PROJECT-BASED FLIPPED CLASSROOM ON CRITICAL THINKING AND CREATIVITY IN BUSINESS ENGLISH TEACHING: A CASE STUDY

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Abstract: In the 21st century, higher order thinking skills such as creativity and critical thinking are in high demand. In the context of China, the policy Made in China 2025 was proposed to develop the interdisciplinary curriculum. This study intends to investigate how implementing a project-based flipped classroom approach influences the development of critical thinking and creativity among students studying business English in higher vocational colleges in Shanxi. A quasi-experimental study with distinct groups was structured for this research. The study involved 120 participants, and information was gathered using the Ennis-Weir Critical Thinking Test and TTCT Creativity Test. The data underwent analysis employing Analysis of Covariance (ANCOVA) and a paired-sample t-test. The results of research showed that project-based flipped classroom performed better in critical thinking ($F=43.81$, $p=.000<.001$, $\eta 2=0.27$), and creativity ($F=106.13$, $p=.000<.001$, $\eta 2=0.47$), demonstrated as a more efficient teaching method for reshaping the current curriculum pedagogy, achieving sustainable development goals in higher vocational education. This research not only theoretically incorporates classroom activities into the enhancement of advanced cognitive skills but also offers direction for stakeholders to foster the sustainable development of talent in higher vocational education. However, it is suggested that further research should be done to include more diversified population and generalize its results. Besides, the method to efficiently conduct the project-based flipped classroom needs further exploration.

Keywords: Project-based flipped classroom, Business English learners, Critical thinking, Creativity, Sustainable development goals

INTRODUCTION

In the modern era of 21st century, skills such as creativity and critical thinking have gained greater significance and become increasingly essential. Consequently, it is crucial for workers to possess the ability to innovate and engage in independent thinking (Momen et al., 2023). Students in higher vocational colleges are required and expected by employers and stakeholders to equip themselves with the abilities of higher-order thinking skills (Yassir et al., 2022). Besides, the sustainable development goals (SDG) recommend shifting from traditional teaching methods to a more interactive and interdisciplinary approach to enhance students' critical thinking and creativity (Carrió Llach & Llerena Bastida, 2023). In addition, according to the policy, Notice of the State Council on Printing and Distributing "Made in China 2025" (2015), China is dedicated to advancing vocational education and preparing students to become skilled professionals. To reach educational goals, vocational education must provide students with a comprehensive and interdisciplinary curriculum that equips them with the necessary skills for their future work. As one of the disciplinary courses, business English is taught to business major students. Based on the abovementioned, this study aims at investigating the efficient ways to enhance the core skills of 21st century and SDG into teaching and curricula.

Addressing the cultivation and enhancement of critical thinking and creativity among higher vocational students is a crucial matter. Research has shown that project-based learning stands out as the most optimal approach (Chiang & Lee, 2016; Yudiono et al., 2019). Nonetheless, project-based learning does exhibit certain limitations, and these can be addressed through the adoption of a flipped classroom approach (Listiqowati et al., 2022). The project-based approach aims to be integrated with the flipped classroom method to examine its impact on higher-order thinking abilities. According to Tomesko et al. (2022), some scholars have testified that the flipped classroom model has a notable impact on enhancing creativity and critical thinking skills (Islim, 2018). The flipped classroom model has found applications across diverse fields, including the social sciences (Rodríguez et al., 2019) , medicine (Ji et al., 2022), the visual arts (Tomesko et al., 2022), physical education (Hu et al., 2022) , and social media (Han, 2022). While there have been numerous studies on the flipped classroom approach, its impact on English learning has not been extensively explored. Some existing research has shown that this approach can positively affect English academic achievement in terms of listening (Thatphaiboon & Sappapan, 2022), vocabulary (Nhac, 2022), pronunciation (Naem Ahmed Al-Amri, 2022), and writing (Han, 2022). The studies mentioned above were focused on English for academic purposes (EAP) rather than English for specific purposes (ESP), which is also referred to as an interdisciplinary course. As a result, there is a lack of research on how flipped classroom instruction affects the higher-order thinking of business English learners. What's more, the research context of Chinese higher vocational colleges was far more adequate to be explored (Chow et al., 2011). Based on our current understanding, there exist demographic and knowledge gaps within this domain.

Consequently, this study addresses three research queries:
RQ1: Is there any influence of the project-based flipped classroom on the critical thinking and creativity of higher vocational business English learners?
RQ2: Do variations exist in the effects of project-based learning and project-based flipped classroom approaches on the critical thinking and creativity of business English learners in higher vocational colleges?
RQ3: Which instructional approach proves to be more efficient in enhancing students' critical thinking and creativity? Is it straightforward project-based learning or the project-based flipped classroom model?

