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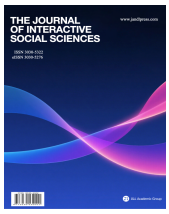

Generative AI in Classroom Teaching: Pathways and Risks

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ABSTRACT

The rapid proliferation of generative artificial intelligence (GenAI) is reshaping classroom teaching while also raising new problems. Drawing on a questionnaire survey of 68 teachers and 358 students, this study examines the current state of GenAI application in classroom teaching. The findings show that GenAI use is fairly widespread among teachers and students, but it largely remains at a shallow level, such as information retrieval and text generation; students use GenAI more frequently than teachers do; and institutions lack clear usage guidelines and guidance. On this basis, the paper proposes application pathways in five respects—intelligent pre-class lesson preparation, in-class human–AI collaboration, post-class personalized tutoring, formative assessment, and teacher development—and analyzes six categories of risk: knowledge reliability, overreliance, academic integrity, data privacy, value orientation, and teacher agency. It then puts forward governance strategies, including establishing a "generate–review" mechanism, redesigning assignments and assessment, formulating classroom usage guidelines, selecting compliant platforms and strengthening data security education, and providing AI literacy training for teachers and developing cross-institutional collaboration in teaching and research. The study aims to provide a reference for frontline teachers in using GenAI appropriately.

1. INTRODUCTION

Since late 2022, generative artificial intelligence (GenAI), represented by ChatGPT, has rapidly entered the public eye, and Chinese large language models such as DeepSeek, ERNIE Bot, and Doubao have been released one after another, steadily lowering the barrier to use. These tools can generate text, images, code, and other content from natural-language instructions, and they hold considerable potential for lesson preparation, answering student questions, assignment feedback, and other teaching activities. Education has therefore become one of the fields most directly affected[1–4].

Policymakers have responded positively to this trend. In 2023, seven departments, including the Cyberspace Administration of China, issued the Interim Measures for the Management of Generative Artificial Intelligence Services, which set out basic rules for related applications. In 2025, nine departments, including the Ministry of Education, issued the Opinions on Accelerating

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the Advancement of Educational Digitalization, and the State Council issued the Opinions on Deepening the Implementation of the "AI Plus" Initiative; both call for integrating artificial intelligence (AI) into every aspect of education and teaching. How to make AI genuinely serve teaching has become an important issue in educational reform.

However, there remains a considerable gap between actual classroom practice and policy expectations. On the one hand, many teachers are willing to experiment but are unsure at which stages and in what ways to use GenAI; their use stays at the level of "searching for materials and writing lesson plans" and does not lead to changes in teaching methods. On the other hand, students' use often runs ahead of teachers', and it is not uncommon for students to complete assignments directly with GenAI, which has been accompanied by weakened independent thinking and distorted academic evaluation. In addition, concerns about the accuracy of generated content and the security of student data have led some teachers and institutions to adopt a wait-and-see attitude[5].

Existing research has devoted considerable attention to the educational value and ethical risks of GenAI[6,7], but most of it is theoretical, and studies based on surveys and practice in frontline classrooms remain relatively scarce. Studies that discuss application pathways and risk governance together and offer teachers actionable solutions are also rare. Against this background, this study takes an application-oriented undergraduate university as its research site. Drawing on a questionnaire survey of teachers and students, it examines the current state of GenAI application in classroom teaching, identifies specific pathways through which GenAI can support teaching, analyzes the potential risks involved, and proposes governance strategies, with the aim of offering practices that frontline teachers can draw on.

2. A Survey of GenAI Application in Classroom Teaching

2.1 Survey Design

2.1.1 Participants. This study took an application-oriented undergraduate university as the sample unit and surveyed enrolled undergraduates and course instructors. The student sample was drawn through stratified sampling, covering three categories of majors (humanities and social sciences, science and engineering, and arts and sports) and four grade levels; the teacher sample was drawn through convenience sampling, covering frontline instructors across all colleges.

