Ethical Dilemmas and Educational Strategies of Academic Integrity among University Students in the Perspective of Artificial Intelligence

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Abstract. The deep integration of artificial intelligence and higher education, while bringing technological convenience to university students, has also introduced a series of digital ethical dilemmas, such as cognitive narrowing, weakened learning autonomy, and the erosion of academic integrity. The causes of these issues can be attributed to the tension between efficiency-oriented evaluation systems in universities and technological productivity, the lag of legal and policy frameworks behind the pace of technological development, the conflict between industrial instrumental rationality and the educational mission of cultivating individuals, as well as the absence of tripartite collaborative governance. Accordingly, this study proposes a three-dimensional synergistic pathway of "subjectivity reconstruction—policy resource transformation—internalization of technological practice": universities should strengthen curriculum system construction, enhance faculty development and student self-governance; promote the conversion of policy resources into teaching resources; and deepen university–industry cooperation to cultivate responsible digital citizens through ethical training and case-based instruction. The aim is to provide systematic references for university students, higher education institutions, and education practitioners, and to facilitate the development of responsible digital citizens who possess both technical competence and ethical awareness in the era of artificial intelligence.

Keywords: University students, Academic integrity, Digital ethical literacy, Triple Helix Theory.

1. Introduction

In recent years, intelligent technologies represented by generative artificial intelligence have been reshaping the teaching models, learning ecology, and governance paradigms of higher education with unprecedented breadth and depth [1–5]. This wave of educational digital transformation driven by artificial intelligence has far surpassed the boundaries of pure technology and is profoundly penetrating the intrinsic values of education, the subject–object relationships between teachers and students, and the deep structural transformation of learners' cognitive frameworks. From personalized pathway planning in intelligent learning companion systems to AI-assisted academic writing and creative stimulation enabled by generative models, artificial intelligence has rapidly permeated daily learning, research exploration, and social interaction on university campuses, becoming an indispensable digital learning companion for university students [12].

Just as every revolutionary technology is accompanied by an intense interplay of opportunities and challenges, the rapid popularization of artificial intelligence in higher education has also triggered extensive reflection within academia and society at large regarding students' use of AI technologies [6–10]. On the one hand, some scholars argue that artificial intelligence serves as a powerful engine for empowering personalized learning and realizing instruction tailored to individual aptitudes. It can liberate students from tedious and repetitive tasks of information collection and organization, provide personalized learning pathways and immediate feedback, and enable learners to concentrate their valuable cognitive resources on higher-order analytical and creative activities [12]. On the other hand, other researchers caution that artificial intelligence may exert negative influences on education and that its potential risks should be treated with prudence. When seeking instant answers from AI becomes habitual, or when machines substitute for processes of independent thinking and ethical judgment that students ought to experience personally, the willingness and capacity for independent

reflection, in-depth analysis, and critical evaluation may gradually be weakened. Therefore, in the process of deep integration between artificial intelligence and education, systematically examining and effectively enhancing university students' digital ethical literacy has become a major issue with both theoretical urgency and practical necessity [13-14].

However, the risks to academic integrity faced by university students are increasing day by day, and incidents of academic misconduct occur with growing frequency, making it difficult to effectively respond to the ethical challenges brought by the wave of artificial intelligence [11]. A systematic exploration of pathways for improvement therefore possesses pressing practical significance. In light of this, by adopting the perspective of the Triple Helix Theory, this study systematically reviews relevant literature and policy documents, conducts an in-depth analysis of the practical dilemmas and underlying causes of academic integrity issues among university students, and subsequently constructs a pathway for enhancing students' ethical literacy in academic integrity. The purpose is to provide targeted recommendations for university students, higher education institutions, and educational practitioners, and to guide students to grow into responsible digital citizens who possess technical competence, critical awareness, and ethical consciousness amid the surge of artificial intelligence.