LITERATURE REVIEW

Theoretical Framework

This study's theoretical framework is called Bloom's Taxonomy, which is originally known for its explanation of higher order thinking (Chandio et al., 2016). This theory has been employed across multiple domains, including advanced cognitive processes (Y. M. Huang et al., 2023), development of the curriculum (Karanja & Malone, 2021), and evaluation (Jauhariyah et al., 2021).

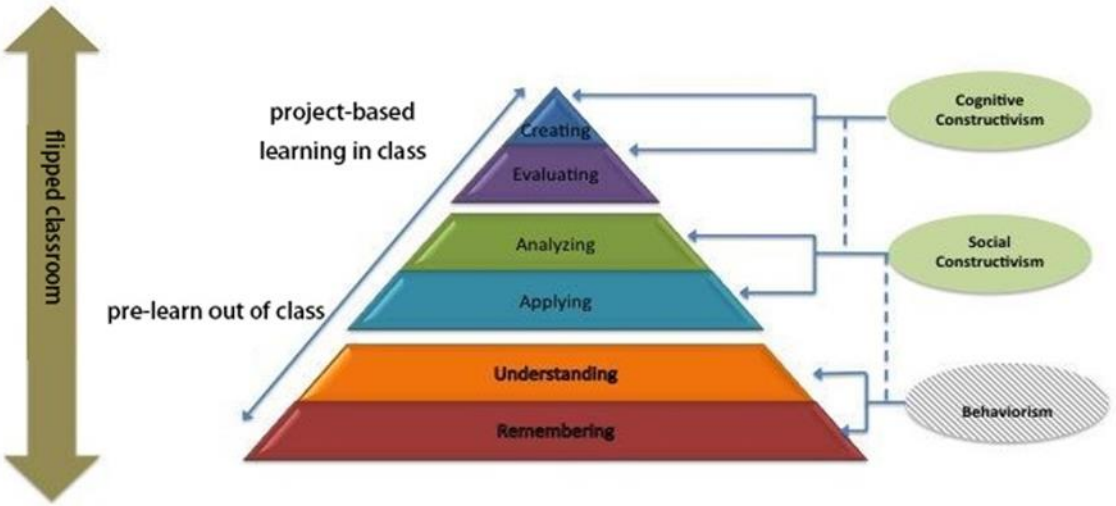

Figure 1. Theoretical Framework revised from Bloom's Taxonomy

Figure 1 shows Bloom's taxonomy as a theoretical framework to incorporate hybrid classroom activities into advanced cognitive abilities. In a flipped classroom, project-based learning takes place both during and after class. Before class, students are expected to learn on their own or preview the assigned materials, which will be tested during class. This process allows students to develop their understanding of the subject matter. During class, teachers guide students based on the quiz and help them work collaboratively on projects according to their preferences or interests. Students are encouraged to explore the classroom and learn from their classmates while working on their initial drafts, and teachers provide guidance and support as needed. By seeking guidance from teachers and peers, students can engage in higher-order thinking. They can analyze problems, evaluate their situations, and develop innovative solutions. Bloom's Taxonomy theory combines two theories: behaviorism and constructivism. Behaviorism holds that all behaviors result from experience and can be trained through proper conditioning, regardless of a person's background or race (Rouleau et al., 2016). Prior to the class, instructors will allocate pre-recorded lecture videos or supplementary materials for students to examine. Those who successfully accomplish this assignment will earn a more favorable formative assessment, whereas those who complete it will receive a less favorable formative assessment. The use of such reinforcement and penalties within the classroom falls under the category of behaviorism (Araiba, 2020). During class, students engage in project-based learning with teachers offering guidance. Instructors supply the required materials and delegate tasks for students to fulfill. Within the supportive framework of teachers, students collaborate and acquire knowledge from one another. This form of peer learning is referred to as social constructionism (Powell & Kalina, 2009). Subsequently, students construct and innovate knowledge structures using their prior experiences within this learning journey. This is known as cognitive constructivism (Powell & Kalina, 2009). All of the previously mentioned clarifications can be elucidated through Table 1. In this research, the theoretical model serves as a directive for instructional techniques, and its influence on the critical thinking and creativity of business English vocational students is being examined.

