

THE IMPACT OF PROJECT-BASED LEARNING ON CREATIVE ABILITY IN VOCATIONAL VIDEO ADVERTISING DESIGN: A YUNNAN CASE STUDY

Rui Yang¹, Sansanee Jasuwan^{2*}

^{1,2} Department of Education and Society, Institute of Science Innovation and Culture,
Rajamangala University of Technology Krungthep, Bangkok, Thailand

*Corresponding author: sansanee.s@mail.rmuth.ac.th

ABSTRACT

This study aimed to investigate the impact of Project-Based Learning (PBL) on students' creative ability and learning attitudes in a higher vocational video advertising design course. A quasi-experimental design was employed, involving 70 students from two intact classes at a vocational college in Yunnan Province, China. The experimental group (n=35) received PBL instruction, while the control group (n=35) received traditional teaching over a 20-week semester. Creative ability was measured using the Student Creative Ability Scale and the instructor-rated Project Evaluation Scale, while learning attitudes were assessed using the Students' Learning Attitudes Questionnaire. Data were analyzed using descriptive statistics and independent-samples t-tests. The findings revealed that students in the PBL group demonstrated significantly higher overall creative ability and more positive learning attitudes than those in the traditional instruction group. Significant differences were also observed across all four dimensions of creative ability: creative thinking, expressive ability, problem-solving ability, and project innovation. The results suggest that PBL is an effective pedagogical approach for fostering creativity and enhancing learning experiences in vocational design education.

Keywords: Project-Based Learning, Creative Ability, Learning Attitudes, Vocational Education, Video Advertising Design

INTRODUCTION

In recent years, the scale-expansion development model of higher vocational education has shifted toward quality improvement and competency-oriented development. Not only must universities and colleges produce students with theoretical and technical knowledge, but they must also develop students' ability to address complex issues in professional life, e.g., originality, problem-solving, and self-learning capacity. Especially in the field of art and design education, students are expected to turn abstract ideas into concrete, aesthetically significant, original, visually attractive and effective designs. This means higher requirements for teaching and the teaching atmosphere.

In design education, creativity is often described as an intrinsic competence essential for students to produce original and insightful design outcomes. Earlier research by Guilford (1967) linked creativity to divergent thinking, highlighting an individual's ability to generate novel and varied ideas. Torrance (1974) further argued that fluency, flexibility, originality, and elaboration were significant measures of creative performance. In recent years, Runco and Jaeger (2012) proposed a 'standard definition' of creativity, stating that it should be characterized by the generation of ideas or products that are both novel and appropriate in a given context.

In the field of video advertising design, creativity extends beyond individual imagination to encompass the integrated abilities of conceptualizing information, solving communication problems, and translating creative ideas into effective visual expressions. However, in actual vocational education classrooms, teaching methods still predominantly rely on teacher demonstration and student imitation. Learning tasks often lack support from authentic contexts

and open-ended problems. This teaching model may limit students' originality to some extent and lead to homogenization.

As one of the new teaching methods to overcome the weaknesses of conventional teaching, Project-Based Learning (PBL) is gradually being introduced. The essence of PBL is to guide students to actively build knowledge through active participation in the implementation of realistic, difficult and open tasks within a problem-solving, results-based education process (Thomas, 2000). Studies have shown that, compared with conventional teaching, active and project-based learning methods effectively develop students' deeper understanding, higher-order thinking skills, and potential for knowledge transfer (Prince, 2004; Hmelo-Silver, 2004).

Previous research has shown that students' learning motivation and self-regulation are closely related to academic performance and creative development (Pintrich & De Groot, 1990; Zimmerman, 2002). From this perspective, students' attitudes toward project-based learning can be understood as an important psychological link between teaching methods and creative development.

Project-Based Learning has clear theoretical support and is increasingly used in vocational education. However, research has not yet provided sufficient evidence on how it supports creativity in design-oriented vocational courses. Many existing studies primarily examine overall academic performance or improvements in technical skills. Fewer studies examine creativity as a multidimensional outcome or explore how different aspects of creativity develop through project-based instruction.

This study uses a quasi-experimental design and is carried out in the Video Advertising Design and Production course at a higher vocational college in Yunnan Province. The focus is on examining how Project-Based Learning influences students' overall creative ability and its specific dimensions. Students' learning attitudes toward different instructional approaches are also examined as an important learning-related outcome, reflecting their learning experiences under different teaching conditions.

The following research questions guide the research:

RQ1: What are the effects of Project-Based Learning and traditional teaching methods on students' overall creative ability?

RQ2: What are the effects of Project-Based Learning and traditional teaching methods on students' learning attitudes?

