Research on the Current Status, Problems, and Countermeasures of College Students' Use of Generative Artificial Intelligence

***Yujuan Yan**

Jilin Engineering Normal University, Changchun, Jilin Province, China

***Corresponding Author**

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ABSTRACT

The rapid development of generative artificial intelligence technology is profoundly transforming the educational ecosystem. As an important user group of AI technology, college students' current usage status, cognitive attitudes, and behavioral characteristics warrant in-depth investigation. This study systematically examines college students' use of generative AI across six dimensions: usage frequency, application scenarios, satisfaction, privacy concerns, academic integrity, and ethical awareness, based on a questionnaire survey of 222 students from a higher vocational college. The findings reveal that the AI usage rate among college students reaches 98.2%, with 58.1% being high-frequency users (daily); AI has a significant positive impact on learning outcomes (66.7% perceive improvement or significant improvement); however, prominent issues include weak privacy protection awareness (81.5% have not carefully read privacy policies), inconsistency between academic integrity cognition and behavior (73.4% agree that AI content can be referenced but not directly submitted, yet only 5.0% always proactively disclose AI use), and lack of school AI usage regulations (84.2% are unclear or unaware of school policies). The study recommends improving school AI usage norms, strengthening AI ethics education, and enhancing students' digital literacy to guide college students to use generative AI rationally, normatively, and responsibly.

Keywords: Generative artificial intelligence; college students; usage status; academic integrity; privacy protection; ethical norms

INTRODUCTION

Research Background

Since the end of 2022, generative artificial intelligence (Generative AI) technologies represented by ChatGPT, ERNIE Bot, Tongyi Qianwen, and others have rapidly emerged. With their powerful capabilities in natural language processing, code generation, and image creation, they are profoundly changing human production and lifestyle patterns. The education sector, as the core domain for knowledge dissemination and innovation, has been at the forefront of being impacted and reshaped by generative AI.

The college student population, characterized by high technology acceptance, strong learning needs, and intense innovation willingness, has become an important user group of generative AI technology. On one hand, AI technology provides college students with personalized learning tutoring, efficient homework assistance, and convenient programming support, greatly enhancing learning efficiency and innovation capabilities. On the other hand, the misuse of AI technology also brings a series of problems including academic integrity risks, privacy leakage hazards, and capability degradation caused by over-reliance.

In this context, gaining an in-depth understanding of college students' current AI usage status, cognitive attitudes, and behavioral characteristics has important theoretical and practical significance for guiding students to use AI rationally, preventing AI usage risks, and formulating scientific AI education policies.

Research Objectives and Significance

This study aims to systematically investigate the current status of generative AI usage among college students at a higher vocational college through questionnaire surveys. The specific research objectives include: (1) understanding college students' AI usage frequency, product types, application scenarios, and usage motivations; (2) evaluating students' satisfaction with AI products and the impact of AI on learning outcomes; (3) examining students' cognitive attitudes toward AI privacy protection, academic integrity, and ethical risks; (4) understanding students' awareness of school AI usage regulations and their needs for ethical norms; (5) based on survey results, proposing countermeasure suggestions for guiding students to use AI rationally and normatively.

The significance of this study lies in: providing empirical evidence for colleges and universities to formulate AI usage policies; providing reference for conducting AI ethics education; and providing foundational data for subsequent related research.

RESEARCH OBJECTS AND METHODS

Research Subjects

This study adopted a cluster sampling method, targeting students in classes taught by the author at a higher vocational college. A total of 236 questionnaires were collected, with 222 valid questionnaires, yielding a valid response rate of 94.1%.

The basic characteristics of the sample are as follows: In terms of gender distribution, 124 were male (55.9%) and 97 were female (43.7%). In terms of grade distribution, 62 were freshmen (27.9%), 81 were sophomores (36.5%), 42 were juniors (18.9%), and 17 were seniors (7.7%). In terms of major categories, 138 were from science and engineering (62.2%), 60 from humanities and social sciences (27%), and 24 from arts (10.8%). The sample aligns with the major settings and student characteristics of higher vocational colleges, possessing a certain degree of representativeness.

Research Instruments

This study employed a self-developed questionnaire consisting of 20 questions covering six dimensions: (1) basic information; (2) usage status: whether AI has been used, usage frequency, product types, application scenarios, and usage motivations; (3) satisfaction and effects: overall satisfaction, willingness to pay, and impact on learning outcomes; (4) privacy protection: privacy policy reading status, privacy concern content, degree of privacy concern, and reduced usage due to privacy concerns; (5) academic integrity: academic integrity cognition and proactive disclosure of AI usage; (6) ethical cognition: ethical risk awareness, understanding of school regulations, and need for ethical norms.

The questionnaire combined single-choice questions, multiple-choice questions, and scale questions. Data were collected through an online questionnaire platform.

Data Analysis Methods

Descriptive statistical methods were used to analyze the questionnaire data, primarily employing indicators such as frequency and percentage to present the distribution of each item, with analysis and discussion based on the data.

