulation implies deliberate monitoring and control of one's own learning, and nothing in this design bears on whether such monitoring occurred. What the data show is that reported use is unevenly distributed across task types. Whether that unevenness reflects strategic judgement or simply tracks the contours of difficulty cannot be determined here, and the distinction matters for practice: the first would call for helping students choose better, the second for reducing the difficulty that drives them to offload.

C. Benefits and Over-Reliance

The most striking feature of the open-ended data is that benefit and apprehension are voiced by the same students. Participants who described AI as a personalized tutor or a productivity gain also described the erosion of critical thinking, and several articulated the mechanism in some detail, identifying uncritical acceptance of output as the specific pathway to superficial understanding. This is not a contradiction requiring resolution; it is a recognisable feature of how people relate to any tool that reduces effort.

Two implications follow. The first is methodological: usage frequency alone is a poor proxy for educational impact, because the same reported frequency is compatible with critical interrogation and with passive acceptance. The second is practical: awareness of a risk does not entail the capacity or the disposition to manage it. Students in this sample could name the hazard precisely and were nonetheless using the tools at moderate frequency. Institutional responses that rely on students' own vigilance therefore rest on a weak foundation, since the awareness such approaches assume was already present here without evident protective effect. It should be stressed that this study did not measure whether apprehension moderated behaviour; the observation is that awareness and use coexist, not that awareness fails.

The prominence of prompt formulation as a difficulty deserves separate comment. It was the third most frequent concern and is qualitatively different from the others: unlike over-reliance or output accuracy, it names a discrete skill that instruction might address. Its appearance in an inductively coded dataset, unprompted by any survey item, stands against the literature reviewed for this study, in which it appears infrequently; a systematic review of AI literacy frameworks would be required to establish whether it is generally under-represented.

D. Relationship to Previous Research

The concentration of use at comprehension support aligns with the pattern reported by Luo et al. (2025), whose review found AI-based learning tools most consistently beneficial for cognitive knowledge acquisition and considerably more variable in their effects on cognitive process and skill development. The present data offer a complementary observation from the student side: participants rated comprehension support highest and overall learning achievement lowest, a gradient that mirrors where the intervention literature finds effects to be most and least dependable.

The concerns students raised correspond closely to the risks identified in the review literature. Mallik and Gangopadhyay (2023) foreground the displacement of student effort as a recurring theme across two decades of AI in education, and that is substantively what participants here described in their own terms. Teng's (2025a, 2025b) finding that outcomes diverge according to whether students interrogate or copy AI output supplies a mechanism for what this study can only observe as coexisting benefit and apprehension: the students describing critical rechecking and those describing passive acceptance may be occupying the two poles Teng documented behaviourally. This study cannot confirm that interpretation, having measured neither engagement quality nor learning outcomes.

Prompt formulation and access constraints (intermittent connectivity and free-tier limits) were salient in this sample. Whether they are under-represented in the wider literature cannot be established from the sources reviewed here, and whether they reflect features of the Indonesian context or of this particular sample cannot be established from 23 responses.

E. Measurement Considerations

The very high internal consistency ($\alpha = .92$) and the descriptive inter-composite coefficient (Section 4.4) are compatible with respondents having expressed a single general orientation toward AI rather than differentiating usage from perceived effectiveness, which would be a measurement problem rather than a substantive finding, and one that future instrument development should address directly.

F. Practical Implications

The following are tentative implications, offered as hypotheses for future work, not as prescriptions. This is one small convenience sample, and none of what follows should be treated as established.

If the pattern replicates, the concentration of AI use at the comprehension stage would suggest that instructors might consider assessment designs that target that stage: asking students to interrogate, correct, and extend AI-generated explanations would engage them at the point where offloading is most attractive, rather than attempting to exclude the tools. The gap between task-level and achievement-level perceptions would further suggest that instructors might consider distinguishing components where AI assistance is permitted from those requiring independent work, so that the reasoning demands associated with durable learning are preserved somewhere in the assessment structure.

For students, the practice several participants described independently, treating AI output as provisional and rechecking it, might merit examination as a candidate habit. Whether it is teachable, and whether it addresses the accuracy concerns raised in this sample, cannot be established here.

