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Evaluating the Effectiveness of MOOCs in Blended Learning: A Study in Chinese Universities

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Abstract

Background and Aim: With the rapid advancement of educational technology, integrating Massive Open Online Courses (MOOCs) into literature courses has emerged as a significant pedagogical trend. While MOOCs offer accessibility and flexibility, their effectiveness in enhancing students' academic performance in literature courses remains debated. This study aims to examine the impact of MOOC-integrated blended learning on foundational knowledge, writing ability, and critical thinking among literature students in higher education.

Materials and Methods: This study employed a quasi-experimental design with a nine-week intervention. A total of 109 students from a Chinese university participated, with 55 in the experimental group and 54 in the control group. Pre-tests and post-tests were conducted, and independent sample t-tests were applied to analyze differences in learning outcomes across the three key variables.

Results: The findings indicate that MOOC integration significantly improved students' foundational knowledge ($p=0.004$) and critical thinking skills ($p=0.019$). However, the experimental group exhibited lower writing scores compared to the control group ($p=0.001$), suggesting that MOOCs may not provide sufficient interactive support for writing skill development.

Conclusion: This study demonstrates that MOOC integration in a Chinese literature course significantly enhances foundational knowledge and critical thinking but negatively impacts writing skills. To address this, blended learning designs should incorporate structured writing activities with personalized feedback mechanisms (e.g., peer review, instructor conferencing, or calibrated AI-assisted tools) to provide targeted support for writing development.

Keywords: MOOCs; Blended Learning; Higher Education; Literature Courses; Critical Thinking; Writing Ability; Quasi-experimental Study

Introduction

The Current Situation of Blended Learning

Educational informatization is a widely used local term in several Asian countries, including China. It refers to the systematic and comprehensive utilization of modern information technology within higher education systems (Yu et al., 2005). This concept provides methodologies, technologies, and innovative practices for the educational system (Lytvyn et al., 2020). In recent years, with the rapid development of educational information technology, transforming traditional classroom structures, enhancing teachers' information literacy, constructing new informatized teaching formats, and promoting the integration of information technology and pedagogy have become significant research topics in education (Ma & Li, 2022).

As modern educational technologies evolve, digitization has become a continuation of informatization (Levina, 2019). In contrast, the foundation of digitization lies in the extensive introduction of electronic resources and digital technologies into teaching practices, which offers numerous opportunities for the development of students' abilities. Specifically, digital education is closely tied to the use of electronic content, e-learning environments, social media, virtual reality technologies, and open information systems (Frolova et al., 2020).

Digital education enables students and learners to acquire knowledge more easily than before by employing various methods of information collection, thereby reducing the time required for learning(Islam & Jahan, 2018). Graham (2006) defines blended learning as "the integration of face-to-face and computer-mediated instruction (Graham, 2006) ." Garrison and Kanuka (2004) describe it as " the thoughtful integration of classroom face-to-face learning experiences with online learning experiences (Garrison &

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Kanuka, 2004)." This elucidates that blended learning is an educational approach that merges traditional classroom teaching with online learning facilitated by computer technology. The adoption of blended teaching methods has rapidly increased as educators recognize their potential to enhance students' satisfaction with their learning experiences and their academic achievements (Lim & Morris, 2009). Although blended learning has been a feature of higher education for nearly two decades, it continues to evolve and has yet to be fully embedded and institutionalized within higher education institutions (Smith & Hill, 2019).

Introduction to the Chinese Literature Course

Researchers conducting a search on Google Scholar with "the Chinese literature course" as the keyword yielded ten entries, nine of which were books. Among these, four books defined Chinese literature as contemporary and modern Chinese literature (Denton, 2016; Hightower, 1953; Jones, 1994; Smith & Hill, 2019), while three encompassed a comprehensive history of Chinese literature (Chang, 1973; Giles, 2008; Shadick, 1968), including both ancient and contemporary eras. The focus of this research is a course within the Chinese Language and Literature major, specifically on contemporary and modern Chinese literature. The starting point of modern Chinese literature varies in different documents across different eras, specifically referring to the period following the collapse of the Qing Dynasty, marking the end of the imperial era and the beginning of modern society in the history of Chinese literature.