2. Definition of Core Concepts

2.1. The Connotation of Artificial Intelligence

The concept of artificial intelligence was first proposed in 1956 by scientist John McCarthy at the Dartmouth Conference, who defined artificial intelligence as a technological system that enables machines to simulate human learning and thinking processes so as to replicate intelligent behavior. In his book Artificial Intelligence, Professor Patrick Henry Winston defined artificial intelligence as the exploration of the intrinsic laws of human intelligence and, on this basis, the construction of artificial systems with human-like intelligent characteristics capable of performing tasks that traditionally rely on human intelligence. In 2018, the China Electronics Standardization Institute released the Artificial Intelligence Standardization White Paper, which defined artificial intelligence as "the theories, methods, technologies, and application systems that utilize digital computers or machines controlled by digital computers to simulate, extend, and expand human intelligence, perceive the environment, acquire knowledge, and use knowledge to obtain optimal results." From the perspective of human–computer interaction, Jia Jiyou proposed that artificial intelligence is a technical means of simulating natural intelligence through machines. Synthesizing the understandings and definitions of artificial intelligence by scholars both domestically and internationally, this study holds that artificial intelligence essentially endows machines with "intelligence," enabling them to accomplish tasks that would otherwise require human intellect.

2.2. The Connotation of Digital Ethical Literacy

Based on a careful review of existing studies and literature, current academic discourse primarily defines the connotation of digital ethics in the context of the convergence of education and artificial intelligence from two perspectives: one conceptualizes digital ethics as a set of moral principles that explain its essential nature, while the other defines it as behavioral norms with a focus on practical operations.

1. Digital Ethics as Moral Principles

Digital ethics refers to a series of moral principles that individuals ought to follow in the processes of collecting, analyzing, managing, and utilizing data and resources through artificial intelligence and digital tools. Its core lies in the moral standards and guidelines that social members should adhere to when employing AI tools within the context of artificial intelligence, constituting a composite concept arising from the integration of digitalization and ethics. Digital ethics is also incorporated into the domain of applied ethics, concentrating on moral and ethical issues emerging in the development of artificial intelligence and digital technologies, and paying attention to the relationships among

individuals as well as between humans and technology in social life. On this basis, Christian Fuchs further pointed out that digital ethics belongs to an interdisciplinary philosophical research field intersecting ethics, communication studies, and computer science, primarily focusing on the social problems and challenges triggered by digitalization across various domains and exploring the moral principles that humanity should follow in addressing such issues.

2. Digital Ethics as Behavioral Norms

Digital ethics refers to the behavioral norms that individuals are required to observe in the processes of developing, using, and managing artificial intelligence and digital technologies. As a comprehensive and cross-cultural system of action norms, digital ethics mainly guides the development and application of AI and digital technologies through widely recognized moral standards within industries, thereby responding to ethical challenges emerging in the process of digitalization. The maintenance of digital ethics largely depends on the joint operation of non-coercive and flexible mechanisms such as individual behavioral habits, value orientations, and social–cultural atmospheres. It is not merely a tool for regulating conduct but also embodies profound reflection on the possibilities of a better human life, aiming to guide society to approach the impacts of artificial intelligence and digital technologies on human society, the natural environment, and ecosystems with a responsible and prudent attitude, ultimately promoting sustainable social development and progress.

For university students, digital ethics not only encompasses general principles such as data privacy and algorithmic fairness but is also directly linked to integrity norms in academic activities, including maintaining academic independence in the use of artificial intelligence, ensuring transparent citation, and resisting plagiarism and data manipulation.

2.3. Core Elements of Digital Ethical Literacy

The delineation of the core elements of digital ethical literacy in academia is primarily achieved through conceptual research and the interpretation of policy documents. On the one hand, some scholars, when defining digital ethical literacy, classify it into three progressive levels—individual, organizational, and societal—based on its structural composition. From the perspective of "literacy theory," they further point out that digital ethical literacy encompasses three key dimensions: awareness and a sense of responsibility regarding digital ethics, compliance with digital ethical norms, and the capacity for ethical reflection and decision-making in digital contexts. Starting from the fundamental dimension of ethical consequences, Sun Weiping and colleagues, through comprehensive research and cautious evaluation, emphasized the construction of an overall ethical system centered on humanism, implementing the principles of human-centeredness, justice, openness and transparency, informed consent, and responsibility, and incorporating both fairness and accountability as essential components. On the other hand, scholars have also defined the elements of digital ethics through policy texts. Becker, S. and others employed bibliometric methods and, through systematic reviews of European policy documents related to digital ethics, derived "five core principles," thereby constructing a cluster of digital ethical principles. In March 2023, China issued the Guidelines for the Standardization of Artificial Intelligence Ethical Governance, which explicitly proposed ten highly actionable AI ethical principles, including human-centeredness, sustainability, cooperation, privacy, fairness, sharing, external security, internal security, transparency, and accountability.