2.1.2 Questionnaire structure. The questionnaire was developed around four dimensions: usage, usage scenarios, attitudes and perceptions, and concerns and needs. Most items were single-choice or multiple-choice questions, and the attitude items used a five-point Likert scale.

2.1.3 Administration and response rate. The questionnaire was administered online through Wenjuanxing in October 2026. For students, 400 questionnaires were distributed and 372 were returned; after excluding those with excessively short completion times or highly uniform responses, 358 valid questionnaires remained, yielding a valid response rate of 89.5%. For teachers, 80 questionnaires were distributed and 72 were returned, of which 68 were valid, yielding a valid response rate of 85.0%.

2.1.4 Reliability and validity. The questionnaire was reviewed by three experts in educational technology and revised after a pilot survey. For the scale items, Cronbach's α was 0.87 for the student questionnaire and 0.89 for the teacher questionnaire; the Kaiser–Meyer–Olkin (KMO) values were 0.84 and 0.78, respectively, and Bartlett's test of sphericity was significant in both

cases ($p < 0.001$), indicating that reliability and validity were generally acceptable.

2.2 Survey Results

2.2.1 Prevalence and Frequency of Use

The survey shows that GenAI use is already fairly common among teachers and students: 329 of the 358 students (91.9%) and 52 of the 68 teachers (76.5%) had used it. However, the frequency of use differed markedly (see Table 1). Students who used GenAI at least once a week accounted for 74.9%, compared with only 41.2% of teachers; students who used it almost daily accounted for 21.0%, compared with only 5.9% of teachers. A chi-square test indicated a statistically significant difference in weekly use between students and teachers ($\chi^2 = 30.58$, $p < 0.001$).

Table 1 Distribution of Usage Frequency Among Teachers and Students (%)

Usage frequency	Students (*n* = 358)	Teachers (*n* = 68)
Never used	8.1	23.5
Occasionally (a few times a month or less)	17.0	35.3
1–2 times per week	26.5	22.1
3–5 times per week	27.4	13.2
Almost daily	21.0	5.9

Source: Questionnaire survey.

2.2.2 Main Usage Scenarios

Among teachers who had used GenAI (n = 52), the most common uses were information retrieval (78.8%) and text generation, such as lesson plans and presentation slides (73.1%), followed by exercise item writing (51.9%); assignment feedback (21.2%), classroom interaction design (17.3%), and learning analytics (11.5%) accounted for much lower shares. Thirty-four teachers, or 65.4% of the users, used GenAI only for basic text-related tasks such as information retrieval, text generation, and item writing, without involving assignment feedback, classroom interaction, or learning analytics.

Among students who had used GenAI (n = 329), 83.9% used it for information seeking and Q&A, and 70.2% used it to complete assignments or write reports (see Figure 1), indicating that students are more inclined to treat GenAI as an “answer provider” and a “ghostwriter.”

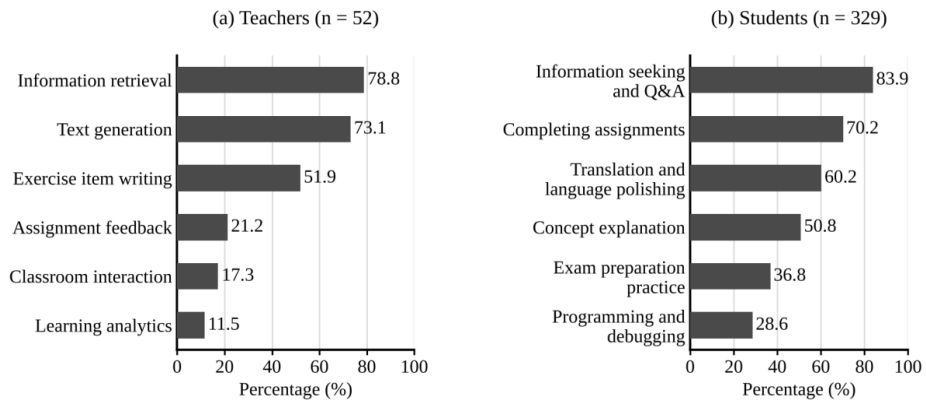

Figure 1 Main Usage Scenarios Among Teachers and Students

Note: Multiple-choice question; percentages sum to more than 100%; only teachers and students who had used GenAI are included.

