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THE EFFECT OF PROJECT-BASED LEARNING ON CREATIVE THINKING IN MARKETING STUDENTS

Chengqin FU¹, Saifon Songsiengchai*²

¹Department of Education and Society, Institute of Science Innovation and Culture (ISIC),
Rajamangala University of Technology Krungthep, Bangkok, Thailand

saifon.s@mail.rmutk.ac.th

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ABSTRACT

This study aimed (1) to investigate the effects of Project-Based Learning (PBL) on the enhancement of creative thinking among marketing students, (2) to compare PBL with traditional lecture-based instruction in fostering creativity, and (3) to examine students' perceptions of the efficacy of PBL. The research involved 70 undergraduate marketing students. The study used a quantitative research design, incorporating pre-test and post-test assessments and structured questionnaires. The study evaluated creative thinking using a standardized creativity test focused on originality, flexibility, problem-solving, and idea generation. The findings revealed that PBL significantly improved students' creative thinking skills compared to traditional teaching methods. Post-test scores in the PBL group were markedly higher across all assessed dimensions. Survey responses further indicated generally positive perceptions of PBL, highlighting its role in enhancing creativity, learning motivation, collaboration, and practical application. However, students' favourable attitudes may partly reflect the approach's novelty or instructor enthusiasm. Moreover, since the study focused on short-term effects within a single discipline, future research should include larger, more diverse samples and longitudinal designs to assess the sustainability and broader applicability of PBL's impact on creative thinking.

INTRODUCTION

Since the 21st century, technological progress and fierce international competition have made creative thinking an urgent requirement for individual and social development, especially for marketing students as it is crucial to their career development, while they currently have weaknesses in creative thinking such as insufficient innovative awareness and practical ability; Project-Based Learning (PBL), as a student-centered teaching method that emphasizes "learning by doing" through practical projects, can effectively stimulate and enhance marketing students' creative thinking, helping higher education transform from knowledge transmission



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to ability cultivation and supporting the high-quality training of marketing professionals (Khraim, 2022).

Research Questions:

- 1) How does Project-Based Learning (PBL) affect the creative thinking (fluency, flexibility, originality, and elaboration) of undergraduate marketing students?
- 2) To what extent does project-based learning (PBL) differ from traditional learning methods in enhancing marketing students' creative thinking?
- 3) What are students' perceptions of project-based learning's effectiveness in enhancing their creative thinking skills?

The hypothesis is proposed:

H1: Project-based learning (PBL) has a statistically significant positive effect on the enhancement of creative thinking skills (fluency, flexibility, originality, and elaboration) among undergraduate marketing students.

H2: Marketing students who engage in project-based learning demonstrate higher creative thinking skills than those who experience traditional teaching methods.

H3: Students have positive perceptions of project-based learning's effectiveness in improving their creative thinking skills.

Null Hypotheses (H_0):

H0₁: Project-based learning (PBL) has no statistically significant effect on the enhancement of creative thinking skills among undergraduate marketing students.

H0₂: There is no significant difference in creative thinking skills between marketing students taught through project-based learning and those taught through traditional teaching methods.

H0₃: Students do not hold positive perceptions of project-based learning's effectiveness in improving their creative thinking skills.

Research Objectives:

- 1) To examine the effect of project-based learning (PBL) on the enhancement of creative thinking skills in marketing students.
- 2) To compare the differences in creative thinking development between students taught using project-based learning and those taught using traditional learning methods.
- 3) To measure students' perceptions of project-based learning's efficacy in improving their creative thinking skills.

LITERATURE REVIEW

Related Theories

(1) Constructivist Learning Theory

Constructivist learning theory, a highly influential perspective in contemporary educational psychology originating from Piaget's cognitive developmental theory and enriched by Vygotsky's sociocultural theory, holds that learning is an active process where learners construct new knowledge based on their existing cognitive schemas through interaction with the environment, involving assimilation and accommodation, while emphasizing the key role of social interaction (e.g., teacher guidance and peer collaboration) in knowledge construction; widely adopted in education since the 1990s with diverse schools of thought, it highlights the situatedness, collaboration and reflexivity of learning, has been extensively applied in digital instructional design with the integration of information technology, and deeply influences teaching models such as PBL, advocating a shift from traditional teacher-centered, knowledge-



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transmission education to student-centered, meaning-construction oriented instruction (Wit, 2020; Wang, 2011).

