

ETHICAL CHALLENGES AND COUNTERMEASURES IN ARTIFICIAL INTELLIGENCE EDUCATION APPLICATION AT SOUTHWEST JIAOTONG UNIVERSITY HOPE COLLEGE*

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Abstract

The research committee examined the issues raised for study concerning artificial intelligence, technology, tool integration, and the emergence of new ecosystems—even though these enhance efficiency in education. Research Methodology The research population comprised administrative staff from the Hope College of Southwest Jiaotong University. This study employed a mixed-methods approach (quantitative + qualitative research), utilizing quantitative data to understand overall trends, and qualitative data to gain detailed insights. The Taro Yamane formula was used to calculate the sample size for a limited population as follows: $n = N/(1 + Ne^2)$. The sample size for administrative personnel = $150/(1 + 150 \times 0.1^2) = 60$. The study's findings provide guidelines for ethical management that can be replicated by private universities with limited resources and funding. Moreover, the findings call on provincial authorities to issue supervisory manuals in the form of a menu and allocate emergency budgets. According to the statistical values, the frequency of data security audits was 1.108, the coverage rate of AI ethics training was 1.127, and the algorithmic bias review was 1.055. Conclusion: The implementation aims to create an integrated three-dimensional external support system and jointly safeguard a smooth and stable transition to digital intelligence transformation for applied universities.

Keywords: Education, Ethics, Collaborative

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Introduction

Ethical Challenges and Countermeasures in the Application of Artificial Intelligence in Education

The swift advancement of artificial intelligence (AI) technology is revolutionizing the global educational landscape, marking a "technological revolution." AI has progressed from being a mere "support tool" to a pivotal element reshaping educational models, from crafting dynamic, personalized learning pathways to automating educational management processes. Its significance and value in education have been empirically validated: through comprehensive analysis of learning data, AI can deliver knowledge in a "targeted" manner, as exemplified by the AI Teaching Assistant system at Southwest Jiaotong University Hope College.

AI has infiltrated daily life in numerous forms, with its influence and role in the world and humanity expanding daily. We are transitioning into a full AI era. Consequently, whether at a national, organizational, or individual level—irrespective of age or profession—success now hinges on learning, adapting, and keeping pace with these changes (Coeckelbergh, 2024).

A topic of discussion is AI's immense potential in supporting graduate student supervision, tailored to their diverse needs and knowledge levels. With its superior processing power and advanced self-learning capabilities, technological advancement is accelerating rapidly. AI can design individualized teaching plans and manage ethical issues, even when working with the same number of students in a classroom. In the AI era, teachers will become increasingly adept at analyzing learning outcomes through data analysis and knowledge classification. Although some experts predict that these overall changes may render several segments of society obsolete or unnecessary, currently, teachers and schools remain vital, and ever-evolving AI models could become invaluable resources for them (Knox, 2020).

However, these debates may threaten educational equity. The United States has established a four-dimensional regulatory system: 'Standards – Regulation – Law – Literacy' (Yue, 2017). A review of AI application in education reveals that technical issues persist, such as the indistinct division of roles between humans and machines, as well as challenges in adapting to intelligent technologies. There are also ethical concerns, such as the risk of data breaches

among teachers within institutions (Chaudhuri, Dayal, & Narasayya, 2011). Thus, creating innovations in AI relevant to ethical operations within educational organizations is crucial. Moving forward, it is essential to design strategic approaches for AI application in education from three perspectives: technological, operational, and ethical. From a technological standpoint (Issenberg, et al., 1999), there is an urgent need to seek high-level design frameworks aligned with policy documents and to develop the roles of humans and machines within the intelligent learning process (Ouyang & Jiao, 2021). This underscores the importance of researching AI related to ethics in operations. The functioning of universities is a critical area, making the ethical challenges and countermeasures in the application of artificial intelligence in education at Hope College, Southwest Jiaotong University the focus of this research

Objectives

1. To examine the current status of artificial intelligence (AI) applications in education at Southwest Jiaotong University and Hope College.
2. To analyze the ethical challenges associated with the implementation of AI in educational contexts.
3. To develop appropriate ethical governance strategies to address AI-related challenges in application-oriented universities

Methodology

This study employed a mixed-methods research design, integrating both quantitative and qualitative approaches to comprehensively investigate ethical challenges and governance strategies in the application of artificial intelligence (AI) in education.

