Unveiling Indonesian Higher Education Students' English Academic Writing Misconduct in The Era of Technology & AI: Comprehension vs Practice

Siti Rahimah Yusra[1], Rizaldy Hanifa[1]

[1] Department of English Language and Literature, Universitas Negeri Padang, Padang, Indonesia

Correspondence: Siti Rahimah Yusra, Department of English Language and Literature, Universitas Negeri Padang, 25131, Padang, Indonesia. Tel: 0751 7058692. E-mail: sitiryusra@fbs.unp.ac.id

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Abstract

The widespread use of internet-based media and AI-powered tools for learning has provided students with convenient access to information and writing assistance. However, rather than improving their English academic writing skills, such reliance may lead to academic misconduct, including plagiarism and unethical use of AI-generated content. Such concerns motivate the researchers to gain insights from 50 second-semester students in Indonesia enrolled in two English essay writing courses regarding academic integrity and violations. Employing a qualitative descriptive approach, data were collected through a questionnaire assessing students' understanding of academic integrity, followed by an analysis of 94 essays from 47 students before and after completing the questionnaire. Findings revealed a notable gap between students' conceptual understanding of academic integrity and their actual writing practices. Although students recognized the importance of ethical writing, instances of plagiarism from internet sources and AI-generated text incorporation persisted. These discrepancies stem from underdeveloped English writing proficiency, lack of awareness about plagiarism, and dependency on digital assistance. The study underscores the need for early and continuous instruction in academic integrity and English writing skills, along with institutional policies and support systems to mitigate academic misconduct in English academic writing.

Keywords: English academic writing, plagiarism, writing misconduct, technology and AI in writing

1. Introduction

Recent advancements in technology have notably supported English language learners, especially in enhancing their writing skills. Learners currently have access to a wide array of tools, such as writing evaluation platforms, translation engines, and a vast amount of information available online. These resources facilitate idea generation and provide thorough feedback on students' written work. Feedback enhances mechanics, style, grammar, and punctuation, resulting in improved accuracy and proficiency as students gain awareness of proper language forms (Ghahri et al., 2015; Moore et al., 2016; Parra & Calero, 2019).

The emergence of artificial intelligence (AI)-powered tools, including ChatGPT, improves learning opportunities through personalized and interactive experiences. These tools facilitate various language tasks, including translation, question answering, and essay generation, enabling students to investigate diverse writing styles, create outlines, and enhance their writing skills (Kasneci et al., 2023). AI systems can also tailor learning environments, promoting adaptive interactions that improve individual learning outcomes (Zhang & Aslan, 2021). Technology provides unparalleled support for student writers due to the extensive accessibility and instant availability of these resources (Khalil & Er, 2023).

Nonetheless, despite these advantages, the accessibility and convenience of technology in writing present inherent risks. The increasing reliance of students on digital tools raises concerns regarding potential over-dependence on technology, which may result in decreased focus during classroom activities and a decline in the commitment to cultivating genuine writing skills (Yunus et al., 2013). Excessive dependence on AI tools may hinder students' autonomy in learning, thereby obstructing the development of independent writing skills (Chen & Cheng, 2008). The availability of online resources and AI-generated content may encourage students to integrate external texts into their writing, resulting in potential plagiarism, which is a serious academic violation with significant repercussions (Bretag, 2013; Khalil & Er, 2023). Examples of such practices encompass unauthorized use of materials, collaboration on assessments intended to be completed individually, and falsification of information, all of which are classified as academic misconduct (Şendağ et al., 2012; Siaputra & Santosa, 2016).

The influence of these behaviors has been widely discussed by scholars, especially regarding the role of technology in enabling plagiarism, cheating, and collusion among students (Ali et al., 2021). Plagiarism has been observed across various educational levels, with instances of students directly integrating content sourced from the internet into their assignments (Denisova-Schmidt et al., 2019; Rogerson & McCarthy, 2017; Zafarghandi et al., 2012). Cheating, frequently facilitated by online resources, is becoming more prevalent in both supervised and unsupervised assessments, particularly in online examinations with restricted supervision (Ahmadi, 2012; Denisova-Schmidt et al., 2019). Collusion, defined as students collaborating on individual assignments for academic gain, continues to be

a notable concern (Crook & Nixon, 2019; Kim & LaBianca, 2018; Sutton & Taylor, 2011).