Table 1. Theoretical Correspondence and Reasons to Fit

Bloom's Taxonomy	Integrated Theories	Progress	Reasons to fit
Remembering	Behaviorism	Pre-class in FC	Students view designated videos and materials to either earn assessments or prevent penalties.
Understanding			Students assimilate information and convert it into comprehension, drawing from foundational knowledge.
Application	Social constructivism	During class in FC with PBI	Students apply knowledge in practical scenarios and gain insights from both their peers and instructors during this process.
Analysis			Students assess their implementations using feedback from teachers and classmates;
Evaluation	Cognitive constructivism	After class in FC with PBI	Students are provided with assessments for their initial work when they make their presentations.
Creation			Students make revisions and generate new content, enhancing their understanding in the process.

Note: FC = Flipped Classroom, PBI = Project-based Instruction

Related Research

Business English Learning Situations

Ever since China became a member of the World Trade Organization (WTO) and introduced the Belt and Road initiative, it has been consistently advocating for international trade. Moreover, Li Keqiang (2023) in the government working report indicated that China's open market offers numerous opportunities for enterprises from various countries to expand and grow within the country. All these measurements showed the importance of learning English well. Moreover, it is known from a recruitment website that college graduates with certain English skills are more popular among foreign affair companies than their counterparts (Suting, 2023). English for Special Purposes (ESP) encompasses the study of business English, which can be integrated with other majors for a more interdisciplinary approach to learning. This study focuses on e-commerce students who are currently learning business English. However, there is a dearth of research on the higher order thinking skills of business English students in Chinese higher vocational colleges.

PBI integrated with FC

Project-based learning allows students to collaborate and acquire fresh insights by building upon their prior experiences and existing comprehension (Wadsworth, 1996; Wells et al., 2016). Based on an extensive review of the literature, it is evident that project-based learning can have a substantial impact on enhancing critical thinking skills (Khusanova, 2021; Velez & Power, 2020; Wang, 2022) and creativity (Lu et al., 2022; Mehmet, 2005; Puspitasari, 2020; Samsudi et al., 2019; Siew & Ambo, 2020). Furthermore, numerous research studies have indicated that enhancing student engagement, elevating higher-order cognitive abilities, and fostering positive attitudes through project-based learning can substantially enhance the quality of vocational education (Viswambaran & Shafeek, 2019). However, other researchers have reached divergent conclusions, suggesting that project-based learning does not yield a noteworthy influence on critical thinking and creativity (Siew & Ambo, 2020). Ambiguous findings offer a chance for additional investigation. Additionally, project-based learning has some drawbacks that can be addressed by flipped classroom. One such drawback is that project-based learning requires more collaborative work, which can reduce learners' sense of work independently. Furthermore, teachers in project-based learning mode often find that time is limited due to the need to provide students with ample discussion time while also offering guidance (Sezer & Esenay, 2022).

A flipped classroom means that the activities in class have been flipped, with the focus now on outside the classroom (G.-J. Hwang et al., 2015; Lage & Platt, 2000). The benefits of flipped classroom are to facilitate students' critical thinking (Atwa et al., 2022; Listiqowati et al., 2022), creativity (Tien et al., 2020), and engagement (Y.-M. Huang et al., 2022). Numerous studies and research have testified its significant role in higher order thinking skills (Dong et al., 2021; Lu et al., 2022), creativity (Tien et al., 2020b; Tsai et al., 2020) and critical thinking (Aránguiz et al., 2020; Atwa et al., 2022; Bin-Hady & Hazaea, 2022; Naem Ahmed Al-Amri, 2022; Yavuz & Ozdemir, 2019). However, few of flipped classroom learning focused on business English and most of them were in the areas such as social sciences, health sciences, and biological sciences (G. J. Hwang et al., 2011). Besides, the research about the hybrid learning: project-based flipped learning was far more adequate. Among the few cases is one done by Chandio et al. (2016). In the study, the project-based flipped learning model was utilized to assess teaching and evaluation methods. The results showed that a process-oriented assessment model worked well with the project-based flipped learning approach, creating a harmonious system that positively impacted teaching, learning, and assessment. Another project-based flipped classroom is used to develop real life competencies (Sanchez-Muñoz et al., 2022), which discovered that the development of skills like creativity, cooperation, and oral communication along with the combination technique drives the self-learning processes of biomedical science students. Another study is proposed by Sezer & Esenay (2022), which sought to determine how the project-based flipped classroom paradigm affected students' critical thinking abilities in a course of geography at one of Indonesia's universities. The results showed that the project-based flipped classroom had a significant effect to develop student's critical thinking skills in the context of Indonesia. Compared with studies on other disciplines, not enough studies apply project-based flipped classroom to improve business English learners' creativity level and critical thinking skills in the context of Chinese higher vocational colleges. The knowledge gap and population gap will be filled up in this study.