Survey Results and Analysis

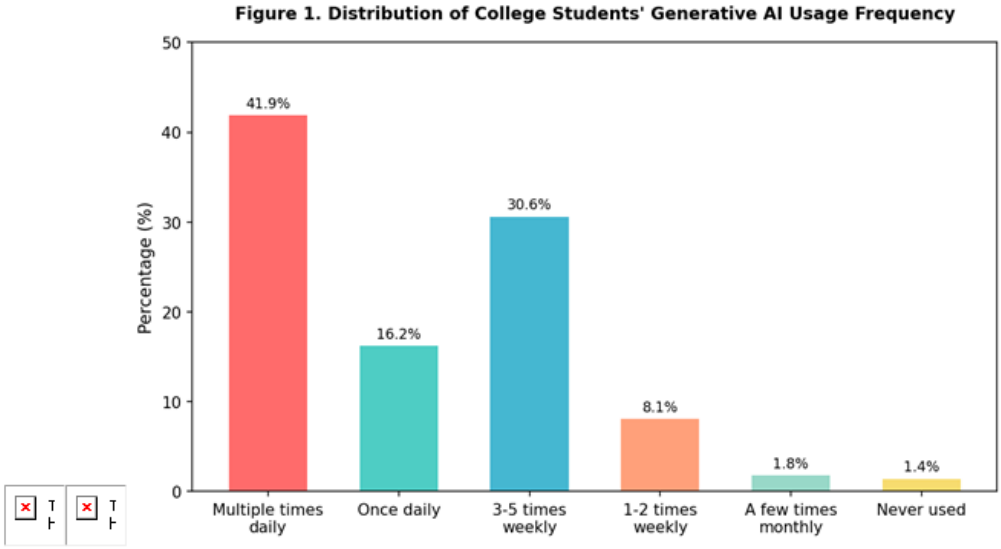
Current Status of Generative AI Usage

Usage Rate and Usage Frequency

The survey results show that among the 222 student respondents, 218 reported having used AI products (such as Doubao, ChatGPT, ERNIE Bot, Tongyi Qianwen, Midjourney, etc.), yielding a usage rate as high as 98.2%. Only 4 students (1.8%) had never used AI products. This data indicates that generative AI has achieved a high degree of penetration among the college student population.

Regarding usage frequency, 93 students (41.9%) used AI multiple times daily, 36 students (16.2%) used it once daily, 68 students (30.6%) used it 3-5 times weekly, 18 students (8.1%) used it 1-2 times weekly, 4 students (1.8%) used it a few times monthly, and 3 students (1.4%) had not used it. The total number of high-frequency users (daily) reached 129 students, accounting for 58.1%, over half of the respondents, indicating that AI has become an important tool in college students' daily learning and life.

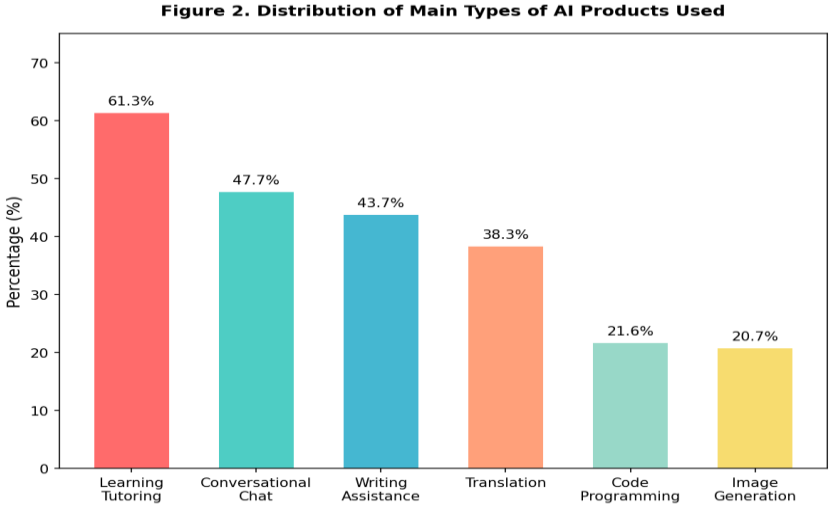
Figure 1. Distribution of College Students' Generative AI Usage Frequency



Main Types of AI Products Used

Regarding the choice of AI product types (multiple-choice, limited to 3 options), the top three categories were: learning tutoring (Zuoyebang, Xiaoyuan Souti, etc.), 136 responses (61.3%); conversational chat (ChatGPT, ERNIE Bot, etc.), 106 responses (47.7%); and writing assistance (Grammarly, Mitaxiezhuomao, etc.), 97 responses (43.7%). Additionally, translation tools (DeepL, Youdao Translation, etc.) received 85 responses (38.3%), code programming tools (GitHub Copilot, Cursor, etc.) received 48 responses (21.6%), and image generation tools (Midjourney, Stable Diffusion, etc.) received 46 responses (20.7%).

