# Impacts of Artificial Intelligence on Students' Collaborative Learning of Film and Television Media

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## Abstract

This study explores the impact of AI technology on students' collaborative learning, academic performance, learning attitude, and creative development levels in undergraduate film and television media courses. This study used a quasi-experimental design with participants from four universities: Sichuan University of Communication, Sichuan University, Jilin Animation College, and Chengdu University. The experiment was conducted from March to August 2024. The experimental group adopted an AI-assisted collaborative learning strategy (n = 472), and the control group participated in traditional classroom teaching (n = 118). The Attitude Scale measured students 'attitudes towards AI collaborative learning, and performance tests assessed the impact of AI applications on students' academic performance. For an exploratory analysis, we conducted in-depth interviews with the students. The results show that AI collaborative learning significantly improves students' academic performance and creative development level. Students in both groups scored high attitudes towards AI collaborative learning, and the students in the experimental group spoke highly of the innovation and motivational improvement of AI collaborative learning. Researchers and educational practitioners should consider that AI collaborative learning can positively affect academic achievement and student performance and significantly increase students' learning motivation.

**Keywords**: Artificial intelligence, Collaborative learning, Film and television and media education, Technology application, Educational innovation

## Introduction

With the rapid development of digital technology, the application of artificial intelligence (AI) in education, especially in film and television media education, has made remarkable progress. Integrating AI technology revolutionizes traditional teaching methods and learning approaches, providing new tools and methodologies for education practitioners and learners. However, with the widespread spread of these emerging technologies, the traditional collaborative learning models face new challenges and open up unique opportunities. As a student-centered education method, collaborative learning has long played an important role in film and television media education. Through collaborative learning, students can solve problems in a team environment and develop creative thinking and critical analysis skills [Dillenbourg, 1999]. This method is especially suitable for practice-oriented subjects such as film and television media because it can simulate the real working environment and encourage students to learn and apply what they have learned in practice [Johnson & Johnson, 1999]. However, the traditional collaborative learning model faces many challenges, such as uneven student participation, resource allocation, and difficulty in teachers managing team activities effectively [Slavin, 2011].

The rise of artificial intelligence technology has provided new ideas for solving these problems. Through AI-driven tools, such as intelligent recommendation systems, automated evaluation software, and virtual collaboration platforms, teachers can better track students' learning progress, provide personalized feedback, and optimize the efficiency of team collaboration [Huang & Rust, 2018]. These tools can not only reduce teachers' burden but also help students gain a deeper understanding and higher creative output in collaboration [Luckin et al., 2016].

Although AI technology provides strong support for improving the teaching effect, its application in collaborative learning still faces challenges. First, the complexity and implementation cost of AI technology may limit its wide application in the field of education, especially in resource-limited educational institutions [Holmes et al., 2019]。 Second, the use of AI technology may raise concerns about data privacy and ethical issues, especially when dealing with students' data [Zawacki-Richter et al., 2019].In addition, balancing the relationship between AI technology and humanities education to ensure that the application of technology does not weaken students' deep understanding of the artistic creation process is an urgent problem to be solved [Selwyn, 2019].

**Objectives**

To examine the impact of AI-assisted collaborative learning on students' academic performance

To compare students' attitudes toward AI-assisted collaborative learning.

To study how students perceive AI application-assisted collaborative learning.

**Research Methods**

**Research Design**

This study used a quasi-experimental design (quasi-experimental design) to evaluate the impact of AI technology on collaborative learning in film and television media education.

**Sample**

Samples were students enrolled in four universities in 2024 that have extensive influence and rich teaching resources in film and television media education in China, including Sichuan Media University, Sichuan University, Jilin Animation College, and Chengdu University. Four hundred and seventy-two students are assigned to the experimental group and one hundred and eighteen to the control group, as in Table 1

Table 1: Number of Students in the experimental and controlled groups by subjects, schools, and year of study

| Subjects | Schools | Year of Study | Experimental group | Control group |
|----------|---------|---------------|---------------------|----------------|
| Screen Writer | Sichuan University of Media and Communication | Second-grade undergraduate | 45 | 15 |
| | SCU | Second-grade undergraduate | 30 | 6 |
| | Jilin Animation Institute | Second-grade undergraduate | 41 | 17 |
| | Chengdu University | Second-grade undergraduate | 30 | 6 |
| Film and Television | Sichuan University of Media and | Undergraduate grade three | 45 | 7 |

| Subjects | Schools | Year of Study | Experimental group | Control group |
|---|---|---|---|---|
| Arts | Communication | | | |
| | SCU | Undergraduate grade three | 28 | 4 |
| | Jilin Animation Institute | Undergraduate grade three | 46 | 7 |
| | Chengdu University | Undergraduate grade three | 30 | 7 |
| Director Thinking | Sichuan University of Media and Communication | Second-grade undergraduate | 82 | 24 |
| | SCU | Second-grade undergraduate | 25 | 6 |
| | Jilin Animation Institute | Second-grade undergraduate | 40 | 12 |
| | Chengdu University | Second-grade undergraduate | 30 | 7 |
| | | | 472 | 118 |

