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Effect of Project-Based Learning on Artistic Skills of Vocational High School Students

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Abstract

Background and Aims: This study addresses the gap between technical training and creative competence development in vocational art education, a persistent challenge in China's vocational education reform. Grounded in constructivist and experiential learning theories, this study aimed to: (a) compare vocational high school students' artistic skills before and after Project-Based Learning (PBL), (b) compare post-PBL skills against a 70% competency criterion, and (c) assess student satisfaction with PBL.

Methodology: The sample comprised 50 first-year art students from a Kunming vocational school, selected via cluster random sampling. A one-group pretest-posttest design was employed. Instruments included six PBL lesson plans, a reliable artistic skills assessment rubric (ICC=0.82), and a student satisfaction questionnaire. Data were analyzed using paired sample t-tests, one-sample t-tests, and descriptive statistics.

Result: Results indicated a statistically significant improvement in posttest artistic skill scores ($M = 76.34$, $SD = 4.03$) compared to pretest scores ($M = 65.92$, $SD = 5.30$, $p < .001$), with a very large effect size (Cohen's $d = 2.62$). This 10.42-point increase represents a substantial educational gain. Posttest scores also significantly exceeded the 70% criterion (67.2 points), $p < .001$. Furthermore, student satisfaction was very high ($M = 4.52$, $SD = 0.50$).

Conclusion: The study concludes that PBL is an effective instructional approach for enhancing artistic skills and meeting competency standards in vocational art education, supporting learner-centered reform and offering practical implications for curriculum design in vocational schools.

Keywords: Artistic Skills; Project-Based Learning; Vocational High School Students; Learning Satisfaction; Competency-Based Education; Constructivist Learning; Vocational Art Education

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Introduction

Enhancing instructional quality and student competencies is a central priority in China's vocational education reform (State Council, 2019). From an education management perspective, instructional models directly influence curriculum quality, competency standards, and the attainment of institutional reform goals. However, vocational art education continues to be dominated by a traditional skill-centered paradigm that prioritizes technical replication over creativity, critical thinking, and authentic application. Such an approach often limits opportunities for student exploration, collaboration, and real-world problem-solving, thereby leading to a gap between classroom learning and industry demands (OECD, 2020; UNESCO, 2021). Modern vocational systems emphasize the need to balance technical proficiency with innovation and collaboration to meet employability frameworks, yet assessment practices often overlook these higher-order competencies.

Project-Based Learning (PBL), grounded in constructivist and experiential learning theory, addresses these challenges by engaging students in authentic, inquiry-driven projects (Thomas, 2000). PBL is particularly suited to vocational education management contexts as it supports curriculum integration, interdisciplinary learning, and performance-based assessment—key elements for aligning instructional practice with industry expectations (Luo et al., 2024). It fosters active learning, collaboration, and reflection, facilitating the integration of theoretical knowledge with practical skills and the development of higher-order competencies. Recent studies in vocational settings have demonstrated PBL's effectiveness in promoting learner autonomy (Green & du Plessis, 2023), communication skills, and practical competence development (Luo et al., 2024). Despite supporting evidence, empirical research on PBL's effectiveness in vocational art education, particularly concerning foundational skills such as drawing, remains scarce. Previous studies have largely focused on general or higher education, leaving a gap in understanding how PBL impacts vocational high school students who require a dual focus on technical competence and creativity. This study, therefore, investigates the effects of PBL on vocational school students' artistic skills and learning satisfaction, contributing empirical evidence for instructional improvement and curriculum reform. By measuring both artistic skills and satisfaction, this study provides a comprehensive view of educational effectiveness, an approach valued in education management research.

Objectives

1) To compare students' artistic skills before and after receiving instruction through Project-Based Learning.

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2) To determine whether students' artistic skills after learning through Project-Based Learning meet or exceed the predetermined 70% competency standard, based on the school's official benchmark.

3) To evaluate students' satisfaction with Project-Based Learning as an instructional approach in vocational art education.

Literature Review

This literature review focuses on the application of Project-Based Learning (PBL) in vocational high school art education and its impact on students' artistic skills and satisfaction. It systematically examines the theoretical foundations of art education assessment, the pedagogical characteristics of PBL, and the design principles for student satisfaction evaluation.