Based on existing research and in combination with the characteristics of artificial intelligence and the specific needs of university students, this study proposes that the core elements of university students' digital ethical literacy include ethical cognition and awareness, compliance with norms and practical competence, critical thinking and decision-making ability, a just and inclusive technological outlook, as well as a sense of responsibility and a global perspective. The core elements of university students' digital ethical literacy from the perspective of artificial intelligence are presented in Table 1.

Table 1. Core Elements of University Students' Digital Ethical Literacy from the Perspective of Artificial Intelligence

Element Category	Description of Core Connotation
Ethical Cognition and Awareness	Recognize that artificial intelligence is not merely a technical tool but also a form of social practice rooted in value judgment; establish a human-centered ethical perspective and remain vigilant toward the potential alienation of human subjectivity and dignity caused by technology.
Norm Compliance and Practical Competence	Be well acquainted with laws, regulations, and ethical guidelines related to artificial intelligence and data security; uphold academic integrity in research and learning, clearly indicate AI-assisted content, and strictly prohibit ghostwriting, plagiarism, data fabrication, and other forms of misconduct.
Critical Thinking and Decision-Making Ability	Be capable of recognizing algorithmic bias, discrimination, and opacity; when confronted with ethical dilemmas, conduct rational analysis and judgment based on ethical principles and make responsible decisions.
A Just and Inclusive Technological Outlook	Pay attention to issues such as the digital divide and inequality of technological access; advocate the inclusiveness and universal accessibility of technological development; promote the use of technology to advance social justice and sustainable development.
Responsibility and a Global Perspective	Clearly acknowledge one's ethical responsibilities as a user, developer, or disseminator of technology; possess the awareness and capability to participate in global dialogues and governance concerning technological ethics, and understand and respond to international ethical initiatives and norms.

With the widespread application of generative artificial intelligence in higher education, university students have become direct users and deeply engaged participants in such technologies. Various stages of their academic practices—such as information retrieval, paper writing, and data analysis—may involve AI assistance or even substitution. As incidents of academic misconduct occur with increasing frequency, issues of academic integrity have become ever more prominent, seriously undermining academic authenticity and educational equity. On this basis, this study focuses on the student population, with particular attention to the ethical dilemmas of academic integrity faced by university students in the era of artificial intelligence. Guided by the Triple Helix Theory, it further explores the fundamental causes of ethical issues related to academic integrity among university students as well as corresponding pathways for breakthrough and improvement.

3. The Realistic Ethical Dilemmas of Academic Integrity among University Students

Amid the wave of deep integration between artificial intelligence and higher education, university students encounter a series of ethical dilemmas related to academic integrity in the course of using AI technologies. These dilemmas involve the narrowing of cognitive structures, the weakening of learning autonomy, and the absence of sound academic integrity evaluation systems. Collectively, these challenges reflect the profound tension between the instrumental rationality of technological tools and the educational logic of cultivating individuals, while also underscoring the urgency of exploring breakthrough pathways. Such exploration holds significant theoretical value and practical necessity for fostering responsible digital citizens who possess technological competence, ethical consciousness, and critical spirit.

