

Perceptions of Artificial Intelligence Ethics and Data Privacy Among Students and Parents

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Abstrak: Penelitian ini bertujuan untuk menganalisis persepsi etika kecerdasan buatan (AI) dan kekhawatiran terhadap privasi data di kalangan pelajar serta orang tua di Kota Yogyakarta. Dengan menggunakan pendekatan mixed-method, penelitian ini melibatkan survei terhadap 250 pelajar dan 200 orang tua, serta wawancara mendalam kepada 25 informan dan tiga Focus Group Discussion (FGD). Hasil penelitian menunjukkan bahwa 62% pelajar memiliki tingkat kekhawatiran sedang terhadap privasi data, sedangkan 78% orang tua menunjukkan tingkat kekhawatiran yang tinggi. Analisis regresi mengindikasikan bahwa tingkat literasi digital berpengaruh signifikan terhadap persepsi etika dan kekhawatiran privasi ($\beta = -0.35, p < 0.001$), di mana individu dengan literasi digital lebih tinggi memiliki pemahaman etika AI yang lebih baik dan kekhawatiran privasi yang lebih rendah. Temuan kualitatif memperkuat perlunya transparansi algoritma, mekanisme *consent* yang jelas, serta peningkatan kapasitas sekolah dalam pengelolaan dan perlindungan data pribadi. Penelitian ini merekomendasikan penyusunan kebijakan perlindungan data di tingkat sekolah, pengembangan program literasi AI bagi pelajar dan orang tua, serta penerapan *data processing agreement* yang wajib bagi penyedia layanan pendidikan digital (EdTech).

Kata kunci: Etika Artificial Intelligence , Literasi Digital dan Privasi Data

Abstract: This study aims to analyze perceptions of artificial intelligence (AI) ethics and concerns about data privacy among students and parents in Yogyakarta City. Using a mixed method approach, this study involved a survey of 250 students and 200 parents, as well as in depth interviews with 25 informants and three Focus Group Discussions (FGDs). The results show that 62% of students have a moderate level of concern about data privacy, while 78% of parents show a high level of concern. Regression analysis indicates that the level of digital literacy has a significant effect on ethical perceptions and privacy concerns ($\beta = -0.35, p < 0.001$), where individuals with higher digital literacy have a better understanding of AI ethics and lower privacy concerns. Qualitative findings reinforce the need for algorithm transparency, clear consent mechanisms, and increased school capacity in personal data management and protection. This study recommends the development of data protection policies at the school level, the development of AI literacy programs for students and parents, and the mandatory implementation of data processing agreements for digital education service providers (EdTech).

Keywords: Artificial Intelligence Ethics, Digital Literacy, and Data Privacy

INTRODUCTION

Over the past decade, Yogyakarta has emerged as one of Indonesia's most adaptive regions in adopting educational technology (EdTech). Schools, madrasahs, and various learning institutions have begun integrating platforms such as Google Classroom, Ruangguru, Quipper, Zenius, and local learning management systems (LMS) to support online and blended learning.¹ The COVID-19 pandemic further accelerated this shift, along with the use of artificial intelligence (AI) tools such as educational chatbots, automated assessments, and adaptive learning system.²

Despite the efficiency and personalization offered by AI in education, concerns related to ethics and data privacy are becoming increasingly urgent. Many EdTech platforms collect student data ranging from access logs, quiz scores, to interaction patterns to be processed by machine learning algorithms. Without proper oversight, this creates risks of privacy violations, algorithmic bias, and misuse of personal information.³

These concerns are particularly relevant in Indonesia after the enactment of Law No. 27 of 2022 on Personal Data Protection (PDP Law). The regulation requires data controllers, including educational institutions and EdTech providers, to ensure secure data processing, purpose clarity, and the protection of data-subject rights such as access, correction, and deletion. However, public understanding especially among students and parents regarding their rights and obligations under the PDP Law remains limited.⁴

Previous studies show that Indonesia's digital literacy level is still moderate.⁵ Students generally possess adequate technical abilities but lack awareness of digital

¹ Regulation of the Minister of Education, Culture, Research and Technology No. 53 of 2023 on Quality Assurance of Higher Education - LAMDIK

² A. Rahmawati, N. , & Prasetyo, 'Pemanfaatan AI Dalam Platform EdTech: Peluang Dan Tantangan Etis Di Sekolah Menengah', *Jurnal Teknologi Pendidikan Indonesia*, 2022, pp. 145–60.