1. Learning Theories Supporting PBL in Vocational Art Education

The effectiveness of PBL is underpinned by several interconnected learning theories. Constructivist learning theory posits that knowledge is actively constructed by learners through engagement with ideas and experiences (Dewey, 1910; Piaget, 1973). In a vocational art context, this translates to students building artistic understanding by tackling authentic projects. Experiential learning theory (Kolb, 1984) further emphasizes the role of concrete experience, reflective observation, and active experimentation in skill development. Social learning theory (Bandura, 1977) highlights the importance of collaboration and observation, which are integral to PBL's group work and peer feedback components. These theories collectively explain how PBL supports the development of creativity, problem-solving, and technical mastery in vocational students. Green & du Plessis (2023) demonstrated that PBL in vocational education promotes learner autonomy and deeper understanding through hands-on, real-world activities, fostering a greater sense of responsibility for students' own learning.

2. Theoretical Foundations of Art Education Assessment

Based on existing scholarship, the review clarifies that art education assessment should encompass aesthetic, technical, and conceptual dimensions, emphasizing the importance of interdisciplinary integration in artistic practice. Effective assessment must holistically reflect students' experiences in skill development, attitudinal shifts, and collaborative practice. Specifically for skill assessment, this study adopts a six-dimensional framework synthesized from the theories of Eisner (2002), Sternberg (1997), and others (form expression, design application, image interpretation, craft practice, work appreciation, interdisciplinary integration), providing a structured basis for evaluation. These dimensions are essential for vocational art students as they reflect industry expectations for technical ability, creative thinking, visual communication, and professional practice.

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3. PBL Pedagogy and Its Application in Art Education

Concurrently, PBL, as an authentic project-driven constructivist teaching model, is grounded in principles such as Kilpatrick's (1918) "purposeful act" and Dewey's (1910) "reflective thinking." These principles have been widely validated for enhancing student engagement and promoting deep learning (Larmer et al., 2015), demonstrating significant advantages in bridging theoretical knowledge and professional practice. Empirical studies support these claims. Luo et al. (2024) found that PBL effectively promoted vocational undergraduate students' oral English ability, with 87.5% of students achieving "High" or "Very High" developmental levels across multiple dimensions, demonstrating PBL's effectiveness in competency-based vocational education. Similarly, Hunter-Doniger (2018) demonstrated that authentic project tasks enhance students' artistic practice skills and motivation. These studies, despite varying contexts, consistently show PBL's potential to foster skill transfer and engagement.

4. Student Satisfaction in Student-Centered Learning Environments

Regarding satisfaction evaluation, literature suggests it should cover multiple core dimensions, including learning content, the learning process, instructor support, and evaluation outcomes. Educational management and instructional design literature explains that student-centered learning, autonomy, meaningful tasks, and supportive teaching environments contribute to positive learning experiences (Ryan & Deci, 2000). This theoretical grounding justifies satisfaction as a key outcome variable, as it reflects the learning environment's quality and its capacity to engage students. Research by Luo et al. (2024) identified that factors such as well-designed lesson plans, teachers' efficacy, and authentic activities significantly influence vocational students' learning outcomes and engagement. This study draws on relevant guidelines for student satisfaction surveys and art education assessment, tailoring the instrument to the features of PBL. The content validity of the questionnaire was ensured through expert review (using the IOC index), and its reliability was confirmed via Cronbach's Alpha analysis, aligning with educational measurement standards.

5. Identifying the Research Gap

Despite the growing body of evidence, a clear research gap remains. Few experimental studies have systematically investigated PBL's effect on foundational, multi-dimensional artistic skills within the specific context of vocational high schools in China. Existing research often lacks rigorous designs or focuses on broader educational levels. Furthermore, as noted by Nurhaini et al. (2024), effective PBL implementation in vocational high schools faces challenges, including inadequate preparation and the need for regular teacher development forums, highlighting the importance of understanding context-specific factors that influence PBL effectiveness. The present study addresses this gap by employing a quasi-experimental design to examine the impact

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of PBL on a comprehensive six-dimensional artistic skills framework in a vocational setting, thereby providing much-needed empirical evidence for this underrepresented population.

In summary, this review integrates the artistic skills framework, PBL pedagogy, and satisfaction assessment models, demonstrating how the literature on learning theories, assessment, and empirical outcomes logically supports the research focus. It provides a solid theoretical and methodological foundation for the research. It ensures the scientific rigor and contextual relevance of the questionnaire design and lays the groundwork for subsequent data collection and analysis.