Figure 2. Distribution of Main Types of AI Products Used

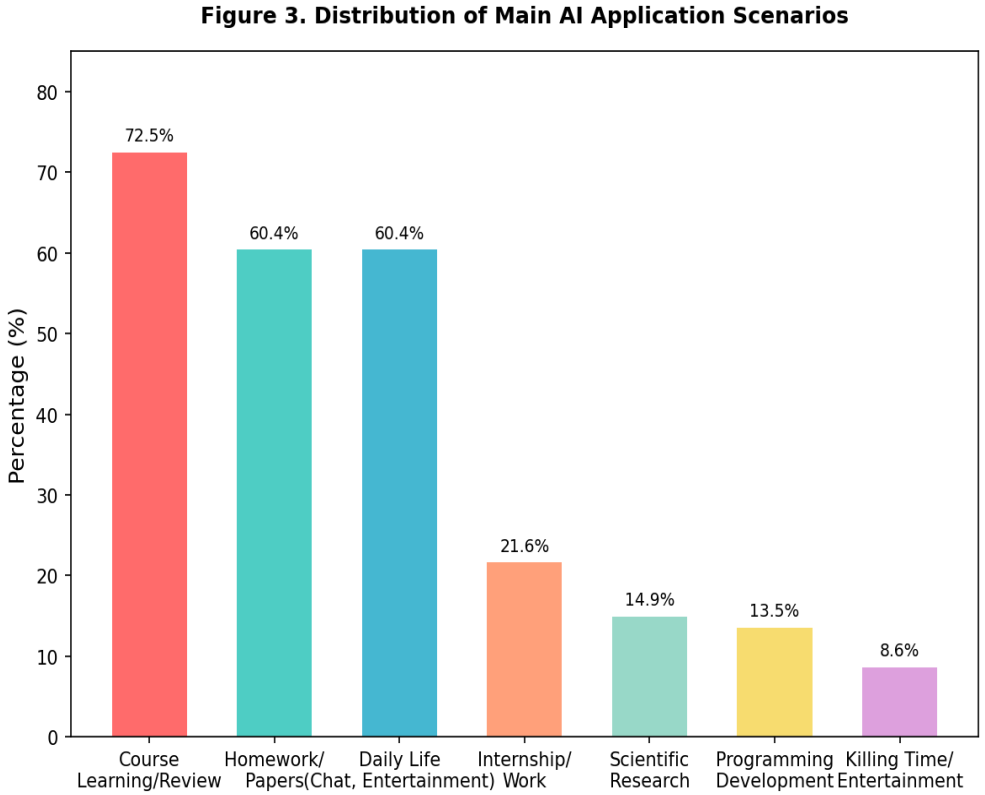


This result reflects the diversified characteristics of college students' AI product usage. Learning tutoring and conversational chat categories represent the most fundamental and universal AI applications. Writing assistance tools meet the needs of paper writing and report preparation, while translation tools serve foreign language learning and literature reading. The relatively lower proportions of code programming and image generation tools may be related to the sample's academic background (not purely computer science majors).

Main Application Scenarios

Regarding AI usage scenarios (multiple-choice), the top three scenarios were: course learning/review, 161 responses (72.5%); completing homework/papers, 134 responses (60.4%); and daily life (chatting, entertainment, etc.), 134 responses (60.4%). Additionally, internship/work-related usage received 48 responses (21.6%), scientific research projects received 33 responses (14.9%), programming development received 30 responses (13.5%), and killing time/entertainment received 19 responses (8.6%).

Figure 3. Distribution of Main AI Application Scenarios

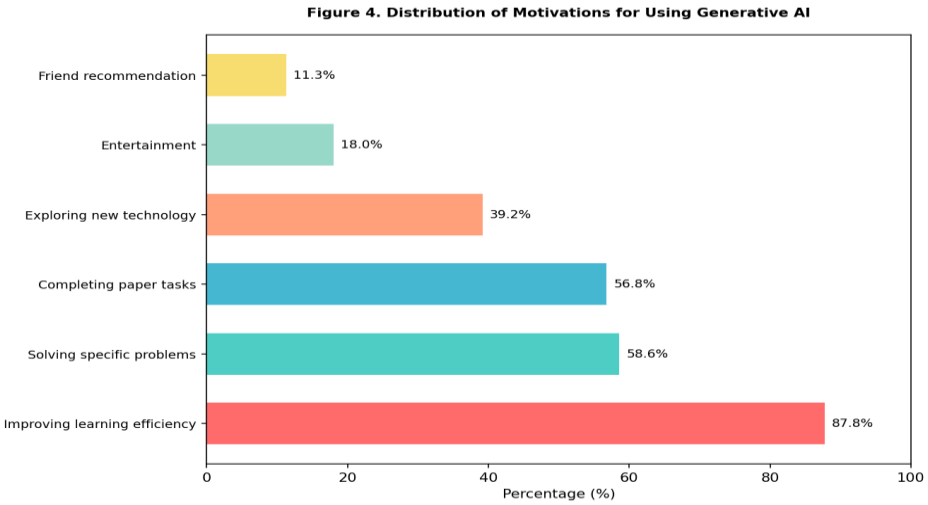


The data shows that college students' core AI usage scenarios are concentrated in course learning, homework completion, and daily life, reflecting AI's dual function as both a learning and life tool. The high proportion of course learning and homework completion indicates that AI has become an important auxiliary tool for students' studies. The high proportion of daily life scenarios suggests that AI is extending from a learning tool to a life assistant.

Usage Motivations

Regarding usage motivations (multiple-choice, limited to 3 options), the top three motivations were: improving learning/work efficiency, 195 responses (87.8%); solving specific problems (such as code debugging, translation, etc.), 130 responses (58.6%); and completing homework/paper tasks, 126 responses (56.8%). Additionally, curiosity/exploring new technology received 87 responses (39.2%), killing time/entertainment received 40 responses (18.0%), peer/friend recommendation received 25 responses (11.3%), and teacher requirement or suggestion received 14 responses (6.3%).