Academic misconduct among students in Indonesia has been documented, including instances of plagiarism, the use of third-party services, and unauthorized assistance in thesis writing (Nugraha et al., 2020; Wijaya & Gruber, 2018). These practices undermine the academic integrity of institutions and raise concerns regarding students' dedication to creating authentic, original work (Adiningrum, 2015; Ampuni et al., 2020; Santoso & Cahaya, 2019). Factors including grade pressure, procrastination, insufficient awareness of plagiarism, and dependence on online resources contribute to these behaviors (Kennet & Shkodkina, 2018). Furthermore, educational policies and the proficiency levels of students, especially among novice writers, contribute to the occurrence of misconduct (Ali et al., 2021; Babaii & Nejadghanbar, 2017; Bretag, 2013; Harper et al., 2019).

A deeper understanding of academic integrity, particularly regarding technology use in writing, is essential, especially in underrepresented regions such as Indonesia. Research on academic misconduct in developed countries provides important insights; however, this issue is still insufficiently examined in developing nations (Ali et al., 2021). Examining the Indonesian context may uncover distinct cultural, pedagogical, and technological elements that affect students' commitment to academic integrity. This study looks into the comprehension of academic integrity among Indonesian higher education students in the context of technology and artificial intelligence, with a specific focus on their writing practices.

To guide this study, the following research questions are meant to be answered:

1. How do Indonesian higher education students perceive academic integrity?
2. To what extent do Indonesian students engage in academic misconduct in their writing practices?

This research aims to provide insights into the influence of technology and AI on academic misconduct in Indonesian higher education, with potential implications for enhancing academic integrity policies and practices globally.

2. Literature Review

2.1 Academic writing and the impact of technology and AI

The integration of technology and artificial intelligence (AI) has significantly altered academic writing practices, influencing students' approaches to writing assignments and the production of written content. Historically, the development of writing skills has predominantly depended on classroom instruction, which frequently fails to address the varied needs of students (Graham, 2019). The emergence of technology and AI has provided students with unparalleled access to supplementary resources outside traditional classroom environments, facilitating personalized support for the enhancement of their writing skills (Dong, 2023; Strobl et al., 2019). AI-based tools such as grammar checkers, citation generators, and plagiarism detectors offer prompt feedback, assisting students in adhering to academic standards and managing intricate citation requirements (Song & Song, 2023; Srinivasa et al., 2022; Yan, 2023). These technologies correspond with constructivist educational theories that highlight the importance of feedback in facilitating learning processes and fostering student autonomy in writing (Alvarez et al., 2012; Yücel & Usluel, 2016).

However, the incorporation of technology and AI in educational settings presents notable ethical and pedagogical issues. The literature identifies persistent challenges concerning plagiarism, intellectual property rights, and the authenticity of student work, which are exacerbated by the accessibility of digital resources (Elkhatat, 2023; Evering & Moorman, 2012; Khalaf, 2024). Scholars contend that AI tools may obscure ethical boundaries, raising concerns that excessive dependence on automated assistance could diminish students' creativity and critical thinking abilities (Bogani et al., 2023; Paraman & Anamalah, 2023). The ethical design and implementation of AI in education necessitate careful consideration, as AI algorithms may unintentionally affect students' interpretation and representation of academic content. This aligns with the moral development framework, emphasizing the necessity for students to engage in ethical judgment and autonomy in academic practices (Wright et al., 2024).

Furthermore, differences in access to technology and AI tools intensify educational inequalities, as not all students have the same availability of these resources. This disparity may worsen achievement gaps and restrict opportunities for individuals from underserved backgrounds to access the educational benefits provided by AI (Wright et al., 2024). Educators and policymakers must implement equitable policies to ensure all students access essential academic tools, which will promote a learning environment that supports integrity and inclusivity.

