Students' Subjective Evaluation and Acceptance of AI-Enabled Smart Classrooms: A Survey at Xi'an University of Finance and Economics

Kang Du

College of Economics, Xi'an University of Finance and Economics, Xi'an, China
dk1@xaufe.edu.cn

Abstract: This study investigates students' subjective evaluation and acceptance of AI-enabled smart classrooms at Xi'an University of Finance and Economics. Based on a cross-sectional survey of 166 undergraduate students, the study finds that although only around half of the students were aware of the concept of AI-assisted learning, more than three-quarters reported using AI tools in their studies and over 86% expressed high acceptance. Subjective evaluations indicated that students generally perceived AI tools as useful and believed they could enhance learning interest. However, many students remained cautious about the potential of AI to replace traditional teaching. The findings suggest that while students are willing to engage with AI-assisted learning, greater efforts are needed to improve awareness, critical understanding, and digital literacy. This study adds localized evidence to the growing body of research on educational AI and offers practical implications for improving smart classroom implementation in Chinese higher education.

1. Introduction

The rapid advancement of artificial intelligence (AI) and related technologies is transforming educational environments. Smart classrooms – technology-enhanced spaces equipped with digital and AI tools – have emerged to create more interactive, intelligent, and personalized learning experiences[1]. By blending traditional teaching with advanced ICT infrastructure, smart classrooms aim to enhance student engagement and improve instructional effectiveness[2]. Research emphasizes their potential to enhance classroom management, instructional support, and student performance through adaptive feedback, automated assessment, and environmental regulation[3]. For example, multi-sensor systems can automatically monitor students' attention and participation in class , while AI-driven analytics platforms enable instructors to tailor content and feedback based on real-time student performance data[1]. These innovations illustrate the potential of AI to support teachers and adaptively cater to student needs in smart classroom settings.

With growing adoption in universities, it has become increasingly important to understand how students themselves perceive and evaluate these technologies. Empirical studies in higher education reveal generally positive attitudes towards AI tools such as intelligent tutoring systems, generative

language models, and chatbots, especially for their ability to support personalized learning, brainstorming, and writing assistance[4]. Successful implementation of AI in smart classrooms, however, depends not only on technological capability but also on user acceptance. According to technology acceptance research, students' willingness to adopt AI-based educational tools is influenced by perceived usefulness, ease of use, and trust in the technology[5]. At the same time, concerns about data privacy, ethical implications, and potential overreliance on AI remain widespread, particularly among students and educators educators[6,7].

Notwithstanding these challenges, a growing body of empirical evidence suggests that well-implemented AI teaching tools can improve learning efficiency and student satisfaction. For example, a recent large-scale survey at a Latin American university found that students perceived AI tools as having a significantly positive impact on their academic experience – enhancing their comprehension of course material, stimulating creativity, and boosting learning productivity[8]. When used thoughtfully, AI can personalize learning and provide responsive support, leading to higher student success and contentment in smart classroom environments[9]. Moreover, research shows that student attitudes and acceptance of AI are closely linked to how useful and easy-to-use the technology is perceived to be—consistent with classic models of technology acceptance such as TAM and related frameworks[10]

Given the significant investment in smart classroom infrastructure and AI tools, it is critical to understand how students actually perceive and embrace these innovations. Students are the ultimate stakeholders in the application of educational technology; their subjective evaluations will influence the scope and success of AI applications in everyday learning. However, there is still limited research focused specifically on Chinese higher education contexts—especially at regional universities like Xi'an University of Finance and Economics.Therefore, this study aims to examine students' subjective evaluation and acceptance of AI smart classrooms in the context of Xi'an College of Finance and Economics.

In this context, students were surveyed to understand their perceptions of the benefits (e.g., increased engagement and efficiency) provided by AI tools, as well as their reservations or conditions for accepting AI tools. The results of the survey will reveal university students' use of AI-assisted learning as well as their subjective evaluations, providing practical insights for educators and policymakers to help them better align AI learning innovations with students' needs. Ultimately, understanding student acceptance is key to capitalizing on the potential of AI in education-ensuring that smart classroom technologies are not only state-of-the-art, but also actively embraced by those they serve.

