

THE DESIGN OF COLLEGE STUDENT'S CAREER PLANNING COURSE BASED ON PBL MODEL FOCUSING ON IMPROVING REPORT WRITING SKILLS*

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Abstract

This study aimed to 1) examine the impact of PBL on students' career report writing skills and 2) assess students' satisfaction with the PBL teaching model. The study adopted a single-group pre- and post-test precision experimental design with a teaching period of 8 weeks. 59 students majoring in emergency rescue technology participated in a PBL course designed based on real career tasks. The course content covered four modules: career planning document writing, corporate project report writing, PPT production and presentation, and mock interviews. Data collection included writing ability tests before and after the intervention and a satisfaction questionnaire survey after the course. The results revealed that:

1) After the implementation of Problem-Based Learning (PBL), college students' career report writing skills significantly improved in all dimensions, including structural logic, data integration, standardized language use, and audience adaptation ($p < 0.001$).

2) The students expressed high satisfaction with the teaching model, especially in terms of learning experience and workplace connection value.

Keywords: Problem-Based Learning (PBL), report writing skills, vocational education.

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Introduction

Against the backdrop of global economic restructuring and industrial upgrading, the goal of vocational education has shifted from single-skill training to the cultivation of comprehensive qualities and higher-level abilities. Career report writing, as a core skill for workplace communication and decision support, directly impacts university students' employment competitiveness and career development potential (Bazerman, 2018). However, multiple surveys show that Chinese university students generally suffer from unclear logical structures, insufficient data support, non-standard expression, and weak audience awareness in career report writing (Zhaopin.com, 2023; China Vocational and Technical Education Association, 2024). Especially in vocational colleges, traditional teaching models often emphasize format training and template application, neglecting problem analysis and logical construction in real workplace situations, leading to students' inability to apply what they learn (Li Juan, 2022).

To address this challenge, educational researchers and practitioners have begun exploring problem-based learning (PBL) models. Originating in medical education, PBL emphasizes that students construct knowledge and develop skills through collaborative inquiry, resource integration, and iterative feedback within authentic, complex, and open-ended problem situations (Hmelo-Silver, 2004). In vocational education, PBL has been proven to effectively enhance students' critical thinking, collaborative abilities, and knowledge transfer skills (Savery, 2015). In recent years, some universities in China have attempted to apply PBL to professional writing instruction, achieving initial success (Wang Guangfa, 2020; Ministry of Education Vocational Education Development Center, 2025). However, existing research largely focuses on eastern universities or general writing courses, with a lack of systematic PBL curriculum design research specifically for vocational colleges in central and western China (such as emergency rescue technology).

Therefore, this study takes the Emergency Rescue Technology major at Suining Engineering Vocational College in Sichuan Province as an example, designing and implementing a problem-based learning (PBL) course using a provincial-level career planning competition as a vehicle. This course systematically integrates four modules: career planning, project reporting, PowerPoint presentations, and mock

interviews. The aim is to improve students' career report writing skills through real-world task-driven learning and multiple rounds of feedback iteration. The study not only focuses on the effectiveness of skill enhancement but also delves into students' satisfaction with and perceived value of the PBL learning process. To guide the investigation, this study proposes the following research hypotheses: (H1) The PBL teaching model significantly improves students' career report writing skills across the dimensions of structural logic, data integration, standardized expression, and audience adaptation; (H2) Students report high levels of satisfaction with the PBL teaching model, particularly regarding the learning experience and its perceived workplace relevance. By testing these hypotheses, this study hopes to provide a curriculum model with both theoretical basis and practical reference for the reform of vocational education writing instruction.

Objectives

1. To compare the effectiveness of the PBL model on college students' report writing skills.
2. To investigate college students' satisfaction toward using of the PBL model.

Literature Review

1. The Theoretical Connotation and Development of the Problem-Based Learning (PBL) Teaching Model

Problem-based learning (PBL) is a student-centered teaching method, the core of which lies in promoting knowledge construction and skills development through solving real and complex problems (Hmelo-Silver, 2004). By positioning authentic problems as the starting point for learning, PBL inverts the traditional instructional hierarchy: knowledge transmission occurs before class, while class time is dedicated to problem analysis, collaborative inquiry, and solution optimization. This pedagogical shift effectively moves the teaching focus from "teacher instruction" to "student inquiry" (Savery, 2015).

In vocational education, PBL's emphasis on practice aligns closely with the goal of cultivating workplace readiness. The model requires that problem design originate from real-world work scenarios, the learning process simulate professional workflows, and the outcomes possess practical application value.

For example, in emergency management, tasks such as "developing emergency plans for high-rise building fires" naturally integrate the training of multiple skills, including legal knowledge, risk assessment, and report writing (Zhang Li, 2021).

