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Ethical-AI Pedagogy: Developing Moral Reasoning and Digital Responsibility Among Students in the Age of Intelligent Systems

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Abstract: The development of intelligent systems that are increasingly integrated into academic activities has transformed how students seek information, assess source credibility, and make decisions. However, this increased access and efficiency are not always accompanied by ethical readiness, especially concerning algorithmic bias, data privacy, automated decision-making, and the boundaries of AI use in academic contexts. This study aims to analyse how AI Ethics education can shape students' moral thinking and digital responsibility in the era of intelligent systems. Using a mixed-methods explanatory design, this research combines quantitative surveys with focus group discussions and individual reflections to capture experiences, risk perceptions, and moral dilemmas arising from the use of AI technology. The results indicate that understanding AI Ethics significantly influences students' digital responsibility. Although students actively use various AI-based applications, their ethical understanding remains moderate and somewhat ambiguous, particularly regarding digital plagiarism, system bias, and algorithmic mechanisms. Case-based AI Ethics educational interventions have been shown to enhance moral sensitivity, digital caution, and students' reflective capacity. These findings underscore the urgency of integrating AI ethics into higher education curricula as a strategic effort to prepare a generation that is not only skilled in utilising technology but also morally responsible within a complex and often opaque digital ecosystem.

Keywords: AI ethics education, Moral thinking, Digital responsibility

Introduction

The development of artificial intelligence (AI) over the past decade has transformed how humans interact with technology, including in higher education. Students now face intelligent systems in nearly all academic activities, from information processing and writing to decision-making. As noted by Floridi (2019), this development marks a 'new conceptual era that places information as the foundation of human action' (p. 17). This change broadens learning opportunities but also raises ethical issues that students may find difficult to understand. Many of them rely on AI to support academic tasks without understanding how algorithms work, how biases are formed, and who gains control over their personal data (Mittelstadt et al., 2016).

The need for AI ethics education is becoming increasingly urgent as intelligent systems begin to influence students' daily digital behaviour. HCI literature shows that ethical understanding affects the quality of human–

machine interactions, regardless of users' digital literacy levels (Selwyn & Paparozzi, 2022). For example, the use of AI as a decision aid can "decrease moral sensitivity when individuals only follow the suggestions of automated systems" (Moor, 2006; Bostrom & Yudkowsky, 2014). Issues such as algorithmic bias (Binns, 2018), data privacy (Nissenbaum, 2010), and automation in academic assessment (Williamson & Piattoeva, 2019) demonstrate that students need a critical thinking framework to evaluate the social consequences of these technologies.

On the other hand, digital communication studies emphasise that intelligent systems never operate neutrally. Technology is always related to power structures and the distribution of information authority (Van Dijck et al., 2018; Zuboff, 2019). Content moderation, automatic recommendations, and information personalisation have the potential to shape how students understand social reality. Gillespie (2020) shows that algorithms can serve as an 'epistemological filter' that determines what users view or ignore. Therefore, AI ethics education needs to help students realise that technology is not just a tool but part of a communication ecosystem that influences how they see the world.

Nevertheless, there is a striking gap between students' technological literacy and their ethical awareness. Many students claim to understand the benefits of AI but are hesitant to assess the moral implications of technology misuse or the consequences of automation (Eynon & Malmberg, 2021). Viewing technology as an 'objective' or 'neutral' entity (Noble, 2018; Crawford & Paglen, 2019) exacerbates the tendency to accept algorithmic results without critical evaluation. UNESCO (2021) even states that the understanding of AI Ethics still lags far behind the pace of innovation.

In response to these challenges, this study explores how AI ethics education can shape students' moral thinking and digital responsibility. By combining perception surveys, focus group discussions, and individual reflections, this research examines how students interpret the risks and opportunities associated with the use of intelligent systems. This approach aligns with Cowls and Floridi's (2018) call for emphasising ethics embedded in real-world practice, not just normative discourse." Additionally, the frameworks from Behaviour & Information Technology, which focus on user behaviour, and from Information, Communication & Society, which highlight power relations in technology, provide an analytical foundation for a more comprehensive understanding of students' experiences.

Ultimately, AI ethics education is not just about adding technical knowledge, but also about building students' moral capacity to navigate an increasingly complex, biased, and often opaque digital ecosystem (Jobin et al., 2019; Dignum, 2019). Therefore, integrating AI ethics into higher education curricula is a strategic step to prepare a generation that is not only technologically proficient but also morally responsible.