If the pattern replicates, AI literacy provision might consider two components. Evaluation of output (recognising fabrication, detecting bias, verifying claims) would respond to the second most frequent concern. Construction of input, that is, instruction in formulating and refining prompts for academic tasks, would respond to the third, and may be less commonly provided. The framing of both might acknowledge that students in this sample were already aware of the risks; whether provision that assumes ignorance would be received poorly was not examined here.

If the pattern replicates, institutions might consider distinguishing permissible scaffolding from impermissible substitution through concrete illustrations rather than general prohibition; a single participant raised academic ethics unprompted, and that single response cannot show that generic policy language is ineffective. Institutions selecting or endorsing particular tools might also consider weighing data privacy and security alongside pedagogical fit (Madanchian & Taherdoost, 2025), a consideration that surfaced directly in one participant's response.

G. Limitations

The limitations of this study are substantial and constrain every claim made above.

Sample size and composition. Twenty-three participants recruited by convenience through the researcher's own networks cannot support population inference and plausibly over-represent students already comfortable with AI. The two Chinese participants are not reported separately, and an adequately powered cross-national comparison would require a sample sized by a priori power analysis; a conventional heuristic suggests roughly 30 participants per group. The findings are hypotheses for larger, more rigorously sampled studies, not conclusions about Indonesian students generally.

Measurement. All data are self-reported, and social desirability may operate in either direction. Common-method variance is a plausible partial explanation for the covariation between the composites reported in Section 4.4, and the high internal consistency ($\alpha = .92$) may reflect acquiescent or undifferentiated responding, since several respondents gave identical values across all 14 items.

Design. The cross-sectional design cannot establish causality in any direction, and the reported coefficient should not be read causally.

Data completeness. Year of study and field of study were incompletely recorded, and gender was not collected.

Qualitative analysis. Coding was performed by a single researcher without a second coder or formal reliability assessment; five of the nine concern themes rest on a single response (see Section 3.5).

VI. CONCLUSION

This exploratory descriptive survey of 23 university students, 21 of them in Indonesia, offers an early description of how generative AI enters self-directed academic work within a small convenience sample. Within this small sample, AI functioned as a task-specific aid concentrated where new material must be understood and where ideas must be generated, rather than as a constant companion to study. Students endorsed its contribution to comprehension more readily than any broader claim about their attainment, and the concern they raised most often, in their own words, was that the convenience they valued might be displacing their capacity to think independently.

If replicated in larger samples, these findings would suggest that responses to that tension might centre on instructional design that keeps students in an active relation to the material: assessment that requires interrogation of AI output rather than its reproduction, explicit provision in evaluating output and constructing prompts, and institutional guidance concrete enough to distinguish support from substitution. Whether such approaches are effective was not examined here. The prominence of prompt formulation as a self-identified difficulty is a finding that warrants further investigation.

These conclusions are provisional in proportion to the evidence behind them. Twenty-three respondents recruited by convenience cannot establish how Indonesian students in general use AI. What the study can offer is a transparently reported starting point and a set of specific questions for adequately powered work: whether the concentration of use at comprehension replicates in larger samples; whether awareness of over-reliance predicts any protective behaviour; and whether prompt formulation constitutes a distinct and teachable component of AI literacy. Longitudinal designs, behavioural trace data, and instruments capable of distinguishing usage from appraisal will be needed to answer them.

A. Declarations

Ethics approval. Approved by the institutional review board of Nanjing University of Information Science & Technology (NUIST). All participants provided informed consent; the one respondent who declined was excluded from all analyses.

Data availability. The anonymised item-level response matrix appears in Appendix B. Verbatim open-ended responses and the thematic coding matrix are available from the author on reasonable request.

Conflicts of interest. The author declares no conflict of interest.

Funding. This research received no external funding.

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Appendix A. Research Questionnaire

Self-administered online questionnaire (Google Forms), 20 items: 4 consent and demographic items (Section A), 7 usage-frequency items (Section B), 7 perceived-effectiveness items (Section C), and 2 open-ended items (Section D). Sections B and C use five-point Likert scales. Administered in English, with Bahasa Indonesia and Chinese translations available on request. Mean completion time 8–12 minutes. Internal consistency across the 14 Likert items: Cronbach's $\alpha = .92$.

