

An Instructional Activity Based on Collaborative Learning and Blended Learning to Improve Independent Learning Ability and Learning Motivation of College Students

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Abstract

In the context of the digital transformation of higher education, improving college students' independent learning ability and learning motivation has become an important issue in teaching reform. This study designed and implemented an instructional activity integrating collaborative learning and blended learning to examine its effects on students' independent learning ability, learning motivation, and academic performance. A 16-week quasi-experimental study was conducted with 120 freshmen from two parallel classes of the course *Educational Technology Basics*. The experimental group received collaborative-blended instruction, while the control group received traditional classroom-based instruction. Data were collected through an independent learning ability scale, a learning motivation questionnaire, academic performance records, and semi-structured interviews with 15 students. Quantitative data were analyzed using independent samples t-tests, and interview data were analyzed through content analysis. The results showed that the experimental group achieved significantly greater improvement in independent learning ability and learning motivation than the control group, with better academic performance after the intervention. The findings indicate that collaborative-blended instruction can provide a flexible, interactive, and student-centered learning environment, offering practical implications for improving teaching quality in higher education.

Keywords: collaborative learning; blended learning; independent learning ability; learning motivation; college students

Introduction

With the rapid development of information technology and the continuous advancement of educational reform, higher education has entered a stage in which traditional classroom-centered teaching is being reshaped by digital resources, online platforms, and learner-centered pedagogical approaches. In this context, blended learning has gradually become an important direction of college teaching reform. By integrating online and offline learning scenarios, blended learning extends the boundaries of classroom instruction, provides students with more flexible access to learning resources, and supports personalized learning needs across different times and spaces (Nikolopoulou, 2023). Meanwhile, collaborative learning emphasizes interaction, cooperation, shared responsibility, and joint knowledge construction among learners. Through group discussion, peer support, task division, and collective problem solving, collaborative learning can enhance students' communication skills, teamwork awareness, and ability to construct knowledge in social learning contexts (Tang et al., 2025).

However, the practical implementation of these teaching approaches in higher education remains insufficient. In many college courses, online learning resources are often used as supplementary materials rather than as an integral part of the teaching process, which leads to a weak connection between online preparation and offline classroom activities. Similarly, collaborative learning is sometimes reduced to simple group work, with limited task structure, insufficient peer interaction, and unclear responsibility distribution. As a result, students may still rely heavily on teacher instruction and external requirements, while their initiative in goal setting, learning planning, self-monitoring, and reflective learning remains underdeveloped. Their learning motivation is also frequently driven by examinations, grades, and course completion requirements, which may weaken sustained engagement, knowledge transfer, and the effective application of learning outcomes (Walker et al., 2024).

Existing studies have suggested that blended learning environments are more suitable for fostering students' self-directed learning than teacher-centered instruction alone (Adigun et al., 2025). Therefore, it is necessary to construct an instructional design that systematically connects digital learning resources, classroom interaction, collaborative tasks, and learning evaluation. The integration of collaborative learning and blended learning provides a feasible response to this need. Blended learning can offer flexible learning space, diversified resources, and continuous learning support, while collaborative learning can strengthen peer interaction, task responsibility, mutual

supervision, and reflective engagement. When these two approaches are integrated into a coherent instructional activity, they can create a more structured, participatory, and student-centered learning environment, thereby supporting the development of autonomous learning behavior and motivational improvement.

Based on the above considerations, this study designs and implements an instructional activity that integrates collaborative learning and blended learning in a college course context.

Research Objectives

This study sets four core research objectives to guide the whole research process:

1. To construct a complete instructional activity model combining collaborative learning and blended learning applicable to college classroom teaching.
2. To empirically verify whether the proposed collaborative–blended instructional activity can effectively enhance college students’ independent learning ability.
3. To explore the intervention effect of this integrated teaching activity on college students’ intrinsic and extrinsic learning motivation.
4. To summarize students’ subjective learning experiences and perceptions towards the collaborative–blended teaching mode through semi-structured interviews, and further analyze the internal operating mechanism of the teaching activity.

