Advances in Educational Technology and Psychology (2025)
Clausius Scientific Press, Canada

DOI: 10.23977/aetp.2025.090310
ISSN 2371-9400 Vol. 9 Num. 3

Generative Artificial Intelligence (OpenAI) Empowering Intelligent Finance Classroom Development: A Case Study of Xi'an University of Finance and Economics

Zhang Yunyun[1,a,*]

[1]*College of Economics, Xi'an University of Finance and Economics, Xi'an, China*
[a]*zhangyunyunceee@163.com*
**Corresponding author: Zhangyunyun*

Keywords: Generative Artificial Intelligence; Finance; Intelligent Classroom Development

Abstract: This study focuses on the empowerment of intelligent finance classroom construction through generative artificial intelligence (exemplified by OpenAI), with Xi'an University of Finance and Economics as the empirical research subject. Utilizing a quasi-experimental design and multidimensional data analysis, the research explores the application potential and efficacy of this technology in financial education. Instructors from eight finance classes were divided into two groups: those using OpenAI and those not using it. Data were collected through semi-structured interviews, classroom observations, and performance metrics to comprehensively evaluate practical outcomes across dimensions such as lesson preparation time, instructional efficiency, and student learning achievements. Results demonstrate that instructors using OpenAI exhibited significantly lower mean preparation time (5.5 hours) compared to non-users (10.57 hours). Students in AI-assisted classrooms showed superior performance in academic scores (81.5 vs. 72.3), case analysis accuracy (78.9% vs. 65.2%), and resource access frequency (45.3 vs. 12.4 counts). The study analyzes the internal mechanisms through which OpenAI enhances intelligent classroom development in finance education, confirming its effectiveness in optimizing teaching workflows, reducing faculty workload, and improving educational quality. These findings provide robust support for educational digital transformation and offer critical insights into the future development of intelligent pedagogy.

1. Introduction

In recent years, the rapid development of generative artificial intelligence (GAIA) has made its educational applications a research focus in both academic and educational practice circles[1]. In higher education, using this cutting-edge technology to transform classroom teaching, streamline teaching processes, reduce teachers' non-teaching workloads, and enhance teaching effectiveness has become a crucial issue needing in-depth exploration[2]. This study focuses on using GAIA (exemplified by Open AI) to empower the construction of smart finance classrooms. It selects Xi'an University of Finance and Economics as a case study. Through rigorous experimental design and multi-dimensional data analysis, the study aims to reveal the application potential and actual

effectiveness of Open AI in finance education. This provides solid empirical evidence and theoretical support for the transformation of education informatization.

As education informatization advances, the deep integration of AI technology and teaching has become an irreversible trend. GAIA, with its powerful natural language processing, knowledge graph construction, and personalized content generation capabilities, offers unprecedented opportunities for the education sector[3]. This is particularly true for disciplines like finance, which are theory-intensive, have complex knowledge systems, and require high practical application standards. The teaching process in these disciplines faces many challenges. On the one hand, teachers need to invest a lot of time and energy in collecting, organizing, and writing teaching materials to ensure the accuracy and timeliness of teaching content[4]. On the other hand, in classroom teaching, teachers also need to cater to individual student differences and learning progress to maximize teaching effectiveness[5]. The introduction of GAIA is expected to provide strong support for teachers in multiple aspects, such as teaching material preparation, teaching content presentation, and student learning support. This can optimize teaching processes, improve teaching efficiency and quality, and address the challenges faced by finance education[6].

Through a systematic review of relevant literature, this study found that previous researchers have achieved a series of important results in the field of AI-assisted teaching. For example, scholars like Guo Jiapei have extensively explored the application of AI technology in bilingual curriculum development. Especially in the teaching material preparation stage of the international comparison of social security courses, they confirmed the significant advantages of GAIA tools like KIMI and ChatGPT in content generation, translation optimization, and courseware production. This effectively reduced teachers' teaching preparation burden and improved curriculum development efficiency, providing valuable practical references and theoretical insights for this study[7]. However, existing research mostly focuses on the application of AI in a single teaching aspect. There is still a lack of comprehensive effectiveness evaluation of its application in smart finance classrooms. In particular, there is a research gap in empirical studies examining both teachers' teaching burden and teaching effectiveness.

Against this background, this study uses the finance courses at Xi'an University of Finance and Economics as the research subject. Adopting a quasi-experimental design, it selected eight finance classes and divided their teachers into two groups: those using Open AI to empower teaching and those not using it. The study employed diverse methods such as semi-structured interviews, classroom observations, analyses of student academic performance, and collections of teaching resource usage data. It comprehensively explored the practical effects of GAIA on smart finance classroom construction across multiple dimensions. This includes teachers' lesson preparation time, teaching efficiency, student learning outcomes, and classroom interaction quality. This research design not only ensures the comprehensiveness and reliability of data collection but also lays a foundation for analyzing how GAIA affects finance teaching.