METHODOLOGY

Research Design

The objective of this study is to investigate the impact of various instructional approaches on the development of critical thinking and creativity among Chinese higher vocational students studying business English. The study lasted for 12 weeks, with the experimental group using a hybrid mode of project-based flipped classroom while the control group only used project-based learning. Additional information is presented in Figure 2. This research is structured into three stages: the preliminary phase, the intervention phase, and the subsequent phase. In the preliminary phase, there was a two-week pre-intervention stage where the instruments, including the creativity and critical thinking tests, were pre-tested and pilot studied for validity and reliability. The intervention period spans a duration of 12 weeks and involves the implementation of distinct teaching techniques tailored to various groups. In the subsequent stage, a post-test is administered to gather data for subsequent analysis. The procedure was concluded in Figure 2.

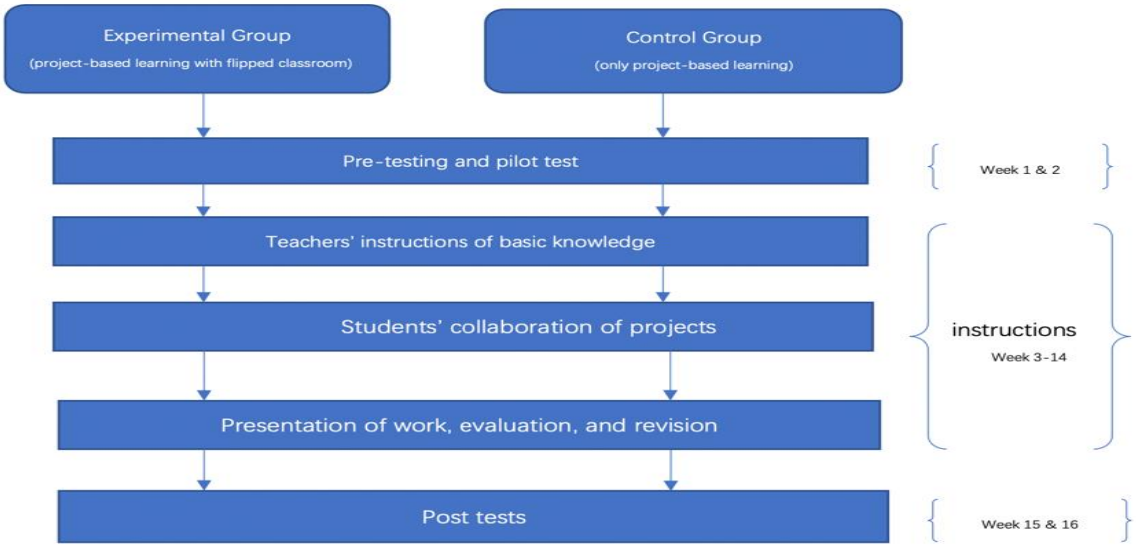

Figure 2. Research Design

Teaching Design

This flipped classroom approach involves a hybrid project-based learning model that spans 6 projects over a period of 12 weeks. Each project is divided into three in-class stages and three out-of-class stages, as illustrated in Figure 3.