2. Methodology

2.1 Participants and Data Collection

This study used a cross-sectional survey design to investigate students' subjective evaluation and acceptance of AI smart classrooms. Data were collected in May 2025 using a structured online questionnaire for undergraduate students at Xi'an College of Finance and Economics. A total of 178 questionnaires were obtained, of which 166 were valid. Among them, 37 were male students and 129 were female students. All respondents participated voluntarily and anonymously and informed consent was obtained.

2.2 Measures

The questionnaire consisted of two major sections: students' experience and acceptance of AI-assisted learning, and their subjective evaluation of AI applications in education.

2.2.1 Use and Acceptance of AI-assisted Learning

Participants were asked if they were (1) aware of the concept of AI-assisted learning, (2) had used AI-assisted tools in their studies, and (3) expressed a high level of acceptance of AI-assisted learning. Responses to each item were recorded as a binary outcome (yes/no). In addition, the gender of the respondents was collected in this study to examine potential gender differences in experience and acceptance.

2.2.2 Subjective Evaluation of AI in Education

Students' subjective evaluations were measured by three variables: (1) Perceived usefulness: Based on a composite score of Likert scale items containing 10 questions, the total score ranged from 15 to 50. Higher scores indicate greater usefulness of AI-assisted learning. It should be noted that the scale asks students about their views on AI-assisted teaching from a variety of dimensions such as active learning, deep thinking, and personalized learning, and each question is scored from 1-5, with higher scores suggesting that Ai is useful. (2) AI's ability to increase interest in learning: Measured using a four-point Likert scale (1 = most likely, 4 = least likely), with lower scores indicating greater agreement. (3) Artificial Intelligence as an alternative to traditional teaching: Again, a 4-point scale was used, with lower scores indicating greater belief in the substitution potential of AI. All items were pre-tested with a small group of students to ensure clarity and relevance.

2.3 Data Analysis

Descriptive statistics were computed to summarize students' responses. Frequency distributions and percentages were used to compare AI learning awareness, usage, and acceptance across gender groups. Mean scores and standard deviations were calculated for all subjective evaluation variables. Data were analyzed using Stata 17.0.

To enhance the interpretability of results, gender differences were presented side by side in Table 1, while the central tendencies of subjective evaluations were shown in Table 2. No imputation was conducted for missing data, as all responses were complete.

3. Results

3.1 Use and Acceptance of AI-assisted Learning by Gender

Table 1 shows the distribution of students' awareness, use and acceptance of AI-assisted learning by gender. Among male students (n=37), 43.2% indicated that they were aware of the concept of AI-assisted learning, 78.4% indicated that they had used AI-assisted tools in their studies, and 86.5% indicated that they had a high level of acceptance. In contrast, among female students (n=129), a slightly higher percentage (51.2%) were aware of AI-assisted learning, with 76.7% indicating that they had used AI-assisted learning. Notably, 87.6% of the female students were highly receptive to AI-assisted learning.

Table 1: Use and Acceptance of AI-assisted learning by Students of Different Genders

Variable	Male	Female
1. Knowing the concept of AI-assisted learning, n (%)	16 (43.2%)	66 (51.2%)
2. Have used AI-assisted learning, n (%)	29 (78.4%)	99 (76.7%)
3. High acceptance of AI-assisted learning, n (%)	32 (86.5%)	113 (87.6%)
N	37	129

These findings suggest that acceptance of AI-assisted learning is generally high among both male and female students, and that usage and acceptance are relatively comparable between genders. However, the level of awareness of AI-assisted learning is still at a moderate level, which indicates that there is still room for further promotion of the concept of AI-assisted learning among the student population. In other words, students have and are willing to use AI-assisted learning even if they do not understand what AI-assisted teaching means.

3.2 Subjective Evaluation of AI in Education

Table 2 summarizes students' subjective evaluations of AI applications in education. For the usefulness of AI-assisted learning, the mean score was 29.91 (SD = 7.48) on a scale of 15 to 50, indicating that the evaluation was generally positive. When asked if AI could increase their interest in learning (1 = most likely, 4 = least likely), students rated the item with a mean of 2.15 (SD = 0.44), indicating that they viewed AI as having moderate to high potential.