The Current Situation of Blended Learning in Chinese Literature Courses

In the existing English literature, there are relatively few studies on blended teaching in Chinese literature courses, mainly focusing on the following points: (1) changes in the method of teaching Chinese literature as a second language under other language systems (Hwa et al., 2012), (2) blended teaching in literature and culture courses in Chinese language teaching (Wu, 2021), (3) research on the educational practice of blended teaching in Chinese literature courses (Cho et al., 2020), but conference papers dominate this kind of research.

Statement of the Problem

Firstly, from the above discussion, it is evident that Chinese literature courses are foundational to the curriculum of Chinese Language and Literature majors, characterized by their comprehensive content and the requirement to read a vast array of literary works. Traditionally, these courses have relied on conventional teaching methods, with limited application of modern educational technology in the instruction of Chinese literature.

Secondly, research conducted over the past decade indicates that digital natives' usage and perception of technology do not reflect the profound changes in higher education teaching and learning that were anticipated (Caviglia et al., 2018). This situation mirrors the dual gap between expectations and reality observed in literary works. A noticeable discrepancy exists between the expected acceptance of blended education by digital native students and their actual engagement, highlighting differences between the potential of technology and the implementation by educators, as well as between the perception of millennials as digital natives and their actual use of technology in learning contexts (Naveh & Shelef, 2021).

Lastly, uneven and insufficient development has been a characteristic phase of higher education in China, representing a structural issue that requires long-term resolution. This disparity is initially evident in the resource gap between universities in western and eastern regions. Furthermore, the imbalance extends to differences among various types of institutions. For example, according to the 2016 Quality Report on Undergraduate Education by the Ministry of Education's Evaluation Center, monitoring data of the basic state of teaching in 787 universities showed that in 2015, a total of 1,010,998 courses were offered. Among these, 985 universities averaged 3056.9 courses each, 211 universities averaged 2284.2 courses each, ordinary undergraduate universities averaged 1837.0 courses each, newly established undergraduate universities averaged 875.3 courses each, and independent colleges averaged 769.0 courses each (Xia et al., 2023).

Therefore, there is reason to believe that the emergence of blended education could enhance the overall quality of education in Chinese universities, potentially bridging the gap between disparities across

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regions and university tiers and promoting educational equity. Thus, this paper aims to explore the application of blended education in university literature courses, based on this premise.

Research Objectives:

1. To evaluate the impact of MOOC-integrated blended learning on students' foundational knowledge acquisition in Chinese literature courses compared to traditional instruction.
2. To assess whether MOOC-integrated blended learning enhances or impedes students' writing abilities in Chinese literature courses.
3. To determine the effect of MOOC-integrated blended learning on the development of critical thinking skills among students in Chinese literature courses.

Literature review

MOOC

In 2008, George Siemens and Stephen Downes offered a course titled "Connectivism and Connective Knowledge," introducing the term "MOOC".Because of their open nature, MOOCs are accessible to everyone with an Internet connection, allowing learners and facilitators to engage in dialogue, sharing, and introspection. Therefore, proponents emphasize how it can improve lifetime learning and provide more creative chances for higher education to everyone, regardless of background or expertise (Littlejohn et al., 2016). The widespread use of modern mobile technologies additionally makes MOOCs available anywhere, at any time (De Freitas et al., 2015).

MOOCs are designed to facilitate mass participation and open access via the internet. These courses aim to provide an interactive and engaging learning experience, combining videos, lectures, and readings with interactive elements like forums and quizzes (Seidametova, 2018). Moreover, MOOCs are described as "online courses designed for a large number of participants, which can be accessed by anyone anywhere as long as they have an internet connection, free of charge, with no formal prerequisites" (Veletsianos & Shepherdson, 2016). This definition highlights the accessibility and inclusivity of MOOCs, emphasizing their role in democratizing education by removing geographical, financial, and prerequisite barriers.