Artificial Intelligence Ethics and Algorithmic Issues

The ethics of artificial intelligence are increasingly becoming a global concern as the use of intelligent systems in human decision-making rises. Floridi (2019) emphasises that AI is not merely a technical device but a new informational environment that shapes human moral actions. In their study, Floridi and Taddeo (2020) describe data ethics as a framework that must ensure a balance between human values, justice, and transparency in the design of intelligent systems.

The issue of algorithmic bias has become a central focus. Mittelstadt et al. (2016) mapped how automated decisions can lead to structural injustice, particularly in education, health, and the public sector. A similar point is emphasised by O'Neil (2016), who refers to problematic algorithms as Weapons of Math Destruction because they amplify inequalities without clear accountability mechanisms, particularly when used on vulnerable groups. In the context of data-driven decision-making, Nissenbaum (2010) reminds us that privacy is not just about protecting information but also involves social integrity and relationships between individuals. The concept of contextual integrity helps us see that students are often unaware of changes in data flow when using AI applications. Additionally, Cowls and Floridi (2018) propose the principle of a "good AI society," which includes justice, human well-being, and responsible governance. Jobin et al. (2019) add that although many institutions have issued AI ethics guidelines, the implementation gap remains significant.

Moral Reasoning, Digital Literacy, and Digital Responsibility

The development of digital technology demands that students are not only technically skilled but also ethically competent. Eynon and Malmberg (2021) indicate that digital citizenship requires a critical understanding of how information is shaped and used in everyday life. Selwyn and Paparozzi (2022) emphasise the importance of ethical literacy in the face of automated systems that increasingly take over human thinking and judgment. In the realm of moral reasoning, Moor (2006) describes that the emergence of machine ethics requires humans to understand the moral limitations of machines while also strengthening their own moral considerations. This perspective is relevant to students who rely on AI for writing, decision-making, and filtering information.

Meanwhile, UNESCO (2021) emphasises that digital ethics competence must include transparency, accountability, and awareness of technology's social impacts. Vrielink and van den Hoven (2021) propose a digital citizenship competency model that encompasses the ability to critique bias, verify data integrity, and assess the implications of algorithmic decisions. Zuboff (2019) and Noble (2018) offer critical perspectives on surveillance capitalism and structural bias in search engines, which are increasingly relevant for students who deal with curated digital information systems daily.

AI in Higher Education and Socio-Pedagogical Implications

The use of AI in higher education has grown rapidly, ranging from automated assessments to academic recommendation systems. Luckin et al. (2016) states that AI has great potential to enhance personalised learning but must be accompanied by deep ethical reflection. Selwyn (2019) offers a critique of technological dependence in education, warning that AI can reshape the pedagogical relationship between instructors and students. Williamson (2017) explains how datafication in education increasingly makes students objects of monitoring. This relates to Williamson and Piattoeva's (2019) research on algorithmic governance, which shows how institutional decision-making can be influenced by systemic biases. Crawford and Paglen (2019) demonstrate how AI training data often contains unconscious visual biases that users may not realise. For students using AI for academic tasks, understanding this is important to prevent dependence without critical evaluation. Green (2020) reminds us that 'smart' technology is often misunderstood as an instant solution, even though its impact is highly determined by the social context of its use. In Indonesia and across Asia, the meaning of digital literacy is also often shaped by cultural conditions and institutional policies.

Method

Research Design

This study uses an explanatory mixed-methods design, in which the quantitative approach is used first to map students' understanding of AI Ethics issues, followed by a qualitative approach to deepen the interpretation of the initial findings. This mixed approach is commonly used in digital behaviour and technology literacy studies because it allows researchers to observe the relationships between perceptions, experiences, and user practices more comprehensively (Creswell & Plano Clark, 2018). In the context of AI Ethics education, this design provides space to capture the dynamics of students' moral thinking, which are not always reflected solely in survey data.

Participants and Sampling

This study involved 120 students from one faculty with different study programs, namely PGSD, Counselling Guidance, and Information Technology Education, selected using purposive sampling according to the research criteria. Purposive sampling was used to ensure variation in students' experiences with intelligent systems in academic activities. The reliability test showed Cronbach's alpha values of 0.82 (AI ethics), 0.79 (risk perception), and 0.84 (digital responsibility). The inclusion criteria include:

a) Active student
b) Digital technology users in the context of learning and
c) Having experience using AI for academic tasks, information searching, or study management.