RQ3: What are the effects of Project-Based Learning and traditional teaching methods on students' creative ability across its specific dimensions (including creative thinking, expressive ability, problem-solving ability, and project innovation)?

LITERATURE REVIEW

Theoretical Foundations

This study is grounded in three interconnected theoretical frameworks. Constructivist learning theory primarily stems from the work of Piaget and Vygotsky. The theory believes that learning is not a simple transfer of knowledge from teachers to students, but a process in which learners actively construct understanding through interaction with learning tasks, materials and social situations (Piaget, 1970; Vygotsky, 1978). From this theoretical standpoint, students are

regarded as active participants in the learning process, with teachers serving as organizers and supporters rather than merely as providers of information.

Based on constructivism, situated cognition theory further points out that cognition is deeply rooted in the social, cultural and material environment. The theory challenges the view that knowledge is abstract and can be transferred across different situations, and instead holds that learning is essentially inseparable from the activities and environments in which it occurs (Brown et al., 1989). Lave and Wenger (1991) further conceptualized learning as a process of participation in the "practice community" and put forward the concept of "legitimate marginal participation".

Self-determination theory provides a well-established analytical framework for understanding how the teaching environment affects learners' motivation, engagement and psychological state (Deci & Ryan, 2000). The theory holds that when the three basic psychological needs autonomy, competence and belonging are met, students are most likely to experience high-quality learning motivation. Teaching environments that can identify and support these needs are often associated with more lasting input and deeper learning (Ryan & Deci, 2020).

PBL in Creative and Design Education

Creativity often thrives in complex situations. Rather than a general characteristic, it is better to understand it as a multidimensional ability that is closely related to a specific field. The core definition emphasizes that creative results need to be both novel and applicable (Runco & Jaeger, 2012). Project-based learning can promote creative development because it allows students to address real problems over a long cycle continuously. Students do not get clear answers at the beginning but need to identify problems, devise plans, compare different paths, and constantly adjust after receiving feedback (Blumenfeld et al., 1991; Thomas, 2000).

In the project, students usually need to complete a final work and explain the design decisions behind it. This process requires them to clearly express their thinking and improve the work by repeatedly trying to modify it—such a learning path is actually very close to the iterative rhythm of "conceiving → testing → adjusting → optimizing" in real design practice (Bell, 2010; Krajcik & Blumenfeld, 2006).

PBL in Chinese Vocational Education

In recent years, Project-Based Learning has become increasingly common in domestic vocational education. This trend is related to the direction of education reform—the country increasingly values students' practical ability, innovative thinking and future employment. The Implementation Plan for the Reform of National Vocational Education issued by the State Council (2019) specifically mentions that curriculum design should connect with the work process and strengthen the practical training link. Another policy initiative, the Double High Plan, released by the Ministry of Education and the Ministry of Finance (2019), focuses on innovation in teaching models and curriculum reform in vocational institutions, encouraging schools to develop project-based courses and strengthen cooperation with industry partners.

Although Project-Based Learning is clearly encouraged by national policies, empirical research on vocational education in China remains relatively limited. Many existing studies mainly describe policy directions or teaching reform experiences. Research using quasi-experimental designs and multiple outcome measures remains uncommon. Studies that directly

examine the relationship between PBL and creative outcomes in vocational design education are particularly scarce.

Research Gaps

Although Project-Based Learning has received widespread attention, several gaps remain in research on vocational design education. First, there is a lack of rigorous quasi-experimental studies that compare PBL with Traditional Learning in vocational design courses using multidimensional measures of Creative Ability. Second, many existing studies rely on a single type of outcome measure. The integration of self-report data and performance-based assessment is still limited. Third, although learning attitudes are frequently discussed in theory, few empirical studies treat them as outcome variables and compare them across instructional approaches.

RESEARCH METHODS

This study used a quantitative research approach and adopted a quasi-experimental design. The purpose was to examine the effects of Project-Based Learning on students' Creative Ability and Learning Attitudes in a real teaching setting. The research was conducted within a higher vocational course titled Video Advertising Design and Production.

In a natural classroom environment, it was not possible to randomly assign individual students to different groups. For this reason, intact classes were used as the unit of assignment. The existing classes were randomly assigned to either the experimental group or the control group. This class-based quasi-experimental design allowed instructional comparison while keeping normal classroom conditions unchanged. Both groups were taught by the same instructor and followed identical course content, schedule, and assessment criteria. The only systematic difference between the two groups was the instructional method.

Participants

The participants were 70 second-year students majoring in Advertising Design at a higher vocational college in Yunnan Province, China. These students were between 18 and 20 years old, had completed the basic course in advertising design, and had mastered basic skills in video editing and graphic design. Two intact classes were used, with one class assigned to the experimental group (n=35) and the other to the control group (n=35).