Furthermore, researchers have found that the advent of MOOCs has better facilitated the implementation of flipped classroom models in traditional teaching. The flipped classroom model, where students engage with online content (such as MOOCs) outside of class and focus on interactive activities in class, has become increasingly popular. This approach maximizes classroom time for discussion and practical application of knowledge. Educators use MOOC content as supplementary material, providing students with a broader range of learning resources and interactive content (Ghanbarzadeh et al., 2014).

Many universities are adopting a blended learning model, using MOOCs to complement traditional classroom teaching. This approach allows for a combination of online and face-to-face learning, enhancing the educational experience (Seidametova, 2018).

Constructivism

Cognitive constructivism is based on the works of Swiss developmental psychologist Piaget. He believes that learning happens through active construction of meaning. As learners, when we encounter experiences or situations that challenge our way of thinking, we develop a state of inequality. Then, we must change our thinking to restore balance. For this purpose, we attempt to integrate new information into our existing knowledge. When we are unable to do that, we adapt to higher-level thinking by restructuring existing knowledge (Amineh & Asl, 2015). The rise of constructivism as a philosophy has had a profound impact on classroom instruction, most notably changing the paradigm of learning from one that is teacher-centered to one that is student-centered (Adom et al., 2016).

Theoretically, constructivism is a model that constructs how learning happens (Cobern, 1993). Constructivism suggests that learning is a process of constructing knowledge rather than passively receiving information. When a person actively analyzes knowledge in a way that makes sense to them rather than just passively absorbing it in its original form, learning happens most efficiently (Carlson, 2003).

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In addition, some studies explore the synergistic relationship between educational technologies and constructivist approaches to education, discussing how technological tools can facilitate constructivist approaches to teaching and learning that focus on active, experiential and collaborative learning, and also how digital technologies can provide dynamic and interactive learning environments that enable students to construct knowledge through exploration and interaction (Pourhosein Sarameh et al., 2013).

The fundamental knowledge

The fundamental knowledge that serves as the basis for new knowledge is known as foundational knowledge. It can manifest as problem-solving expertise, problem-solving knowledge, and fundamental skills like critical thinking ability (Kong, 2014). It also encompasses the subject knowledge gained during training and real-world work experience in a certain industry (Kereluik et al., 2013). The facts, beliefs, concepts, procedures, abilities, language, and ways of thinking that are necessary for more complex or independent study in an academic field are known as foundational knowledge (Logan & Angel, 2014).

Foundational knowledge can be understood as the basic building blocks required for the continuous and cumulative development of understanding and skills in a particular discipline. It encompasses the essential knowledge and skills needed for lifelong learning in all areas, from general liberal arts to professional specialism. It also encompasses broader values and perspectives that go beyond the specifics of a particular field of study, leading to the concept of graduation (McInnis, 2002).

Foundational knowledge is critical to the development of critical thinking skills in education. It serves as the foundation for students to answer questions and reason about issues in the classroom. Educators need to be aware of the importance of using foundational knowledge to improve students' critical thinking skills (Makhene, 2022).

The decline in student engagement, the focus on employment-related generic skills, and the loss of coherence in undergraduate degrees due to modular programme structures driven by student choice and market opportunities have led to a need to reconsider the extent to which universities should provide students with foundational or core knowledge. The government's requirement for universities to describe the attributes that their graduates should demonstrate highlights the importance of revisiting foundational knowledge. Universities should demonstrate their distinctive values and develop top-quality graduates through a cohesive curriculum that includes the basics (McInnis, 2002).

Writing

Marleen Kieft said that writing is the basic process of encoding thoughts in language, leading to a better understanding of the material. So, Writing is the process of expressing thoughts, ideas, and information through written language. It involves using words, sentences, and paragraphs to convey meaning and communicate with others (Kieft et al., 2006).

Writing can be defined as the process of expressing thoughts, ideas, or information through the use of written symbols or language (Hendricks, 2016). It involves the creation of text that can be read and understood by others (Castelló et al., 2013). Overall, writing is a fundamental means of communication and expression that plays an important role in a variety of disciplines and contexts.