3.1. Algorithmic Recommendation Narrowing Students' Cognition

Relying on algorithmic analysis of students' past learning data and preferences, artificial intelligence is capable of pushing customized learning content and resources to learners. Intelligent tools such as "AI learning companions" developed by some universities can support multimodal learning pathway planning and adaptive learning recommendations, automatically identify students' knowledge weaknesses, and deliver tailored learning resources, thereby greatly improving learning efficiency. However, such systems depend on fixed algorithmic mechanisms for content delivery, confining students within limited and homogeneous knowledge domains and generating an "information cocoon" effect. A study based on digital communities of Generation Z university students found that differences in platform algorithmic architectures significantly influence the intensity of information homogenization. When students remain in such homogeneous knowledge environments for extended periods, they find it difficult to access diverse viewpoints and interdisciplinary knowledge, and the breadth and depth of their cognitive structures may be constrained. The development of critical thinking and comprehensive literacy thus faces potential risks. More seriously, when confronted with complex academic tasks, students may become more inclined to rely on algorithmically recommended ready-made content or outputs generated by AI tools rather than engaging in independent reflection. This tendency can blur the boundary between originality and imitation and may even lead students to regard algorithm-generated content directly as their own achievements, thereby unintentionally or deliberately violating academic integrity norms. In an invisible manner, this weakens the comprehensiveness and systematic nature that education ought to embody, posing substantive challenges to the goal of holistic student development and diminishing the possibility of individuals' all-round growth.

3.2. Technological Dependence Weakening Students' Autonomy

With the widespread application of artificial intelligence tools represented by ChatGPT in learning environments, some students have gradually become accustomed to relying on AI tools to complete learning tasks. An empirical study analyzing authentic dialogue records between students and ChatGPT found that students frequently used AI for writing assistance and as a concrete task-oriented tool, with multiple instances in which students directly requested AI to ghostwrite course reflections. Although the convenience of AI tools may improve task completion efficiency in the short term, it may invisibly intensify students' dependence on such tools, and their willingness and ability to engage in active inquiry, deep thinking, and independent problem-solving may gradually deteriorate. The learning process shifts from human-centered knowledge construction to technology-mediated task delivery, making students prone to cognitive inertia characterized by passive information reception. As a result, innovative consciousness, reflective capacity, and practical spirit cannot be effectively cultivated. In academic practice, the lack of independent thinking ability further increases the tendency to rely on artificial intelligence, thereby giving rise to issues of academic integrity. The purpose of education is not only the transmission of knowledge but also the cultivation of thinking and practical capabilities. Excessive dependence on technological tools may cause human subjectivity in the learning process to yield to digital technologies, ultimately leading students to lose their autonomy in learning.

3.3. Deficiencies in the Academic Integrity Evaluation System

At present, most universities have not incorporated digital ethics courses centered on academic integrity into compulsory curricula, nor have they established effective mechanisms that integrate academic integrity with student evaluation. In student assessment, greater emphasis is typically placed on quantifiable indicators such as knowledge mastery and academic output, with evaluation methods predominantly consisting of written examinations, course papers, or laboratory reports. Comparatively little attention is paid to difficult-to-quantify dimensions such as digital ethical literacy represented by academic integrity. Such evaluation approaches are ill-suited to addressing the complex and evolving problems of academic misconduct.

Due to the absence of a systematic academic integrity evaluation framework, students often face the dilemma of lacking clear ethical standards to guide their behavior when completing routine assignments or conducting academic research. Academic integrity norms require not only cognitive awareness of ethical standards but also the practical ability to make ethical judgments and responsible decisions in specific contexts. These abilities are often dynamic, situational, and even ambiguous in nature, making them difficult to comprehensively measure through paper-based tests alone. Nevertheless, scenario simulations based on real cases or process-oriented evaluations that integrate analyses of students' digital behaviors remain uncommon. As a consequence, students' ethical literacy often remains at the level of cognition and is seldom tested or verified through practical application.

In addition, the evaluation of digital ethics represented by academic integrity should not be confined to unilateral judgments by teachers alone; it should also accommodate students' self-reflection, peer evaluation, and even feedback from technological systems and social public opinion. At present, the subjects of evaluation in universities are still largely limited to teachers, making it difficult to fully mobilize students' initiative in ethical cultivation. Such singularity of evaluative subjects not only affects the comprehensiveness and objectivity of assessment but also invisibly weakens students' sense of subjectivity and responsibility in the practice of digital ethics.