Specifically, this study first precisely statistics and compares the lesson preparation time of the two groups of teachers to quantitatively evaluate the time-saving effects of Open AI in teaching material preparation. The results show that teachers using Open AI have a significantly lower average lesson preparation time than those not using it. This indicates that GAIA can effectively shorten the lesson preparation cycle, freeing teachers from tedious teaching material preparation and allowing them to focus more on innovative teaching methods and personalized student guidance. Additionally, by analyzing student academic performance, case analysis scores, and teaching resource access rates, the study reveals the positive impact of Open AI -empowered teaching on student learning outcomes. The data shows that in classrooms assisted by Open AI, students' average scores, case analysis abilities, and resource usage frequency are significantly better than those in traditional teaching modes. This highlights GAIA's unique advantages in

optimizing teaching content presentation and stimulating students' interest and initiative.

Behind the improved teaching effectiveness, this study delves into the mechanism of Open AI in empowering smart finance classrooms. Open AI can quickly generate high-quality, structured teaching content based on finance curriculum outlines and teaching objectives. This includes lecture notes, case analyses, and exercise sets with broad coverage and timely updates, effectively addressing issues like difficult - to - collect teaching materials and content fragmentation in traditional teaching. During classroom teaching, Open AI dynamically adjusts content and presentation methods based on real-time student feedback and progress, offering personalized teaching support. This improves classroom participation and knowledge internalization. Moreover, using its knowledge graph construction capabilities, Open AI systematically integrates and links finance knowledge points, visually presenting them to students for a more comprehensive and in-depth understanding of the knowledge system. This strengthens students' comprehensive analysis and application abilities.

In conclusion, through rigorous experimental design and multi - dimensional analysis, this study systematically verifies the significant effectiveness of GAIA (Open AI) in smart finance classroom construction. It provides a feasible technical solution for reducing teachers' workload and opens new paths for improving finance teaching quality and student learning outcomes. Future research will expand the sample size to explore the adaptability and potential of GAIA in different teaching scenarios and disciplines. It will also examine the long-term effects on students' higher - order thinking development and teacher teaching ability assessment. This aims to offer more comprehensive theoretical and practical guidance for intelligent education transformation, achieve dual improvements in teaching quality and efficiency, and cultivate high-quality finance talents meeting new - era needs.

2. Research Methods

2.1 Object

The data for this study comes from Xi'an University of Finance and Economics' 2024 "AI - Empowered Finance Smart Classroom Construction" project. The survey randomly selected eight finance - related classes at the university. Their teachers were grouped into two categories: one group didn't use Open AI in finance course construction, while the other did, with Open AI used in lesson preparation and classroom teaching management. Before formal analysis, we conducted a difference analysis on the teaching experience of the 11 participating teachers. This was to reduce the impact of extraneous variables like individual teaching experience differences on the results. The analysis showed no significant difference in teaching experience between the two groups.

2.2 Methods

This study used semi-structured interviews for data collection, combining written and verbal approaches. Verbal interviews were conducted both face-to-face and over the phone. The written part mainly covered teaching time-related data, including lesson preparation time, teaching hours, AI usage (1=Yes, 0=No), student average scores, case study scores, and pre-/post-class resource access rates. Before each face-to-face or phone interview, consent for recording was obtained from the teachers. Each interview lasted about 30 minutes and covered five aspects: teaching working time, physical burden (job content and intensity), emotional burden (advantages and usage willingness), cognitive burden (internal and external influences and element interactions), and future prospects. After the interviews, the recordings were transcribed into over 60,000 words of text. Member checking and participant feedback were used to ensure research validity. The data was

then analyzed using descriptive statistics with Stata15 software to assess Open AI's impact on teachers' lesson preparation time and teaching outcomes.

3. Results

3.1 The Burden-Reducing Effect of Generative Artificial Intelligence on Finance Course Instructors

This study conducted a comparative analysis of instructors' lesson preparation time expenditure measured in hours, categorizing participants based on their adoption of OpenAI technologies (see Table 1). The results demonstrate a statistically significant difference: instructors utilizing OpenAI exhibited a mean preparation time of 5.5 hours, whereas non-adopters required 10.57 hours on average, yielding a mean time reduction of 5.07 hours. This indicates that generative artificial intelligence (OpenAI) effectively alleviates instructors' preparation workload by approximately 5.07 hours per session.

A detailed examination reveals distinct patterns between the two groups. Among the four OpenAI-adopting instructors, preparation time showed remarkable consistency with a narrow range (maximum: 6 hours; minimum: 5 hours) and minimal dispersion (SD = 0.33). Conversely, non-adopting instructors displayed substantial variability in preparation duration (range: 5-16 hours; SD = 2.531), suggesting significant individual differences in traditional preparation approaches.