Section A. Consent and demographic information

Item	Question	Response options
A1	Do you agree to participate in this study?	Yes, I agree / No, I do not agree
A2	In which country are you currently residing?	Indonesia / China / Other
A3	What is your current major or field of study?	Open text
A4	What is your current year of study?	1st / 2nd / 3rd / 4th year / Postgraduate

Section B. AI usage frequency

Scale: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always.

Item	Statement	Construct measured
B1	I use AI tools frequently for my academic activities.	General usage frequency
B2	I spend a considerable number of hours per week using AI tools for learning.	Time investment
B3	I use AI to help me understand difficult course materials.	Comprehension support
B4	I use AI to help me complete written assignments (e.g., essays, reports).	Assignment completion
B5	I use AI to brainstorm ideas or generate explanations for my coursework.	Brainstorming
B6	I use AI to check or correct my work before submitting it.	Error checking
B7	I rely on AI tools as part of my daily study routine.	Daily integration

Section C. Perceived effectiveness

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

Item	Statement	Construct measured
C1	Using AI helps me complete academic tasks more efficiently.	Perceived efficiency
C2	AI improves the overall quality of my academic assignments.	Perceived assignment quality
C3	AI helps me understand learning materials more clearly.	Perceived comprehension
C4	My academic performance has improved since I started using AI tools.	Perceived academic performance
C5	Using AI tools increases my confidence in completing academic tasks.	Perceived confidence
C6	AI helps me produce more accurate and well-organized assignment results.	Perceived output quality
C7	I believe my overall learning achievement has increased due	Perceived overall achievement

Item	Statement	Construct measured
	to AI use.	

Section D. Open-ended items

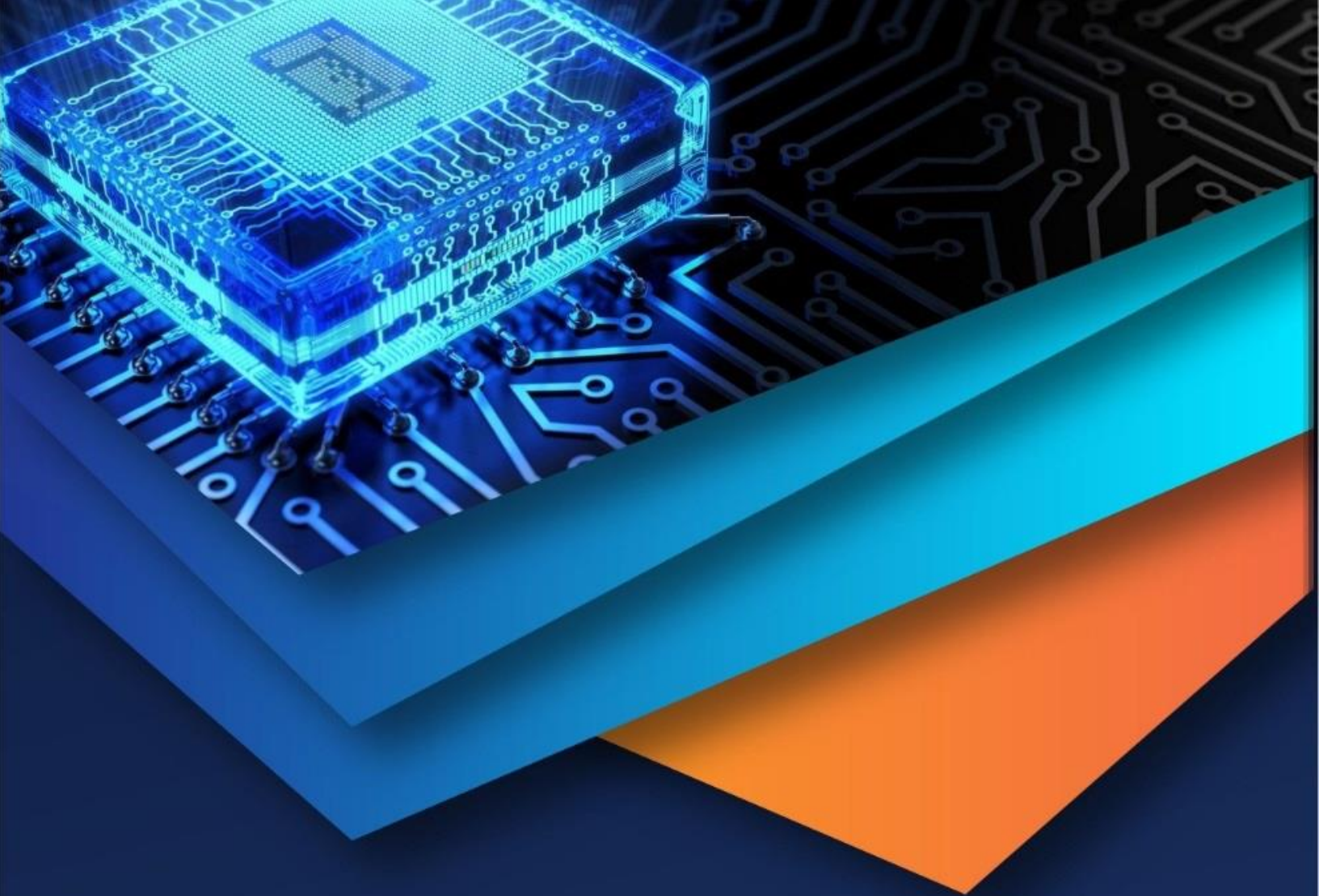
Item	Question
D1	What is the biggest concern or challenge you experience when using AI tools in your learning?
D2	What is the biggest benefit you experience when using AI tools for learning?