4. Causes of the Ethical Dilemmas of Academic Integrity among University Students

The academic integrity dilemmas faced by university students do not exist in isolation; rather, they are the result of systemic influences arising from the interaction and mutual reinforcement of multiple factors. These causes stem not only from the tension between efficiency-oriented evaluation systems in higher education and the productive capacity of artificial intelligence technologies, but are also closely related to the lag of external legal and policy frameworks as well as the contradictions between industrial technological logics and the educational mission of cultivating individuals. Moreover, they resonate deeply with the absence of collaborative governance mechanisms among universities, industry, and government.

4.1. The Contradiction between Efficiency-Oriented Evaluation Systems and the Productive Capacity of Artificial Intelligence Technologies

In the face of the rapid advancement of artificial intelligence technologies, a significant disconnect has emerged between higher education evaluation mechanisms and students' actual technological application capabilities. On the one hand, traditional quantitative evaluation indicators—centered on paper quality, laboratory reports, or examination scores—struggle to distinguish between outcomes independently produced by students and those assisted or even completed by artificial intelligence. On the other hand, the continuous iteration of AI tools has steadily strengthened their capabilities in information integration, logical construction, and even creative generation, substantially lowering the threshold for producing high-quality content. Yet evaluation systems remain largely confined to formal assessments of final outputs, lacking attention to deeper competencies such as learning processes, cognitive development, and ethical practice.

This contradiction between evaluation systems and technological productivity may not only lead to the proliferation of AI-generated content and foster academic misconduct, but may also push educational objectives toward efficiency-first orientations while neglecting qualities—such as critical thinking and innovative exploration—that require long-term investment and are difficult to quantify, thereby marginalizing them in students' allocation of learning resources and time. Such tendencies not only encourage behaviors such as plagiarism and appropriation, but also fundamentally suppress the development of independent thinking and creativity, seriously hindering students' intellectual autonomy and innovative capacity, and ultimately triggering issues of academic integrity and normative compliance.

4.2. The Contradiction between the Lag of Legal Applicability and the Widespread Use of Technology

The formulation and promulgation of traditional laws and public policies typically follow a rigorous, cautious, yet lengthy process. In contrast, artificial intelligence technologies represented by large language models evolve and expand their application boundaries at a pace that nearly follows Moore's Law, with new models, applications, and even risks emerging on a monthly or weekly basis. The disparity between the slow pace of legal development and the rapid advancement of technological applications has resulted in significant regulatory vacuums and dilemmas. Although the international community has attempted to respond through ethical guidelines and soft-law approaches, these efforts often fall into predicaments characterized by insufficient binding force and weak enforcement.

This lag in legal norms and the absence of relevant usage guidelines frequently place students in a blind state of "what is not prohibited is permissible" when using AI tools, leaving them unclear about which behaviors constitute legitimate assistance and which have entered the gray zones of academic misconduct. For instance, the ethical boundary between using AI for ideation support and directly generating an entire paper remains undefined, with no clear guidance currently available. Such normative vacuums not only deprive students of explicit ethical standards in technological use, but also become a significant breeding ground for academic misconduct, data misuse, and related problems.

4.3. The Contradiction between the Instrumental Rationality of Industrial Technology and the Benevolent Educational Mission

The industrial logic driving technological development is fundamentally oriented around instrumental rationality and capital logic, which stands in structural conflict with the fundamental educational mission of cultivating individuals toward the good. This conflict is not merely abstract; rather, it directly permeates university teaching and management through the design, deployment, and allocation of responsibilities in technological products, continuously generating and intensifying ethical dilemmas related to academic integrity.

In the educational process, learning is essentially a cognitive construction activity that requires deep thinking, trial and error, and reflection. However, the design of AI tools often tends to eliminate such cognitive friction by simplifying complex thinking processes into the instant output of answers. This "nanny-style" mode of knowledge provision, while seemingly improving learning efficiency on the surface, in fact deprives students of opportunities for growth through confusion, exploration, and breakthrough in the thinking process, inducing cognitive inertia and superficial thinking. It easily gives rise to academic integrity violations; over time, students' subjectivity in learning is gradually eroded, learning regresses from active construction to passive reception, and the critical thinking, innovative spirit, and ethical judgment advocated by education are imperceptibly undermined.