There are several factors associated with learning to write: First, it improves communication skills because it forces people to analyze information, weigh arguments, and make logical conclusions. Second, it fosters the development of critical thinking abilities because writing requires people to analyze information, evaluate arguments, and draw logical conclusions. Finally, learning to write is a prerequisite for success in many careers that require written communication, such as marketing, research, journalism, and other fields (Kieft et al., 2006).

Writing requires the rapid retrieval of specific knowledge from long-term memory (Kellogg, 2001). Articulated and coherent texts require a high level of language proficiency (McCutchen, 1984). The ability to think clearly about substantive issues is crucial for good writing (Nickerson et al., 2014). The best indicator of performance in a course is the ability to write an extended essay (Geiser & Studley, 2013). Several findings have implications for the design of writing instruction (Hayes & Flower, 1986; Rijlaarsdam et al., 2005). Neglected principles in the field of writing can be useful when training complex skills through

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deliberate practice. Mature writing involves transitioning between planning, generating, and reviewing (Flower & Hayes, 1980; Levy & Ransdell, 1995) to address both the content problem of what to say and the rhetorical problem of how to say it (Bereiter & Scardamalia, 1987; Scardamalia & Bereiter, 1991).

Self-regulation of writing ability depends on having sufficient working memory resources (Ransdell & Levy, 2013). It is important to not only instruct college-level writers but also to develop their writing skills. While knowledge of correct spelling, punctuation, grammar, diction, thesis statements, topic sentences, and paragraph articulation is necessary, it is not sufficient for effective writing. Writers must undergo training to ensure that their knowledge can be retrieved and creatively applied in their writing (Kellogg & Raulerson, 2007). Deliberate practice in written composition not only automates a skill but also brings it to excellence (Zimmermann et al., 2017). This approach to skill development involves striving to improve performance, being intrinsically motivated to engage in the task, practicing the task within one's ability, receiving feedback on knowledge of the results, and engaging in high levels of repetition over several years.

Critical Thinking

According to the traditional philosophical tradition, critical thinking is defined as 'the tendency and skill to engage in activities with reflective skepticism (McPike, 1981). (McPike, 1981) describes purposeful, self-regulated judgement that involves interpretation, analysis, evaluation, and inference based on evidence, concepts, and methods, as well as criteria or conceptual considerations on which judgements are based. Critical thinking is defined in cognitive psychology as the mental processes, strategies, and representations used by individuals to solve problems, make decisions, and learn new concepts (Sternberg, 1986). It involves seeing both sides of an issue, being open to new evidence that refutes one's viewpoint, reasoning dispassionately, requiring claims to be supported by evidence, inferring and deducing conclusions from existing facts, and problem-solving (Willingham, 2007).

Critical thinking is a goal-oriented thinking process that involves careful analysis and evaluation of information(Dewey, 1910; Hitchcock, 2020). argued that education in reflective thinking benefits both individuals and society. Recognising the kinship between a child's innate curiosity, rich imagination, and love of experimental enquiry and the scientific attitude can contribute to individual happiness and the reduction of social waste. Siegel (1988) suggests four considerations that support the use of critical thinking as an educational ideal. (1) Schools and teachers must respect the reasoning and interpretive requirements of pupils, treat them honestly, and recognise the need to confront them with their independent judgements. The goal of education is to enable children to become successful adults, which requires the development of self-reliance. Education should enable children to develop a tradition of rationality in the fields of history, science, and mathematics. Additionally, education should equip children with the necessary critical aptitudes and attitudes to become democratic citizens, which requires rational procedures (Bourke, 1975).