³ J. Floridi, L., & Cows, 'A Unified Framework of Five Principles for AI in Society.', *Harvard Data Science Review*, 1.1 (2019), doi:<https://doi.org/10.1162/99608f92.8cd550d1>.

⁴ Ministry of Communication and Information Releases AI Circular for Developers - Gizmologi.id

⁵ [PRESS RELEASE] DISSECTING THE DIGITAL LITERACY GAP IN INDONESIA | DIFUSSION #88 - Center for Digital Society

ethics, cybersecurity, and data protection.⁶ Meanwhile, parents who play an important supervisory role often have minimal knowledge of how AI works or how educational platforms manage personal data⁷. This gap may lead to misunderstandings and defensive attitudes toward AI adoption in schools.

In Yogyakarta often referred to as a “digital student city” these issues warrant attention. With thousands of students and hundreds of schools already connected to digital learning systems, empirical studies examining AI ethics and data privacy perceptions among both students and parents remain scarce, even though both groups are key stakeholders in ensuring the ethical use of AI-based EdTech.

Although AI integration in Yogyakarta’s education sector continues to grow through platforms like Ruangguru, Google Classroom, and various analytics tools, research focusing on ethical and privacy implications remains limited. Prior studies tend to emphasize pedagogical effectiveness⁸, while topics such as algorithmic transparency, fairness, and student data security are rarely examined. Yet global literature⁹ stresses the need for fairness, accountability, and privacy protection in AI-supported education. Research involving both students and parents is also limited, even though both groups play complementary roles as users and supervisors of technology¹⁰.

In addition, the implementation of the PDP Law has not been followed by clear technical guidelines for the education sector, creating a gap between regulatory expectations and actual data-protection practices in schools¹¹. This study seeks to fill methodological gaps by using a mixed method approach to examine the relationship

⁶ Alif Alfi dan Devi Miftahul Jannah Takdir, ‘Digital Data Security Literacy in College Students: An Analysis of Awareness and Behavior in Facing Cyber Threats in the Digital Age’, *ITEJ*, 3.1 (2025), doi:<https://journal.diginus.id/ITEJ/article/view/715>.

⁷ L. Setiawan, D., & Hadi, ‘Tingkat Literasi Digital Orang Tua Terhadap Penggunaan EdTech Di Daerah Istimewa Yogyakarta’, *Jurnal Pendidikan Dan Teknologi Digital*, 5.1 (2023), pp. 22–33.

⁸ Rahmawati, N., & Prasetyo.

⁹ Floridi, L., & Cows.

¹⁰ Setiawan, D., & Hadi.

¹¹ Kemenkominfo. (2023a). *Indeks literasi digital Indonesia 2023*. Direktorat Jenderal Aplikasi Informatika, Kementerian Komunikasi dan Informatika Republik Indonesia.

between digital literacy, AI ethics perceptions, and privacy concerns among students and parents in Yogyakarta. In doing so, it addresses the lack of empirical work that combines ethics, privacy, and digital literacy within the context of AI based education in Indonesia.

RESEARCH METHOD

This study employs a mixed-method approach using an explanatory sequential model, combining quantitative and qualitative analyses. The complexity of AI ethics and data privacy requires not only numerical measurement but also a deeper understanding of social contexts, values, and personal experiences. The first phase involved a quantitative survey to map digital literacy levels, AI-ethics perceptions, and privacy concerns among students and parents. The findings were then enriched through in depth interviews and focus group discussions (FGDs).