Source: Questionnaire survey.

2.2.3 Attitudes Toward and Concerns About GenAI

Overall, teachers and students held positive attitudes: 85.2% of students and 72.1% of teachers believed that GenAI is helpful for teaching or learning. Concerns nevertheless exist (see Figure 2). Teachers were most concerned about inaccurate generated content (83.8%), followed by student overreliance (77.9%) and plagiarism or ghostwriting (72.1%); students were most concerned about inaccurate answers (67.3%), and 45.5% worried about being wrongly accused of plagiarism owing to unclear regulations.

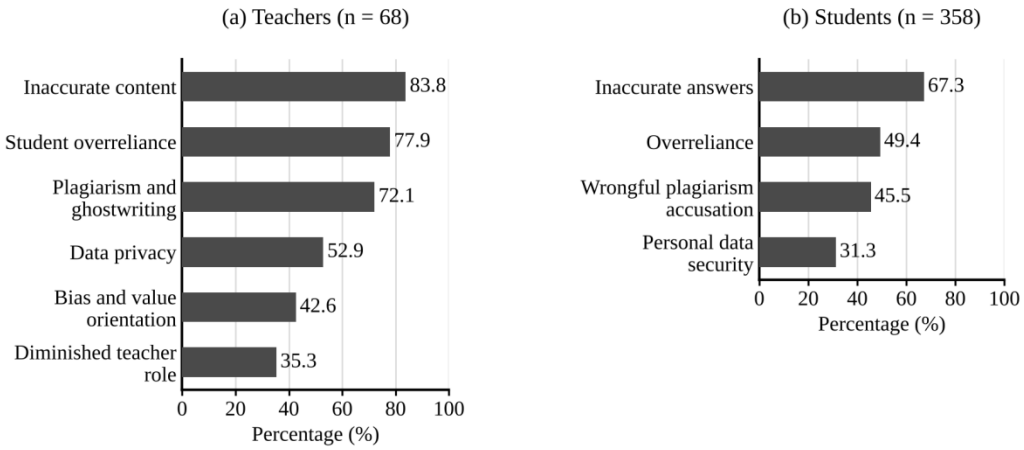

Figure 2 Main Concerns of Teachers and Students About GenAI

Note: Multiple-choice question; percentages sum to more than 100%; all respondents answered. Source: Questionnaire survey.

2.2.4 Needs for Training and Guidelines

The survey also reveals a clear shortage of guidelines and training. Only 11.8% of teachers reported that their department had explicit usage regulations, 19.1% had received systematic training, and only 14.7% actively guided students in using GenAI in class; among students, only 14.5% knew that the university had relevant regulations. At the same time, demand was strong:

88.2% of teachers wanted training, 86.8% wanted the university to issue usage guidelines, and 79.4% wanted access to instructional cases and prompt design methods they could draw on; 84.1% of students wanted teachers to give clear guidance on the boundaries of GenAI use in their courses.

2.3 Problem Identified

Taken together, the results reveal three prominent problems in current application.

First, use is widespread but shallow. Use is concentrated on information retrieval and text generation, with very little involvement in deeper stages such as classroom interaction and learning analytics; GenAI has not yet truly entered the teaching process.

Second, students use GenAI more than teachers do, and teachers provide insufficient guidance. Students' frequency of use is significantly higher than teachers', and a considerable share of that use is for completing assignments directly, yet fewer than 15% of teachers actively guide students in using it.

Third, usage guidelines and systematic training are lacking. Most teachers and students are unclear about which uses are permitted, teachers lack access to training, and students fear being wrongly accused. This not only amplifies the risks to academic integrity and data security but also makes some teachers reluctant to try GenAI.