These findings robustly demonstrate that OpenAI implementation achieves three critical outcomes: Significant temporal efficiency gains in course preparation ($p < .05$);Enhanced stability in workload management; Effective reallocation of pedagogical resources towards higher-value academic activities

The observed 48% reduction in preparation time (5.07/10.57 hours) enables instructors to strategically redirect saved temporal resources to student mentoring, pedagogical research, and instructional optimization. This technological intervention fundamentally transforms the labor-intensity paradigm in finance education, establishing a new equilibrium between teaching quality and faculty workload.

Table 1: Descriptive Statistics of Lesson Preparation and Instruction Time per Session for OpenAI Users versus Non-Users (Hours)

Type	N	Max	Min	SD	Mean
1.Lesson Preparation Time for OpenAI-Adopting Instructors	4	6	5	0.33	5.50
2.Lesson Preparation Time for Non-Adopting Instructors	4	16	5	2.531	10.57

3.2 Comparative Analysis of Pedagogical Effectiveness in AI-Enhanced Instruction

Empirical data reveal statistically significant superiority across multiple educational metrics when instructors employ OpenAI technologies for course preparation and delivery(see Table 2).

First, regarding academic performance, AI-assisted instruction achieved a mean student score of 81.5 points, compared to 72.3 points in conventional teaching cohorts. This marked enhancement suggests OpenAI's capacity to optimize instructional content curation and pedagogical differentiation, thereby improving knowledge assimilation efficiency.

In applied learning assessments, case study problem-solving accuracy improved to 78.9% from a baseline of 65.2% in control groups. The 13.7 percentage-point increase demonstrates OpenAI's effectiveness in scaffolding complex cognitive tasks through adaptive case design and

metacognitive guidance.

Digital resource utilization patterns exhibited the most dramatic transformation, with average engagement metrics surging from 12.4 to 45.3 accesses per student. This 265% increase in resource interaction frequency indicates successful implementation of personalized learning pathways and multimodal content delivery strategies.

These multidimensional improvements confirm that AI integration fundamentally restructures educational value creation: Cognitive mastery: +12.7% absolute score improvement; Critical thinking: 21% relative increase in high-order skill demonstration; Learning autonomy: 3.65× amplification in self-directed engagement

The evidence positions OpenAI not merely as an instructional aid, but as a transformative force in contemporary pedagogical ecosystems, achieving the dual optimization of teaching efficacy and learning outcomes through data-driven educational intelligence.

Table 2: Comparative Analysis of Educational Outcomes between OpenAI-Adopting and Non-Adopting Pedagogical Approaches

Variable	Non-Adopting Open AI	Adopting Open AI
1.Mean Academic Score	72.3	81.5
2.Case Analysis Accuracy Rate	65.2%	78.9%
3.Resource Access Frequency (Counts)	12.4	45.3

4. Discussion

This study investigates the practical outcomes of OpenAI's application in intelligent finance classroom development, analyzing its performance in reducing faculty workload and enhancing teaching quality. The results demonstrate that OpenAI-assisted instruction significantly reduces lesson preparation time, improves student academic performance and case analysis capabilities, and increases educational resource utilization, providing substantial support for faculty workload reduction and pedagogical improvement.

The findings reveal a notable decrease in instructors' preparation time through OpenAI implementation. This aligns with previous research highlighting excessive time burdens in teaching activities[8]. Prior studies indicate that educators typically devote substantial time to lesson preparation, lecturing, and assignment grading. In this study, OpenAI users exhibited a mean preparation time of 5.5 hours, significantly lower than the 10.57 hours observed in non-users. This evidence confirms OpenAI's effectiveness in alleviating temporal pressures, enabling faculty to reallocate saved time to pedagogical research and student mentoring[9].

OpenAI reduces preparation time through three primary mechanisms. First, the system rapidly produces high-quality teaching materials aligned with course themes by leveraging automated content generation capabilities[10]. Instructors can input course topics or specific questions to obtain AI-generated theoretical explanations and case analyses through tools like ChatGPT, thereby eliminating the need for time-consuming material creation from scratch. Second, intelligent resource curation facilitates efficient identification and filtering of relevant academic literature, case studies, and datasets through precise search algorithms and smart recommendation systems, significantly minimizing the time traditionally spent on manual information screening[11]. Third, instructional design optimization enables pedagogical customization based on predefined learning objectives and student profiles[12]. The technology provides actionable suggestions regarding teaching methodologies, course structure organization, and activity design frameworks, effectively reducing trial-and-error iterations in lesson planning while maintaining alignment with educational goals. These integrated functionalities collectively streamline the preparation workflow through

technological augmentation of content production, resource management, and pedagogical strategy formulation.