The best way to conceptualise the critical thinking process is as a list of constituent events that can occur in various orders, selectively, and more than once. The process of problem-solving involves several steps, including identifying the difficulty, defining the problem, breaking it down into manageable sub-problems, generating multiple potential solutions, determining the relevant evidence, and designing a plan for systematic observation or experimentation to uncover the necessary evidence. (7) Executing systematic observation or experimentation, (8) Noting the results of the observation or experimentation, (9) Collecting relevant testimony and information from others, (10) Judging the credibility of the collected testimony and information, (11) Drawing conclusions from the evidence and testimony, and (12) Accepting a solution that is well-supported by the evidence (Hitchcock, 2020; Lai, 2011).

This study aims to address this gap by investigating the impact of MOOC-integrated blended learning on foundational knowledge, writing skills, and critical thinking in a Chinese university's contemporary and modern literature course. The findings will contribute to a better understanding of how to effectively leverage MOOCs to enhance literature education in China and provide practical implications for curriculum design and pedagogical innovation.

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Research Hypothesis

To evaluate the effectiveness of MOOCs in Chinese literature education, particularly their impact on three core student competencies, this study tests the following hypotheses.

Table 1 List of Hypotheses in the Study

Hypotheses	Statement
$H_0$1	Students in the experimental group using MOOC-integrated blended learning have no significant difference in scores in fundamental knowledge tests compared to students in the control group using traditional instruction.
Ha1	Students in the experimental group using MOOC-integrated blended learning will demonstrate significantly higher scores in fundamental knowledge tests compared to students in the control group using traditional instruction.
$H_0$2	Students in the experimental group using MOOC-integrated blended learning have no significant difference in scores on writing tests compared to students in the control group using traditional instruction.
Ha2	Students in the experimental group using MOOC-integrated blended learning will demonstrate significantly higher scores in writing tests compared to students in the control group using traditional instruction.
$H_0$3	Students in the experimental group using MOOC-integrated blended learning have no significant difference in scores in critical thinking. Tests were compared to students in the control group using traditional instruction.
Ha3	Students in the experimental group using MOOC-integrated blended learning will demonstrate significantly higher scores in critical thinking tests compared to students in the control group using traditional instruction.

Methodology

Population and sample

The population of this research is about 600 junior students majoring in Chinese language and literature in the School of university in Yunnan Province All of the students have passed two years of systematic study of Chinese Language and Literature major courses, and before participating in this study, all of them have studied ancient literature, literary theory, and criticism of ancient Chinese literature, and all of them have a certain ability of literary writing and criticism. The students had been exposed to educational technologies integrated in teaching in their previous studies, such as Blue Ink Cloud Classroom, Rain Classroom, etc., and some of their teachers had recommended the use of MOOC, so they were not unfamiliar with the integration of modern educational technologies. In addition, they were all between 19-21 years old, with more girls than boys. Students of this age are more curious about new things, are willing to explore.

The study selected classes taught by the researcher as experimental classes. Each group has about 60 students. They were all from the junior class, without any special selection of the best students. The students had the same number and the same ratio of males to females. There is little difference in the percentage of students in these two classes in the various performance zones in the course before their studies. They had received 12 years of primary education in China and two years of university education. They all had at least 14 years of learning the Chinese language and literature. The students in the sample were in an intact class in the third grade. Without any special selection, the students were under no pressure to participate in the to take part in the experimental group study in this research.

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For the group sample, the total population of Chinese language and literature majors at the College was too large to conduct a classroom intervention. So, the sample of this research was selected from Chinese language and literature majors at Kunming College of Arts and Sciences.

In order to bring the number of research in line with scientifically justified weighted numbers, the research was calculated using computational software. In the research's expected effect size is 0.6, the p-value is 0.05, the Statistical power is 0.8, calculated that the minimum total sample size is 72, the minimum sample size per group is 36. Based on this sample size calculation, the study group's sample size is 109, the control Group is 55, and the treatment Group is 54.

Experimental framework

The experiment was divided into an experimental group and a control group, and lasted for nine weeks. The design was as follows: Using purposive sampling, two classes were selected from 12 junior-year Chinese Language and Literature major classes (approximately 600 students) at a Chinese university to serve as the experimental and control groups. Three key variables were identified: foundational knowledge, writing ability, and critical thinking.