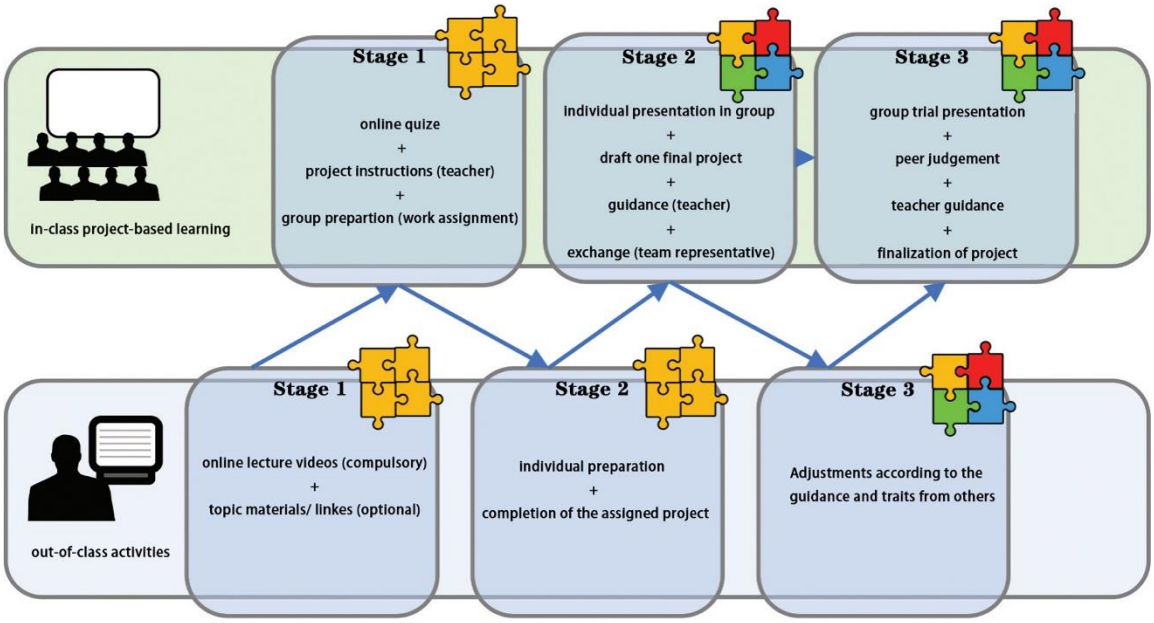

Figure 3. *Teaching Design of Project-based Flipped Classroom*

As depicted in Figure 3, in the initial extracurricular session, students are provided with a compulsory lecture video by their instructor along with optional supplementary materials. Students have the freedom to study at their own rhythm, contingent on their comprehension level. In the initial stage of classroom instruction, students engage in online quizzes through the app to assess their comprehension of assigned subjects. The instructor subsequently examines the test outcomes and concentrates on areas where errors are prevalent. Students are afforded the chance to pose individualized queries to their instructors and obtain tailored assistance. Following this, the teacher offers project guidance founded on the knowledge previously acquired to acquaint students with the impending project. Subsequently, students engage in group discussions and select the portions they prefer to work on. During the subsequent extracurricular phase, students individually prepare a specific portion of the project, considering the contributions of other group members, with the objective of ensuring the overall project is logically coherent and well-structured. Additionally, they are responsible for gathering necessary materials and finalizing their selected segment of the overarching project. In the second part of the course, each student is tasked with presenting their designated portion to the group, providing a thorough explanation, while other group members assess and engage in discussions regarding the interconnections among various project segments. Subsequently, the students collaboratively draft the entire project plan and seek guidance from their instructors. At the same time, delegates from other groups also made visits to the class. This served a dual purpose: they could offer feedback on the projects of other teams, while also gaining valuable insights and knowledge from observing other teams' work. Next, during the third phase outside the classroom, individuals fine-tune their work based on the guidance from the instructor and feedback from their peers. Within each group, one student is designated to coordinate and consolidate all project components. In the third phase of the course, every group designates a representative to deliver a practice presentation, after which the teacher and other groups evaluate them using SWOT principles. Finally, each group finalizes their project and receives an assessment from the instructor.

Samples and Participants

This research focused on business English learners who were instructed using the project-based learning approach at the China-Australia Business School. A convenience sampling method was employed to choose 120 participants from four distinct categories. As the existing classes were not feasible for the study, four sophomore business English classes were randomly selected, each with an average of 30 students. Two of these classes constituted the experimental group (EG), receiving instruction through the project-based flipped classroom model, while the other two classes formed the control group (CG), being taught with the traditional project-based learning method.

Instruments

All research tools underwent a pre-testing phase and were assessed by experts to establish their content validity. A pilot test was then conducted to confirm the construct's validity and reliability.

Ennis-Weir critical thinking test

In this research, the Ennis-Weir Critical Thinking Test was employed. This assessment comprises clear, straightforward instructions and a letter to a newspaper editor containing ten brief paragraphs. This letter has been customized to align with the specific circumstances in Shanxi. Among the ten paragraphs, eight of them present arguments in favor of prohibiting cars. The scoring process involves assessing the arguments and concepts presented in each paragraph and gauging the level of argumentation for each paragraph. Experts in the field conducted content validation for this tool, and these experts were education professors or individuals well-versed in critical thinking assessment. Furthermore, the inter-rater reliability was assessed using the kappa value, involving two lecturers. The kappa value of 0.54, which exceeds 0.40, indicates that there is good consistency in the lecturers' assessments of the students.

TTCT creativity test

In this study, the TTCT was customized to assess the creativity of the participants within the specific context. Since the interviewees were all Business English learners, the activities were modified to align with the context of teaching Business English. The campaign encompassed three factors: fluency, flexibility, and originality, each corresponding to the Business English teaching content or activity. Content validity has been tested by experts in the creative field. Fluency Cronbach alpha is 0.77>0.70; flexibility 0.73>0.70; originality is 0.68>0.60. 0.6 is considered a moderate strength of internal reliability (Hair et al., 2019). Hence, this tool guarantees the test's reliability. The validation of creativity assessment instruments was carried out by experts within the pertinent domains. Expert assessments were provided by various education professors and specialists well-versed in evaluating creativity. The selection of experts for evaluation was made based on their expertise and extensive experience.