Figure 4. Distribution of Motivations for Using Generative AI



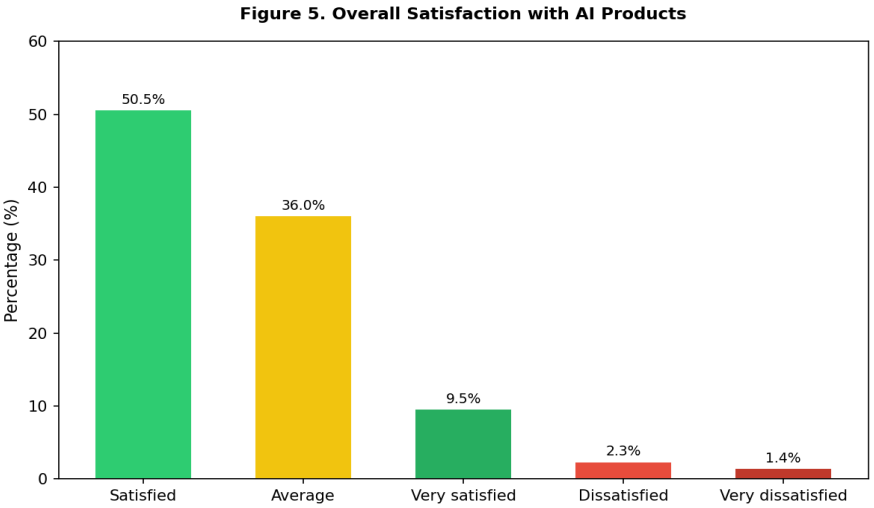
"Improving learning/work efficiency" emerged as the dominant motivation with an absolute advantage, indicating that college students' AI usage has clear purpose and utilitarian orientation. "Solving specific problems" and "completing homework/papers" ranked second and third, further confirming AI's positioning as a learning and problem-solving tool. Notably, "teacher requirement or suggestion" accounted for only 6.3%, suggesting that teachers' guiding role in AI usage remains relatively weak at present.

Satisfaction and Learning Outcomes

Overall Satisfaction

Regarding overall satisfaction with AI products (5-point scale), 112 students (50.5%) selected "satisfied," 80 students (36.0%) selected "average," 21 students (9.5%) selected "very satisfied," 5 students (2.3%) selected "dissatisfied," and 3 students (1.4%) selected "very dissatisfied," with 1 non-response. The total satisfaction rate (satisfied + very satisfied) was 60.0%, indicating that college students' overall evaluation of current AI products tends to be positive. However, 36.0% of students rated it as "average," suggesting that AI products still have considerable room for improvement in experience and functionality.

Figure 5. Overall Satisfaction with AI Products

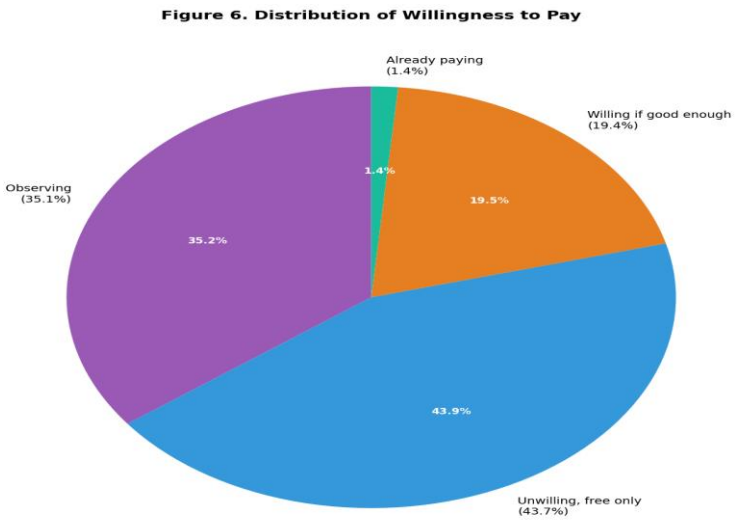


Willingness to Pay

Regarding willingness to pay, 78 students (35.1%) selected "observing," 97 students (43.7%) selected "unwilling, will only use the free version," 43 students (19.4%) selected "willing, if the features are good

enough," and 3 students (1.4%) selected "already paying for use," with 1 non-response. This data indicates that college students' overall willingness to pay for AI is relatively low, with over 70% of students in an observing or refusal-to-pay state. Only less than 20% of students expressed willingness to pay. This may be related to students' limited financial capacity and the fact that free AI product features already basically meet their needs.