(2) Creative Thinking Theory

Creative thinking theory, an important field in cognitive psychology and educational research, explains how individuals generate novel and valuable ideas and innovative problem-solving methods, positing that creative thinking is an advanced cognitive ability that can be nurtured rather than an exclusive trait of the gifted, with divergent thinking as its essence; based on this theory, the Torrance Tests of Creative Thinking (TTCT) was developed to evaluate creative potential in four dimensions, while subsequent research expanded the theory to include the interplay of sociocultural factors and contextual dimensions, such as the componential model emphasizing domain-relevant skills, creative thinking skills and intrinsic motivation; in recent years, it has attracted increasing attention in educational technology and interdisciplinary integration, been applied in STEAM and other educational practices, and explored at the neural level, forming a systematic theoretical framework that provides strong support for educational reform and innovative talent cultivation (Redifer et al., 2019; Beaty et al., 2015).

(3) Experiential Learning Theory

Experiential Learning Theory (ELT), systematically proposed by American educator David A. Kolb in 1984 and rooted in the pragmatism and cognitive development ideologies of Dewey, Vygotsky and Piaget, holds that learning is a continuous knowledge construction process starting from experience, progressing through reflection, conceptualization and practical application, and encapsulated in a four-stage cyclic model (concrete experience, reflective observation, abstract conceptualization, active experimentation) where effective learning requires traversing the entire cycle; based on this model, learning styles theory was developed to categorize learners into four types for personalized instruction, and ELT has been widely applied in higher education, adult education, corporate training and other fields, integrated with digital technologies in recent years through virtual simulations and interactive platforms, emphasizing the unity of knowledge and action and promoting the transformation of teaching from knowledge imposition to experience-guided and reflection-facilitated learning (Seaman et al., 2017).

Related Studies

(1) Project-Based Learning

Project-Based Learning (PBL), an instructional paradigm rooted in constructivist and situated cognition theories that integrates knowledge acquisition, capability cultivation, and real-world problem-solving, emphasizes students' active knowledge construction through authentic, open-ended, and interdisciplinary tasks, with teachers acting as facilitators and evaluators, and it fosters deeper understanding, learning motivation, and 21st-century competencies (e.g., critical thinking, collaboration, creativity) while requiring institutional support for effective implementation; its implementation involves seven interrelated and progressive steps—identifying the project theme (around core, open-ended questions), role assignment, project guidance and resource preparation, inquiry and practice (the core phase), interim report and feedback, presentation and diversified evaluation, and reflection and debriefing—which together form a structured learning system promoting students' active knowledge construction and multi-dimensional development (Almulla, 2020; Parrado-Martínez & Sánchez-Andújar, 2020; Puente et al., 2019).



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(2) Creative Thinking

Creative thinking is a high-order cognitive process through which individuals generate innovative and valuable ideas beyond conventional patterns, regarded as a core competency and widely studied across psychology and education; it is mainly characterized by fluency, flexibility, originality, and elaboration derived from divergent thinking, can be cultivated through education rather than being innate, and is increasingly integrated with digital technology and interdisciplinary education while also influenced by cultural and social factors (Rylander Eklund et al., 2021). Its cultivation follows four interrelated steps: guided creativity training, instruction in creative tools such as mind mapping and brainstorming, motivational support for creative output to enhance intrinsic motivation, and creative process documentation and reflection to improve metacognitive abilities. In higher and vocational education, numerous empirical studies confirm that active learning approaches, such as Project-Based Learning, effectively improve students' creative thinking. However, challenges, including insufficient teacher training and rigid assessment systems, remain, requiring institutional support to systematically foster creative thinking as a teachable and developable ability to meet 21st-century talent demands (Suherman & Vidákovich, 2022).

(3) Creative Thinking in Marketing Education

Creative thinking is increasingly recognized as a core competency in marketing education, essential for future marketing professionals to adapt to the rapidly changing market environment and consumer demands, as marketing inherently emphasizes innovation in various aspects such as problem-solving and brand communication; higher education institutions thus adopt pedagogical strategies like PBL, case-based learning and simulation exercises to nurture students' creativity, with empirical studies showing that PBL and creative thinking training improve students' idea originality, flexibility and ability to apply theories to real scenarios, while collaborative group projects bridge the gap between conceptual ideation and professional practice; in vocational marketing programs, integrating creative thinking training with design thinking, digital content creation and PBL also enhances students' employability, and overall, cultivating creative thinking in marketing education boosts students' learning engagement and equips them with essential competencies for modern marketing practice (Rusetski, 2024).