The control group followed a traditional instructional approach. In the experimental group, the following interventions were implemented:

Integration of MOOCs to create a digitally enhanced blended learning environment.

Pre-tests and post-tests were administered at the beginning and end of the experiment to assess the three key variables: foundational knowledge, writing ability, and critical thinking.

As shown in Figure 2, the pre-test was conducted in the first week, including assessments, informing students of the experimental procedures, and preparing materials. The experimental phase lasted from Week 1 to Week 9. In the ninth week, both groups took the same post-test as the pre-test, and the collected data were analyzed and compared.

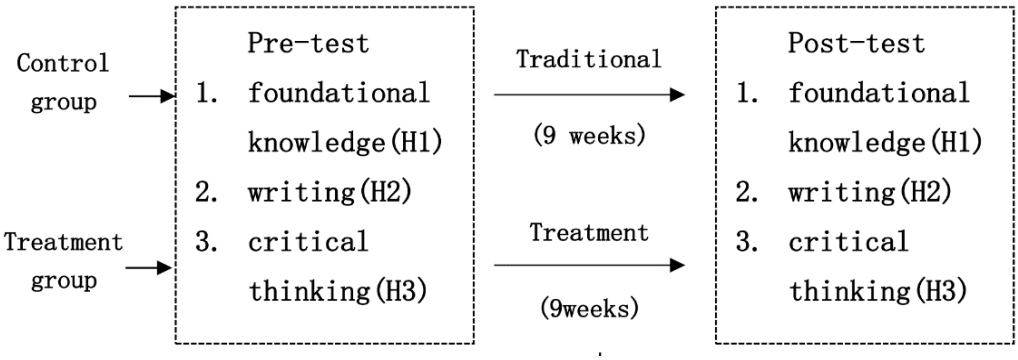

Figure 1 Experimental framework

Reliability and validity testing

To ensure the validity of the test items, this study conducted an Index of Item-Objective Congruence (IOC) evaluation. Three literature course professors were invited to assess the IOC index of the test items. The analysis yielded a score of 0.977, indicating a satisfactory level of consistency.

To establish the reliability of the experiment, a pilot test was conducted before the main study. Two classes consisting of students who had never taken the target course were selected to ensure strict adherence to the experimental process. Each pilot test class included no fewer than 60 students, divided into experimental and control groups. The study followed a structured design, with pre-tests and post-tests administered as planned, and a questionnaire distributed to the experimental group at the end of the experiment. The pilot study lasted eight weeks, during which the control group received traditional instruction, while the experimental group watched MOOC instructional videos before class. The pilot study revealed several issues that needed to be addressed before conducting the main experiment:

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1. Student Variability in MOOC Usage: Significant individual differences existed among students in their engagement with MOOC resources. Teachers needed to carefully adjust and integrate MOOC instructional materials to align with the actual learning levels of students at the study institution.

2. Importance of Reflective Teaching: Teaching reflection played a crucial role in determining instructional effectiveness, questionnaire results, and the overall success of the research.

3. Clarification of Pre-Test and Post-Test Objectives: It was essential to emphasize to students that the test scores were solely for research purposes and would not affect their final academic grades. This measure aimed to reduce test anxiety and prevent cheating or answer-sharing among students.

Descriptive Statistics of Variables

The experiment lasted from Week 1, covering a total of 15 class sessions. Two classes participated, with a total of 109 students—55 in the experimental group and 54 in the control group. A rigorous analysis was conducted using JAMOVI software to compare the test results of the key experimental variables, as shown in Table 2.

Table 2 Independent Sample T-testfor Students' Post-test Score

variable	Mean Difference	P	Cohen's d	group	Mean	SD	N
Foundational knowledge	-2.94	0.004	-0.546	Control group	25.5	5.98	54
				Treatment group	28.5	4.72	55
Writing	2.02	0.001	0.707	Control group	11.2	2.86	54
				Treatment group	9.19	2.86	55
Critical thinking	-2.38	0.019	-0.445	Control group	20.5	6.36	54
				Treatment group	22.9	4.55	55

Table 2 presents the results of the independent sample t-test for students' post-test scores across three variables: foundational knowledge, writing, and critical thinking. The results indicate that for foundational knowledge, the treatment group (M = 28.5, SD = 4.72, N = 55) scored significantly higher than the control group (M = 25.5, SD = 5.98, N = 54), t(107) = -2.94, p = 0.004, Cohen's d = -0.546, suggesting a moderate effect size in favor of the treatment group.