3. Pathways for Applying GenAI to Enhance Classroom Teaching

The survey indicates that GenAI is applied at a shallow level, so its role in each stage of teaching needs to be clarified. Following the teaching process, this paper proposes application pathways in five respects: before class, in class, after class, assessment, and teacher development.

3.1 Before Class: Intelligent Lesson Preparation with Teacher Review

In lesson preparation, collecting materials and writing exercises are the most time-consuming tasks. After specifying the course objectives, class hours, and the class's overall learning profile, teachers can ask GenAI to generate a draft instructional design, case materials, and tiered exercises, so that lesson preparation shifts from "starting from scratch" to "revising a draft."[8,9] The key lies in sequence and review: the teacher sets the objectives first, and generated content may be used only after the teacher has verified the facts and adapted it to students' learning needs.

3.2 In Class: Human–AI Collaboration, with GenAI as Teaching Assistant and the Teacher as Facilitator

The core of in-class teaching is to let GenAI serve as a teaching assistant while the teacher acts as facilitator. GenAI can provide reference information on the spot and generate discussion materials from multiple perspectives, and it can also become an object of students' critique and revision; the teacher is responsible for designing tasks, organizing discussion, and guiding students' thinking. GenAI should be introduced only after students have thought independently, so that answers do not appear too early and replace thinking.

3.3 After Class: Personalized Tutoring and Assignment Feedback

After class, GenAI can answer questions, generate tiered practice, and provide preliminary feedback on assignments, so that students receive immediate responses when they encounter difficulties and teachers have more time to attend to common problems. At the same time, the ways in which GenAI responds should be constrained, and teachers should spot-check the quality of its

feedback.

3.4 Assessment: Using Process Data to Support Teachers' Judgment

Formative assessment requires organizing large volumes of material, which teachers often find difficult to manage alongside their other duties. GenAI can help organize task records, summarize common problems, and refine the descriptors in rubrics, providing a reference for teachers' judgments. However, assessment conclusions involve holistic judgments about students and value orientations and must be made by teachers; GenAI should not directly assign scores or grades.

3.5 Teacher Development: Improving Prompt Design Skills and AI Literacy

Whether teachers can use GenAI effectively depends on their prompt design skills and AI literacy. An effective prompt usually needs to specify the role, task, context, format, and constraints, and to require the model to flag uncertain content; teachers must also be able to judge the quality of outputs and iterate continuously.

4. Risks of Applying GenAI in Classroom Teaching

This paper classifies the risks into six categories: knowledge reliability, overreliance, academic integrity, data privacy, value orientation, and teacher agency.

4.1 Knowledge Reliability Risk: Generated Content May Be Erroneous

GenAI generates content probabilistically and may produce "hallucinations" that seem plausible but conflict with facts, such as fabricated data and references, often in a highly confident tone that makes errors hard to detect. In the survey, 83.8% of teachers and 67.3% of students were concerned about inaccurate answers. Once erroneous content enters lesson plans or slides, or is accepted by students as a conclusion, its influence spreads through the classroom and is harder to correct than an error made by an individual searching for information.

4.2 Overreliance Risk: Weakened Independent Thinking

When answers are available at any time, students may skip problem analysis, reasoning, and trial and error, and outsource their thinking to the tool. Of the teachers, 77.9% worried that students would become overreliant and that their independent thinking would weaken, and 49.4% of students were themselves concerned about overreliance; among students who had used GenAI, 70.2% used it to complete assignments or write reports. Students may appear to complete tasks while bypassing the thinking processes necessary for developing competence.

4.3 Academic Integrity Risk: Ghostwritten Assignments and Distorted Assessment

Submitting generated content directly means that assignments no longer reflect students' actual level, thereby distorting assessment. Of the teachers, 72.1% were concerned about plagiarism or ghostwriting, which is consistent with the finding that 70.2% of students who had used GenAI used it to complete assignments. The absence of rules creates another risk: 45.5% of students worried about being wrongly accused owing to unclear regulations, while only 14.5% knew that their university had relevant regulations; moreover, the accuracy of existing detection tools is limited, so they cannot serve as a basis for determining misconduct.