The research design consists of two phases:

1. Quantitative phase: A cross sectional survey to describe perceptions of AI ethics, privacy concerns, and their relationship with digital literacy.
2. Qualitative phase: A phenomenological approach to explore students' and parents' subjective experiences with AI-based learning technologies and data protection practices in schools.

This design enables triangulation between numerical and narrative data, allowing a more comprehensive understanding of the phenomenon.¹²

The study was conducted in Yogyakarta, a national educational hub with high levels of digital technology adoption¹³. Participants consisted of:

1. Junior and senior high school students from five major districts (Gondokusuman, Umbulharjo, Tegalrejo, Mergangsan, and Jetis).
2. Parents from varied socioeconomic and educational backgrounds.

¹² V. L. Creswell, J. W., & Plano Clark, *Designing and Conducting Mixed Methods Research (3rd Ed.)* (Sage Publications, 2018).

¹³ Ministry of Communication and Information Releases AI Circular for Developers - Gizmologi.id

Students were selected using stratified random sampling to ensure proportional representation, while parents were chosen purposively based on their children's active use of AI based EdTech.

The quantitative sample comprised 250 students and 200 parents. Qualitative data consisted of 25 in depth interviews (15 students and 10 parents) and three FGDs involving teachers, school administrators, and parent committees.

Survey instruments measured:

1. AI ethics perceptions, adapted from Floridi & Cowls (2019), covering fairness, accountability, transparency, and security.
2. Privacy concerns, based on the IUIPC scale¹⁴.
3. Digital literacy, based on four dimensions from the Ministry of Communication and Information Technology (2023): digital skills, ethics, security, and culture.

Content validity was reviewed by three experts, and reliability was confirmed using Cronbach's alpha ($\alpha > 0.7$). Qualitative instruments included semi structured interview guides covering experiences with AI, platform privacy policies, and data-protection practices.

Quantitative data were collected through Google Forms distributed via schools and parent groups, while qualitative sessions (45–60 minutes each) were conducted in school-community settings. Quantitative analysis used descriptive statistics, Pearson correlations, and multiple linear regression to examine the influence of digital literacy on AI ethics perceptions and privacy concerns. Comparisons across demographic groups were tested using t-tests and ANOVA.

Result And Discussion

A total of 450 respondents participated, consisting of 250 students (55.6%) and 200 parents (44.4%) from five subdistricts in Yogyakarta. Among students, 52% were female and 48% male; among parents, 60% were mothers and 40% fathers. Most students

¹⁴ Sung S. Kim and James Agarwal Naresh K. Malhotra, 'Internet Users' Information Privacy Concerns (IUIPC): The Construct, the Scale, and a Causal Model', *INFORMS*, 15.4 (2004), pp. 336–55, doi:DOI 10.1287/isre1040.0032.

were aged 14–18, while 45% of parents held university degrees. Seventy eight percent of respondents use AI-based EdTech platforms such as Google Classroom, Quipper School AI, and Teachers Room AI, indicating strong AI penetration in Yogyakarta's education landscape.

Quantitative Findings

The average AI ethics perception score was 3.92 (high). Algorithmic fairness received the highest rating (mean = 4.12), followed by security and transparency (mean = 3.95). Accountability scored lower (mean = 3.68), suggesting that automated decision-making processes remain poorly understood.

Data-privacy concerns were relatively high (mean = 4.05). Respondents were most worried about unauthorized data collection (80%) and potential misuse by third parties (73%). However, only 42% reported understanding platform privacy policies, indicating a gap between usage and comprehension.

Digital literacy averaged 3.78. Digital skills (mean = 4.10) and culture (mean = 3.90) were strong, while digital ethics (mean = 3.55) and security (mean = 3.48) scored lower.

Correlation analysis showed that digital literacy positively correlated with AI-ethics perceptions ($r = 0.61$; $p < 0.01$) and negatively correlated with privacy concerns ($r = -0.47$; $p < 0.05$). Regression analysis confirmed digital literacy as a significant predictor of AI-ethics perceptions ($\beta = 0.58$; $p < 0.01$).