Appendix B. Anonymised Item-Level Response Matrix

The table reports the complete Likert responses for the 23 analysable cases. Participant identifiers are those assigned in the original response export and are retained unchanged so that each row can be traced to the source data; they carry no personal information. Identifier 4 is absent because that respondent declined consent and was excluded from all analyses. Item labels follow Appendix A. Verbatim open-ended responses are not reproduced here; they are available from the author on reasonable request.

ID	Country	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
1	Indonesia	3	2	3	2	1	2	1	2	1	2	1	1	1	1
2	Indonesia	4	4	4	3	3	3	3	4	4	4	4	3	4	3
3	Indonesia	5	5	5	4	5	5	4	5	5	5	5	5	5	4
5	Indonesia	3	2	4	3	3	3	3	3	3	4	2	3	3	3
6	Indonesia	3	5	5	1	5	3	3	4	4	5	4	5	3	1
7	Indonesia	3	2	2	3	3	1	1	1	2	2	2	2	2	1
8	Indonesia	4	4	5	2	4	3	3	3	4	4	3	3	4	3
9	Indonesia	4	3	5	4	4	3	3	3	3	4	3	3	3	3
10	Indonesia	5	1	1	5	3	5	1	5	1	1	3	5	1	3
11	China	1	4	1	1	1	4	1	1	1	1	4	1	1	4
12	Indonesia	3	3	5	4	5	3	3	3	3	4	4	4	4	4
13	Indonesia	4	3	4	3	4	4	2	4	4	5	4	4	4	4
14	Indonesia	4	4	4	4	4	4	4	4	4	4	4	4	4	4
15	Indonesia	5	5	5	5	5	2	4	5	3	5	4	2	3	4
16	Indonesia	4	3	5	4	3	4	3	4	5	5	4	4	5	3
17	Indonesia	3	2	2	5	5	2	5	2	4	5	1	2	1	5
18	China	1	2	3	2	2	3	1	1	1	1	1	2	2	1
19	Indonesia	3	3	4	4	4	3	2	3	4	4	5	3	5	3
20	Indonesia	3	2	3	1	4	3	2	3	3	4	4	4	4	2
21	Indonesia	3	3	3	3	3	4	3	3	3	3	3	4	4	4
22	Indonesia	2	2	4	2	3	4	2	3	3	4	3	3	3	3
23	Indonesia	4	3	4	3	4	4	4	4	4	4	3	4	4	3
24	Indonesia	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Note. All values are integers on a five-point scale. B1–B7 are usage-frequency items; C1–C7 are perceived-effectiveness items. Item wording appears in Appendix A.



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