4.4 Data Privacy Risk: Leakage of Teacher and Student Information

Teachers may enter materials containing students' names and grades, and students may enter personal information; such data may be retained by platforms or even used for model training. Of

the teachers, 52.9%, and of the students, 31.3%, were concerned about this issue, yet only 11.8% of teachers reported that their department had explicit regulations. Teachers and students generally lack understanding of how platforms handle data, and the consequences of a leak are difficult to reverse.

4.5 Value Orientation Risk: Biased Content

Generated content derives from training data and may carry cultural, gender, or regional biases, and it may also be inconsistent with China's mainstream values. Of the teachers, 42.6% were concerned about this issue; because students' ability to discern such content is limited, its subtle influence calls for teachers' guidance in class.

4.6 Teacher Agency Risk: Teachers' Overreliance on the Tool

The risk to teacher agency is manifested in overreliance on the tool. Of the teachers, 35.3% worried that GenAI would diminish their own role; among teachers who had used it, 73.1% used it to generate text such as lesson plans and slides. If such outputs are applied without adaptation, teaching will lose the teacher's personal experience and distinctive character, and instructional design skills and professional judgment may also weaken. Teachers are the responsible agents of teaching; setting objectives, selecting content, and providing value guidance cannot be handed over to a tool.

5. Governance Strategies

In response to these risks, this paper proposes a set of complementary strategies at three levels: teachers, courses, and institutions.

5.1 Establishing a "GenAI Generation–Teacher Review" Mechanism and Cultivating Students' Verification Habits

For teachers, GenAI-generated teaching materials should be treated as drafts and used in three steps—generate, verify, and finalize: the teacher first sets the objectives and specifies the requirements, then checks facts, data, and sources item by item, and finally revises and finalizes the materials in light of students' learning needs. A verification checklist with four items—factual accuracy, traceable sources, alignment with objectives, and appropriate value orientation—can be developed and made a standard step in lesson preparation. For students, they should be required to trace key conclusions to original sources and to attach a verification statement to their assignments, so that "doubt and verification" is treated as an ability to be trained.

5.2 Redesigning Assignments and Assessment by Adding Process-Based and In-Person Presentation Tasks

Teachers can add in-person presentation tasks such as in-class writing, group presentations, and oral defenses, so that students explain their thinking on the spot; require students to submit topic selection records, drafts, and revision histories, using process evidence to show that learning has actually taken place; design tasks that draw on local cases or classroom discussions to reduce the applicability of generic answers; and appropriately increase the weight of formative assessment. For tasks in which GenAI use is permitted, students should be required to state how they used it and to take responsibility for the final content.

5.3 Formulating Classroom GenAI Usage Guidelines That Specify Permitted and

Prohibited Uses

It is recommended that institutions issue general principles and that each course specify detailed rules in its syllabus, classifying uses into three categories: encouraged uses, such as information retrieval, idea stimulation, and language polishing; conditional uses, such as writing assistance, which require prior disclosure and acknowledgment; and prohibited uses, such as use in examinations and independently completed assessment tasks, and entering students' personal information into platforms. An appeal channel should also be established to avoid determining violations solely on the basis of detection tool results. In the survey, 84.1% of students wanted teachers to clarify the boundaries of use and 86.8% of teachers wanted their institution to issue guidelines, indicating a real need for such guidelines.

5.4 Selecting Compliant Platforms and Strengthening Data Security Education

Institutions should select platforms that comply with regulations such as the Interim Measures for the Management of Generative Artificial Intelligence Services and whose data processing practices are transparent, and teachers should give priority to these platforms. In use, the principle of data minimization should be observed: personally identifiable information such as names, student ID numbers, and grades should not be entered, and where such materials must be analyzed, they should first be de-identified. Data security should also be incorporated into education for teachers and students, so that they understand that the content they enter may be retained and used.