By achieving these objectives, this study aims to provide empirical evidence for the effectiveness of collaborative–blended instructional design and offer practical guidance for improving teaching quality and promoting student-centered learning in higher education (Islam et al., 2022).

Literature Review

Blended learning has become an important pedagogical response to the digital transformation of higher education. By combining online learning resources with face-to-face classroom interaction, this approach extends learning beyond the physical classroom and provides students with greater flexibility in accessing materials, completing tasks, and engaging in learning activities (Hua et al., 2024). More importantly, blended learning changes the organization of the learning process. Students are no longer positioned only as recipients of classroom instruction, but are expected to preview materials before class, participate in online discussions, review course content after class, and regulate their own learning progress through digital platforms. These

characteristics make blended learning closely related to the development of self-directed and independent learning ability (Hua et al., 2024).

Collaborative learning provides another important theoretical foundation for improving students' learning engagement and responsibility. Rather than treating learning as an individual process of knowledge reception, collaborative learning emphasizes knowledge construction through interaction, task division, peer support, group discussion, and shared problem solving (Tang et al., 2025). In this process, students need to clarify learning goals, coordinate group tasks, exchange ideas, evaluate peer contributions, and reflect on their own learning performance. These activities can strengthen students' communication ability, cooperative awareness, and responsibility for learning tasks. When collaborative learning is embedded in a blended learning environment, online platforms further extend the time and space of collaboration by enabling asynchronous discussion, resource sharing, and continuous peer interaction outside the classroom (Tang et al., 2025).

Independent learning ability and learning motivation are two closely connected outcomes in this instructional context. Independent learning ability usually involves learning planning, strategy selection, self-monitoring, time management, and reflective evaluation. Students with stronger independent learning ability are more capable of setting goals, controlling learning progress, selecting appropriate strategies, and evaluating learning outcomes (Luo & Zhou, 2024; Thanh Thuy et al., 2024). Learning motivation provides the psychological basis for sustaining these behaviors. Intrinsic motivation encourages students to engage in learning because of interest, curiosity, competence development, and self-growth, whereas extrinsic motivation is mainly driven by grades, examinations, and external requirements (Grande et al., 2022). Although extrinsic motivation can promote short-term participation, intrinsic motivation is more important for sustained engagement and long-term learning development. In blended learning environments, knowledge construction and interactive learning experiences can further strengthen students' academic motivation and learning outcomes (Younas et al., 2025).

Many scholars have conducted in-depth research on blended learning, collaborative learning, independent learning ability and learning motivation. For instance, Hua et al. (2024) pointed out that blended learning optimizes the learning rhythm of college students and lays a foundation for autonomous learning. Tang et al. (2025) confirmed that standardized collaborative group tasks can significantly improve students' learning participation. Nevertheless, the current literature still leaves several issues underexplored. First, blended learning and collaborative learning are often examined as separate instructional approaches, while their integrated effect on

college students' independent learning ability and learning motivation has received relatively limited attention (Tang et al., 2025). Second, prior studies have tended to focus on academic achievement as the major outcome, with less attention paid to how instructional activities shape students' learning autonomy, self-regulation, and motivational development (Luo & Zhou, 2024). Third, more empirical evidence is needed from quasi-experimental designs that combine scale measurement, academic performance data, and qualitative interview evidence (Tong et al., 2022). To address these gaps, this study integrates collaborative learning and blended learning into a unified instructional activity and examines its effects on students' independent learning ability and learning motivation through both quantitative and qualitative evidence.

Concepture Framework

The research framework is based on the assumption that an instructional activity integrating collaborative learning and blended learning can improve students' learning process and learning outcomes. In this framework, the instructional activity is the independent variable, while independent learning ability, learning motivation, and academic performance are the main outcome variables. Collaborative learning activities provide peer interaction, task cooperation, group responsibility, and mutual evaluation. Blended learning provides online resources, flexible learning time, pre-class preparation, and post-class extension. Together, these elements create a learning environment that supports students' active participation, self-regulation, and motivational improvement.