The sample size for quantitative research is determined according to the minimum recommendations of Hair et al. (2019) for descriptive-inferential analysis, while the number of qualitative participants is based on thematic saturation (Guest, Bunce, & Johnson, 2006).

Research Instrument

Survey

The survey instrument consists of four parts:
- Basic demographics;
- AI ethics comprehension scale (adapted from Jobin, Ienca, & Vayena, 2019);
- Digital responsibility scale (referring to Eynon & Malmberg, 2021);
- Risk perception and technology opportunity scale (based on Mittelstadt et al., 2016).

Each item uses a 1–5 Likert scale.

FGD Guide and Individual Reflection

To explore students' experiences and interpretations more deeply, a guided group discussion protocol (FGD) and narrative reflection tasks were used. The qualitative protocol includes open-ended questions about algorithmic bias, data privacy, academic experiences with AI, and moral dilemmas in everyday digital situations. This approach follows the recommendations of Miles, Huberman, & Saldaña (2014) for exploring subjective experiences.

Procedures

Data collection was conducted in two stages. The first stage involved completing an online survey. After the initial analysis, the second stage involved a Focus Group Discussion (FGD) followed by a written reflection task to deepen the analysis of the quantitative results. Each FGD session lasted 60–90 minutes and was guided by a trained moderator. All data were stored in accordance with institutional digital security protocols.

Data Analysis

Quantitative Analysis

The survey data were analysed using descriptive and inferential statistics. Cronbach's alpha was used to assess internal consistency. Correlation and simple linear regression analyses were conducted to evaluate the relationship between understanding of AI ethics, risk perception, and digital responsibility. The analysis procedures followed the guidelines of Field (2018).

Qualitative Analysis

FGD data and reflections were analysed using thematic analysis (Braun & Clarke, 2006) to identify patterns of students' moral thinking and digital practices. Three main stages were conducted: open coding, axial coding, and refinement. Validity was strengthened through triangulation of survey data, FGD, and narrative reflections.

Mixed-Methods Data Integration

The integration is carried out in an explanatory sequential manner: quantitative findings are used as the basis for developing exploratory questions in the qualitative stage. The results of the integration are presented narratively, showing the consistency or discrepancies between the findings of the two analysis stages.

Ethical Considerations

The research follows the ethical guidelines for social and educational research, including informed consent, anonymity, and data confidentiality. All participants have the right to withdraw at any time without consequences. The research complies with the principles of Responsible AI (Dignum, 2019) and with international recommendations on AI Ethics from UNESCO (2021).

Results and Discussion

Result

The analysis was conducted on data from 120 student respondents, obtained through three main sources: quantitative surveys, focus group discussions (FGDs), and individual reflections. Overall, the findings indicate that students use artificial intelligence-based technology extensively in academic activities, but their critical understanding of its ethical implications has not yet been fully developed.

In general, students demonstrate extensive use of AI-based technologies (ChatGPT, Grammarly, QuillBot, Google Bard, academic recommendation systems, and automation detectors), but their understanding of the ethical implications still varies. This pattern aligns with the characteristics of the digital generation, which is familiar with technology but does not always possess a deep capacity for reflection (Selwyn & Paparozzi, 2022).

Quantitative Survey Results

Descriptive Statistics

To obtain an overview of the respondents' conditions, descriptive statistics were conducted on the main research variables.

Table 1. Descriptive statistics of research variables

Variable	Mean	SD	Category
Understanding AI Ethics	3.74	0.62	Currently
Digital Responsibility	3.83	0.58	Currently
AI Risk Perception	3.69	0.65	Currently
Dependence on AI	4.02	0.71	High

This finding indicates a tendency toward heavy reliance on AI technology, which a deep understanding of ethics or digital responsibility has not balanced. A high level of familiarity does not always reflect a deep understanding, so the average score remains in the moderate category.

Student AI Ethics Literacy Level

Most respondents (about 68%) claim to be familiar with terms such as algorithmic bias, but only about 29% can provide concrete examples in real-world contexts. Additionally, 72% of respondents say they rely quite a bit on AI to complete academic tasks, while 51% admit to having used AI without adequate ethical considerations. As many as 39% are still unsure about where to draw the line between using AI and digital plagiarism. This is consistent with the findings of Eynon & Malmberg (2021), which indicate that students understand technological terms superficially but have not yet achieved critical understanding. These findings highlight an area of ambiguity in AI usage practices that is not yet supported by a clear ethical framework.