2.2 Academic Integrity, Misconducts, and Measures of Mitigation for Writing Practices

Academic integrity is considered a fundamental principle of education, based on the values of honesty, trust, fairness, respect, and responsibility (Fishman, 2014; McCabe et al., 2012). This ethical framework supports the commitment of students and faculty to uphold high academic standards, thereby preserving the institution's reputation and fostering trust within the academic community (Holden et al., 2021; Parnther, 2020). Universities are essential in promoting these values, as compliance with integrity standards demonstrates an institution's commitment to ethical practices, subsequently influencing public perceptions of its academic credibility (Holden et al., 2021).

Paradoxically, academic misconduct, such as plagiarism, cheating, and other dishonest practices, continues to be widespread in educational environments (Şendağ et al., 2012; Siaputra & Santosa, 2016). Cheating behaviors, including the use of unauthorized materials, fabrication of information, and plagiarism, undermine individual moral development and institutional credibility (Parnther, 2020). Scholars concerning moral and cognitive development indicate that students who participate in dishonest practices may carry these

behaviors into their professional lives, potentially affecting future professional ethics (Singh & Bennington, 2012). Technological advancements, especially in online education, have created increased opportunities for "e-cheating," as students utilize online tools to circumvent integrity guidelines (Daffin & Jones, 2018; King & Case, 2014).

Plagiarism is a common type of academic misconduct in writing, manifesting in various ways, including improper citation and the utilization of "paper mills" or contract cheating services (Bretag, Harper, Burton, Ellis, Newton, van Haeringen, et al., 2019; McCabe, 2016). Misunderstandings regarding citation practices and paraphrasing frequently result in unintentional plagiarism among students, underscoring the necessity for targeted training in these domains (Fishman, 2009; Roig, 2015). Resnik (2012) emphasizes that the lack of proper attribution for ideas or the verbatim reproduction of text without quotation marks can lead to nuanced instances of plagiarism, highlighting the necessity for students to be cognizant of these practices.

Institutions have implemented various preventive measures to combat academic misconduct, focusing on education and the establishment of clear policies. The Indonesian government, via the Ministry of National Education, requires institutions to enforce academic codes of conduct, instruct students on citation practices, and conduct originality checks (Minister of National Education, 2010). Universities have developed formal codes of conduct, as illustrated by Padang State University's Rector's Decree No. 34, which incorporates ethical standards into student regulations and mandates originality statements for academic submissions (Tata Tertib Kehidupan Kemahasiswaan Di Kampus Universitas Negeri Padang, 2019). Explicit policies that delineate misconduct, outline consequences, and offer citation guidelines have demonstrated effectiveness in decreasing academic infractions and steering students toward ethical conduct (Bretag, Harper, Burton, Ellis, Newton, van Haeringen, et al., 2019; Sotiriadou et al., 2020).

Training programs, such as workshops focused on academic writing and citation, play a crucial role in aiding students' compliance with integrity standards (Adiningrum, 2015). These programs assist students in comprehending academic norms and provide strategies to prevent plagiarism, especially in online learning environments where the potential for academic dishonesty is elevated (Bylieva et al., 2020). Some studies highlight the effectiveness of digital plagiarism detection tools, such as Turnitin, in deterring misconduct. Additionally, they propose that manual detection methods can enhance these tools by offering a more nuanced understanding of originality (Brown & Janssen, 2017; Dubljević et al., 2014; Levine & Pazdernik, 2018). Integrating technological tools with educational initiatives enables institutions to develop a holistic strategy for maintaining academic integrity and confronting the ethical challenges introduced by digital advancements.

3. Method

This research employed a descriptive qualitative approach to investigate the influence of technology and artificial intelligence on academic integrity among students in Indonesian higher education. The study explored students' comprehension of academic integrity, their awareness of misconduct, and the presence of potential academic misconduct in their writing submissions. This section provides a detailed explanation of the participants, the data collection process, the identification of misconduct, and subsequent analysis.