**Experimental group:** The students in the experimental group used a variety of AI assistance tools, such as ChatGPT, Zhiying Secret Circle, and Baidu "Wenxin Yiyi", which were integrated into their collaborative learning tasks to improve their learning effect and collaborative efficiency. The main task of students in the experimental group is to use these AI tools to conduct teamwork, create projects, deliver achievement presentations, and receive the corresponding learning evaluation.

**Control group:** Students in the control group did not use AI tools but relied on traditional learning methods and collaboration modes to perform the same learning tasks. Their tasks included completing the project through a face-to-face discussion, a conventional information lookup, a manual authoring process, and undergoing the same learning assessment.

Data collection

The data collection process for this study was rigorously designed, combining multiple quantitative and qualitative methods to ensure the reliability and comprehensiveness of the findings. Data was collected throughout the semester (March to June 2024, late callback two months), covering the three core courses: Screen Writers, Film and Television Art, and Director Thinking. The primary data collected include academic performance evaluation, students' attitudes toward artificial intelligence-assisted collaborative learning survey, and students' perception of the application of artificial intelligence in collaborative learning.

Data analysis

## 1. Impact of AI-assisted collaborative learning on students' Academic Performance.

This study used a combination of parametric and non-parametric tests to assess the impact of AI-assisted collaborative learning on academic performance in film and television media students.

Table 2 :The difference in academic performance between students with and without AI tools in each course

| Group | Course | N | Mean Rank | Sum of Ranks | Mann-Whitney U | Z-value | Sig. |
|---|---|---|---|---|---|---|---|
| Experimental | Screenwriting | 472 | 300.10 | 141,647.00 | 110,768.500 | -2.564 | .010 |
| Control | | 118 | 286.45 | 33,721.00 | | | |
| Experimental | Visual Arts | 472 | 320.34 | 151,600.00 | 94,351.000 | -4.360 | .000 |
| Control | | 118 | 245.89 | 29,015.00 | | | |
| Experimental | Directing | 472 | 310.56 | 146,591.50 | 98,356.500 | -3.256 | .001 |
| Control | | 118 | 229.44 | 27,020.50 | | | |

The analysis showed that the experimental group had significantly better academic performance than the control group in collaborative learning using AI. For example, in the Written Writing course, the mean grade of the experimental group was significantly higher than the control group, with a Mann-Whitney U value of 110768.500 and a Z-value of-2.564, significance p <.05. Similarly, in the courses of "Film and Television Art" and "Director Thinking," the academic performance of the students in the experimental group also showed significant

advantages, with corresponding Z values of -4.360 and -3.256 respectively, with significance p <.05.

Based on the above analysis, students who used AI-assisted learning tools had significantly better academic performance in all courses than those who did not. The results show that AI technology significantly improves students' academic performance, especially regarding creative expression, technology application, and teamwork.

In addition, the students in the experimental group maintained high academic performance in the subsequent follow-up tests, indicating the continuous positive impact of the application of AI tools. These findings suggest that the application of AI in film and television media education not only improves students' academic performance but also provides new tools and methods for future educational practice.

## 2. Students' attitudes toward artificial intelligence assisted in the collaborative learning of film and television media education

This study assessed students' attitudes towards AI-assisted collaborative learning through a structured questionnaire, focusing on four dimensions: satisfaction, impact on education, motivation, and usability. The questionnaire was conducted in three stages: before, after, and subsequent tests. Students' attitudes towards using AI tools were collected at each stage.