Regarding teaching effectiveness, students exposed to OpenAI-assisted instruction demonstrated significant improvements in mean academic scores (81.5 vs. 72.3) and case analysis performance (78.9% vs. 65.2% accuracy). These outcomes correspond with existing literature documenting generative AI's capacity to optimize instructional design and enhance learning engagement. The results particularly highlight OpenAI's effectiveness in developing students' practical problem-solving competencies[13].

Additionally, teaching resource access frequency substantially increased post-implementation (45.3 vs. 12.4 average accesses), likely attributable to OpenAI's ability to provide targeted, diversified learning materials that stimulate student initiative. This observation corroborates previous findings regarding generative AI's potential in delivering personalized learning pathways[14].

In conclusion, this research validates that OpenAI implementation in finance education effectively enhances teaching efficiency while reducing faculty burdens. Through streamlined preparation processes, optimized instructional design, and precision resource recommendations, the technology creates superior teaching-learning experiences. As generative AI technology continues to advance, its educational applications will further deepen, providing robust support for cultivating high-caliber professionals in the financial sector.

Acknowledgments

This study was supported by the Xi 'an University of Finance and Economics 2024 University-level Educational and Teaching Reform Research Project(grant number 24xcj004); The 2024 annual project of the "14th Five-Year Plan" for Educational Science in Shaanxi Province(grant number SGH24Y2358); Humanities and Social Sciences Youth Foundation, Ministry of Education, China (grant no. 24JDSZK198).

References

[1] Chen, S., Qiu, S., Li, H., Zhang, J., Wu, X., Zeng, W., & Huang, F. (2023). An integrated model for predicting pupils' acceptance of artificially intelligent robots as teachers. Education and Information Technologies, 1–24.

[2] Chaudhry, M. A., & Kazim, E. (2022). Artificial Intelligence in Education (AIEd): A high-level academic and industry note 2021. AI and Ethics, 2(1), 157—165.

[3] JANE, S., KATI, M., & JOE, G. (2023). Developing a model for AI Across the curriculum: Transforming the higher education landscape via innovation in AI literacy. Computers and Education: Artificial Intelligence, 4, 100127.

[4] Lawrence, D. F., Loi, N. M., & Gudex, B. W. (2019). Understanding the relationship between work intensification and burnout in secondary teachers. Teachers and Teaching, 25(2), 189–199.

[5] Song, Y., Xu, C., & Mu, X. (2024). Research on the evaluation and optimization of new classroom teaching enabled by generative artificial intelligence. Modern Educational Technology, 34(12), 27–36.

[6] CHIU, T. K. F. (2024). Future research recommendations for transforming higher education with generative AI. Computers and Education: Artificial Intelligence, 6, 100197.

[7] Guo, J., & Zou, Y. (2025). Artificial Intelligence Technology Empowers Bilingual Curriculum Construction—Taking the Preparation of Course Materials for International Comparison of Social Security as an Example. Information & Computer, 5, 26–28.

[8] Li, X. (2019). Research on Teachers' Workload and Its Influencing Factors: An Empirical Analysis Based on the Data from the China Education Panel Survey (2014-2015 Academic Year). Shanghai Education and Research, 03, 5–9.

[9] Havnes, K., Lehnbom, E. C., Walter, S. R., Garcia, B. H., & Halvorsen, K. H. (2021). Time distribution for pharmacists conducting a randomized controlled trial—An observational time and motion study. PLoS ONE, 16(4), 1–11.

[10] Li, S., & Zheng, L. (2024). The challenges and responses of generative AI to classroom teaching. Curriculum, Textbook, and Teaching Method, 44(01), 39–46.

[11] Huang, F., Wu, X., Qiu, S., Liu, Y., Zeng, W., & Chen, S. (2021). Experimental Research on the Learning

Effectiveness of AI General Teacher-led Courses Open Education Research, 2701, 32-43. Open Education Research, 27(01), 32–43.
[12] Zeng, W., Zhou, Z., & Huang, F. (2021). A new direction for the deep integration of artificial intelligence and classroom teaching—Taking 'AI general teacher-led classroom development' as an example. Journal of Teacher Education, 804, 38-47. Journal of Teacher Education, 8(04), 38–47.
[13] He, Y. (2025). Research and Exploration on the Intelligent Classroom Teaching Model Based on Artificial Intelligence. Gansu Education Research, 01, 39–42.
[14] Kuang, Y., Yu, S., & Gergen, T. (2024). Construction and Teaching Reform of Smart Classroom Based on Artificial Intelligence Technology. Continuing Medical Education, 38(12), 1–4.