Digital Responsibility

Digital responsibility in this study is positioned as the primary variable that reflects the outcome of students' ethical awareness formation. Students' level of digital responsibility falls into the moderate category, with an average score of 3.83. This finding indicates that although students are quite active in using AI-based technology, considerations of social impact, ethical data use, and long-term consequences of digital actions have not yet fully become part of their reflective habits. This aligns with the literature that students often view technology as a neutral entity (Noble, 2018; O'Neil, 2016). Factors that enhance digital responsibility include previous ethical discussion experiences, involvement in academic communities, and exposure to data privacy issues on social media.

Correlation Analysis Between Variables

To test the relationship between variables, Pearson correlation analysis was conducted.

Table 2. Correlation Between Variables

Variabel	1	2	3
1. Understanding AI Ethics	1		
2. Risk Perception	0.52**	1	
3. Digital Responsibility	0.61**	0.48**	1

Note: $p < 0.01$

This result shows that understanding of AI ethics is fairly strongly related to students' digital responsibility. Perceptions of technological risks also contribute to shaping a more reflective attitude.

Regression Analysis

Linear regression analysis was conducted to identify the contribution of each variable to digital responsibility.

Table 3. Regression analysis results

Predictor Variable	Beta	Sig
Understanding AI Ethics	0.47	0.001
Risk Perception	0.31	0.004

$R^2 = 0.52$

These results indicate that understanding AI Ethics is a dominant factor in predicting students' digital responsibility, followed by perceptions of technological risk. The model shows that most of the variation in students' digital responsibility can be explained by factors such as understanding of AI ethics and risk perception. The relatively high coefficient of determination value suggests that the variables of AI ethics and risk perception have substantial contributions, although other factors outside the model may also influence it.

Sintesis

Overall, the quantitative findings point to a pattern of high usage with a moderate ethics gap, a condition in which high technology usage intensity is not fully accompanied by adequate ethical awareness. Students are in a transitional position from merely being technology users to becoming reflective users, but this process has not yet fully matured. This condition indicates that students' use of technology remains dominated by an instrumental orientation, while the reflective and ethical dimensions have not developed optimally.

Qualitative Findings (Focus Group Discussion and Individual Reflection)

Awareness of Bias and Algorithmic Uncertainty

Group discussions show that many students realise that digital platforms can filter information, but they do not understand how this process works. They feel 'guided' by algorithms (Van Dijck et al., 2018), but they do not know how to evaluate or correct them. Some students mentioned:

"I don't know if the content recommendation is neutral."
"I feel like the app is directing me toward a certain perspective."
"Sometimes I just believe the AI results without double-checking."

This statement indicates a dependence on technology accompanied by overconfidence (automation bias).

Ethics in Academic AI Usage

Students have diverse views regarding ethical boundaries.
Some consider the use of AI as 'technical assistance." Others worry that AI reduces the ability to think independently (Mittelstadt et al., 2016). There are also those who see the use of AI for academic writing as a grey area because not all lecturers provide clear guidelines. This underscores the need for more explicit institutional policies (UNESCO, 2021).

Tension Between Efficiency and Morality

Students acknowledge that AI provides convenience, but it raises moral dilemmas.

- Efficiency vs Academic Honesty
- Speed vs Reflection Quality,
- Ease vs Digital Responsibility.

Awareness of this moral dilemma is an early indicator that AI ethics education is beginning to shape moral sensitivity (Moor, 2006; Floridi, 2019).

Integrative Model of Research Findings

Based on the integration of quantitative and qualitative findings, the relationship between variables in this study can be formulated as follows: understanding AI ethics influences students' digital responsibility through the mediation of their perception of technological risks. Additionally, usage experience and reflective discussion serve as reinforcing factors in this process. This model shows that digital responsibility is not formed instantly but through a gradual process involving conceptual understanding, risk awareness, and experiential reflection.

Discussion

AI Ethics Education Enhances Moral Reasoning

Empirical findings, particularly the regression results showing a significant contribution of ethical-AI understanding to digital responsibility ($\beta = 0.47$), reinforce the literature that contextualised ethics education into real user experiences can change how students perceive the risks and consequences of technology (Cowls & Floridi, 2018; Vrielink & van den Hoven, 2021). These results also align with the view that digital ethics is not merely normative knowledge but a reflective ability to evaluate the social and epistemic implications of technology (Tsamados et al., 2022).