Instructional Intervention

The experiment lasted for 20 weeks. The experimental group received PBL instruction, which included five main components: (1) Project Introduction, where students were introduced to authentic or simulated video advertising design situations; (2) Task-Driven Learning, where classroom activities were arranged around specific project tasks; (3) Group Collaboration, where students worked in teams of three to five with assigned roles; (4) Reflection and Feedback, provided at several stages of the project; and (5) Product Presentation, where students presented their final video advertising works. The control group received traditional instruction, characterized by teacher explanation and demonstration, content-oriented instruction, individual practice, and instructor feedback and correction.

Research Instruments

Three instruments were used for data collection. The Student Creative Ability Scale is a self-report questionnaire consisting of 20 items organized into four dimensions: Creative Thinking, Expressive Ability, Problem-Solving Ability, and Project Innovation. All items were rated on a 5-point Likert scale. The Students' Learning Attitudes Questionnaire consists of 16 items across four dimensions: Perceived Learning Value, Learning Engagement Intention, Perceived Learning Autonomy, and Perceived Instructional Support. The course instructor used the Project Evaluation Scale to evaluate students' final video advertising projects across the same four creative dimensions, with a total score of 100 points.

Content validity of all instruments was confirmed through expert review using the Index of Item-Objective Congruence (IOC). Two experts in educational research and vocational design education evaluated the tools. A pilot test with 25 students confirmed the reliability. The overall Cronbach's α coefficient of the Student Creative Ability Scale was .87, with subscale values ranging from .78 to .83. The overall α coefficient of the Learning Attitudes Questionnaire was .87.

Data Collection and Analysis

All instruments were administered at the end of the 20-week instructional period (Week 20). Students' final video advertising projects were also submitted for instructor evaluation. Data were analyzed using descriptive statistics and independent-samples t-tests in SPSS. Effect sizes were calculated using Cohen's d. The significance level was set at .05.

FINDINGS

Sample Characteristics

The participants were 70 sophomore students majoring in Advertising Design. Both instructional groups were taught by the same instructor and followed identical course objectives, instructional content, schedules, learning resources, and assessment criteria. Instructional method constituted the primary systematic difference between the two groups.

Results for Research Question 1: Overall Creative Ability

Students' creative ability was assessed at the end of the instructional intervention using the Student Creative Ability Scale. Table 1 presents the comparison of the experimental and control groups on creative ability dimensions.

Table 1: Comparison of Experimental and Control Groups on Creative Ability (Item-level)

No	Items	Experimental Group (PBL) Mean	SD	Interpretation	Control Group (Traditional) Mean	SD	Interpretation
1	Creative Thinking	4.22	0.55	Very High	3.61	0.62	High
2	Expressive Ability	4.17	0.55	High	3.59	0.63	High
3	Problem-Solving Ability	4.20	0.53	High	3.35	0.64	Moderate
4	Project Innovation	4.19	0.55	High	3.57	0.64	High

An independent-samples t-test revealed a statistically significant difference between the PBL and traditional instruction groups, with students receiving PBL achieving higher overall creative ability scores, $t(68) = 4.27$, $p < .001$. The associated effect size was large (Cohen's $d = 1.02$). These findings indicate that the instructional method had a statistically significant and practically meaningful effect on students' overall creative ability, supporting H1.

Results for Research Question 2: Learning Attitudes

Students' learning attitudes were assessed using the Students' Learning Attitudes Questionnaire.

Table 1: Comparison of Experimental and Control Groups on Learning Attitudes (Item-level)

No	Items	Experimental Group (PBL) Mean	SD	Interpretation	Control Group (Traditional) Mean	SD	Interpretation
1	Perceived Learning Value	4.31	0.50	Very High	3.71	0.61	High
2	Learning Engagement Intention	4.25	0.53	Very High	3.66	0.65	High
3	Perceived Learning Autonomy	4.24	0.53	Very High	3.64	0.65	High
4	Perceived Instructional Support	4.31	0.50	Very High	3.71	0.61	High

The independent-samples t-test showed a significant difference in overall learning attitudes between the groups ($p < .001$). The effect size was large (Cohen's $d \approx 1.00$). Students in the PBL group reported higher learning attitudes than those in the traditional instruction group. This supports H2.

Results for Research Question 3: Dimensions of Creative Ability

Independent-samples t-tests were conducted for each of the four dimensions of creative ability. The findings revealed that the group differences were statistically significant for all four dimensions. Effect sizes were large: Cohen's $d \approx 1.04$ for Creative Thinking, 0.98 for Expressive Ability, 1.04 for Problem-Solving Ability, and 1.01 for Project Innovation. These results support H3.

Instructor-Rated Project Evaluation

Instructor evaluation of final video advertising projects provided performance-based evidence. Table 3 presents the results.