Table 1 Conceptual framework of the collaborative–blended instructional activity

Instructional Input	Learning Process Mechanism	Outcome Variables	Expected Effect
Collaborative learning activities	Group project design, problem-solving seminars, peer evaluation, task division, mutual help, and peer supervision	Independent learning ability	Improved planning, self-monitoring, task responsibility, and self-reflection
Blended learning activities	Online micro-lessons, pre-class preview tasks, online discussions, offline classroom activities, and learning platform support	Learning motivation	Increased intrinsic motivation and strengthened extrinsic motivation
Collaborative–blended instructional activity	Integration of online and offline learning with structured student cooperation	Academic performance	Better knowledge acquisition, application, and course achievement

Research Methodology

This study adopted a quasi-experimental research design and combined quantitative and qualitative research methods to comprehensively evaluate the effect of the instructional activity based on collaborative learning and blended learning on college students' independent learning ability and learning motivation. The whole research process was divided into three stages: preparation, implementation, and evaluation.

Research Design

The study used a quasi-experimental design with an experimental group and a control group. Quasi-experimental designs have been widely used in recent higher education intervention studies to examine the effects of innovative teaching models on students' learning motivation and learning outcomes (Sahudra et al., 2024). The experimental group received the collaborative–blended instructional activity, while the control group received traditional teaching. The two groups followed the same teaching content and teaching schedule to reduce the interference of irrelevant variables (Tong et al., 2022).

Sample Selection and Sample Size Determination

The participants were 120 freshmen from two parallel classes in the public course *Educational Technology Basics* at a university. According to the principle of equivalent grouping, one class of 60 students was assigned as the experimental group and the other class of 60 students was assigned as the control group. Before the experiment, both groups completed the independent learning ability scale and learning motivation questionnaire, and their academic performance from the previous semester was collected. The pre-test results showed no significant difference between the two groups, which supported the initial equivalence of the sample and the validity of the experimental comparison (Tong et al., 2022).

Research Instruments

The research instruments included three parts. First, the independent learning ability scale was used to measure students' ability in learning planning, learning strategy use, self-monitoring, and self-evaluation (Thanh Thuy et al., 2024). Second, the learning motivation questionnaire was used to measure intrinsic motivation and extrinsic motivation (Grande et al., 2022). Third, academic performance data from the mid-term and final examinations were used as supporting evidence. In addition, semi-structured interviews were conducted with 15 randomly selected students from the experimental group to understand their subjective experience of the instructional activity.

Data Collection Methods

Data collection included quantitative and qualitative procedures. Quantitative data were collected through pre-test and post-test measures of independent learning ability and learning motivation, as well as course examination results. Qualitative data were collected through semi-structured interviews after the intervention. The interview questions focused on students' experience of online learning, group cooperation, task completion, peer evaluation, and changes in learning motivation.

Instructional Activity Implementation

For the experimental group, the instructional activity based on collaborative learning and blended learning was designed and implemented for 16 weeks. The online learning part was carried out through the university's online learning platform, including watching micro-lessons, completing pre-class preview tasks, and participating in online discussion groups. The offline learning part was dominated by collaborative learning activities, including group project design,

problem-solving seminars, and peer evaluation. The teacher guided and coordinated the process, encouraged students to plan their learning process actively, allocate learning tasks, and solve learning problems independently.

The control group adopted the traditional teaching mode, which was mainly based on offline classroom lectures and supplemented by simple online learning resource release. Systematic collaborative learning activities were not organized for the control group. The teaching content and teaching progress of the two groups were kept consistent to eliminate the interference of irrelevant variables.

Data Analysis

SPSS statistical software was used to analyze the quantitative data. Independent samples t-tests were conducted to compare the differences between the experimental group and the control group before and after the intervention. Interview data were organized, coded, and analyzed by content analysis to explore the internal mechanism through which the instructional activity influenced students' learning ability and motivation (Nicmanis, 2024).

Research Results

Changes in Independent Learning Ability

The pre-test results of the independent learning ability scale showed that the mean score of the experimental group was 68.23 and that of the control group was 67.89. There was no significant difference between the two groups before the intervention ($p > 0.05$). After 16 weeks of teaching intervention, the post-test mean score of the experimental group reached 82.56, while that of the control group was 71.34. The independent samples t-test showed a significant difference between the two groups after the intervention ($p < 0.01$). This indicates that the instructional activity based on collaborative-blended learning significantly improved college students' independent learning ability.