In this context, students not only demonstrate increased conceptual knowledge but also a change in their thinking. This is reflected in students' tendency to begin recognising algorithmic bias, question data neutrality, and be more cautious when using automated systems. These changes indicate the development of moral reasoning that is not only cognitive but also contextual and situational.

This finding reinforces the argument that AI ethics education acts as a catalyst in shaping students' critical awareness of technology. This aligns with the responsible AI approach, which emphasises the importance of integrating ethical values into the human interaction process with intelligent systems (Dignum, 2019). Therefore, AI ethics education not only enhances technological literacy but also develops a more mature moral framework.

Digital Responsibility is Shaped Through Exposure to Real Cases

Research shows that students' digital responsibility develops more strongly when they encounter contextual ethical scenarios, such as digital plagiarism, platform moderation, and data surveillance practices. In these situations, students tend to demonstrate more reflective responses and consider the long-term consequences of their actions.

This pattern aligns with the findings of O'Neil (2016) and Zuboff (2019), which emphasise the importance of understanding the structure of algorithmic power in shaping users' critical awareness of technology. When students realise that algorithms are not neutral and can reproduce biases and social inequalities, they become more cautious in using technology.

Furthermore, the role of risk perception as a mediating variable in this study indicates that awareness of technology's potential negative impacts is a key factor in shaping digital responsibility. Students with higher risk awareness tend to exhibit more ethical and reflective behaviour. This is consistent with the literature

emphasising that understanding algorithmic risks, privacy, and system transparency is an essential foundation in technology ethics (Mittelstadt et al., 2016).

However, this finding also indicates a gap between knowledge and practice. Although students understand the concept of AI ethics, not all are able to implement it consistently in their daily lives. This shows a difference between 'knowing' and 'acting' in digital ethics, as discussed by Bostrom and Yudkowsky (2014) and Moor (2006). Therefore, ethics education needs to be designed not only to enhance understanding but also to cultivate reflective habits in practice.

The Importance of Integrating Ethics-AI Curriculum at Universities

The findings of this study indicate that AI ethics education significantly contributes to students' moral maturity, enhances critical literacy, improves the ability to detect digital risks, and fosters reflective habits before using technology. This underscores that AI ethics cannot be positioned as supplementary content but rather as a core competency in higher education.

From a broader perspective, integrating ethics-AI into the curriculum aligns with the digital humanism approach, which emphasises placing human values at the centre of digital transformation (Teran, 2021). This approach asserts that technology should not only improve efficiency but also strengthen individuals' capacity for reflection and social responsibility.

Furthermore, this finding strengthens the argument that a solely digital literacy-based approach is insufficient to address the complexities of AI-based technology ecosystems. As demonstrated in the study by Holmes et al. (2022), effective AI education must systematically integrate ethical, critical, and reflective dimensions into the learning process.

Furthermore, the integration of ethics and AI contributes to the formation of digital citizenship, in which students are not only users of technology but also moral agents capable of understanding, evaluating, and critiquing the digital systems they use (Vrielink & van den Hoven, 2021). In this context, digital responsibility emerges as a key indicator of the success of ethics-AI education.

Overall, the findings of this study show a high usage–moderate ethics gap, a condition in which high levels of technology use are not accompanied by adequate ethical awareness. This indicates that the main challenge in education in the era of intelligent systems is not only the adoption of technology but also the need to build ethical awareness that keeps pace with technological developments. Without strengthening the ethical dimension, the use of AI could lead to more instrumental, less reflective practices in the long term.

Conclusion

This research shows that understanding AI ethics has a significant effect on students' digital responsibility ($\beta = 0.47$), with risk perception acting as a mediating variable. These findings indicate that the ethics dimension plays an important role in shaping responsible digital behaviour in the era of artificial intelligence-based technology. In addition, this research reveals a high usage–moderate ethics gap, in which high levels of AI usage are not accompanied by adequate ethical awareness. This indicates that students' use of technology still tends to be instrumental rather than fully reflective.

Overall, this research affirms that integrating ethics-AI education into college curricula is not just an add-on, but a crucial component in building the moral capacity of a generation living within a smart technology ecosystem. This effort is necessary to minimise the risks of technology misuse, raise awareness of systemic biases, and ensure that students are not only skilled technology users but also critical thinkers who can justify their digital choices.

Implication

Theoretical Implications

The findings of this research make several important contributions to the development of theory in the fields of technology ethics, digital literacy, and human-AI interaction studies.