4.4. The Lack of Effective Dialogue and Collaborative Mechanisms among Universities, Industry, and Government

The Triple Helix theory emphasizes that universities, industry, and government should form an ideal pattern of interactive penetration and co-evolution. Universities adhere to an educational logic, focusing on the impact of technological development on educational attributes and the cultivation of students as subjects; industry concentrates on commercial value and economic returns, pursuing technological iteration and market efficiency; government prioritizes balancing technological development with risk prevention to promote harmonious human-technology development. However, in practice, although all three coexist within the same digital ecosystem, the absence of institutionalized platforms for cooperation, consultation, and governance mechanisms has created divisions in value recognition regarding digital ethics, the delineation of responsibility boundaries, and frameworks of risk perception. Collaboration thus appears fragmented, unified ethical standards are difficult to implement, and policy formulation often lags behind technological evolution, resulting in a passive situation in which "regulation chases technology."

The dispersion of responsibility causes digital ethical risks to circulate among different actors rather than being resolved, suppressing the potential for healthy trilateral cooperation and ultimately leaving university students as the direct bearers of digital ethical dilemmas, thereby triggering academic integrity violations. The absence of an institutionalized collaborative governance system among universities, industry, and government is both a structural root of current academic integrity problems among university students and a systemic obstacle that must be overcome in cultivating their ethical literacy in academic integrity.

5. Construction of Educational Strategies for Addressing Academic Integrity Issues among University Students

In the face of the multiple challenges to academic integrity encountered by university students in the age of artificial intelligence, single-dimensional responses have proven insufficient, and it is imperative to construct systematic and collaborative pathways for breakthrough. Based on the Triple Helix theory, and proceeding from three dimensions—internal restructuring of the educational system, effective transformation of policy resources, and deep integration of technological practice—this section proposes operable implementation paths aimed at guiding university students to establish ethical self-awareness in the use of technology and at providing a practical framework for cultivating responsible digital citizens in the AI era.

5.1. Reconstructing the Curriculum System and Student Self-Governance Mechanisms

1. Embedding Academic Integrity into the Curriculum System and Professional Education

Universities should systematically integrate academic integrity education into existing curriculum systems and professional education, thereby breaking the traditional separation between ethical education and technological practice. For example, compulsory courses related to digital ethics may be added to general education modules, covering common topics such as academic integrity, intellectual property, and data privacy, in order to enhance students' awareness of academic integrity. Universities should also promote the organic integration of academic integrity with disciplinary education by encouraging the development of ethics courses with distinctive professional characteristics in light of multidisciplinary features. Students from computer science, education, philosophy, and other majors may be encouraged to jointly explore ethical issues concerning the use of artificial intelligence in diverse scenarios. Through interdisciplinary communication and exchange, university students can understand the reasonable use of AI technologies from multiple disciplinary perspectives, thereby deepening and enriching their individual comprehension of academic integrity.

2. Implementing Faculty Development Programs for Academic Integrity Teaching Capacity

Teachers are the key implementers of academic integrity education, and their own ethical literacy and teaching competence directly influence educational outcomes. Universities may guide faculty members to strengthen their academic integrity awareness through multiple approaches. First, institutions may regularly organize seminars and thematic lectures on academic integrity literacy, inviting experts from ethics, educational technology, computer science, and other fields to share and discuss emerging ethical issues, thereby enhancing teachers' understanding of the connotations of academic integrity and promoting interdisciplinary integration. Second, teachers should be encouraged to explore teaching practices and reflect on how to incorporate academic integrity discussions into classroom learning. For instance, situational teaching methods may be employed to design realistic conflict scenarios involving AI applications, allowing students to assume different roles and engage in perspective-taking, deliberation, and decision-making within simulated contexts. Through such pedagogical exploration, teachers can optimize their instructional strategies and improve their teaching capabilities. Finally, institutions should simultaneously establish comprehensive teaching support systems. On the one hand, digital teaching resource repositories should be developed to provide greater choice and convenience for teachers in learning and teaching academic integrity. On the other hand, incentive mechanisms should be instituted to recognize and

reward teachers with outstanding instructional outcomes, thereby motivating continuous exploration in academic integrity education.