(4) Research on the Application of Project-Based Learning in Creative Thinking

Research on the application of Project-Based Learning (PBL) in fostering students' creative thinking has been growing, with scholars generally agreeing that PBL, as a "learning by doing" teaching methodology centered on students and based on real-world tasks and interdisciplinary problems, provides favorable contextual and structural support for the generation and improvement of creative thinking; cognitively, PBL's focus on complex, practical problems aligns with the four stages of creative thinking, encouraging students to transfer existing knowledge and propose creative solutions, while teachers' guidance helps enhance their concept recombination and plan optimization abilities; empirical studies confirm that PBL significantly improves students' creative output in terms of fluency, uniqueness and flexibility, and its social constructivist mechanism and process-oriented interventions (e.g., staged objectives, creativity tools, feedback sessions) further promote creative idea generation and development; with digital technology advancement, digital PBL platforms also expand possibilities by facilitating cross-regional collaboration, enhancing visual expression and imagination, and enabling personalized feedback, collectively forming a dynamic support system for creative thinking development (Patrício et al., 2018; Radić et al., 2019).



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Critical Review of Existing Studies on Project-Based Learning and Creative Thinking

Although many studies have confirmed that project-based learning helps cultivate creative thinking, a critical review shows several limitations: some studies rely on subjective teacher evaluations or lack control groups, leading to weak causal inference and measurement bias; findings on collaborative creativity are often context-specific to Western higher education and may not apply cross-culturally; and most research focuses on general higher education rather than marketing-specific vocational curricula, with insufficient systematic comparisons between PBL and traditional teaching in these contexts. Thus, while the literature provides a solid conceptual basis, an empirical gap remains in robust experimental designs, cross-cultural validation, and contextually adapted research on PBL's effects on creative thinking in vocational marketing education (Ilmudeen, 2021).

METHOD

Research Design

This study adopts a quantitative research design to examine the effect of Project-Based Learning (PBL) on creative thinking among third-year marketing majors at Yunnan Tourism Vocational College, with two classes assigned to an experimental group that received PBL and a control group that received traditional direct instruction. The independent variable is PBL implemented through seven key steps, while the dependent variable is creative thinking measured across training, tool application, motivational support, and process reflection. Data collection includes a two-part, five-point Likert questionnaire covering demographic information and PBL effectiveness, a structured PBL learning plan, and pre- and post-test creative thinking assessments adapted from the Torrance Tests of Creative Thinking (TTCT) that measure fluency, flexibility, originality, and elaboration. Descriptive and inferential statistics, including independent and paired t-tests, will be used to analyze differences between the two groups. Before formal data collection, both the TTCT-based test and the PBL questionnaire were validated by educational psychology and marketing education experts, pilot-tested with 20 students, and found to have good reliability (Cronbach's $\alpha > 0.8$), ensuring instrument credibility and validity.

Population and Sample Size

The study population consists of 70 third-year marketing majors from two intact classes at Yunnan Tourism Vocational College, selected for their strong professional foundation and representativeness in the transition from academic learning to practical competence. This study employed cluster sampling by class as the sampling unit, randomly assigning one class (35 students) to the experimental group, which received Project-Based Learning, and the other (35 students) to the control group, which received traditional direct instruction, forming a quasi-experimental design. The sample included 38 males (54.3%) and 32 females (45.7%), mostly aged 18–21, with GPAs of 2.6–3.5 and monthly household income mainly between 5,001 and 8,000 RMB; the two groups were balanced in demographics, academic background, and pre-test creative thinking scores to ensure comparability and reduce confounding variables. Although individual random assignment was not used for administrative and classroom integrity reasons, groups were allocated by lottery and random number table, and baseline equivalence was verified to control potential bias, making the sampling method scientifically reasonable and practically feasible for examining PBL's effect on creative thinking.