Table 2 Comparison of Independent Learning Ability Scores of Two Groups Before and After Experiment

No.	Group	Pre-test Score	Post-test Score	Score Improvement
1	Experimental Group	68.23	82.56	14.33
2	Control Group	67.89	71.34	3.45
3	p-value (pre-test)	>0.05	<0.01	-

Changes in Learning Motivation

The results of the learning motivation questionnaire showed that the pre-test scores of intrinsic motivation and extrinsic motivation in the two groups were at the same level ($p > 0.05$). After the experiment, the intrinsic motivation score of the experimental group increased from 22.15 to 31.67, and the extrinsic motivation score increased from 25.32 to 28.41. In the control group, the intrinsic motivation score increased from 21.98 to 24.02, and the extrinsic motivation score increased from 25.11 to 26.25. These findings show that the instructional activity not only improved students' extrinsic motivation but also had a more significant role in promoting intrinsic motivation, which is the core of sustainable learning.

Table 3 Comparison of Learning Motivation Scores of Two Groups Before and After Experiment

No.	Group	Pre-test	Post-test	Pre-test	Post-test
		Intrinsic Motivation	Intrinsic Motivation	Extrinsic Motivation	Extrinsic Motivation
1	Experimental Group	22.15	31.67	25.32	28.41
2	Control Group	21.98	24.02	25.11	26.25
3	p-value (post-test)	<0.01	<0.01	<0.05	<0.05

Academic Performance and Interview Results

The academic performance data showed that students in the experimental group performed better than those in the control group in the course assessment after the intervention. This result is consistent with the improvement in independent learning ability and learning motivation. The interview data further indicated that students in the experimental group perceived the instructional activity as helpful for clarifying learning goals, organizing learning tasks, increasing peer support, and improving their willingness to participate in learning activities. Many students reported that the online resources helped them prepare before class, while the group activities encouraged them to complete tasks more actively and reflect on their own learning process.

Table 4 Summary of research results according to the research objectives

Research Objective	Main Evidence	Result	Interpretation
Improve independent learning ability	Pre-test and post-test scale scores	Experimental group improved by 14.33 points	The activity strengthened students' planning, self-monitoring, and task responsibility
Improve learning motivation	Intrinsic and extrinsic motivation questionnaire	Intrinsic motivation increased more strongly in the experimental group	The activity stimulated active participation and sustainable learning interest
Support academic achievement	Course academic performance data	Experimental group performed better than the control group	Improved learning process contributed to better learning outcomes
Understand student experience	Semi-structured interviews with 15 students	Students reported stronger peer support and clearer learning tasks	The activity improved learning participation and perceived learning support

Discussion

The findings show that the instructional activity integrating collaborative learning and blended learning effectively improved students' independent learning ability, learning motivation, and academic performance. These results are consistent with the conceptual framework of this study. The online component of blended learning provided flexible resources, learning tasks, and continuous access to course materials, which helped students develop more regular learning planning and self-monitoring habits (Hua et al., 2024). The offline collaborative component encouraged students to participate in group discussion, peer evaluation, and task-based problem solving, which strengthened their sense of responsibility and learning initiative (Islam et al., 2022).

The improvement in independent learning ability was closely connected with the increase in learning motivation. When students were required to complete pre-class online tasks and then participate in offline group activities, they needed to take greater responsibility for their own learning process. This learning structure made students move from passive acceptance of knowledge toward active preparation, interaction, and reflection. At the same time, collaborative learning created a peer-support environment in which students could share learning difficulties, receive feedback, and compare learning progress. This process helped transform external task requirements into stronger intrinsic motivation (Walker et al., 2024).