5.5 Providing AI Literacy Training for Teachers and Establishing a Cross-Institutional Teaching and Research Collaboration Mechanism

Teachers are the key to governance. In the survey, 88.2% of teachers wanted training and 79.4% wanted instructional cases they could draw on, yet only 19.1% had received systematic training. It is recommended that institutions provide tiered training on prompt design, output verification, teaching scenario design, and ethical norms, and reduce the cost of individual exploration through cross-institutional collaborative lesson preparation and the sharing of case repositories and prompt libraries. Both training and collaboration should proceed from one premise: teachers bear responsibility for teaching objectives, assessment conclusions, and value guidance, and GenAI serves only as an aid.

6. Conclusion

Through a questionnaire survey, this study finds that GenAI use is fairly widespread among teachers and students, but its application remains shallow, and institutions lack guidelines and training. On this basis, the paper proposes five application pathways, analyzes six categories of risk, and offers governance strategies. The findings suggest that GenAI is a tool for assisting teaching and that the leading role of teachers will not change: objectives are set by teachers, content is reviewed by teachers, assessment is judged by teachers, and values are guided by teachers.

The sample was drawn from a single application-oriented undergraduate university, and the teacher sample is small, which limits the generalizability of the conclusions. Future research could enlarge the sample and conduct cross-institutional and interdisciplinary comparisons, use quasi-experimental designs to test the effects of each pathway on learning outcomes, and track over time its impact on students' thinking skills and teachers' professional development.

References

[1] Yao, Y., & Liu, B. (2026). Embedding generative artificial intelligence in engineering experimental teaching: Risks and governance pathways. Science and Society, 16(3), 22–36. DOI: 10.19524/j.cnki.10-1009/g3.2026.03.022

[2] Wang, Y., & Qin, Z. (2026). Ethical risks, generative mechanisms, and preventive pathways of generative artificial intelligence in empowering ideological development. Tribune of Study, (5), 21–28. DOI: 10.16133/j.cnki.xxlt.2026.05.002

[3] Que, M., & Guo, J. (2026). Structural tensions and governance approaches of generative artificial intelligence in building a leading country in education. Journal of Jiangxi Normal University (Philosophy and Social Sciences Edition), 59(4), 85–95.

[4] Sun, T., & Nong, Z. (2026). Has generative artificial intelligence truly achieved moral growth? A longitudinal evaluation study based on educational value alignment. e-Education Research, 47(7), 43–52. DOI: 10.13811/j.cnki.eer.2026.07.006

[5] Zhang, Q., Dai, Y., & Hu, B. (2026). Configurational pathways of "dual-qualified" teachers' willingness to use generative artificial intelligence and risk governance. Heilongjiang Researches on Higher Education, 44(11), 127–135. DOI: 10.19903/j.cnki.CN23-1074/G.2026.11.017

[6] Yang, J., & Yan, N. (2026). Pathways and effects of the United Kingdom's mitigation of the risks of generative artificial intelligence in education from the perspective of collaborative governance. Journal of Comparative Education, (3), 40–52. DOI: 10.27044/j.cnki.bjjyxb.2026.03.04

[7] Liu, X., Liu, J., Dong, J., et al. (2026). Ethical challenges and responses in classroom teaching assessment in higher education in the era of generative artificial intelligence. Higher Education Exploration, (4), 79–85.

[8] Zhou, C., & Li, Y. (2026). Application patterns, ethical risks, and optimization strategies of embedding generative artificial intelligence in the development of digital textbooks for vocational education. Education and Vocation, (6), 104–112. DOI: 10.13615/j.cnki.1004-3985.2026.06.013

[9] Zhang, J. (2026). Knowledge transformation, potential risks, and governance pathways of digital textbooks driven by generative artificial intelligence. Nanjing Journal of Social Sciences, (3), 141–152, 172. DOI: 10.15937/j.cnki.issn1001-8263.2026.03.014