Table 3: Teacher Evaluation of Final Video Advertising Projects (full score = 100)

No	Items	Experimental Group (PBL) Mean(100)	SD	Control Group (Traditional) Mean(100)	SD
1	Creative Thinking	88.40	6.05	79.10	5.82
2	Expressive Ability	87.95	6.12	78.70	5.90
3	Problem-Solving Ability	88.10	6.08	79.05	5.85
4	Project Innovation	88.25	6.15	79.20	5.88
	Total	88.20	6.10	79.00	5.80

Effect size analysis indicated very large differences between instructional methods. Cohen's *d* values ranged from approximately 1.50 to 1.57 across the four creative dimensions, with the overall project score yielding a Cohen's *d* of 1.55. These instructor-rated outcomes provide performance-based evidence that complements the questionnaire findings.

DISCUSSION

The findings of this study provide evidence that Project-Based Learning is more effective than traditional instruction in promoting creative ability among vocational video advertising design students. Students who receive PBL are generally better than students who receive lecture-style teaching in terms of creative performance. Both their perception of self-reporting ability and teachers' evaluation of the final project show obvious differences. From a constructivist perspective, learning is a process of actively participating in tasks rather than passively absorbing information. Students in the PBL group have always been encouraged to explore independently, participate in group discussions, and reflect on their work throughout the project, which may foster creativity (Piaget, 1970; Vygotsky, 1978).

Situated learning theory emphasizes that learning is closely related to the specific situation and practice in which it occurs (Brown et al., 1989; Lave & Wenger, 1991). In this study, project tasks were designed around realistic video advertising scenarios. Students, therefore, engaged in activities similar to those used by professional designers, which may have supported the development of creative competence as a practical, applied ability rather than an abstract skill. Regarding learning attitudes, students in the PBL group showed a higher sense of learning value, greater willingness to invest, greater learning autonomy, and a more complete perception of teaching support. Self-determination theory holds that autonomy, sense of ability and interpersonal association with learning are important for the learning experience and motivation (Deci & Ryan, 2000; Ryan & Deci, 2020). In the project-based practice of this course, students need to make independent decisions, collaborate, and respond to feedback throughout the process. These learning environment characteristics may be why students in the PBL group show a more positive learning attitude.

The dimensional analysis revealed that PBL's effects were not confined to a single aspect of creativity. Rather, improvements were observed across creative thinking, expressive ability, problem-solving ability, and project innovation. This multi-faceted improvement effect proves that project-based learning is suitable for design career courses that require novel ideas and implementation priorities.

Several limitations of this study should be acknowledged. The research was conducted at a single higher vocational college and focused on a single course. The findings are therefore specific to this particular institutional and disciplinary context. Intact classes were used, so students were not randomly assigned at the individual level. Creative Ability was partly measured through students' self-reports, and the teaching practice lasted only one semester. Future research should extend to multiple institutions, adopt longitudinal designs, and incorporate additional measures such as students' creative confidence and group collaboration dynamics.

CONCLUSION

In conclusion, this study demonstrates that Project-Based Learning is an effective pedagogical approach for cultivating creative ability and enhancing learning attitudes in vocational design education. The results offer practical guidance for educators and curriculum designers seeking to reform instructional practices and better prepare students for the creative demands of professional design work.

REFERENCES

- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 83(2), 39–43. <https://doi.org/10.1080/00098650903505415>
- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3–4), 369–398. <https://doi.org/10.1080/00461520.1991.9653139>
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32–42. <https://doi.org/10.3102/0013189X018001032>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235–266. <https://doi.org/10.1023/B:EDPR.00000034022.16470.f3>
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist*, 42(2), 99–107. <https://doi.org/10.1080/00461520701263368>
- Krajcik, J. S., & Blumenfeld, P. C. (2006). Project-based learning. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 317–334). Cambridge University Press. <https://doi.org/10.1017/CBO9780511816833.020>
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.
- Piaget, J. (1970). *Science of education and the psychology of the child*. Orion Press.
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33–40. <https://doi.org/10.1037/0022-0663.82.1.33>

- Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, 93(3), 223–231. <https://doi.org/10.1002/j.2168-9830.2004.tb00809.x>
- Runco, M. A., & Jaeger, G. J. (2012). The standard definition of creativity. *Creativity Research Journal*, 24(1), 92–96. <https://doi.org/10.1080/10400419.2012.650092>
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, Article 101860. <https://doi.org/10.1016/j.cedpsych.2020.101860>
- Thomas, J. W. (2000). *A review of research on project-based learning*. Autodesk Foundation.
- Torrance, E. P. (1974). *Torrance tests of creative thinking: Norms–technical manual*. Ginn.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2