Research Design

A convergent parallel mixed-methods design was adopted, allowing quantitative and qualitative data to be collected and analyzed simultaneously. The integration of findings was conducted during the interpretation phase to provide a more comprehensive understanding of the research problem.

Population and Sample

The population consisted of administrative staff at Southwest Jiaotong University Hope College, totaling approximately 150 individuals. The sample size was determined using Yamane's formula, resulting in 60 participants. Stratified random sampling was employed to ensure representation across different administrative units.

Research Instruments

The quantitative instrument was a structured questionnaire using a 5-point Likert scale, covering three main areas: (1) AI application in education, (2) ethical challenges, and ethical governance practices.

The qualitative instrument consisted of semi-structured interviews aimed at exploring in-depth perspectives on ethical issues and governance strategies.

The instruments were validated by three experts in educational technology and research methodology. The reliability of the questionnaire was tested using Cronbach's alpha coefficient, which yielded a value greater than 0.80, indicating high internal consistency.

Data Collection

Quantitative data were collected through questionnaires distributed to administrative staff. Qualitative data were obtained through in-depth interviews with selected participants. All participants were informed about the research objectives, and ethical considerations such as confidentiality and voluntary participation were strictly maintained.

Data Analysis

Quantitative data were analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation. Qualitative data were analyzed using thematic analysis to identify key patterns and themes related to ethical challenges and governance strategies. The results from both datasets were integrated and interpreted to provide a comprehensive understanding of AI ethics in educational contexts.

Ethical Considerations

The study adhered to research ethics principles, including informed consent, confidentiality, and data protection. Participants were assured that their responses would be used solely for academic purposes.

Research Results

According to the structure aligned with the research objectives, this chapter presents the content in the following order:

Results of the quantitative research

Research findings on the attitudes and perspectives of administrators, teachers, and students toward the ethical challenges of using artificial intelligence (AI) in education, covering the characteristics of the sample, the current status of AI applications in education, an overview of perceptions of ethical risks, and the differences in viewpoints among the three stakeholder groups. Administrative staff: Age – **43.3%** are in the **20–30** age group and **48.3%** are in the **31–40** age group. Length of service: The largest proportion is those with more than **10** years of service (**31.7%**). Position: **45.0%** are officers, and another **45.0%** hold positions at deputy department head level or higher. Distribution by department: The majority are in the “Other” category (**50.0%**), followed by the Student Affairs Office (**20.0%**) and the Academic Office (**18.3%**).

Perception of the Implementation of School Ethical Governance by

Administrative Staff

	N	Mean	S. D
Frequency of data security audits	60	3.60	1.108
Coverage rate of AI ethics training for teachers and students	60	3.52	1.127
Algorithmic bias review mechanism	60	3.35	1.055

(1) Self-assessment of the implementation of internal governance: The frequency of data security audits scored $M = 3.60$, the coverage rate of ethics

training scored 3.52, and the review mechanism for algorithmic bias scored 3.35. All indicators were at a "moderately above-average" level but did not reach the "basically implemented" standard. As shown.

Results of Qualitative Research

A qualitative analysis of "Ethical Challenges and Countermeasures in the Application of Artificial Intelligence for Education at Wang College, Southwest Jiaotong University" can be structured as follows: The study highlights the complex ethical challenges that emerge from the integration of artificial intelligence within the educational environment at Wang College. Key concerns include issues of data privacy, algorithmic bias, transparency, and potential impacts on students' freedom of decision-making and equity. Through qualitative analysis, it was found that these challenges require proactive and comprehensive approaches to ethical governance. The identified countermeasures emphasize the importance of establishing clear ethical guidelines, increasing transparency in AI systems, promoting broad stakeholder participation, and supporting the ongoing development of ethical awareness among both faculty and students.