3.1 Participants

The research focused on second-semester undergraduate students participating in two writing courses at a state university located in West Sumatera, Indonesia. A total of 50 students were invited to participate in the study due to their prior completion of an introductory writing course and their familiarity with the university's academic integrity guidelines. This purposeful sampling approach sought to gather insights from students possessing basic writing skills and a recent comprehension of the academic standards required by their institution.

To mitigate potential bias, it is essential to acknowledge that participants were drawn from a single institution, which may restrict the applicability of the findings to other settings. Furthermore, although 50 students initially participated, only 28 completed the questionnaire, demonstrating a notable decline in responses. The decline could be attributed to students' perceived sensitivity around academic integrity issues, as well as technical or logistical constraints during questionnaire administration. Future research should consider alternative methods for encouraging participation, such as providing assurances of anonymity and emphasizing the importance of honest responses.

3.2 Data Collection

In order to find out the students' comprehension about academic integrity and misconducts regarding writing, a 20-item questionnaire was administered to the participants in this study. The nature of questions of this questionnaire included both closed-ended and open-ended questions aiming to capture the overall tendency of participants' comprehension towards the issue of Academic Integrity in writing practices while allowing observations of their responses in a more detailed manner. The questionnaire was structured around key themes adapted from Fishman's (2014) core values of academic integrity, the Indonesian Ministry of Education's Academic Integrity Platform ANJANI (2022), the university's Rector's Decree No. 34 (Tata Tertib Kehidupan Kemahasiswaan Di Kampus Universitas Negeri Padang Title, 2019) and Carroll's (2016) framework on managing plagiarism.

Examples of questions included:

Excerpt 1: Question to confirm students' comprehension of Academic Integrity (close-ended)

Which of the following statements are correct about Academic Integrity? (Choose 3 answers that you believe are correct)

a) Academic Integrity is a rule made by university, applied within the university, and intended to preserve the university's reputation

b) It is a principle upheld by academician to be applied in each and every academic conduct

c) It highlights codes of how academicians interact to each other

d) It is a principle in the academic world that should be applied by academicians in all areas of academic conduct

e) It is an academic principle in which academicians are responsible for their learning to acquire good academic skills.

Excerpt 2: Question to confirm students' comprehension of Academic Integrity (open-ended)

Student A is someone who starts working on assignments as soon as they are given by lecturer. One of Student A's friends, who is struggling, asks about the assignment. Student A decides to help by showing his/her completed assignment. In this case, can Student A be considered to have committed a violation? Explain the reason.

Excerpt 3: Question to confirm students' comprehension of Academic misconduct (open-ended)

Among the violations mentioned in the Academic Integrity Module, describe some that you have noticed around you!

Excerpt 4: Question to confirm students' perception of learning about Academic Integrity (open-ended)

When is the appropriate time for students to learn about Academic Integrity?

The questionnaire was administered online following completion of the Academic Integrity Module, which was integrated into the writing course as a foundational learning session. The Academic Integrity Module was designed to introduce students to the principles of academic integrity, common forms of misconduct (e.g., plagiarism, unauthorized collaboration), and the ethical implications of using digital sources in writing. This module was a mandatory component of the writing class curriculum, spanning two 90-minute sessions with interactive discussions, case studies, and reflective exercises. Although all 50 students were invited to participate, only 28 responses were received and analyzed.

To identify potential academic misconduct, each student was asked to submit two essays: one prior to completing the Academic Integrity Module and one two weeks after completing the module. The essays were designed to reflect students' understanding of course content, with prompts covering contemporary social issues. These topics encouraged students to express their perspectives while adhering to academic standards of originality and intellectual property. Students' essays were then uploaded to TurnitIn which inform the researchers about the traces of writing similarities and possibilities of plagiarism as well as cheating using AI-generated texts.

Data collection took place over an academic semester, with the questionnaire distributed at the midpoint of the term and essay submissions occurring after the completion of the Academic Integrity Module. This timeline enabled students to incorporate the module's content into their writing practices and afforded adequate time for data analysis before the end of the semester. Before data collection commenced, participants were informed about the study's objectives, their right to withdraw, and the confidentiality of their responses. Written consent was secured, accompanied by assurances concerning the anonymization of all data.