Conceptual Framework

Based on the research framework, Project-Based Learning was treated as the independent variable, while students' artistic skills and learning satisfaction were treated as dependent variables. The framework is grounded in social constructivist theory and experiential learning theory, emphasizing learning through interaction, experience, and reflection. In this process, PBL is posited to foster key mediating processes such as student engagement, reflection, and collaboration, which in turn lead to the development of artistic skills and learning satisfaction. This conceptualization aligns with findings from Luo et al. (2024), who identified that well-designed PBL approaches incorporating authentic activities and teacher efficacy positively influence student outcomes in vocational education.



Figure 1 Conceptual Framework of the Study

Methodology

1. Participants and Sampling

The population of this study consisted of 300 first-year students enrolled in six classes at Guandu Vocational High School, Kunming, Yunnan Province, during the academic year 2025.

The sample comprised 50 first-year students from one intact class. Cluster random sampling was employed to select the sample class from the six available classes. The selected class served as a single experimental group in this study. The sample size of 50 is considered acceptable for quasi-experimental educational research, providing sufficient statistical power for the planned analyses (Cohen, 1988). Detailed demographic information, such as gender distribution and prior

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art training, was not collected for this study, which is acknowledged as a limitation.

2. Research Instruments

PBL Lesson Plans: Six 2-hour lesson plans were developed based on the Project-Based Learning framework, focusing on cultivating vocational high school students' artistic skills. The lessons covered thematic projects corresponding to six artistic skill dimensions: Form Expression, Design Application, Image Interpretation, Craft Practice, Art Appreciation, and Interdisciplinary Integration. Each lesson plan followed a structured PBL cycle, including project introduction, planning, implementation, presentation, and reflection, with the teacher acting as a facilitator. This structured approach aligns with recommendations from Luo et al. (2024), who emphasized the importance of well-designed lesson plans in effective PBL implementation. Expert validation confirmed a high level of appropriateness, with mean scores ranging from 4.60 to 4.65, significantly exceeding the established criterion of 3.51.

Artistic Skills Assessment Rubric: A rubric-based assessment tool was developed to evaluate students' artistic skills across the aforementioned six dimensions. Each dimension was rated on a 4-point scale (1 = Beginning to 4 = Excellent), yielding a total possible score of 96. Three expert art teachers were involved in the content validation process. The instrument demonstrated good content validity (IOC values ranged from 0.67 to 1.00) and acceptable inter-rater reliability, with an Intraclass Correlation Coefficient of 0.82 based on the ratings of two trained independent assessors.

Student Satisfaction Questionnaire: A questionnaire was designed to assess students' perceptions of the PBL-based art instruction. It consisted of 17 items measured on a 5-point Likert scale (1 = Very Low to 5 = Very High), covering learning content, instructional process, teaching support, and learning outcomes. While all items received an IOC of 1.00 from three experts, indicating excellent content validity, the possibility of a slightly lenient review is noted. The questionnaire showed acceptable internal consistency, with an overall Cronbach's Alpha coefficient > 0.70. Cronbach's alpha for subscales ranged from 0.72 to 0.85, indicating good reliability.

3. Data collection

The procedures for data collection were as follows:

1) The samples were given the pretest to measure students' artistic skills

2) The samples were taught using project-based learning strategies over a period of six weeks, with one 2-hour session per week.

3) After finishing the instruction, the samples received the posttest using the same instrument that was used in the pretest.

4) The samples were given the students' satisfaction questionnaire.

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4. Data analysis

In this study, data were analyzed using the statistical program according to the research objectives. Before analysis, the normality of difference scores for the paired sample was assessed and found to satisfy the assumptions for the t-test.

1) Compare students' artistic skills before and after receiving project-based learning strategies by using a t-test for dependent samples. Effect sizes (Cohen's d) and 95% confidence intervals were calculated to determine the magnitude and precision of the effect.

2) Compare students' artistic skills with the determined criteria set at 70 percent by using a t-test for one sample. This 70% criterion was based on the vocational school's official competency benchmark for satisfactory achievement in core subjects. Effect sizes were also calculated for this comparison.

3) Assess the student's satisfaction with project-based learning strategies by using the arithmetic mean and standard deviation.

Results

The findings are presented in direct response to the three research objectives.

1. Comparison of artistic skills before and after Project-Based Learning

The paired-samples t-test was conducted to compare students' artistic skills before and after learning through the Project-Based Learning method. The results of descriptive statistics and the paired-samples t-test are presented in Table 1. This analysis aimed to determine whether Project-Based Learning could effectively enhance students' artistic skills.