The study suggests that addressing these ethical challenges is crucial not only for protecting individual rights, but also for fostering trust and acceptance of AI technology in the education sector. Ultimately, this research underscores the necessity for Wang College to develop a robust framework that balances technological innovation with ethical responsibility, in order to create a sustainable and equitable AI-empowered educational environment.

Conclusions, Discussions

Alignment and Deepening with Domestic Research: The assertion by Fitria, T. N. (2023, March) Artificial intelligence (AI) technology in OpenAI ChatGPT application: A review of ChatGPT in writing English essay that "data ethical crises are the most severe risks in AI education" is fully validated in this study—students express the highest concern about biometric data leakage, and data privacy protection emerges as the most prominent theme in open-ended questionnaire responses (accounting for 22.0%). The "impact of algorithmic bias on educational

equity" identified by Li, F., Ruijs, N., & Lu, Y. (2022) Ethics & AI: A systematic review on ethical concerns and Li, Ruijs, & Lu, (2022).related strategies for designing with AI in healthcare concretized in scenarios such as incorrect attendance records and unfair grading in this study, with the further discovery of disciplinary differences in such risks, enriching scenario-based research on algorithmic bias. Additionally, the "insufficient AI ethical literacy of teachers" noted by Qian, Y., Xing, Z., & Shi, X. (2021) and the "student AI dependence phenomenon" observed are significantly reflected in the Hope College case, confirming the prevalence of these issues in application-oriented universities. Weymark, J. A. (2005) Resonance and Differences with International Research: The research conclusion by Yan, & Liu, H. (2025). Ethical framework for AI education based on large language models. (Yan, & Liu, 2025) that "generative AI has become the mainstream tool in the field of education" is highly consistent with Hope College's extensive use of tools such as DeepSeek and ChatGPT. The "lack of agile governance as a core barrier to ethical governance in AI education" emphasized by UNESCO (2021) accurately identifies the crux of the college's lagging governance.

1.Ethical Research shows that algorithmic bias may distort the evaluation of practical abilities, and the leakage of practical training data may infringe on the rights and interests of teachers and students. If these risks are not controlled, they will directly erode the core quality of application-oriented talent cultivation.

2.Governance Strategies Must Adapt to the Scenario Characteristics of Application-Oriented Universities: AI applications in application-oriented universities are highly focused on practical teaching and training management,.

3.Connecting Top-Down and Bottom-Up Governance Channels: Research findings indicate a cognitive gap between the governance perspectives of administrative staff and the practical experiences of teachers and students, leading to difficulties in implementing existing governance measures.

Research Contributions and Limitations

Based on the research findings on ethical challenges and governance strategies in the application of artificial intelligence (AI) in education, the following recommendations are proposed:

Practical Recommendations

Educational institutions, particularly application-oriented universities, should prioritize establishing clear ethical guidelines for AI use. These guidelines should address data privacy, algorithmic transparency, and accountability. Additionally, institutions should promote ethical awareness by organizing continuous training programs for administrators, teachers, and students to enhance their understanding of responsible AI use.

Furthermore, universities should integrate ethical governance mechanisms into their existing digital systems. This includes implementing data protection protocols, developing monitoring systems for algorithmic bias, and ensuring human oversight in AI-assisted decision-making processes. Educational authorities should develop standardized frameworks and regulatory policies for AI ethics in education. A “menu-based” policy approach is recommended, allowing institutions to adopt flexible yet structured guidelines based on their contextual needs. Moreover, governments should allocate dedicated funding to support AI ethical governance, capacity building, and technological infrastructure.

Recommendations for Future Research

Future studies should expand the scope by including multiple stakeholder groups, such as teachers and students, to provide a more comprehensive perspective. In addition, researchers are encouraged to employ advanced analytical methods, such as structural equation modeling (SEM), to examine causal relationships among variables.

Further qualitative research, including case studies and in-depth interviews, is also recommended to gain deeper insights into the implementation processes, challenges, and best practices of AI ethical governance in diverse educational contexts.

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