Qualitative Findings

Three key themes emerged:

1. Students appreciate AI for its convenience yet worry about over-reliance and reduced critical thinking.
2. Parents lack understanding of how EdTech platforms collect and use data, highlighting a literacy gap.
3. Both groups emphasize the need for ethical guidelines in schools, including algorithm transparency and data protection measures aligned with the PDP Law.

These findings echo Floridi & Cowls¹⁵, who stress fairness, accountability, and transparency in AI use. They also support the Technology Acceptance Model¹⁶, suggesting that perceived usefulness must be accompanied by ethical and legal awareness. Consistent with national digital-literacy reports, the study underscores that digital-safety awareness in Indonesia remains relatively low.

This research bridges gaps in earlier studies by simultaneously examining digital literacy, perceptions of AI ethics, and privacy concerns among two key educational actors students and parents. It contributes empirical insights to the digital ethics discourse and offers practical recommendations for schools in Yogyakarta to develop ethical guidelines consistent with personal data protection principles.

The findings of this study both align with and extend previous research on AI, digital literacy, and data privacy in education. Earlier Indonesian studies mainly focused on the pedagogical effectiveness of EdTech platforms¹⁷, while ethical issues and data privacy implications received limited attention. This study contributes by addressing these overlooked dimensions.

International literature, such as Floridi and Cowls¹⁸ and Crawford¹⁹, highlights the importance of fairness, accountability, transparency, and privacy in AI systems. The present study supports these concerns, showing that although students and parents in Yogyakarta view AI positively, their understanding of algorithmic accountability and data-privacy mechanisms remains limited.

¹⁵ Floridi, L., & Cowls.

¹⁶ F. D. Davis, 'Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology', *MIS Quarterly*, 1989, pp. 319–340.

¹⁷ E. Kusuma, D., & Wulandari, 'Transformasi Digital Dalam Pembelajaran Di Sekolah Menengah. Jurnal Teknologi Pendidikan Indonesia', *Jurnal Teknologi Pendidikan Indonesia*, 9.2 (2021), pp. 110–122; Rahmawati, N., & Prasetyo.

¹⁸ Floridi, L., & Cowls.

¹⁹ K Crawford, *Atlas of AI: Power; Politics; and the Planetary Costs of Artificial Intelligence* (Yale University Press., 2021).

Previous national findings indicate moderate digital literacy but weak digital ethics and cybersecurity awareness²⁰. This pattern is confirmed here, with both students and parents demonstrating adequate operational skills yet insufficient knowledge of privacy protection. The study also reinforces Setiawan and Hadi's ²¹ conclusion that parents tend to have a lower level of technical understanding despite higher levels of concern.

Overall, the findings show that perceptions of AI ethics and privacy concerns in Yogyakarta are strongly shaped by digital literacy levels. While students and parents generally view AI positively, both groups express significant worries about data security. Students tend to be more accepting yet less critical, whereas parents are more cautious but technically less informed creating an intergenerational gap that schools must address. Strengthening ethics-based digital literacy, ensuring transparency, and improving consent procedures are essential steps toward a safe and responsible AI driven education ecosystem.

CONCLUSION

This study concludes that the integration of artificial intelligence (AI)-based educational technologies in Yogyakarta's education sector has reached a high level of adoption and acceptance among students and parents. AI-driven EdTech platforms are generally perceived as beneficial in supporting learning efficiency, accessibility, and personalization. However, these positive perceptions are accompanied by substantial ethical and data-privacy concerns, particularly regarding unauthorized data collection, third-party data misuse, and the lack of algorithmic accountability. The results show that 62% of students have a moderate level of concern about data privacy, while 78% of parents show a high level of concern. Regression analysis indicates that the level of digital literacy has a significant effect on ethical perceptions and privacy concerns ($\beta = -0.35$, $p <$

²⁰ [PRESS RELEASE] DISSECTING THE DIGITAL LITERACY GAP IN INDONESIA | DIFUSSION #88 - Center for Digital Society

²¹ Setiawan, D., & Hadi.

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