Table 1 Comparison of students' artistic skills before and after learning through Project-Based Learning

Group	n	Full score	Pretest scores		Posttest scores		t	p
			M	S.D.	M	S.D.		
Experimental group	50	96	65.92	5.30	76.34	4.03	18.51*	<.001

*p <.05

As shown in Table 1, the mean score of students' artistic skills in the pretest was 65.92 (S.D. = 5.30), while the mean score in the posttest increased to 76.34 (S.D. = 4.03). The posttest mean score was 10.42 points higher than the pretest mean score. The paired-samples t-test revealed that this improvement was statistically significant (t(49) = 18.51, p <.001). The effect size (Cohen's d = 2.62) is considered very large, indicating substantial practical significance. The 95% confidence interval [9.89, 10.95] suggests high precision in the estimated improvement. This result indicates that students' artistic skills after receiving Project-Based Learning were significantly higher than

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before the intervention. The reduction in standard deviation from 5.30 to 4.03 also suggests that PBL may have helped create more consistent student performance.

2. Comparison of Post-PBL artistic skills with the 70% Criterion

A one-sample t-test was conducted to compare students' posttest artistic skills scores with the criterion score set at 70 percent of the full score. This 70% criterion was based on the vocational school's official competency benchmark for satisfactory achievement in core subjects. The results of the analysis are presented in Table 2.

Table 2 The results of comparing the different scores of artistic skills after learning through the Project-Based Learning method, with the criteria set at 70 percent.

Group	Full score	Criteria score	n	M	S.D.	t	p
Experimental group	96	70% (67.20)	50	76.34	4.03	16.02*	<.001

*p <.05

As presented in Table 2, the mean score of students' artistic skills after learning through the Project-Based Learning method was 76.34, which was significantly higher than the criterion score of 67.20 at the .05 level of statistical significance ($t(49) = 16.02$, $p < .001$). The effect size for this difference is also very large (Cohen's $d = 2.27$), indicating that the PBL intervention not only helped students meet but also substantially exceeded the official competency benchmark. This finding aligns with Luo et al. (2024), who reported that PBL effectively promoted vocational students' abilities, with the majority achieving high developmental levels across multiple dimensions. This finding indicates that students' artistic skills after receiving Project-Based Learning exceeded the predetermined 70 percent criterion.

3. Assessment of Student Satisfaction After Project-Based Learning

Students’ satisfaction with the Project-Based Learning method was analyzed using descriptive statistics. The results of students’ satisfaction levels are shown in Table 3.

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Table 3 Level of student satisfaction after learning through the Project-Based Learning method.

No.	Item	M	S.D.	Level of appropriateness
Section 1: Satisfaction with Learning Content (α=0.82)				
1	Relevance and authenticity of PBL course content to real-world artistic practice (e.g., design tasks, creative projects)	4.52	0.50	Very high level
2	The challenging and inspiring nature of the PBL course content	4.56	0.50	Very high level
3	The extent to which PBL content helped improve my Form Expression Skills (e.g., handling line, color, texture, space)	4.54	0.50	Very high level
4	The extent to which PBL content helped improve my Design Application Skills (e.g., transforming creative ideas into visual solutions, applying visual language)	4.54	0.50	Very high level
Section 2: Satisfaction with the Learning Process (α=0.75)				
5	Experience of self-directed inquiry and artistic problem-solving in PBL	4.44	0.54	high level
6	Experience of group collaboration and interactive communication in PBL	4.48	0.50	high level
7	The extent to which PBL stimulated my interest and initiative in artistic learning	4.52	0.50	Very high level

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No.	Item	M	S.D.	Level of appropriateness
Section 3: Satisfaction with Instructor Support (α=0.78)				
8	Timeliness and effectiveness of guidance and feedback provided by the teacher during PBL	4.48	0.50	high level
9	Helpfulness of the teacher's support (e.g., art resources, technique suggestions, creative strategies)	4.52	0.50	Very high level
10	The teacher's effectiveness in fostering positive classroom interaction and a creative atmosphere	4.48	0.49	high level
Section 4: Satisfaction with Evaluation & Outcomes (α=0.80)				
11	Fairness and transparency of PBL assessment methods (e.g., formative assessment, work presentation, creative report)	4.56	0.50	Very high level
12	The extent to which PBL assessment accurately reflected my improvement in Craft Practice Skills and Work Appreciation Skills	4.48	0.54	high level
13	My satisfaction level with the artistic outcomes (works/projects/presentations) accomplished through PBL	4.50	0.51	Very high level
14	The extent to which PBL helped develop my Interdisciplinary Integration Skills (e.g., connecting art with knowledge from other disciplines)	4.50	0.51	Very high level