First, this study emphasises that students' moral thinking in the era of intelligent systems cannot be explained solely through traditional digital literacy frameworks. Technical mastery alone is insufficient; students need the ability to interpret biases, uncertainties, and the power dynamics inherent in algorithmic systems. Therefore, this research broadens the theoretical understanding of moral-algorithmic reasoning, which is the ability to evaluate technological decisions from the perspectives of justice, accountability, and social impact.

Second, this research reinforces the argument that digital responsibility is situational and develops through experience rather than solely through normative understanding. This provides a foundation for a theoretical model that views digital responsibility as a moral development process, rather than a static competency.

Third, the integration of perspectives from Behaviour & Information Technology and Information, Communication & Society shows that the literature on AI ethics needs to move beyond the 'risk-benefit' framework toward an approach that views students as social actors negotiating with technology. This article positions students as moral subjects engaged in reciprocal relationships with AI, thereby enriching the theory of human algorithm interaction.

Fourth, this research provides a foundation for developing a new conceptual model of experiential ethics-AI education, emphasising the direct connection between the context of use, moral reflection, and the formation of digital responsibility. This model can serve as a reference for developing theory in the study of technology pedagogy in higher education.

This finding also provides an empirical basis for developing more adaptive education policies in response to AI-driven technological developments in higher education institutions.

Practical Implications

In addition to its theoretical contribution, this research offers several practical implications for educational institutions, educators, policymakers, and those developing AI-based technologies.

First, higher education institutions need to systematically integrate AI ethics education into the curriculum, not just as additional material. Strengthening moral and social aspects should go hand in hand with digital literacy instruction. Learning programs can be structured through case studies, self-reflection, simulations, and open dialogues that connect AI with students' academic and social lives.

Second, educators need to develop teaching methods that position students as active and critical users. Scenario-based approaches, such as AI-driven digital plagiarism detection, automated evaluation, or recommendation systems, have proven effective in fostering students' moral awareness.

Third, for campus policy managers, this research emphasises the importance of designing clear, transparent, and responsible AI usage guidelines. The policy should ideally include usage limits, academic ethics, student data security, and mechanisms for handling violations.

Fourth, educational technology developers can utilise these findings to design AI systems that are more sensitive to users' moral needs. Features such as explainable AI, bias alerts, and ethical usage guidelines can enhance students' understanding of the consequences of their decisions made in collaboration with the system.

Fifth, the results of this study support the importance of cross-disciplinary collaboration among computer scientists, educators, social scientists, and ethicists to create a safer, fairer, and more humane digital learning ecosystem.

Recommendations

Based on research findings, several recommendations can be proposed to develop AI ethics education in higher education settings.

First, higher education institutions need to integrate AI ethics into the core curriculum, not just as additional material. This integration can be achieved through the development of dedicated courses or by embedding ethical values into technology-based courses. This is important because research findings show that understanding AI ethics significantly contributes to shaping students' digital responsibility.

Second, the ethics-AI learning process needs to be designed around case-based learning that is contextualised to students' real experiences, such as digital plagiarism, algorithmic bias, and data privacy. This approach has proven to enhance students' reflective abilities and moral awareness in using technology.

Third, lecturers and educational institutions need to promote the strengthening of technology risk perception through critical discussions and structured reflection. Research findings indicate that risk perception serves as a mediating factor in shaping digital responsibility, and it should therefore be systematically developed within the learning process.

Fourth, higher education institutions need to develop clear, ethically oriented policies and guidelines for AI use to foster a responsible academic culture in the utilisation of technology.

Fifth, future research is recommended to develop a more comprehensive research design, such as a longitudinal approach or experiment, to examine long-term changes in students' ethical behaviour and to more thoroughly test the effectiveness of AI ethics education interventions.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in EPESS journal belongs to the authors.

* The author states that the entire research process has been conducted in accordance with the principles of scientific ethics. This research does not violate the rights of research subjects, and all participant involvement was voluntary, with data confidentiality maintained. Additionally, the author guarantees that this work is an original research result, free from plagiarism, has not been previously published, and is not currently under review by another journal. All sources used have been properly cited and listed in the bibliography. The author also declares that there has been no data manipulation or misleading reporting of results in this study.

Conflict of Interest

* The author declares no conflicts of interest in this study. All research processes were conducted for academic purposes, without any connection to financial, institutional, or personal interests that could influence the study's results or interpretation.

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