Compared with the control group, the experimental group showed a more obvious increase in intrinsic motivation than in extrinsic motivation. This suggests that the collaborative–blended instructional activity did more than improve students' compliance with course requirements. It also enhanced their interest in learning, sense of participation, and confidence in completing learning tasks. This finding supports previous research suggesting that blended learning can enhance learning flexibility and resource accessibility (Hua et al., 2024), while collaborative learning can promote interaction and collective knowledge construction (Islam et al., 2022; Tang et al., 2025).

The academic performance results further support the relationship among instructional activity, learning motivation, independent learning ability, and learning outcomes. Students who had stronger learning motivation and better self–regulation were more likely to complete learning tasks effectively and apply knowledge in course assessments. The interview findings also explained the quantitative results by showing that students valued the combination of online preparation and offline cooperation. Therefore, the effect of the instructional activity should be understood as the result of the interaction among learning environment, peer collaboration, self–regulation, and motivation rather than as the isolated effect of one single teaching element (Luo & Zhou, 2024).

New Knowledge from Research

The new knowledge generated by this study lies in the construction and empirical verification of a collaborative–blended instructional activity model for improving college students' independent learning ability and learning motivation. The model shows that online learning resources, offline collaborative tasks, teacher guidance, and peer evaluation can be integrated into a coherent instructional process. This process supports students' self–regulated learning and motivational development through continuous interaction between individual learning and group learning.

Table 5 New knowledge model generated from the research

Online Learning Support	Offline Collaboration	Teacher Guidance	Student Psychological Change	Learning Outcomes
Micro–lessons, preview tasks, online discussion, platform resources	Group project design, seminars, task division, peer evaluation	Guidance, coordination, feedback, learning process support	Higher autonomy, stronger responsibility, increased intrinsic motivation	Improved independent learning ability, motivation, and academic performance

This model indicates that effective teaching reform in higher education should not simply add online resources to traditional classrooms. Instead, online learning, classroom interaction, collaborative tasks, and learning evaluation should be systematically connected. In this way, students can gradually form independent learning habits and stronger motivation through repeated cycles of preparation, cooperation, feedback, and reflection (Dang, 2026).

Conclusion

This study designed and implemented an instructional activity based on collaborative learning and blended learning to improve college students' independent learning ability and learning motivation. Through a 16-week quasi-experimental study involving 120 freshmen, the results showed that the experimental group achieved significantly higher improvement in independent learning ability and learning motivation than the control group. The academic performance and interview results also supported the effectiveness of the instructional activity. Overall, the study confirms that the integration of collaborative learning and blended learning can provide a flexible, interactive, and student-centered learning environment that promotes autonomous learning, learning motivation, and academic development.

Suggestions

Recommendations for Applying the Research Findings

First, colleges and universities should consider applying collaborative-blended instructional activities in both public and professional courses. In practical implementation, online learning resources should be systematically connected with offline collaborative tasks rather than used as isolated supplementary materials. Teachers need to design clear pre-class learning tasks,

structured group activities, peer evaluation mechanisms, and timely feedback procedures, so that students can move smoothly from individual online preparation to classroom interaction and collaborative problem solving (Dang, 2026).

Second, teachers should place greater emphasis on the cultivation of students' independent learning ability and intrinsic motivation throughout the teaching process. Instructional activities should encourage students to set learning goals, plan learning tasks, participate in group cooperation, monitor learning progress, and reflect on learning outcomes. At the same time, teachers should provide appropriate guidance and support to prevent collaborative learning from becoming superficial group work. In this way, students can gradually shift from passive knowledge reception to active exploration, self-regulated learning, and sustained participation (Islam et al., 2022).

Recommendations for Future Research

First, future studies can expand the sample to students from different majors, grades, courses, and universities, so as to further examine the generalizability and applicability of the collaborative-blended instructional activity. Cross-disciplinary comparison may help identify whether the effects of this instructional model vary across different subject areas, learning tasks, or student groups (Dang, 2026).

Second, future research can extend the intervention and follow-up period to examine the long-term effects of collaborative-blended learning on independent learning ability, learning motivation, and academic development. In addition, future studies may further optimize the design of online resources, collaborative tasks, peer evaluation, and teacher feedback mechanisms, in order to improve the alignment between instructional activities and students' actual learning needs (Dang, 2026).

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