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No.	Item	M	S.D.	Level of appropriateness
15	The extent to which PBL has a positive impact on my future artistic learning or career development	4.50	0.51	Very high level
Section 5: Overall Learning Experience Satisfaction (α=0.85)				
16	My overall satisfaction with this PBL art course	4.50	0.51	Very high level
17	My willingness to recommend this type of PBL art course to other students	4.50	0.51	Very high level
Overall Total (α=0.88)		4.52	0.50	Very high level

Table 3 details the descriptive statistics for student satisfaction across four dimensions, measured via a 17-item, 5-point Likert scale. The overall mean score was 4.52 (S.D. = 0.50), reflecting a very high level of satisfaction with the PBL art course. All subscales demonstrated acceptable to good internal consistency, with Cronbach's alpha values ranging from 0.75 to 0.88. These high satisfaction levels are consistent with research by Green & du Plessis (2023), who found that PBL in vocational education leads to positive student perceptions, including deeper understanding and meaningful application of knowledge and skills.

All dimensions received consistently positive ratings. For Satisfaction with Learning Content (Items 1-4), students reported very high satisfaction (M = 4.54), notably valuing the content's relevance, authenticity, and its role in enhancing Form Expression and Design Application Skills. Regarding Satisfaction with the Learning Process (Items 5-7), the self-directed and collaborative aspects of PBL were highly valued (M = 4.48), with the highest score for stimulation of interest and initiative. Satisfaction with Instructor Support (Items 8-10) was also high to very high (M = 4.49), highlighting the importance of timely guidance and a supportive, creative environment. For Satisfaction with Evaluation & Outcomes (Items 11-15), students expressed strong approval (M = 4.51), particularly regarding assessment fairness/transparency and the development of Interdisciplinary Integration Skills. Items on the Overall Learning Experience (Items 16-17)

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confirmed this positive reception, showing high overall satisfaction and a strong willingness to recommend the course.

In summary, the data indicate that students perceived the PBL intervention very positively across all measured facets. The learning process, outcomes, and instructional support collectively fostered a highly satisfactory and engaging educational environment.

Discussion

The findings of this study confirmed that Project-Based Learning (PBL) was associated with significant improvements in vocational high school students' artistic skills. Students' posttest scores were significantly higher than their pretest scores, with a very large effect size, indicating that structured project-based activities effectively enhanced artistic performance across multiple dimensions. This improvement can be linked to specific PBL features, such as authentic tasks that required design planning, collaborative discussion, and iterative refinement—processes that encouraged reflection and experiential learning, which are central to higher-order artistic competency.

This result aligns with previous research demonstrating that PBL promotes deeper learning, problem-solving ability, and authentic skill development (Bell, 2010; Kokotsaki et al., 2016). More recent studies have corroborated these findings in vocational contexts. Luo et al. (2024) found that PBL significantly improved vocational undergraduate students' oral English ability, with 87.5% of students achieving high or very high developmental levels, demonstrating PBL's effectiveness in competency-based vocational education. Similarly, Green & du Plessis (2023) reported that PBL in vocational hospitality education promoted learner autonomy, deeper understanding, and meaningful application of knowledge and skills through hands-on, real-world activities.

The improvement in students' artistic skills may be explained through constructivist learning theory, which emphasizes active knowledge construction through meaningful engagement and real-world application (Dewey, 1910; Kilpatrick, 1918). In the present study, students were required to complete integrated art projects involving design planning, collaborative discussion, and iterative refinement. Such processes encouraged reflection and experiential learning, which are central to the development of higher-order artistic competencies. This suggests PBL helped students move from technical imitation to more original, creative application.

Furthermore, the results are consistent with cognitive apprenticeship theory, which suggests that modeling, guided practice, and feedback support skill acquisition in complex domains (Collins et al., 1989). Through teacher scaffolding and peer collaboration, students were able to progressively refine their artistic techniques and conceptual understanding.