The independent sample t-test and Mann-Whitney U test were used to compare the scores of the experimental group (N=472) and the control group (N=118) in each dimension. Results are shown in Table 3

Table 3: Results of the comparison of students' attitudes between the experimental and control groups

| Dimension | Group | Phase | N | Mean (X) | Standard Deviation (SS) | t-value | Sig. |
|---|---|---|---|---|---|---|---|
| Satisfaction | Experimental | Pre-test | 472 | 74.13 | 9.72 | 0.754 | .528 |
| | Control | | 118 | 73.68 | 11.52 | | |
| | Experimental | Post-test | 472 | 78.80 | 12.42 | 2.341 | .021 |
| | Control | | 118 | 74.00 | 11.33 | | |
| | Experimental | Follow-up | 472 | 80.53 | 13.84 | 3.214 | .002 |
| | Control | | 118 | 75.73 | 13.84 | | |
| Impact on Learning | Experimental | Pre-test | 472 | 42.60 | 8.08 | -0.079 | .206 |
| | Control | | 118 | 45.38 | 6.60 | | |
| | Experimental | Post-test | 472 | 50.77 | 5.78 | 3.453 | .001 |
| | Control | | 118 | 44.73 | 6.02 | | |
| | Experimental | Follow-up | 472 | 52.53 | 6.49 | 4.201 | .000 |
| | Control | | 118 | 44.53 | 6.49 | | |
| Motivation | Experimental | Pre-test | 472 | 26.00 | 3.93 | -0.868 | .722 |
| | Control | | 118 | 26.46 | 3.99 | | |
| | Experimental | Post-test | 472 | 32.67 | 5.27 | 3.202 | .002 |
| | Control | | 118 | 26.50 | 5.03 | | |
| | Experimental | Follow-up | 472 | 34.73 | 5.85 | 4.001 | .000 |
| | Control | | 118 | 24.88 | 5.85 | | |
| Usability | Experimental | Pre-test | 472 | 22.47 | 4.45 | -1.369 | .091 |
| | Control | | 118 | 26.04 | 5.56 | | |
| | Experimental | Post-test | 472 | 30.08 | 4.45 | 2.837 | .005 |
| | Control | | 118 | 26.21 | 4.55 | | |
| | Experimental | Follow-up | 472 | 32.40 | 4.94 | 3.456 | .001 |
| | Control | | 118 | 30.42 | 5.04 | | |

Shown in Table 4, the experimental group scored significantly higher than the control group in terms of satisfaction, impact on learning, motivation, and availability, especially in the post-experiment and subsequent testing stages ($p < .05$)。 These results suggest that the application of AI tools in collaborative learning has a significant positive effect on improving students' learning experience and attitudes. Students showed higher satisfaction with using AI tools, stronger learning motivation, and higher recognition of the tools.

**3. Students' perception of the application of artificial intelligence in collaborative learning**

Five students were randomly selected from the experimental group for in-depth interviews to deeply understand the effect of the application of artificial intelligence (AI) tools in the collaborative learning of film and television media. These students participated in the AI-assisted collaborative learning of three courses: Screenwriter, Film and Television Art, and Director Thinking, and used various AI tools. The interviews were semi-structured based on the interview framework, containing nine open-ended questions exploring students' specific experiences using the AI tool. The following is an academic summary of the interview results:

a) **The overall impact of AI on the learning process**

Students generally believe that AI tools significantly enhance their learning efficiency and learning experience. AI tools can provide personalized learning advice and real-time feedback to students on their learning progress. The students consider this immediate feedback to be one of the critical factors for improving the learning effect. However, some students also mentioned that because the intelligent algorithms of AI tools sometimes give different suggestions from those expected, they are required to make further judgments and choices, thus increasing the cognitive load in the learning process.

b) **The promotional role of artificial intelligence in collaborative learning**

In teamwork, students felt that the AI tool was active in coordinating group work, assigning tasks, and sharing resources. AI tools can help team members better understand each other's progress and provide objective data-based advice, thus reducing misunderstandings and conflicts due to poor communication. Some students mentioned that AI tools promote collaboration efficiency and enhance trust and cooperation among team members

c) **Application of AI in specific tasks**

Students fully utilize the powerful functions of AI tools in executing specific tasks. For example, in the Writing course, students use AI to generate a preliminary draft script and make creative adjustments based on this; in Film Art, AI tools help students quickly generate visual prototypes; and in Director Thinking, AI tools are used to simulate scene construction of different director styles. Students generally believe that AI tools significantly improve task completion efficiency and make complex creative processes more controlled and efficient.

d) **The impact of artificial intelligence on creative expression**

148

There are some differences in students' feedback on AI's impact on creative expression. Most students believe that AI tools provide a lot of useful material and inspiration in the creative generation stage, helping them to break through the creative bottleneck. However, some students point out that AI tools' recommendations are sometimes too stylized, limiting their personalized expression. Students hope AI tools provide flexible, creative support while maintaining creative freedom in future learning.