In contrast, students were skeptical about replacing traditional teaching with AI, with a mean score of 2.23 (SD = 0.49), again using a 1-4 scale. This implies that although AI is seen as an important addition to education, students may still prefer traditional teaching methods or believe that AI cannot completely replace human teaching. Overall, the subjective ratings reflect students' positive view of the role of AI in enhancing the learning experience, as well as a cautious view of AI as a stand-alone educational solution.

Table 2: Descriptive Statistics of Students' Subjective Evaluation on AI in Education (N=166)

Variable	Values	Mean (SD)
AI-assisted learning Perceived usefulness	15 to 50, the bigger the more useful	29.91 (7.48)
AI may boost learning interest.	1 to 4, the bigger, the less likely.	2.15 (0.44)
AI as a substitute for traditional teaching	1 to 4, the bigger, the less likely.	2.23 (0.49)

4. Discussion

The results of this study reveal a high level of student acceptance of AI-assisted learning across both genders. More than three-quarters of students reported having used AI learning tools, and over 86% of both male and female respondents expressed high acceptance. These findings suggest that AI technologies are being rapidly embraced in the university context, even among students who do not necessarily have a full conceptual understanding of what AI-assisted learning entails. This gap between use and awareness may indicate a pragmatic approach among students—one that prioritizes usefulness over theoretical comprehension. Similar trends have been observed in international contexts. For instance, a study by Strzelecki found that university students' AI adoption was strongly predicted by perceived performance and habit, even in the absence of full conceptual clarity[11].

In terms of subjective evaluation, students rated the usefulness of AI-assisted learning moderately high (mean score: 29.91 out of 50), reflecting a generally positive experience with AI integration in the classroom. This supports existing literature which emphasizes the capacity of AI tools to enhance active and personalized learning. Chan and Hu (2023) found that generative AI was seen by students as valuable for brainstorming and writing support, especially when it was seamlessly integrated into the learning process [4]. However, our findings also suggest that students may not yet perceive the full transformative potential of AI in pedagogy, perhaps due to limited exposure or uneven instructional practices.

Another notable finding is that while students generally believed AI could increase learning interest (mean = 2.15), they were more reserved regarding the idea of AI replacing traditional

teaching methods (mean = 2.23). This suggests a preference for a hybrid educational model in which AI serves as a supplementary tool rather than a complete substitute for human instruction. These attitudes are consistent with those reported in a systematic review by Darvishi et al. (2024), which emphasized the importance of preserving human interaction and pedagogical judgment in AI-enhanced education [12]. Emotional intelligence, spontaneous dialogue, and empathetic feedback—qualities that remain difficult for AI to replicate—are likely reasons why students remain cautious about full automation.

Moreover, the relatively low proportion of students who understood the concept of AI-assisted learning (less than 52% overall) underscores the need for improved digital literacy education. Students' readiness to use AI tools should be complemented by institutional efforts to clarify what these tools are, how they function, and what ethical issues they may raise. As Viberg et al. (2023) suggest, fostering AI literacy—including critical understanding, not just functional use—is essential for responsible adoption in higher education settings[13].In this regard, universities should go beyond simply providing access to AI tools and invest in structured learning experiences that enable students to use them reflectively and responsibly.

Finally, this study provides useful evidence on how students at a regional Chinese university perceive and accept AI-assisted learning. Unlike many previous studies that focused on top universities or international contexts, this research offers a more localized view, helping to fill a gap in the existing literature. The findings can support universities in better understanding students' attitudes and in designing more effective AI-supported teaching strategies. However, the study also has some limitations. The data come from a single school and are based on self-reported questionnaires, which may not fully reflect actual behavior. In addition, because the survey was conducted at one point in time, it cannot show how students' views may change over time. Future studies could include more schools, use interviews or follow-up surveys, and explore changes in student attitudes more deeply.

Acknowledgments

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