2. Core Dimensions of Professional Report Writing Skills and Their Theoretical Integration with PBL

Professional report writing is a comprehensive professional skill, with an ability structure comprising four key dimensions: (1) Structural Logic Ability, or the capacity to construct a clear and rigorous argumentative framework. The SCIPAB framework (Situation-Complication-Implication-Proposition-Action-Benefit) is a commonly used logical model in professional reports, requiring students to move beyond simple listing and achieve rigorous causal argumentation (Minto, 2010). (2) Data Integration Ability, meaning the ability to effectively utilize multi-source evidence—such as regulations, standards, and cases—to support arguments. In emergency management, reports need to achieve triple data support from "regulations-standards-cases" (Sichuan Huayou Group Emergency Branch, 2024). (3) Standardized Expression Ability, which refers to the use of accurate and professional industry terminology in written presentation. The precision of terminology, the standardization of format, and the objectivity of language directly affect the professional credibility of the report. (4) Audience Adaptability, or the ability to adjust the content focus and presentation method according to the reader's needs, a key factor distinguishing "classroom assignments" from "workplace tools" (Bazerman, 2018).

The integration of PBL and the development of these writing skills is theoretically grounded. PBL provides the necessary pedagogical conditions for their cultivation: the authentic, complex problems inherent in PBL necessitate rigorous structural logic to propose viable solutions; the inquiry process demands extensive data integration to support arguments; the professional context requires standardized expression to ensure credibility; and the presentation of solutions to peers and simulated stakeholders cultivates audience adaptability. Current teaching practices, in contrast, show obvious shortcomings: the course content is often out of touch with workplace needs, teaching methods focus on template imitation, and the evaluation system emphasizes form over effectiveness (China Vocational and Technical Education Association, 2024). By

positioning students within the very problem contexts that demand these skills, PBL directly addresses these deficiencies, transforming writing from a decontextualized exercise into an authentic professional practice.

Research Methods

1. Population and Sample

Study subjects: All students of the Emergency Rescue Technology major in the School of Emergency Management of Suining Engineering Vocational College in 2025 (4 classes, 236 students in total).

Study Sample: Using cluster sampling, all students from a complete class of the first year of the 2025 Emergency Rescue Technology major were selected as the sample group, totaling 59 students (53 males, 6 females, with an average age of 20).

2. Research Instruments

1. Career Report Writing Ability Test: 30 questions, covering four modules (career planning document, corporate project report, PPT presentation, and mock interview), with a total score of 30 points. The internal consistency of the test was examined using Cronbach's alpha, yielding a reliability coefficient of $\alpha = 0.85$, which indicates good reliability.

2. PBL Course Implementation Plan: Developed around four modules, each including four stages: task preparation, collaborative inquiry, results presentation, and feedback iteration, integrating provincial competition requirements with real-world corporate tasks.

3. Student Satisfaction Questionnaire: 20 questions using a five-point Likert scale, covering four dimensions: PBL acceptance, perceived skill improvement, learning process experience, and workplace relevance. The reliability analysis produced a Cronbach's alpha coefficient of $\alpha = 0.88$, indicating strong internal consistency.

3.Data collection and analysis

Data Collection and Analysis The pre-test will be was conducted at the beginning of the course, and the post-test and questionnaire will be conducted after the course ends. Analysis of writing skills improvement: Using SPSS (or

similar) statistical software, paired-samples t-tests were conducted on the total scores of the pre-test and post-test and the scores of the four ability dimensions to test whether there were statistically significant differences in students' performance before and after the PBL intervention, thereby verifying the research hypothesis H1. Satisfaction questionnaire analysis: Descriptive statistical analysis was performed on the Likert scale (items 1-16), and the mean ($\bar{x}$) and standard deviation (S.D.) of each item and dimension were calculated to present the overall satisfaction level and internal consistency of students with the PBL model, thereby verifying research hypothesis H2.

Research Results

1. Overall Capability Improvement Analysis

To answer the first research question, "Did students' career report writing skills improve after adopting the PBL teaching model?", we analyzed pre-test and post-test data from 59 participants. Paired-samples t-tests were used to compare the results of the two tests. As shown in Table 1, the overall mean score of the post-test ($\bar{x} = 23.58$, S.D. = 0.66) was significantly higher than the overall mean score of the pre-test ($\bar{x} = 14.00$, S.D. = 0.67), representing an improvement of 68.4%. Statistical analysis showed that the improvement in post-test scores was statistically significant ($p < 0.001$). This result conclusively demonstrates that after an 8-week PBL teaching intervention, students' career report writing skills achieved comprehensive improvement.