Figure 6. Distribution of Willingness to Pay

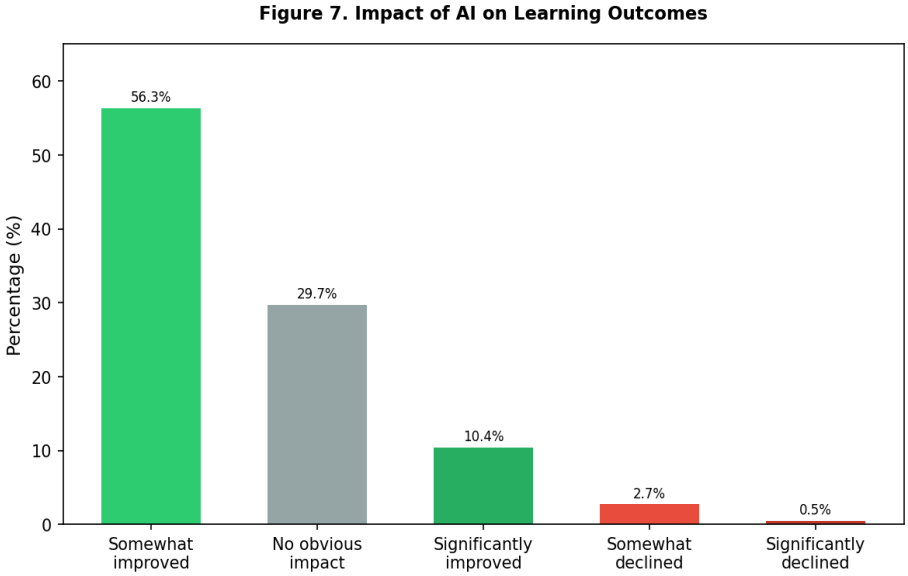


Impact on Learning Outcomes

Regarding the impact of AI use on learning outcomes, 125 students (56.3%) selected "somewhat improved," 66 students (29.7%) selected "no obvious impact," 23 students (10.4%) selected "significantly improved," 6 students (2.7%) selected "somewhat declined (developed dependency)," and 1 student (0.5%) selected "significantly declined," with 1 non-response. Students who perceived a positive impact of AI on learning outcomes (somewhat improved + significantly improved) totaled 148, accounting for 66.7%.

This result indicates that over two-thirds of college students believe AI usage has a positive impact on learning outcomes. However, the proportion of "significantly improved" is only 10.4%, with most students considering it only "somewhat improved." Meanwhile, 3.2% of students believe AI usage led to a decline in learning outcomes, reminding us to pay attention to the potential negative effects of excessive AI usage.

Figure 7. Impact of AI on Learning Outcomes

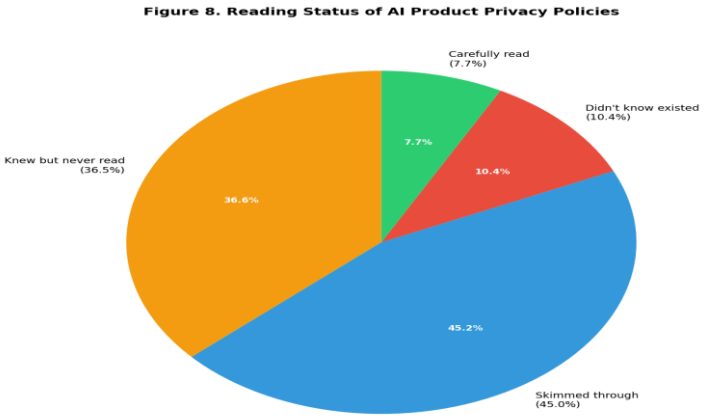


Privacy Protection Awareness

Privacy Policy Reading Status

Regarding whether they have read AI product privacy policies, 81 students (36.5%) selected "knew they existed but never read them," 100 students (45.0%) selected "skimmed through them," 23 students (10.4%) selected "did not know privacy policies existed," and 17 students (7.7%) selected "carefully read them," with 1 non-response. A staggering 81.5% of students have not carefully read AI product privacy policies, with 10.4% not even knowing that AI products have privacy policies. This data reflects a severe lack of attention among college students to AI product privacy protection issues.

Figure 8. Reading Status of AI Product Privacy Policies

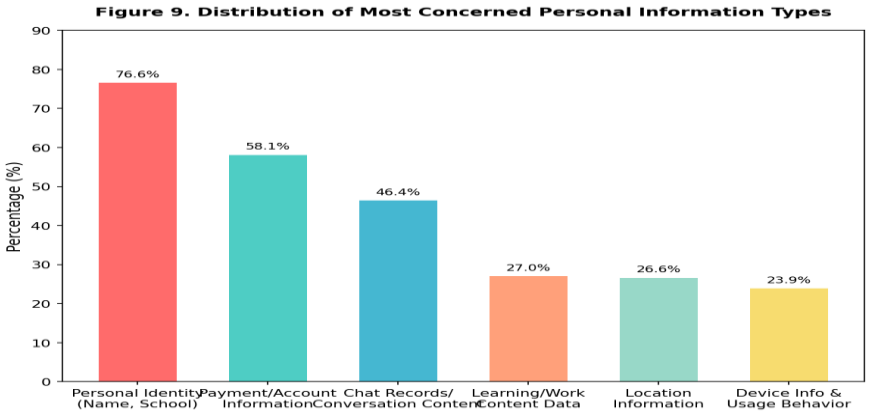


Types of Personal Information Most Concerned About

Regarding "what types of personal information are most concerning for AI products to collect" (multiple-choice, limited to 3 options), the top three concerns were: personal identity information (name, school, etc.), 170 responses (76.6%); payment/account information, 129 responses (58.1%); and chat records/conversation content, 103 responses (46.4%). Additionally, learning/work content data received 60 responses (27.0%), location information received 59 responses (26.6%), and device information and usage behavior received 53 responses (23.9%).

The data shows that college students are most concerned about the leakage of personal identity information and payment account information, which is related to the frequent occurrence of personal information leakage incidents in daily life. Notably, the concern about "chat records/conversation content" also has a relatively high proportion (46.4%), indicating that students are aware that AI conversation content may contain sensitive information.

Figure 9. Distribution of Most Concerned Personal Information Types



Degree of Privacy Concern and Behavioral Responses

Regarding the degree of privacy concern (5-point scale), 128 students (57.7%) selected "average," 52 students (23.4%) selected "relatively concerned," 30 students (13.5%) selected "not very concerned," 6 students (2.7%) selected "not concerned at all," and 5 students (2.3%) selected "very concerned," with 1 non-response. Overall, college students' privacy concern level is at an "average" level, with only 23.4% of students indicating they are "relatively concerned."