3.3 Data Analysis

Following the collection of questionnaire responses and students' essays, the data was undergoing comprehensive analysis to uncover insights into the comprehension of academic integrity among Indonesian higher education students and to identify potential instances of academic misconduct in their writing. The data from the questionnaire were categorized into three groups: (1) Students' comprehension of Academic Integrity, (2) Students' comprehension of Academic Violations, and (3) Students' Responses to Types of Sanctions based on the Violations. This categorization was conducted to describe each response. The results indicated students' understanding of academic integrity and academic misconduct.

Meanwhile, results from the similarity and AI checking conducted by TurnItin were classified into three levels: low (less than 20%), moderate (20%-50%), and high (over 50%) violations, in accordance with the criteria established by the Essay Writing teaching team (see Figure 1 for example).

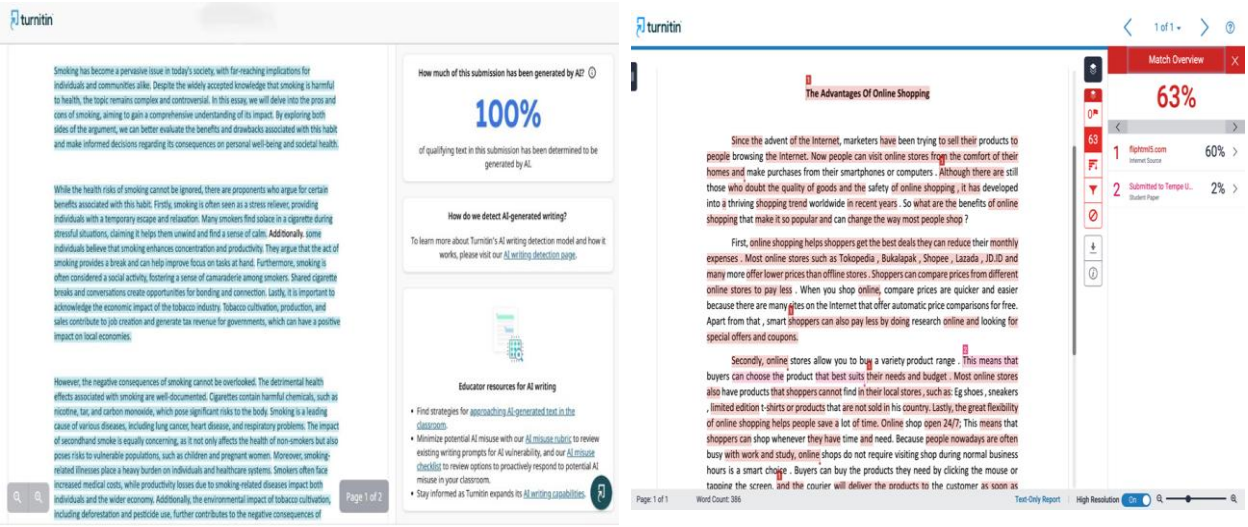

Figure 1. Example of students' essay featuring high similarity score and high AI-generated text report from TurnItin

From the document collected, TurnitIn was not able to generate analysis on several students' essays which therefore were excluded from this study. Due to this reason, current analysis was conducted on 94 eligible essays collected. Results of similarity percentage and AI checking from the essays gathered prior and after the completion of Academic Integrity session were presented in a table to unveil whether the participants' writing compositions were proven to have included unoriginal materials as a result of reliance to the technology and AI while also providing insights on students' practice of writing both before and following the completion of Academic Integrity Module.

4. Results

The results reveal complex dynamics in students' comprehension and perceptions of academic integrity, as well as actual behaviors in their writing practices. Data from questionnaire responses and Turnitin analysis offer insights into students' comprehension and implementation of academic integrity principles. An interpretation of these findings indicates a foundational understanding of integrity alongside unexpected outcomes in writing practices that demonstrate a continued dependence on technology and AI tools.