3. Student Self-Governance and Peer Review Construction

Students are not only the objects of academic integrity education but also the primary agents of academic integrity practice. Vigorously cultivating students' capacities for self-management and self-supervision constitutes a crucial step in internalizing digital literacy at the cognitive level and externalizing it in action. Universities should create favorable conditions to encourage active student participation and establish a three-dimensional self-governance system encompassing student organizational development, peer review mechanisms, and consultation service systems. Under the guidance of instructors, students may engage in activities such as drafting academic integrity norms and conducting case discussions and exchanges on academic integrity, thereby enhancing their sense of participation and subjectivity and transforming academic integrity issues from externally imposed discipline into collectively internalized consensus. At the same time, peer-review components centered on academic integrity should be systematically introduced into professional courses and research projects, requiring students not only to demonstrate the use of AI-assisted tools in their assignments but also to specify their purposes, methods, and boundaries of use. Peers may then evaluate these aspects in terms of the rationality of technological use, the transparency of processes, and the independence of results. This mechanism is not intended as surveillance but as a form of collective ethical deliberation, encouraging students to actively examine the ethical implications of their own technological behaviors in the process of evaluating others and being evaluated, and gradually forming group-recognized norms for AI use.

5.2. Realizing the Effective Transformation of Policy Resources into Educational Resources

1. Promoting the Conversion of Policy Texts and Cases into Curricular Resources

Laws, regulations, and policy documents should not merely function as managerial rules or administrative tools; for universities, they should also serve as vivid teaching resources and case materials. Through the coordinated advancement of curriculum development, case construction, and pedagogical innovation, universities may develop a series of courses interpreting educational policies in the digital era and systematically explain the concrete application of legal and regulatory documents—such as the Ethical Norms for the New Generation of Artificial Intelligence and the Personal Information Protection Law—within educational scenarios. In doing so, abstract and unfamiliar policy texts can be transformed into concrete and engaging teaching materials, helping university students understand the value orientations and social considerations underlying legal policies and thereby cultivating their legal awareness and rule-based thinking. Simultaneously, it is necessary to establish digital ethics case repositories by collecting representative domestic and international cases related to digital ethics and regulatory penalties to provide case support for curriculum development. Such cases should encompass various types, including academic misconduct, data breaches, and algorithmic discrimination, and be accompanied by detailed background descriptions, focal analyses, and ethical reflections, thereby offering robust case-based support for the cultivation of students' academic integrity literacy.

2. Improving Guideline Construction and Policy Feedback Mechanisms

Against the backdrop of incomplete legal and policy frameworks, universities should fully exercise their initiative by constructing campus-level governance systems and behavioral guidelines in accordance with existing laws and policies and in consultation with experts in relevant fields, thereby providing reference guidance for students' reasonable use of AI technologies. Specifically, student use of AI tools may be categorized using a "traffic-light" behavioral framework. Red-light behaviors refer to actions that violate the bottom line of academic integrity, such as submitting course papers or laboratory reports entirely generated by AI or using AI to commit examination fraud. Yellow-light behaviors involve activities completed with AI assistance, such as using AI for outlining, literature organization, or language polishing in academic writing; in such cases, the tools used, their specific functions, and the scope of use must be explicitly disclosed in the final work. Green-light behaviors

primarily refer to auxiliary uses of AI that enhance learning and research efficiency without involving the creation of core knowledge, such as information retrieval or spell-checking. In addition, smooth channels for opinion collection and feedback should be established. Universities may widely gather ethical dilemmas and policy demands encountered by faculty and students through online platforms, telephone hotlines, and questionnaires, thereby guiding students to shift from passive recipients of digital ethics to active constructors and ultimately enabling them to grow into digital citizens who truly possess ethical self-awareness and practical agency.