Regarding "whether you have reduced usage of a certain AI product due to privacy concerns," 87 students (39.2%) selected "had concerns but continued to use," 65 students (29.3%) selected "reduced usage frequency," 50 students (22.5%) selected "no privacy concerns," and 16 students (7.2%) selected "deleted/discontinued use," with 4 non-responses. Over one-third of students, despite having privacy concerns, still choose to continue using, indicating that privacy concerns have not yet become a key factor influencing AI usage decisions.

Academic Integrity Cognition

Cognition on Submitting AI-Generated Content for Assignments

Regarding "how to view the academic integrity issue of submitting AI-generated content for assignments," 163 students (73.4%) selected "can be referenced, but should not be directly submitted," 37 students (16.7%) selected "acceptable if the teacher allows," 9 students (4.1%) selected "completely unacceptable, constitutes academic misconduct," 7 students (3.2%) selected "doesn't matter, as long as it works," and 5 students (2.3%) selected "completely fine," with 1 non-response.

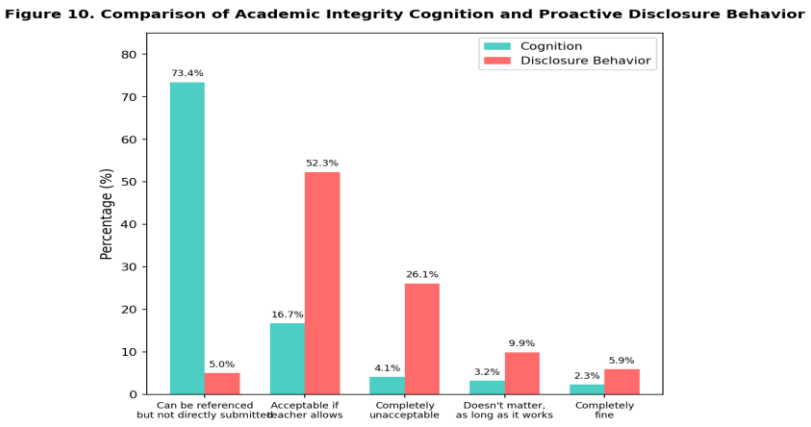
The data shows that over 70% of students agree with the middle-ground position of "can be referenced, but should not be directly submitted" at the cognitive level, indicating that most students have basic academic integrity awareness. However, only 4.1% of students believe it is "completely unacceptable," reminding us to pay attention to the depth and effectiveness of academic integrity education.

Proactive Disclosure of AI Usage

Regarding "whether you would proactively disclose AI usage when submitting homework/papers," 116 students (52.3%) selected "depends on teacher requirements," 58 students (26.1%) selected "sometimes disclose," 22 students (9.9%) selected "rarely disclose," 13 students (5.9%) selected "never disclose," and 11 students (5.0%) selected "always proactively disclose," with 2 non-responses.

This data forms a sharp contrast with academic integrity cognition: although 73.4% of students believe that AI content "can be referenced, but should not be directly submitted," only 5.0% of students indicate they "always proactively disclose" their AI usage, while 52.3% state they will "depend on teacher requirements." This demonstrates a significant gap between students' academic integrity cognition and behavior. The implementation of academic integrity relies heavily on external supervision and constraints (teacher requirements) rather than internal moral consciousness.

Figure 10. Comparison of Academic Integrity Cognition and Proactive Disclosure Behavior



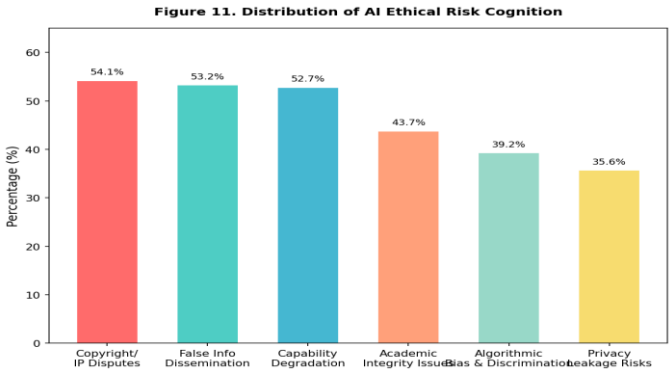
Ethical Risk Cognition

Cognition of AI Ethical Risks

Regarding "what ethical risks AI-generated content may have" (multiple-choice), the top three risks were: copyright/intellectual property disputes, 120 responses (54.1%); dissemination of false information, 118 responses (53.2%); and capability degradation caused by over-reliance, 117 responses (52.7%). Additionally, academic integrity issues received 97 responses (43.7%), algorithmic bias and discrimination received 87 responses (39.2%), and privacy leakage risks received 79 responses (35.6%).

The data shows that college students have a relatively comprehensive understanding of AI ethical risks. Copyright disputes, dissemination of false information, and capability degradation are the three most concerning risks, each exceeding 50%. Notably, "capability degradation caused by over-reliance" ranks third at 52.7%, indicating that students are already aware of the potential negative impact of excessive AI usage on personal capability development.