4.1 Students' Comprehension and Perception of Academic Integrity and Misconducts in Writing

The research findings indicate that a significant majority of participants demonstrate a strong comprehension of academic integrity, with 89.29% acknowledging it as a fundamental code of conduct within the academic environment. Students prioritize honesty (82.14%), accountability (78.57%), and respect (75%) as fundamental values linked to integrity, reinforcing this perception. The significant proportion of students recognizing academic integrity as a guiding principle in their learning responsibilities (71.43%) reflects a conceptual alignment with the ethical standards expected in academia. The findings indicate that students perceive academic integrity as a fundamental aspect of their educational experience. The data has been summarized and displayed in Table 1.

Table 1. Students' Comprehension on Academic Integrity

Students' Comprehension on Academic Integrity	**Number of Response**	**Percentage**
The concepts of academic integrity		
A principle that must be practiced by an academician in accomplishing their academic tasks	18	64.29%
An academic principle to be responsible to own learning in order to develop one's own abilities	20	71.43%
A code of conduct in the academic field that must be practiced in any academic setting	25	89.29%
Values entitled to academic integrity		
Honesty	23	82.14%
Responsibility	22	78.57%
Respect	21	75.00%

Furthermore, the data in Table 2 presents gaps in students' understanding of specific academic violations, especially concerning less overt forms of misconduct. Although a significant majority of students acknowledge common violations like plagiarism (92.86%) and cheating (89.29%), a smaller proportion are aware of more complex infractions, including fabrication and falsification (60.71%) and collusion (67.86%). This disparity indicates that students are generally more cognizant of and responsive to overt forms of misconduct, yet they may neglect or misinterpret subtler forms, which can also undermine academic integrity.

Table 2. Students' Comprehension on Academic Violations

Students' Comprehension on Academic Violations	Number of Response	Percentage
Academic Violations that Students Understand about		
Plagiarism	26	92.86%
Cheating	25	89.29%
Fabrication & Falsification	17	60.71%
Contract Cheating	21	75.00%
Collusion	19	67.86%
Academic Violations Around the Institution		
Plagiarism	18	64.29%
Cheating	19	67.86%
Fabrication & Falsification	2	7.14%
Contract Cheating	3	10.71%
Collusion	2	7.14%

On behalf of the occurrences of academic misconducts, participants were also encouraged to share their perspectives on the importance of academic integrity through the open-ended questions *"When is the appropriate time for students to learn about Academic Integrity?"* and *"How does learning from the Academic Integrity Module help students in their academic journey?"*. Recorded responses were as follow:

"Academic Integrity should be taught, learned, and practiced since early college years or even earlier from high school"

"Academic Integrity could act as guidance to good academic conducts"

"Academic Integrity would motivate students to be more honest and responsible for their studies"

"Academic Integrity trainings would bring changes to students' mindset and perceptions on their academic conducts"

"Codes of conduct relating to Academic Integrity would encourage students to practice writings following ethics"

"Academic Integrity helps students acknowledge the needs to develop their writing abilities"

Students' answers reflect a recognition that sustained exposure to integrity training could promote ethical conduct as a lifelong practice. These responses reveal an awareness among students that ethical conduct requires both cognitive understanding and behavioural reinforcement over time.

4.2 Traces of Academic Misconducts in Students' Writing Products

The analysis of the writing samples in Table 3 reveals a notable contradiction regarding students' conceptual understanding of integrity principles. The Turnitin analysis of the initial essays indicates that before the integrity module, 4.25% of essays exhibited high similarity scores, while 8.51% demonstrated moderate similarity. Additionally, 12.76% of essays were identified as containing high levels of AI-generated content, suggesting that a significant number of students may be employing technology to circumvent authentic writing practices. The dependence on AI prompts inquiries regarding students' thoughts of AI as a legitimate resource in academic writing and their ability to generate original content independently.