Data Analysis

Statistical analysis of the critical thinking and creativity tests was conducted employing the Statistical Package for the Social Sciences (SPSS). To examine variations in critical thinking and creativity between the treatment and control groups, Analysis of Covariance (ANCOVA) was employed. Additionally, a paired sample T-test will be utilized to assess the influence of project-based flipped classroom on critical thinking and creativity.

RESULTS

Descriptive Data Analysis

Table 2. Demographic Information

Subject	Intervention	N	Girls	Boys
EG	Hybrid Project-based flipped classroom	60	31	29
CG	Project-based learning	60	30	30
In total		120	61	59

Note: EG = Experimental group, CG = Control group

Table 2 illustrates the composition of the experimental group, comprising 60 students, with 31 girls and 29 boys. Meanwhile, the control group consists of 30 girls and 30 boys. The gender distribution is balanced, with no significant disparity between the number of boys and girls.

Inferential Data Analysis

Effect of the different teaching strategies on business English learners' critical thinking

Table 1. Results of Critical Thinking Difference Between Groups

Group	*N*	Pre-test		Post-test		ANCOVA			
		M	*SD*	*M*	*SD*	*F*	*p-value*	Adjusted R Square	η^2
EG	60	6.60	2.65	14.91	2.09	43.81	.00	.71	.27
CG	60	7.00	1.93	9.75	2.42				

Note: The pre-test score was used as a covariate. *Sig.<.05****

Table 3 lists the statistical data for critical thinking difference between EG and CG. The results indicate that both EG and CG are beneficial to improve students' critical thinking. ANCOVA was used to compare the difference between the two groups. The assumptions of normality, homogeneity of variance (F=3.00, p=.08>.05), linearity, and homogeneity of regression (F=3.23, p=.07>.05) showed that ANCOVA was appropriate to use in this study, with pre-tests as the covariate. According to Table 3, the results indicated that students in EG performed better and there is significant critical thinking difference between experimental group and control group (F=43.81, p=.00<.05, η^2=0.27).

Table 2. Results of the Effect of Project-based Flipped Classroom on Critical Thinking (N=120)

Post-test		Pre-test		Paired sample t-test			
M	*SD*	*M*	*SD*	*t*	*df*	*p-value*	partial eta squared
14.91	2.09	6.60	2.65	29.65	59	.00	.90

*Note: Sig.<.05****

According to Table 4, there is a significant effect of project-based flipped classroom on students' critical thinking. The scores of critical thinking increased from pre-test (M=6.60, SD=2.65) to post-test (M=14.91, SD=2.09), t (59) =29.62, p-value=.00<.05 (two-tailed). The partial eta squared statistic (.90) indicated a large effect size. In conclusion, project-based flipped classroom has significant effect on business English learners' critical thinking in higher vocational colleges. Moreover, there is a significant difference between project-based learning and hybrid learning method on critical thinking. Therefore, it can be concluded that project-based flipped classroom is more effective to improve business English learners' critical thinking.

Table 3. Results of Creativity Difference between Groups

Group	*N*	Pre-test		Post-test		ANCOVA			
		M	*SD*	*M*	*SD*	*F*	*p-value*	Adjusted R Square	η^2
EG	60	7.06	2.67	14.73	2.83	106.13	.00	.93	.47
CG	60	7.86	2.59	10.7	2.86				

Note: The pre-test score was used as a covariate. *Sig.<.05****

Table 5 lists the creative difference between EG and CG. The results indicated that both teaching methods can have an effect on students' creativity. In addition, ANCOVA was used to compare the difference between the two groups. The assumptions of normality, homogeneity of variance (F=0.40, p=.52>.05), linearity, and homogeneity of regression (F=0.19, p=.66>.05) showed that ANCOVA was appropriate to use in this study, with pre-tests as the covariate. According to Table 5, the results of ANCOVA indicated that EG achieved better scores than CG and there is significant creativity difference between EG and CG (F=106.13, p=.00<.05, η^2=0.47), indicating a large effect size.

Table 4. Results of the Effect of Project-based Flipped Classroom on Creativity (N=120)

Post-test		Pre-test		Paired sample t-test			
M	*SD*	*M*	*SD*	*t*	*df*	*p-value*	partial eta squared
14.73	2.83	7.06	2.67	72.73	59	.00	.98

Note: *Sig.<.05****

According to Table 6, there is a significant effect of project-based flipped classroom on students' creativity. The scores increased from pre-test (M=7.06, SD =2.67) to post-test (M=14.73, SD =2.83), t (59) =72.73, p=.00<.05 (two-tailed). The partial eta squared statistic (.98) indicated a large effect size. In conclusion, project-based flipped classroom has significant effect on business English learners' creativity in higher vocational colleges. Moreover, there is a significant difference between project-based learning and hybrid learning method on creativity. Therefore, it can be concluded that project-based flipped classroom is more effective to improve business English learners' creativity.