skill Dimensions	Full Score	Pre-test $\bar{x}$	S.D.	Post-test $\bar{x}$	S.D.	n	t-test	p
Structural Logic	7	3.15	0.62	5.45	0.57	59	25.31	0.000
Data Integration	8	3.95	0.72	6.38	0.75	59	24.18	0.000
Proper Expression	8	3.85	0.72	6.34	0.74	59	23.47	0.000
Audience suitability	7	3.05	0.6	5.41	0.56	59	26.92	0.000
Total	30	14	0.67	23.58	0.66	59	54.32	0.000

Table 1 Paired t-test of Pre-test and post-test scores for professional report writing ability

2. Student Satisfaction Analysis

The questionnaire results show that students have a high overall satisfaction with the PBL teaching model ($\bar{x} = 4.42$, S.D. = 0.53). Among the dimensions, "perceived value in workplace application" received the highest score ($\bar{x} = 4.47$), followed by "learning process experience" ($\bar{x} = 4.46$). Specifically, students most appreciated "PPT presentation training improves high-pressure presentation skills" ($\bar{x} = 4.51$) and "the SCIPAB framework can be transferred to other workplace scenarios" ($\bar{x} = 4.47$). Most students indicated they would be willing to continue using the PBL model in other courses ($X = 4.46$). As shown in Tables 2

Serial Number	Statement content	n	$\bar{x}$	S.D.
1	Enterprise task orders are more likely to motivate me to write compared to traditional assignments.	59	4.44	0.53
2	The group collaboration mode makes the learning process more efficient.	59	4.25	0.68
3	The multiple-round feedback iteration mechanism significantly improves the quality of reports.	59	4.41	0.59
4	I am willing to continue using the PBL model in other courses as well.	59	4.46	0.50
5	Through peer evaluations within the group, I am better able to identify logical gaps in the report.	59	4.44	0.53
6	Data collection training taught me to support my arguments with evidence.	59	4.44	0.53
7	7.Feedback from industry experts has helped me understand the standard terminology used in this field.	59	4.47	0.50
8	Stress testing scenarios (such as an emergency fire) to enhance adaptability and resilience.	59	4.47	0.50
9	Role division of labor (project manager/technician) helps me understand the logic of workplace	59	4.42	0.56



Serial Number	Statement content	n	$\bar{x}$	S.D.
10	The "absence of a budget cycle" pointed out by the corporate mentor helped me realize the true needs of the workplace.	59	4.47	0.50
11	Field research at the fire station to deepen understanding of professional knowledge.	59	4.44	0.53
12	The teacher presses further, "Why was the data on downtime losses omitted?" to encourage deeper thinking.	59	4.49	0.50
13	The experience of writing a fire work order report is beneficial for handling actual work in the future.	59	4.42	0.56
14	PPT presentation training to enhance my communication skills in high-pressure situations.	59	4.51	0.50
15	The SCIPAB framework can be applied to other writing scenarios in various professional settings.	59	4.47	0.50
16	The achievements accumulated through this course can be directly utilized for job applications.	59	4.47	0.50
17	I believe the PBL (Problem-Based Learning) model will be beneficial to my future career development in the long run.	59	4.46	0.50
18	Through the course experience, I am willing to actively apply the writing framework and methods learned from PBL in subsequent professional courses.	59	4.49	0.50
19	My overall evaluation of the PBL (Problem-Based Learning) mode in this course is very good.	59	4.42	0.53
20	I would recommend this course to my classmates.	59	4.47	0.50

Table 2 Student Feedback on the Long-Term Impact and Overall Evaluation of the PBL Model

Discussions

1. The Role of PBL in Improving Professional Report Writing Skills

Structural Logic and Data Integration: The study confirms that Problem-Based Learning (PBL) significantly enhances students' ability to produce coherent professional reports. Unlike traditional methods that rely on rote memorization of formats, the real-world, task-driven nature of PBL compels students to synthesize complex information actively.

The SCIPAB Framework: A key factor in this success was the repeated training within the SCIPAB (Situation, Complication, Implication, Position, Action, Benefit) framework. This structural tool moved students away from passive "template application" toward "logical construction," allowing them to present arguments that are persuasive and business-oriented rather than merely descriptive.

Iterative Feedback Loops: The improvement was further driven by a multi-tiered review process involving both peer assessment and industry mentor feedback. This exposure helped students internalize high standards of expression and audience adaptation. By constantly revising their work based on professional critique—rather than just academic grading—students developed a sharper awareness of workplace communication norms, a finding consistent with Wang Guangfa (2020).

2. Positive Student Feedback on PBL Learning Experience

Bridging the Classroom-Workplace Gap: High levels of student satisfaction highlight the effectiveness of PBL in making learning feel relevant. The exceptional scores in "Perceived Value in Workplace Connection" suggest that the course successfully bridged the gap between theoretical study and practical application, reducing students' anxiety about future professional demands.