Table 3. Academic Violations Recorded on Students' Writings

Types of academic misconducts	First Essay (Prior Academic Integrity Session)		Second Essay (After Academic Integrity Session)	
	Occurrence	Percentage	Occurrence	Percentage
High similarity cases (over 50%)	2	4.25%	-	-
Moderate similarity cases (over 20%)	4	8.51%	4	8.51%
High AI detection (over 50%)	6	12.76%	8	17.02%
Moderate AI detection (over 20%)	1	2.12%	3	6.38%
Total number of violations	13	27.65%	15	31.91%
Total Essay	47		47	

Unexpectedly, the analysis of the second round of essays—submitted after the integrity module completion—showed an increase in AI-generated content, with 17.02% classified as high AI detections and 6.38% as moderate AI detections. Although no essays were flagged for high similarity scores, the persistence of moderate similarity (8.51%) indicates that the integrity training was inadequate in preventing students from using unoriginal or AI-assisted content in their submissions. The continued use of AI after training highlights the possibility that students may see AI tools as acceptable aids, potentially stemming from unclear boundaries regarding what constitutes misuse of technology in academic contexts.

These results point to a multifaceted understanding of academic integrity among students. Despite demonstrating a high level of theoretical understanding, the rise in AI-generated content after integrity training suggests that the practical implementation of these ethical principles proves to be more challenging to actually enforce. The ongoing dependence on AI tools may reflect a variety of factors, such as academic pressures, time limitations, and insufficient confidence in individual writing abilities, which may lead students to utilize the shortcuts offered by digital resources.

5. Discussion

The results of this study reflect a fundamental comprehension of academic integrity among students and a complex array of behaviors that present a challenge to the consistent application of these principles. This duality aligns with broader scholarly perspectives on academic integrity, which posit that adherence to ethical standards is not always a direct result of knowledge, particularly in the presence of evolving technological influences and academic pressures.

The primary finding shows a majority of students exhibit a strong awareness of the essential components of academic integrity, highlighting honesty, accountability, and respect as fundamental values (Bretag, Harper, Burton, Ellis, Newton, Rozenberg, et al., 2019). This conceptual understanding is in accordance with previous research demonstrating that institutional policies and educator expectations influence students' ethical comprehension (Gullifer & Tyson, 2014; McCabe, 2016). The acknowledgment of academic integrity by students as a fundamental principle within their academic environment reflects an understanding of institutional standards, implying that such policies may cultivate a basic respect for integrity. Bretag et al. (2019) assert that institutional policies function as guiding frameworks that establish a shared ethical foundation, essential for upholding academic standards in varied contexts.

Students easily identify clear forms of misconduct, including plagiarism and cheating; however, there exists a significant gap in their comprehension of more subtle infractions, such as fabrication, falsification, and collusion. Less overt forms of misconduct, although they compromise academic integrity, seem to be misunderstood or undervalued by students (Gullifer & Tyson, 2014; Newton, 2016). This agrees with the findings of Olafson, Schraw, and Kehrwald (2014), who indicated that plagiarism is the most prevalent form of misconduct, attributed to its visibility and the straightforward nature of its identification and subsequent penalties. Park (2017) posited that students frequently underestimate the seriousness of collaborative misconduct or falsification, as these behaviors may seem less harmful than direct copying. The identified understanding gap underscores the necessity of enhancing academic integrity education to encompass the entire range of misconduct, a suggestion endorsed by researchers such as Amzalag, Shapira, and Dolev (2022).

Furthermore, the data indicate a notable dependence on AI tools, despite integrity session, evidenced by a rise in identified AI-generated content in subsequent essays. This result supports contemporary discussions regarding the ethical implications of artificial intelligence in academic works (Frye, 2023; Harper et al., 2019). The ongoing use of AI may reflect that students view these tools as valid resources instead of ethical concerns, prompting inquiries into how institutions can define the limits of permissible technology use. Cinali (2016) asserts that although technology can enhance learning, it necessitates thoughtful integration into educational practices to avert misuse. Institutions must evolve their policies to delineate the appropriate and inappropriate uses of AI tools, particularly in light of the accessibility of these resources and their ease of integration into writing tasks (Ali et al., 2021).