The following presents the normal distribution data for variables. Figure 2 demonstrates that Foundational Knowledge follows a normal distribution.

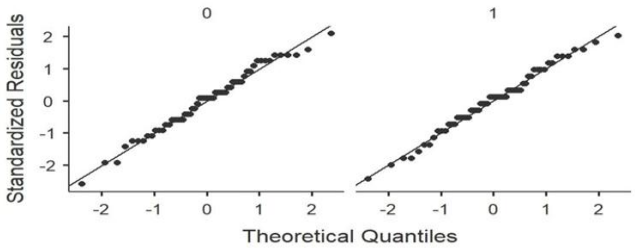

Figure 2 Analysis of Foundational Knowledge Variable using Q-Q Plots
Note: 0 = Control Group, 1 = Experimental Group.

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In terms of writing, the control group (M = 11.2, SD = 2.86, N = 54) outperformed the treatment group (M = 9.19, SD = 2.86, N = 55), t(107) = 2.02, p = 0.001, Cohen's d = 0.707, indicating a large effect size and suggesting that the intervention had a significant but negative impact on writing skills. The following are the normal distribution data for the writing ability variable, which suggests that the variable follows a normal distribution.

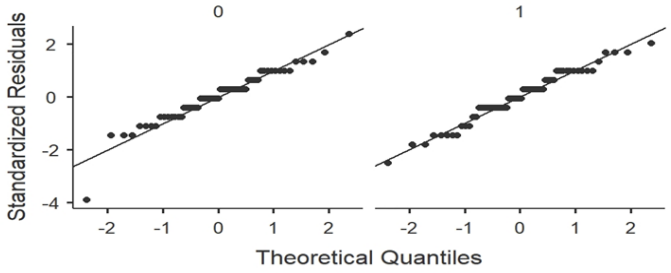

Figure 3 Analysis of Writing Variable using Q-Q Plots
Note: 0 = Control Group, 1 = Experimental Group.

Regarding critical thinking, the treatment group (M = 22.9, SD = 4.55, N = 55) achieved significantly higher scores than the control group (M = 20.5, SD = 6.36, N = 54), t(107) = -2.38, p = 0.019, Cohen's d = -0.445, demonstrating a moderate effect size in favor of the treatment group. The following are the normal distribution data for the critical thinking variable, which suggests that the variable follows a normal distribution.

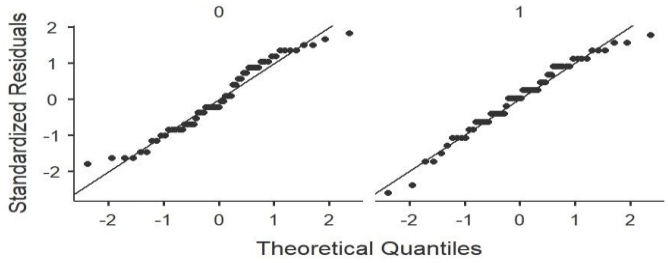

Figure 4 Analysis of Critical Thinking Variable using Q-Q Plots
Note: 0 = Control Group, 1 = Experimental Group.

These findings suggest that the intervention had a positive impact on students' foundational knowledge and critical thinking skills, whereas its effect on writing skills was negative.

Results

The analysis of post-test scores between the control and experimental groups revealed significant differences across three key variables: foundational knowledge, writing ability, and critical thinking. Independent sample t-tests were conducted to compare the mean scores of both groups.