Table 5. Summary of the Posteriori Comparison of Various Creativity Domain

Domain	Group	N	Pre-test		Post-test		ANCOVA			
			M	*SD*	*M*	*SD*	*F*	*p-value*	Adjusted R Square	η^2
Fluency	EG	60	4.65	1.96	10.91	2.25	67.76	.00	.86	.35
	CG	60	5.21	1.87	7.68	2.22				
Flexibility	EG	60	1.88	.69	2.58	.67	11.26	.00	.51	.09
	CG	60	1.98	.74	2.15	.68				
Originality	EG	60	.53	.50	1.23	.49	30.75	.00	.26	.21
	CG	60	.68	.46	.86	.43				

Note: The pre-test score was used as covariate. *Sig.<.05****

To understand the effects of different teaching modes on each sub-dimension of creativity (fluency, flexibility, and originality), ANCOVA was conducted for each sub-dimension. According to Table 7, the results showed that there is a great improvement in the dimension of fluency (F=67.76, p=.00<.05, η^2=0.35), moderate increase in flexibility (F=11.26, p=.00<.05, η^2=0.089), and large rise in originality (F=30.75, p=.00<.05, η^2=0.21). In conclusion, project-based flipped classroom has significant effect on business English learners' creativity in higher vocational colleges. Besides, the hybrid learning method is more effective to improve creativity. Overall, these effect sizes suggest that the experimental group had a higher level of creativity compared to the control group, and that the differences between the two groups are substantial, particularly for fluency and originality.

DISCUSSION

The findings of this study indicate that both project-based learning and the project-based flipped classroom approach have a favorable influence on the creative and critical thinking abilities of students. Nevertheless, blended

learning techniques have demonstrated superior efficacy in enhancing creativity and critical thinking when compared to conventional project-based learning. Consequently, it is conceivable that the project-based flipped classroom approach could be more potent in elevating the levels of critical thinking and creativity among business English learners. These outcomes align with previous research findings (Aránguiz et al., 2020; Sanchez-Muñoz et al., 2022). As discussed in the literature review section, project-based learning possesses certain limitations, which can be addressed through the implementation of a flipped classroom approach. It is acknowledged that the key benefit of the flipped classroom lies in students' ability to pre-study and amass sufficient knowledge for more in-depth class discussions. Conversely, students who solely engage in project-based learning dedicate more time to comprehending and internalizing new information, with fewer chances for independent reflection. Simultaneously, they tend to explore supplementary knowledge and deepen their comprehension, facilitating improved practical applications, interactive dialogues, and comprehensive assessments from both peers and instructors. Throughout this process, students can actively exercise their critical thinking skills.

Effect of the Different Teaching Strategies on Business English Learners' Critical Thinking

Project-based flipped classroom has a more significant effect on critical thinking, which is in line with the results done by Huang et al. (2022). The noteworthy enhancements in critical thinking were ascribed to the amalgamation of project-based learning within the flipped classroom model. The preliminary phase prior to the class, involving students reviewing instructional materials, serves to acquaint them more thoroughly with the content and provides them with a greater reservoir of knowledge to retain (Anderson, 2007), enhancing critical thinking skills involves dedicating more time to the analysis, evaluation, and practical application of information. This leads to the development and improvement of critical thinking abilities (Y.-M. Huang et al., 2022; Ji et al., 2022; Sezer & Esenay, 2022). Upon entering the classroom activity phase, students engage in project work, engage in discussions, and partake in group activities that demand critical thinking and the application of their acquired knowledge to real-life scenarios (Hu et al., 2022). In this hands-on application phase, students strive to merge their existing knowledge with simulated scenarios, putting their expertise into practice in real-world situations. In this process, they engage in critical analysis and employ critical thinking to resolve issues. Following the program, students receive guidance, feedback, and evaluations from both mentors and peers at each program stage. When evaluating the soundness and applicability of their project proposals, students employ critical thinking, and they may provide justifications if they possess strong reasons to support their ideas. Consequently, this process of application and analysis fosters an atmosphere that motivates students to engage in critical thinking while they assess their peers' work and offer feedback. As a result, this further amplifies their capacity to scrutinize, assess, and amalgamate information (Wang, 2022). Subsequently, in extracurricular pursuits, students are encouraged to contemplate their learning experiences, appraise their accomplishments, and delve into metacognition (reflecting on their own cognitive processes). Engaging in this reflective and metacognitive exercise fosters the enhancement of critical thinking skills. It enables students to scrutinize their own approaches to learning, evaluate their strong and weak points, and pinpoint areas that require enhancement (Lu et al., 2022). This practice of self-awareness and self-reflection aids in cultivating advanced cognitive abilities such as critical analysis, assessment, and deep contemplation (Lamsyah et al., 2022).