Scholarly perspectives suggest that the demands of academic achievement and time constraints substantially influence students' dependence on technological shortcuts (Ledesma, 2011; Shaw et al., 2015). In high-performance contexts, students may prioritize outcomes over processes, perceiving AI assistance as a practical solution rather than an ethical compromise. Studies conducted by Singh and Bennington (2012) and Denisova-Schmidt et al. (2019) highlight that students' observations of peers participating in similar behaviors can reinforce the normalization of dependence on technological aids, thereby fostering a culture in which academic integrity is undermined by peer actions and perceived social norms. This cultural dynamic suggests that institutions should foster both individual awareness and a collective commitment to integrity by encouraging an academic culture that discourages such practices.

The data obtained from students' reflections underscore the importance of students' attribute to early and continuous education in academic integrity. A significant number of students expressed a preference for training that commences before university and continues throughout their academic experience. This perspective is supported by scholars such as Bretag et al. (2014) and Siaputra and Santosa (2016), who advocate for integrity education as an ongoing process that fosters ethical reflexivity over time. Introducing integrity training at the secondary education level may facilitate the internalization of ethical standards among students prior to their engagement with high-stakes assessments in university environments. Stone (2023) asserts that students experience considerable anxiety regarding potential breaches of integrity, which can be alleviated through systematic and regular training that enhances confidence in ethical writing practices.

Given that a subset of students committed repeated violations across multiple essays, this study also sheds light on patterns of academic misconduct among students who have previously engaged in such behaviors. This phenomenon, as indicated by Singh and Bennington (2012), implies that students engaging in unethical practices possess a tendency to repeat such behaviors, likely due to insufficient intervention or remediation efforts. Consistent with Amzalag et al. (2022), these findings emphasize the necessity for institutions to track students' behaviors over time and to adopt remedial strategies that target the root causes of misconduct, rather than merely imposing penalties for infractions.

The findings signify major implications for integrity training. A brief integrity session, as implemented in this study, may be inadequate for achieving lasting behavioral change, particularly in light of the pervasive impact of technology on students' writing practices. Bretag et al. (2014) argue that integrity education must be interactive and comprehensive, integrating consistent reinforcement and opportunities for skill development. Training should incorporate clear instructions on the ethical utilization of digital tools and provide strategies for effectively managing academic workloads without relying on technological shortcuts. Levine and Pazdernik (2018) assert that institutions should facilitate students' academic growth by fostering confidence in their writing skills, thereby decreasing the tendency to depend on AI or other unauthorized resources.

6. Conclusion

The current study pinpoints the strengths and gaps in students' comprehension of academic integrity. Despite students exhibiting a strong conceptual grasp of integrity principles, the continued dependence on AI tools and the existence of subtle forms of misconduct suggest that institutions need a more comprehensive approach for integrity education. This approach must encompass ongoing, interactive training, explicit policy guidelines regarding AI utilization, and supportive initiatives that facilitate the development of authentic writing skills among students. Addressing these areas enables institutions to equip students more effectively to navigate the ethical challenges presented by technological advancements, resulting in fostering a stronger culture of academic integrity.

This study has specific limitations that require attention. The group of participants was confined to students from one university, potentially limiting the generalizability of the findings to the wider population of Indonesian higher education students. The study also depended on self-reported perceptions of academic integrity, which may not comprehensively reflect the complexities of students' attitudes or their motivations for engaging in academic misconduct. Future research may mitigate these limitations by utilizing a larger and more diverse sample across various institutions, adopting longitudinal designs to observe changes in integrity perceptions and behaviors over time, and integrating mixed methods, such as in-depth interviews or focus groups, to obtain deeper insights into students' motivations and ethical decision-making processes. Exploring the impact of evolving AI technologies on integrity across various academic disciplines may provide valuable insights for the development of adaptive integrity education programs.

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Authors' contributions

The research was collaboratively conceptualized and executed by both authors. Specifically, Author 1 played a central role in developing the research framework, collecting and analyzing the data, and drafting the manuscript. Author 2 made significant contributions to defining the research problem and designing the conceptual framework. Both authors actively participated in data analysis and critically revised the manuscript to enhance its academic rigor.

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The author(s) declare that they have no competing interests.

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Participants in this study have consented to participate in this research. Any materials/ data/ information disclosed in this study have received approval from all participants.

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