Enhanced Career Identity: The immersive nature of the course helped students transition their self-perception from "students completing assignments" to "professionals solving problems." This shift significantly boosted learning motivation and strengthened their developing career identity.

Authenticity through Resources: The learning experience was enriched by the integration of genuine corporate resources and competition-based scenarios. These elements added a layer of meaningful pressure and realism that hypothetical textbook cases often lack.

The Teacher as Facilitator: Finally, the positive feedback validated the pedagogical shift of the teacher's role from a "lecturer" delivering content to a "facilitator" guiding inquiry. This approach empowered students to take ownership of their learning journey, fostering greater autonomy and engagement.

3. Limitations and Generalizability

While the findings of this study are promising, several limitations must be acknowledged. First, the research employed a single-group pretest-posttest design without a control group. This design cannot fully rule out the influence of extraneous variables—such as students' natural maturation or concurrent learning from other courses—on the observed improvements. Future studies should consider using a randomized controlled trial to establish causal relationships more definitively.

Second, the sample was limited to 59 students from a single major (Emergency Rescue Technology) at one vocational college in western China. This narrow scope raises concerns about generalizability. The effectiveness of the PBL model may vary across different disciplines (e.g., humanities, business), institution types (e.g., research universities), and cultural or regional contexts. Replication studies in diverse educational settings are needed to confirm the broader applicability of the findings.

Third, the study measured students' writing skills immediately after the eight-week intervention, leaving the long-term retention of these skills unexplored. It remains unclear whether the improvements observed would persist over time or transfer effectively to real-world workplace tasks. Longitudinal research tracking students into their internships or early careers would provide valuable insights into the sustained impact of PBL.

Despite these limitations, the study offers robust preliminary evidence that PBL can be a powerful pedagogical approach for enhancing professional writing in vocational education, particularly in resource-constrained regions. By openly addressing these constraints, the research provides a clear roadmap for future investigations to build upon and refine its findings.

Recommendations

This study provides empirical evidence and practical direction for the reform of writing instruction in vocational colleges, with the following main implications:

First, the Problem-Based Learning (PBL) model can effectively bridge the gap between theoretical learning and professional practice in writing instruction. The results show that students made the most significant progress in structural

logic and data integration abilities, thanks to the PBL instructional design driven by real-world professional tasks. It is recommended that vocational writing instruction shift its focus from format standardization to cultivating thinking skills and practical application, constructing a closed-loop teaching system of "learning-practice-reflection-improvement."

Second, the transformation of the teacher's role is key to the successful implementation of PBL. Under the PBL model, teachers need to transform from knowledge transmitters to learning facilitators, resource coordinators, and process facilitators. Vocational colleges should strengthen teacher training to improve their PBL curriculum design, industry resource integration, and process guidance capabilities, build interdisciplinary teaching teams, and form a collaborative education mechanism.

Third, a teaching evaluation system oriented towards competency output should be established. This study validated the effectiveness of Problem-Based Learning (PBL) through multi-dimensional evaluation and recommends that vocational schools establish a comprehensive evaluation system that includes process performance, work quality, ability development, and career adaptability, and introduce industry standards and corporate evaluations to achieve a precise alignment between teaching and workplace needs.

Recommendations for Future Research:

While this study offers valuable insights, its limitations point to several directions for future inquiry. First, subsequent research should adopt more rigorous experimental designs, such as quasi-experimental designs with control groups or randomized controlled trials, to more definitively isolate the effects of PBL from other confounding variables. Comparing PBL with traditional instruction across parallel classes would provide stronger causal evidence.

Second, longitudinal studies are needed to examine the sustainability of PBL's effects. Tracking the same cohort of students over an extended period—through their internships and into their early careers—would reveal whether the writing competencies and professional mindsets cultivated through PBL endure and transfer to authentic workplace contexts. Such research could also explore how these skills evolve with accumulated professional experience.

Third, future research should investigate the transferability and adaptability of the PBL model across diverse educational contexts. Comparative studies involving different disciplines (e.g., engineering, business, healthcare), institution types (e.g., research universities, technical colleges), and regional settings (e.g., eastern vs. western China, urban vs. rural) would help establish the boundary conditions and generalizability of the findings. Cross-cultural comparisons could further illuminate how PBL interacts with varied educational traditions and industry expectations.

Finally, mixed-methods research combining quantitative assessments with in-depth qualitative approaches—such as ethnographic observation, think-aloud protocols during writing tasks, and longitudinal interviews—could yield richer understandings of how and why PBL shapes students' cognitive and identity development over time. Such insights would inform more nuanced refinements of PBL pedagogy tailored to specific learner populations and professional domains.

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