Effect of the Different Teaching Strategies on Business English Learners' Creativity

The project-based flipped classroom exerts a greater influence on creativity, which is in line with the results done by (Hsiao et al., 2022). Furthermore, the substantial and moderate effect sizes in the study indicate that three aspects of creativity are evident: fluency (demonstrating high motivation and engagement to generate more ideas), originality (the ability to learn at one's own pace and engage in independent thinking), and flexibility (encouraging a wider range of ideas from both peers and instructors). The noteworthy enhancements in creativity were attributed to the amalgamation of project-based learning within the flipped classroom model. Initially, the project-based flipped classroom approach affords students ample time for introspection about their out-of-class learning. This reflective period stimulates idea generation, enabling students to link concepts, grasp significance, and foster fresh perspectives. During class, students can participate in exercises that foster creativity, such as brainstorming, creating concept maps, and exploring unconventional ideas (Siew & Ambo, 2020). Another contributing factor is the active engagement of students in the learning process. Instead of passively receiving information, they take an active role in the project's design, planning, and execution. This involvement motivates them to delve into more profound knowledge and encourages innovative thinking (Tien et al., 2020b). Moreover, students collaborate with their peers on their projects during class. This collaborative environment fosters a wide array of ideas from classmates, enabling the presentation of various perspectives and concepts (Rodríguez et al., 2019). Lastly, within this blended model, students cultivate a practice of independent study, facilitating the refinement of their ideas post-class, self-assessment, and reflection on completed projects. This, in turn, nurtures a culture of innovation and creativity (Rodríguez et al., 2019).

CONCLUSION

In this research, business English learners at the China-Australia Business School were interviewed to investigate efficacious teaching approaches for enhancing their critical thinking and creativity. The importance of this study extends beyond theoretical advancements; it also holds relevance for educational reform and offers valuable insights for stakeholders and educators. On a theoretical level, this research integrates curriculum development with higher order thinking and amalgamates Bloom's taxonomy with constructivism principles.

This study offers tangible benefits for nurturing the talents required to drive social and economic progress. The levels of critical thinking and creativity among students in vocational colleges in Shanxi are at an all-time high. However, in alignment with the "Made in China 2025" policy, vocational education must prioritize the fusion of industry and academia, ensuring that the competencies of vocational college students align with the demands of the market and corporate growth. In the context of the 21st century and the pursuit of sustainable development goals, individuals must not only possess expertise and skills in their respective fields but also evolve into interdisciplinary and multifaceted talents equipped with advanced cognitive abilities. This study centers around a vocational college in Shanxi Province to investigate a student-centric blended learning model. This model, to some extent, aligns with market development needs, consequently fostering economic and societal sustainability. To put it differently, this approach assists prospective employers in cultivating highly skilled professionals for the workforce. Moreover, it offers instructors valuable insights for implementing pedagogical reforms. This article emphasizes the inherent shortcomings of project-based instruction and the benefits of the flipped classroom method, which significantly enhance the creative and critical thinking abilities of vocational college students—qualities referred to as essential for 21st-century sustainable development skills. Hence, it is advisable for educators to modernize teaching approaches to align with the fast-paced evolution of society and nurture individuals with critical thinking and creativity within the context of China's unique circumstances. As for students, they should not only apply these thinking skills in their academic pursuits but also in their everyday lives and future workplaces. It's crucial for them to proactively exercise their cognitive abilities, fostering the capacity for independent and critical thinking.

However, a constraint of this study pertains to the generalizability of its findings to a wider context. The study exclusively involved students from a single higher vocational college in Shanxi Province, China, which constrained the diversity of the participant pool. Hence, it is highly recommended to exercise caution when extrapolating the results to other demographic groups. Subsequent research endeavors should explore enlarging the sample size, increasing diversity, and enhancing the generalizability of the findings. Furthermore, qualitative approaches, such as conducting interviews with learners to elicit their viewpoints on teaching methods, can enrich the depth of comprehension within the study. Lastly, the efficient and thorough implementation of the project-based flipped classroom model presents a promising avenue for exploration in future research endeavors.

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