For foundational knowledge:

Students in the experimental group (M = 28.5, SD = 4.72, N = 55) achieved significantly higher scores than those in the control group (M = 25.5, SD = 5.98, N = 54), t(107) = -2.94, p = 0.004, with a moderate effect size (Cohen's d = -0.546). This result suggests that integrating MOOCs into blended learning enhances students' acquisition of foundational knowledge.

For writing ability:

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The control group (M = 11.2, SD = 2.86, N = 54) outperformed the experimental group (M = 9.19, SD = 2.86, N = 55), t(107) = 2.02, p = 0.001, with a large effect size (Cohen's d = 0.707). This indicates that students in the MOOC-integrated learning environment encountered challenges in developing writing skills, potentially due to a lack of sufficient interactive writing support.

Critical thinking:

Students in the experimental group (M = 22.9, SD = 4.55, N = 55) scored significantly higher than those in the control group (M = 20.5, SD = 6.36, N = 54), t(107) = -2.38, p = 0.019, with a moderate effect size (Cohen's d = -0.445). This finding suggests that the blended learning approach incorporating MOOCs facilitated improvements in students' critical thinking abilities.

Overall, these results indicate that while MOOC-based blended learning enhances foundational knowledge and critical thinking, it may not provide adequate support for writing skill development.

Discussion

The findings of this study highlight the complex role of MOOCs in blended learning environments, particularly within the context of Chinese literature education. The significant improvement in foundational knowledge among students in the experimental group aligns with previous research indicating that online learning platforms facilitate flexible, self-paced learning, allowing students to engage deeply with course materials (Bates, 2019; Veletsianos & Shepherdson, 2016). The modular structure of MOOCs, combined with digital resources, likely contributed to students' enhanced retention and comprehension of foundational knowledge in literature courses.

The results also reveal that MOOC-integrated learning positively influenced students' critical thinking skills. This supports the constructivist learning framework, which emphasizes active knowledge construction through interaction with content and problem-solving tasks (Amineh & Asl, 2015; Kong, 2014). The digital learning environment may have encouraged students to engage in self-directed inquiry, reflection, and analytical discussions, thereby enhancing their critical thinking abilities.

However, the negative impact of MOOCs on writing ability warrants further investigation. One possible explanation is that traditional literature courses involve instructor-led guidance, iterative drafting, and direct feedback—elements that are not always well-integrated into MOOC-based instruction. The asynchronous nature of MOOCs and the lack of immediate, personalized feedback may have hindered students' ability to refine their writing skills effectively (Kieft et al., 2006; Kellogg & Raulerson, 2007). Additionally, writing development requires structured peer interaction and instructor feedback, which may have been insufficiently emphasized in the MOOC-integrated approach.

These findings suggest that while MOOCs provide significant benefits for foundational knowledge acquisition and critical thinking, their effectiveness in writing education remains limited. Addressing this challenge may require the integration of structured writing activities, peer review mechanisms, and AI-assisted writing tools to support students in their writing development.

Conclusion

This study examined the impact of MOOC-integrated blended learning on students' foundational knowledge, writing ability, and critical thinking in a Chinese literature course. The findings indicate that while MOOCs significantly enhance foundational knowledge acquisition and critical thinking, they have a detrimental effect on writing skills.

The positive impact of MOOCs on foundational knowledge and critical thinking suggests that online learning environments facilitate deeper engagement with course content and encourage independent analytical thinking. However, the observed decline in writing performance highlights a critical gap in MOOC-based education, emphasizing the need for supplementary instructional strategies to support writing development.

To optimize MOOC-integrated blended learning in literature education, future instructional designs should incorporate structured writing exercises, real-time feedback mechanisms, and collaborative writing

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activities. Moreover, integrating AI-assisted writing tools and peer review frameworks may help mitigate the observed deficiencies in writing development.

Future research should explore the long-term effects of MOOC-integrated learning, investigate additional pedagogical interventions to support writing skills, and examine student perceptions of MOOC effectiveness in literature education. These insights will contribute to refining blended learning strategies and ensuring a more comprehensive educational experience for literature students in higher education institutions.

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