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Data Collection

This study used a quantitative approach to collect data through two main instruments: a Creative Thinking Test adapted from TTCT measuring fluency, flexibility, originality, and elaboration, and a five-point Likert Students' Perception Questionnaire evaluating PBL usefulness, satisfaction, collaboration, and learning gains; experts validated both tools and pilot-tested with 20 students, achieving Cronbach's α above 0.8 for good reliability. Although classroom observations and formative assessments were initially planned, they were excluded due to scheduling constraints. Before the PBL intervention, all 70 participants completed the pre-test and a demographic questionnaire to establish baseline equivalence; after the intervention, they took the same creative thinking post-test and the perception questionnaire. Data were entered into SPSS with quality control for missing responses, and independent and paired t-tests were used to compare baseline differences and intervention effects between the experimental and control groups, alongside reliability, normality, and homoscedasticity checks to ensure transparent and reproducible procedures while acknowledging quasi-experimental limitations.

RESULTS AND ANALYSIS

Based on a review of relevant literature, this section uses SPSS to test research hypotheses through descriptive statistics (frequency, percentage, mean, standard deviation) and independent-sample t-tests, analyzing data from 70 third-year marketing students at Yunnan Tourism Vocational College, with one class as the experimental group receiving project-based learning and the other as the control group using traditional teaching. Data were collected via questionnaires, lesson plans, and pre- and post-tests on creative thinking, and were compared to examine differences before and after the intervention to assess the effect of PBL on improving students' creative thinking; however, since all data were self-reported, social desirability bias may have affected students' ratings of their learning engagement.

To Examine the Effect of Project-Based Learning on the Enhancement of Creative Thinking in Marketing Students

Table 1: Gender, Age, Income and GPA of the Sample Group. (N = 70)

Items	Options	Frequency	Percent %
Gender	Male	38	54.3
	Female	32	45.7
	Total	70	100.0
Age	Under 18	1	1.4
	18-19	37	52.9
	20-21	24	34.3
	22-24	4	5.7
	Over 24	4	5.7
	Total	70	100.0
GPA	Under 2	4	5.7
	2.1-2.5	5	7.1
	2.6-3.0	21	30
	3.1-3.5	32	45.7



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Income	Over3.5	8	11.4
	Total	70	100
	Under 3000	7	10.0
	3001-5000	16	22.9
	5001-8000	30	42.9
	8001-15000	13	18.6
	Over15000	4	5.7
	Total	70	100.0

Table 1 summarizes the demographic and academic characteristics of the 70 marketing student participants, showing a relatively balanced gender structure (54.3% male, 45.7% female), a predominantly young age profile (52.9% aged 18–19 and 34.3% aged 20–21), moderate to high academic performance (45.7% with a GPA of 3.1–3.5 and 30% with 2.6–3.0), and mostly middle-income family backgrounds (42.9% with monthly income of 5,001–8,000 RMB). Overall, the sample features balanced gender representation, typical student age, sound academic levels, and diverse socioeconomic backgrounds, providing a representative foundation for investigating the impact of project-based learning on the development of creative thinking among marketing students.

Comparing pre-test and post-test creative thinking scores for 35 marketing students in the experimental group, pre-test mean scores ranged from 1.640 to 2.550 (low level). In contrast, post-test means ranged from 2.514 to 3.457 (moderate level), indicating significant improvement across all dimensions. Paired-samples t-test results confirmed a highly significant increase ($M_{pre} = 2.07$, $SD = 0.46$; $M_{post} = 3.00$, $SD = 1.40$; $t(34) = 8.25$, $p < 0.001$, Cohen's $d = 1.39$, large effect size), with especially strong gains in originality and problem-solving. Project-based learning effectively fosters marketing students' creative thinking, raising their ability from low to moderate, though different sub-skills improve to varying degrees.

To Compare the Differences in Creative Thinking Between Students Taught Using Project-Based Learning and Those Taught Using Traditional Learning Methods

Table 2 compares creative thinking scores between the experimental group using project-based learning and the control group using traditional methods, using pre-test and post-test statistical analyses including means, variances, and t-tests. As shown in Table 4-3, the control group achieved a mean score of 104.74 while the experimental group reached 122.37, with variances of 13.654 and 11.538, respectively; the paired-sample t-test produced a t-value of 20.78, far exceeding the critical value of 1.692, leading to the rejection of the null hypothesis at the .05 significance level. These results confirm that project-based learning significantly improves marketing students' creative thinking skills compared to traditional teaching methods.