Figure 11. Distribution of AI Ethical Risk Cognition

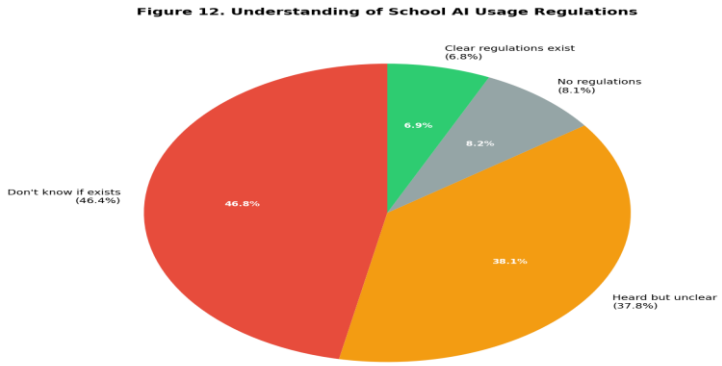


Understanding of School AI Usage Regulations

Regarding "whether you are aware of your school's regulations on AI usage," 103 students (46.4%) selected "don't know if the school has regulations," 84 students (37.8%) selected "heard of them but unclear on details," 18 students (8.1%) selected "the school has no relevant regulations," and 15 students (6.8%) selected "the school has clear regulations," with 2 non-responses. A staggering 84.2% of students are unclear or unaware of whether their school has AI usage regulations, with only 6.8% indicating that their school has clear regulations.

This data reflects a severe lag in colleges and universities' construction of AI usage norms. The vast majority of students lack understanding of their school's AI usage policies, with some not even knowing whether relevant regulations exist. This institutional absence hinders guiding students to use AI in a responsible and ethical manner and may also easily lead to issues of academic integrity.

Figure 12. Understanding of School AI Usage Regulations

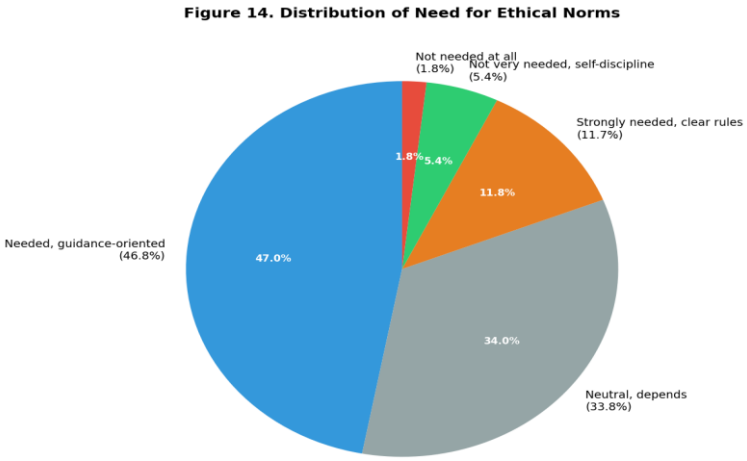


Need for Ethical Norms

Regarding "whether college students' use of AI products requires ethical norm constraints," 104 students (46.8%) selected "relatively needed, primarily guidance-oriented," 75 students (33.8%) selected "neutral, depends on specific circumstances," 26 students (11.7%) selected "strongly needed, clear rules should be established," 12 students (5.4%) selected "not very needed, self-discipline is sufficient," and 4 students (1.8%) selected "completely unnecessary, should not be restricted," with 1 non-response. Students who believe constraints are "needed" (strongly needed + relatively needed) totaled 130, accounting for 58.6%.

The data shows that over half of the students believe college students' AI usage requires ethical norm constraints, with "guidance-oriented" (46.8%) rather than "strictly restricted" (11.7%) being the primary demand. This suggests that when colleges and universities formulate AI usage policies, they should adhere to the principle of "guidance-oriented, supplemented by norms," avoiding simplistic "one-size-fits-all" prohibitions.

Figure 14. Distribution of Need for Ethical Norms



MAIN CONCLUSIONS

Based on the above survey analysis, this study draws the following main conclusions:

First, generative AI has achieved high penetration among college students, with usage characterized by high frequency and diversified scenarios. Survey data shows that the AI usage rate among college students reaches 98.2%, with over half (58.1%) using AI daily. AI has become an important tool in college students' daily learning and life. Usage scenarios extend from course learning and homework completion to daily life, internships, and work. The primary motivation is "improving learning efficiency" (87.8%), reflecting AI's core positioning as a learning and problem-solving tool.

Second, the positive impact of AI on learning outcomes is recognized, but the proportion of "significant improvement" is relatively low. 66.7% of students believe AI has a positive impact on learning outcomes (somewhat improved + significantly improved), but the proportion of "significantly improved" is only 10.4%, with most students considering it only "somewhat improved." Meanwhile, 3.2% of students believe AI usage led to a decline in learning outcomes. This result suggests that while AI's value as a learning tool has been recognized, its "transformative" improvement of learning outcomes still needs exploration, and the risks of excessive usage also warrant vigilance.

Third, privacy protection awareness is weak, with a clear disconnect between "cognition and behavior." A staggering 81.5% of students have not carefully read AI product privacy policies, with 10.4% not even knowing AI products have privacy policies. Although students have relatively high concerns about the leakage risks of personal identity information and payment account information (76.6% and 58.1%), the overall privacy concern level is at an "average" level (57.7%), with over one-third of students continuing to use despite having privacy

concerns. This "high concern, low action" disconnect reflects the weakness of college students' privacy protection awareness.