### e)  Students' adaptability to AI technology

Students believed that specific technical skills and adaptability were needed to use AI tools. Although most students can master the basic operation of AI tools quickly, they think that more profound learning and continuous adaptation are required to realize AI's full potential. Some students mentioned that in the early stage of using AI tools, they gradually adapted and trusted the technology, which affected their learning efficiency to some extent.

### f) The role of AI tools in teaching

Students generally believe that AI tools partially replace traditional learning methods in their learning process, especially in information acquisition and task management. AI tools can automate much preliminary data analysis and information collation work, allowing students to focus more on high-level creative thinking. However, students also pointed out that AI tools do not completely replace traditional learning methods but are auxiliary tools to help them better complete their learning tasks.

g) Impact of AI on learning outcomes

Most students believe that AI tools can significantly improve their learning outcomes, especially in decomposing and managing complex tasks. Applying AI tools enables students to complete learning tasks more systematically and achieve higher-quality learning output in a shorter period of time. However, students also mentioned that the effectiveness of AI tools largely depends on their proficiency in the tools and their deep understanding of the creative process.

h)  Expectations for the future applications of AI technology

Students have a positive attitude towards applying AI technology in learning and hope to make better use of AI tools in future learning processes. They expect AI tools to enhance further their role in creative generation, team collaboration, and learning analysis. They also expect these tools to be more intelligent and personalized to better adapt to the needs of different learners.

l) Overall evaluation of the AI tools

Overall, students highly rated the role of AI tools in collaborative learning. They believe that AI tools improve learning efficiency and outcomes and promote teamwork and personal creativity expression to a large extent. However, students also stressed that AI tools should be combined with traditional learning methods to maximize their utility in collaborative learning.

## Discussion and Suggestions

Impact of AI on academic performance: The results of this study show that AI-assisted collaborative learning significantly improves students' academic performance. The experimental group students were significantly better than the control group in Screenwriting, Film and Television Art, and Director Thinking courses. This finding is consistent with the study by Zawacki-Richter et al. (2019), which showed that AI technology has significantly improved students' learning outcomes through personalized learning paths and automated feedback systems. In addition, Chen et al.(2020) also pointed out that the application of AI in personalized learning and automated evaluation enables students to obtain more accurate learning feedback promptly, thus improving their academic performance.

The impact of AI on the effectiveness of collaborative learning: Research has found that AI also plays an important role in improving the efficiency of collaborative learning. Students in the experimental group said that AI tools played a positive role in task allocation, resource sharing, and team communication, and significantly improved the effect of teamwork. This aligns with the findings of Huang & Rust (2018), who found that AI-driven collaboration tools optimize team dynamics, reduce communication barriers, and improve collaboration efficiency.

The impact of AI on creative expression: While most students think AI tools are useful in creative generation to overcome creative bottlenecks, others point out that AI tools' suggestions are sometimes too stylized to limit their personalized expression. The result is consistent with Selwyn's (2019) view, which noted that while AI technology can accelerate the generation of ideas, its automation may inhibit the uniqueness of creators.

Students 'attitude and experience towards AI-assisted learning: Students' attitude towards AI-assisted learning is generally positive, believing that AI tools significantly improve learning efficiency and collaboration quality. However, some students experienced a process of gradual familiarity and trust in the initial stages of adaptation to these tools, suggesting that educators should focus on the process of the students' adaptation and provide the necessary

support and training when introducing AI technology. Holmes et al.(2019) also pointed out that students' acceptance and adaptability of AI technology directly affect the effectiveness of technology applications.

**Suggestions**

This study explores AI's influence on collaborative learning in film and media education through empirical analysis. The results show that AI technology can significantly improve students 'academic performance, optimize the efficiency of collaborative learning, and stimulate students' creative potential to some extent. However, the application of AI technology still faces challenges, such as the programming of technology may limit students 'personalized expression, and students' adaptability to technology also needs to be further considered.

 Future research should further explore how to optimize the design of AI tools to support students 'creative development while retaining students' personalized expression. Moreover, educators should focus on developing students' ability to adapt to AI technology to ensure that the technology can be effectively used in teaching.

In general, the application of artificial intelligence in the collaborative learning of film and television media has shown broad prospects. When combined with traditional teaching methods, AI technology can provide educators with more effective teaching tools and promote teaching innovation.

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