5.3. Promoting the Deep Transformation of Technological Practice into Educational Scenarios

1. Advancing the Joint Construction of Ethical Training Bases by Universities and Enterprises

University–enterprise cooperation has increasingly become a key link in cultivating digital ethical literacy, including academic integrity. Through the joint establishment of laboratories, students may participate in real technological development and ethical risk assessment, thereby internalizing ethical literacy into habitual behavior. Taking an AI security joint laboratory as an example, such a platform not only focuses on cutting-edge research but also undertakes pedagogical practice functions. Students are required to participate throughout the entire development process—from needs analysis and data collection to model training and deployment—allowing them to confront real-world digital ethical issues and reflect on the hidden ethical risks in algorithm design and technological development, thus internalizing digital ethical literacy while mastering technical skills. Under this learning model, a dual-mentor cultivation system may emerge, in which enterprise mentors and university mentors respectively provide guidance in technical design and value analysis. With such dual guidance, students can not only acquire practical skills such as detecting algorithmic bias and designing privacy-protection schemes, but also gradually establish a systematic cognition of digital ethics. Within such an educational ecosystem, university students will become not merely proficient tool users, but responsible innovators equipped with ethical self-awareness and value judgment.

2. Introducing Enterprise Cases to Conduct Critical Teaching

Real digital ethical dilemma cases arising in enterprise technological development and operations constitute important resources for advancing digital ethics education. Through university–enterprise cooperation, representative ethical cases encountered in commercial practice may be systematically introduced into classroom teaching, guiding students to conduct structured analyses and discussions of relevant issues while constructing a closed-loop pedagogical mechanism of "case analysis—solution design—practical feedback." Students are thereby instructed to propose improvement plans for specific ethical dilemmas, enhancing their value judgment and decision-making capabilities in real ethical conflicts and promoting the cultivation of digital ethical awareness and social responsibility. In the course of such cooperation, enterprises should also be actively encouraged to assume their due social responsibilities, particularly by adhering to ethical bottom lines in the development and promotion of AI products. Enterprises may develop "educational-edition AI tools" tailored to educational scenarios, emphasizing knowledge construction and cognitive cultivation, and incorporating mechanisms for transparency control, fairness assurance, and privacy protection into functional design, thereby reducing the risks of technological misuse at the source and assisting education in truly achieving technology for good. Only when the industrial and educational sectors jointly undertake ethical responsibilities can the healthy and sustainable development of artificial intelligence in education be genuinely promoted.

6. Conclusion

The rapid development of artificial intelligence technologies has reshaped the ecological landscape of universities and has profoundly revealed the tension between technological rationality and ethical values. Grounded in the Triple Helix theory, and through an in-depth review of relevant theories and literature, this study focuses on the practical dilemmas, underlying causes, and potential breakthrough paths concerning the academic integrity literacy of university students. The findings indicate that

university students' academic integrity literacy is currently confronted with a series of practical challenges, including the narrowing of cognition caused by algorithmic recommendation mechanisms, the weakening of learning autonomy due to overreliance on technology, and the absence of comprehensive academic integrity evaluation systems. These dilemmas stem not only from the disjunction between higher education evaluation systems and technological productivity, but also from the lag of legal and policy frameworks behind technological development, the contradiction between the instrumental rationality of industry and the educational mission of cultivating individuals, as well as the lack of collaborative governance mechanisms among universities, industry, and government. Overcoming these dilemmas requires coordinated efforts across the three dimensions of education, industry, and policy. Accordingly, this study constructs a three-dimensional collaborative breakthrough framework centered on "subjectivity reconstruction—policy resource transformation—internalization of technological practice," providing systematic references for university students, higher education institutions, and educational practitioners, and promoting the cultivation of responsible digital citizens who possess both technical competence and ethical self-awareness in the era of artificial intelligence.

If the current practical dilemmas cannot be addressed in a systematic manner, they are likely to produce far-reaching negative consequences and intensify the challenges of human–machine ethical alienation. The deep integration of artificial intelligence technologies with university education is an inevitable historical trend; however, the instrumental nature of technology determines that it can never replace students' subjectivity in thinking. Only through collaborative innovation across the three dimensions of education, industry, and policy can the technological dividends brought by artificial intelligence be fully realized, enabling AI technologies to become a new driving force for the digital transformation of education and to contribute to the cultivation of innovative talents for the digital age across China.

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