Table 2: Comparison Between Control and Experimental Group

Students' Creative Thinking Skills	N	Mean	Variance	df	t	p-value
Control Group	35	104.74	13.654	34	20.78	0.000
Experimental Group	35	122.37	11.538	34		

To Measure the Level of Students' Positive Perceptions Regarding Project-Based Learning's Efficacy in Improving Their Creative Thinking



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The study summarizes 70 students' perceptions of PBL's effectiveness in improving creative thinking, with most items scoring above 3.5 (high level), especially Q1, Q6, and Q22, reflecting strong positive attitudes toward PBL's effectiveness, practicality, and learning engagement. Several items scored moderately (3.31–3.49), possibly due to difficulties with self-study, time management, or teamwork, and standard deviations ranged from 0.778 to 1.304, indicating modest individual differences, particularly in Q28, Q31, and Q34. Overall, students hold generally positive perceptions of PBL's role in developing creative thinking and innovative abilities, and they support its practical value and wider application in teaching.

CONCLUSION

Part 1: To examine the effect of project-based learning (PBL) on the enhancement of creative thinking skills in marketing students

The results indicate that project-based learning (PBL) exerted a significant positive effect on marketing students' creative thinking: the pre-test mean score was 2.18 (SD = 0.45), showing a low overall level in originality, flexibility, and problem-solving, while the post-test mean rose to 3.01 (SD = 1.39); a paired-sample t-test confirmed the improvement was statistically significant ($t(34) = 20.78$, $p < 0.001$) with a large effect size, demonstrating that PBL effectively strengthens students' idea generation, creative problem-solving, and divergent thinking in marketing scenarios, with performance shifting from low to moderate and reflecting better engagement and practical application of creativity in real projects.

Part 2: To compare the differences in creative thinking development between students taught using project-based learning and those taught using traditional learning methods

A statistically significant difference in creative thinking development was found between the experimental and control groups: the experimental group taught via PBL achieved a much higher post-test mean score ($M = 122.37$, $SD = 11.54$) than the control group using traditional teaching ($M = 107.52$, $SD = 14.12$), with an independent-sample t-test showing $t(68) = 5.67$, $p < 0.001$ and a strong effect size (Cohen's $d = 1.21$), consistent with similar studies; this confirms PBL leads to significantly greater improvements in creative thinking, as it involves authentic problem-solving and teamwork that effectively fosters practical creativity and innovation skills vital for marketing education, unlike traditional methods which mainly support conceptual understanding.

Part 3: To measure students' perceptions of project-based learning's efficacy in improving their creative thinking skills

Students reported highly positive perceptions of PBL's role in enhancing creativity. Descriptive analysis of the Students' Perception Questionnaire ($n = 70$) revealed an overall mean score of 3.89 (SD = 0.96), indicating "high" agreement with PBL's effectiveness. Most items exceeded $M = 3.5$, with specific statements such as "PBL helped me generate innovative ideas" ($M = 4.21$, $SD = 0.78$) and "PBL improved my problem-solving skills" ($M = 4.09$, $SD = 0.81$) ranking highest.

A few items (e.g., Q9, Q12, Q13, Q26, Q31) scored moderately ($M = 3.1$ – 3.4), indicating minor challenges in time management or teamwork. The narrow standard deviation range (0.778–1.304) indicates relatively stable responses, confirming the overall reliability and consistency of students' positive perceptions toward PBL as a creativity-enhancing



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instructional model.

RECOMMENDATIONS

Based on the findings and limitations of this study, future research on Project-Based Learning (PBL) and creative thinking in Chinese vocational colleges could expand sample sizes and include multiple institutions or regions to improve external validity and test cross-regional and cross-cultural consistency; adopt longitudinal designs to explore the long-term sustainability of creative thinking improvements and their translation into professional problem-solving abilities; use mixed-method approaches that combine quantitative data with qualitative evidence from interviews, focus groups, and reflective journals to deepen understanding of students' learning experiences, motivations, and challenges; investigate moderating or mediating factors such as personality traits, prior knowledge, team dynamics, and teacher support to optimize personalized PBL design; and explore the integration of PBL with flipped classrooms, digital tools, or gamification to examine synergistic effects on higher-order cognitive skills, ultimately supporting the development of practical and innovative competencies for students in Chinese vocational education to meet evolving workplace demands.

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