Fourth, academic integrity cognition and behavior are inconsistent, with strong reliance on external constraints. 73.4% of students agree with the academic integrity position of "can be referenced, but should not be directly submitted" at the cognitive level, but only 5.0% indicate they "always proactively disclose" their AI usage, while 52.3% state they will "depend on teacher requirements." The implementation of academic integrity relies heavily on external supervision (teacher requirements) rather than internal moral consciousness. This "cognition-behavior" inconsistency is the core challenge facing academic integrity education in the AI era.

Fifth, school AI usage norms are severely lacking, with students expecting guidance-oriented ethical constraints. 84.2% of students are unclear or unaware of whether their school has AI usage regulations, with only 6.8% indicating clear school regulations. Meanwhile, 58.6% of students believe ethical norm constraints are needed, with "guidance-oriented" (46.8%) being the primary demand. The stark contrast between the lag in school institutional supply and the growth in students' normative demands urgently calls for colleges and universities to accelerate the formulation and improvement of AI usage policies.

Countermeasure Suggestions

First, accelerate the formulation of school AI usage norms to clarify the boundaries of "what is permissible" and "what is not."Colleges and universities should promptly formulate and publish AI usage management regulations, clarifying: (1) positive list: explicitly allowing AI usage scenarios and methods, such as information searching, idea inspiration, code debugging, and language translation; (2) negative list: explicitly prohibiting AI usage scenarios, such as exam responses, independently completed assignments, and core content of academic papers; (3) disclosure obligation: requiring students to clearly declare the AI tools used, usage methods, and specific content when submitting assignments that utilized AI assistance; (4) violation handling: Establish clear criteria and procedures for identifying and addressing the improper use of AI, thereby creating a systemic deterrent.

The formulation of norms should adhere to the principle of "guidance-oriented, supplemented by restrictions," avoiding simple prohibitions and encouraging students to actively explore reasonable AI applications within the normative framework.

Second, strengthen AI ethics education to enhance students' digital literacy and academic integrity awareness. Colleges and universities should incorporate AI ethics education into the curriculum system, specifically including: (1) offering AI ethics general education courses: systematically teaching AI technology principles, ethical risks, and academic norms to help students establish comprehensive AI cognition; (2) Conduct specialized education on academic integrity: By analyzing typical cases, explain the new connotations and requirements of academic integrity in the AI era, guiding students to establish sound academic values.; (3) strengthening privacy protection education: educating students on how to protect personal information, identify privacy risks, and use AI products reasonably; (4) cultivating critical thinking: guiding students to rationally view AI's capability limitations, developing critical evaluation abilities for AI-generated content, and avoiding over-reliance.

Third, teachers should proactively embrace AI technology and explore new models of AI-empowered teaching. As guides of teaching, teachers should proactively understand and master AI technology, exploring new models of AI-empowered teaching: (1) incorporating AI into instructional design: clarifying AI usage rules in course teaching and designing different learning tasks that require and do not require AI assistance; (2) reforming evaluation methods: shifting from "result evaluation" to "process evaluation," increasing evaluation methods that AI cannot easily replace, such as classroom presentations, oral defenses, and practical assessments; (3) utilizing AI to improve teaching efficiency: using AI tools for lesson preparation, test creation, and homework grading to devote more energy to student guidance and teaching innovation; (4) Enhance teacher-student communication: Engage in open and candid discussions with students about AI usage, understand their experiences and concerns, and provide tailored guidance.

Fourth, build a multi-party collaborative AI governance framework. AI governance is not only the responsibility of schools and students but also requires the joint participation of government, enterprises, and society: (1) government level: accelerating the formulation of policies, regulations, and standards for AI educational applications to provide policy basis for college AI usage management; (2) enterprise level: AI enterprises should strengthen product ethical design, improve privacy protection mechanisms, and provide education-specific versions to meet the special needs of educational scenarios; (3) school level: establishing long-term mechanisms for AI usage management, conducting regular AI usage surveys and evaluations, and promptly adjusting and improving relevant policies; (4) student level: enhancing self-discipline awareness, using AI rationally, proactively learning AI ethics knowledge, and becoming responsible technology users.

Research Limitations And Future Prospects

Research Limitations

This study has the following limitations: (1) Limited sample representativeness: The survey subjects came from only six classes at a single higher vocational college, with the sample primarily consisting of sophomore science and engineering students. It failed to cover students from different grades, different majors, and different types of colleges, and the generalizability of the research conclusions needs further validation. (2) Cross-sectional survey: This study adopted a cross-sectional survey design, which only reflects the AI usage status at a single point in time and failed to track the dynamic changes in students' AI usage behavior. (3) Self-report bias: The survey data primarily relied on students' self-reports, which may be subject to social desirability bias, especially on sensitive issues such as academic integrity and privacy protection, where students' responses may deviate from their actual behavior.

Future Prospects

Based on the limitations of this study, future research can deepen in the following aspects: (1) Expanding the sample scope: conducting large-sample surveys across multiple schools, majors, and grades to improve the representativeness and generalizability of research conclusions. (2) Longitudinal tracking research: conducting longitudinal tracking surveys to examine the changing trends of students' AI usage behavior over time and their influencing factors. (3) Mixed research methods: combining questionnaire surveys, in-depth interviews, behavioral observations, and other methods to comprehensively and deeply understand students' AI usage behavior. (4) Intervention research: based on survey results, designing and implementing AI ethics education intervention programs, evaluating intervention effectiveness, and providing empirical support for college AI education practice.

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