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In addition to skill improvement, students reported very high levels of satisfaction with the PBL approach. This finding can be interpreted through the lens of Self-Determination Theory, which posits that learning environments supporting autonomy, competence, and relatedness enhance intrinsic motivation (Ryan & Deci, 2000). The PBL framework provided students with opportunities to make creative decisions, collaborate with peers, and experience tangible project outcomes, thereby strengthening their engagement and motivation. The consistently high satisfaction ratings, while positive, may also indicate a ceiling effect, suggesting the questionnaire could be refined in future iterations to capture more nuanced feedback.

The findings also carry implications for education management. The successful implementation of PBL required structured lesson plans, clear rubrics, and systematic evaluation, highlighting the importance of instructional leadership and resource management. For school administrators, these results suggest that investing in teacher training for PBL and allocating time for collaborative curriculum planning can be effective strategies for enhancing educational quality and aligning school outcomes with industry expectations. However, as noted by Nurhaini et al. (2024), effective PBL implementation requires addressing challenges such as inadequate preparation and the need for regular group discussion forums to support teacher development. Luo et al. (2024) similarly emphasized the importance of well-designed lesson plans and teachers' pedagogical efficacy in successful PBL implementation.

Overall, the findings suggest that Project-Based Learning is an effective instructional strategy for improving artistic skills and enhancing learning satisfaction in vocational high school art education.

This study has several limitations that should be considered. First, the one-group pretest-posttest quasi-experimental design, without a control group, limits the ability to draw strong causal conclusions. Threats to internal validity, such as maturation, testing effects, and instructor expectancy, cannot be entirely ruled out. Second, the sample was drawn from a single intact class in one vocational school, which limits the generalizability of the findings. Third, the six-session intervention was relatively short, and the study did not assess the long-term retention or transfer of artistic skills. Fourth, self-report bias may have influenced the satisfaction results. Finally, detailed demographic information was not collected, precluding analysis of potential differential effects across student subgroups. Future research should employ more rigorous designs, such as randomized controlled trials or quasi-experimental designs with control groups, include multiple schools and longer intervention periods, and use mixed methods to gain deeper insights into the learning processes. Studies should also investigate the sustainability of skill gains and explore how PBL can be effectively implemented across different vocational disciplines,

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addressing implementation challenges identified by Nurhaini et al. (2024), such as teacher preparation and resource allocation.

Recommendation

For Educators: Integrate PBL by designing authentic, professionally relevant projects. Guide students through the full creative process (planning, creation, presentation, reflection) and use clear rubrics to assess both process and product. Provide adequate scaffolding and formative feedback throughout project implementation. As noted by Luo et al. (2024), teachers' pedagogical efficacy and well-designed lesson plans are crucial factors in successful PBL implementation.

For Curriculum Designers: Incorporate PBL modules and exemplar projects into vocational art programs. Provide professional development resources and establish regular teacher collaboration forums (Nurhaini et al., 2024) to support teachers transitioning to student-centered models. Address resource and time constraints through careful curriculum planning.

For Future Research: As noted in the limitations, future studies should conduct longitudinal studies on skill retention and transfer, employ mixed-methods for deeper insights into learning experiences, and replicate the study across institutions and disciplines. Investigate the specific mediating mechanisms, such as student engagement and collaboration, that contribute to PBL's effectiveness. Additionally, research should explore strategies to address implementation challenges identified in vocational contexts (Nurhaini et al., 2024).

New Knowledge from the Research

This study contributes new knowledge to the field of vocational art education and education management in several ways. First, it provides empirical evidence from an underrepresented context, demonstrating that PBL significantly improves artistic skills among vocational high school students in China. Second, it introduces and validates a structured six-dimensional artistic skills framework (form expression, design application, image interpretation, craft practice, work appreciation, and interdisciplinary integration) within a PBL setting. This framework offers a systematic way to develop and measure complex artistic competencies that reflect industry expectations. Third, the finding that students significantly exceeded the official 70% competency benchmark suggests that PBL can effectively align instructional outcomes with institutional standards, offering a practical strategy for curriculum reform. Fourth, the research highlights the role of structured educational management—including clear lesson planning, assessment rubrics, and systematic evaluation—in supporting innovative, student-centered pedagogies. Finally, the study contributes to the growing body of literature on PBL in vocational education (Green & du Plessis, 2023; Luo et al., 2024; Nurhaini et al., 2024) by focusing specifically

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on multi-dimensional artistic skill development and identifying both the effectiveness and implementation considerations for PBL in vocational art contexts.

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