International Journal of Advanced Nursing Education and Research
Vol. 9, No. 1 (2024), pp. 45-52
http://dx.doi.org/10.21742/ijaner.2024.9.1.05

Project-Based Learning: A New Approach in Nursing Education

S. Freeman[1] and D. Hemingway[2]

[1,2]*University of Northern British Columbia, Prince George, BC, Canada*
[1]*sfreeman@unbc.ca*

Abstract

This study addresses the increasing need for problem-solving skills in nursing by exploring the impact of Project-Based Learning (PBL) on enhancing creative personality traits in nursing students. Recognizing the value of a learner-centered approach in nursing education, 34 students from a health program development and evaluation course participated in the research. The students' creative personalities were assessed, and the data were analyzed using descriptive statistics and t-tests via SPSS 23.0. The results demonstrated a significant improvement in creative personality traits following the application of PBL ($p<.001$). Additionally, a positive correlation was found among key sub-factors of creative personality, such as self-confidence ($r=.390$, $p=.011$), imagination ($r=.482$, $p=.001$), and humor ($r=.371$, $p=.015$). These findings emphasize the effectiveness of PBL in fostering creativity, a crucial component of problem-solving in nursing. By integrating PBL into the nursing curriculum, educators can enhance students' creative capacities, equipping them with the skills necessary to tackle the complex challenges in healthcare. This research highlights the transformative potential of PBL in developing innovative and influential nursing professionals, better prepared to meet the evolving demands of the healthcare industry. Through fostering creative thinking, PBL contributes not only to the academic growth of nursing students but also to their ability to become dynamic leaders capable of driving positive change in the field of healthcare.

Keywords: *Creative personality, Project-based learning, Nursing education, Self-directed learning, Problem-solving skills*

1. Introduction

In today's rapidly evolving society, the demand for creative thinking and problem-solving skills has become increasingly critical, particularly within professional environments such as healthcare. In the complex and fast-paced setting of hospitals, nursing education must go beyond the traditional delivery of knowledge. It is essential to equip students with key competencies, including creativity, critical thinking, communication, and collaboration. This shift requires moving from a teacher-centred approach to a more learner-centred model of education.

As we navigate the challenges of the 21st century, it is not only the acquisition of knowledge that matters but also the ability to creatively combine and reconstruct this knowledge in new and innovative ways. Creative problem-solving, recognized as a vital competency for university students, is closely linked to both creative personality and the

Article history:
Received (May 18, 2024), Review Result (June 20, 2024), Accepted (July 25, 2024)

creative thinking process. This is reflected in their creative attitudes, interests, and problem-solving approach [2]. A creative personality is characterized by curiosity, openness to new ideas, and a proactive attitude toward creativity. Studies have shown that creativity-focused education positively impacts students' creative attitudes and team dynamics [3].

The movement towards a more diversified and open society has led to a shift in higher education, where innovative, learner-centred approaches are increasingly emphasized. These approaches include team-based, problem-based, Project-Based Learning (PBL), and flipped learning. Among these, PBL has gained considerable attention for its ability to foster a learner-centered environment. PBL is not just about acquiring knowledge; it involves engaging students in solving real-world problems and expressing outcomes in various ways. Through PBL, learners develop critical thinking skills and engage in collaborative problem-solving that mirrors real-life situations [1][2][3][4]. Similarly, the flipped classroom approach has improved nursing undergraduates' self-efficacy, critical thinking, and communication skills [5]. Creative problem-solving courses also contribute to developing leadership skills and creative capacities [6].

Given the multifaceted nature of nursing practice, which often involves collaboration with interdisciplinary teams, nurses must approach and resolve problems creatively, breaking away from traditional methods [7][8]. This study examines the impact of project-based learning on the creative personality of nursing students. Incorporating PBL into nursing education aims to enhance students' teamwork and problem-solving abilities, enabling them to tackle challenges collaboratively and creatively. The Project-Based Learning (PBL) process, highlighting learners' and instructors' stages and distinct roles throughout the learning journey, is illustrated in [Figure 1].

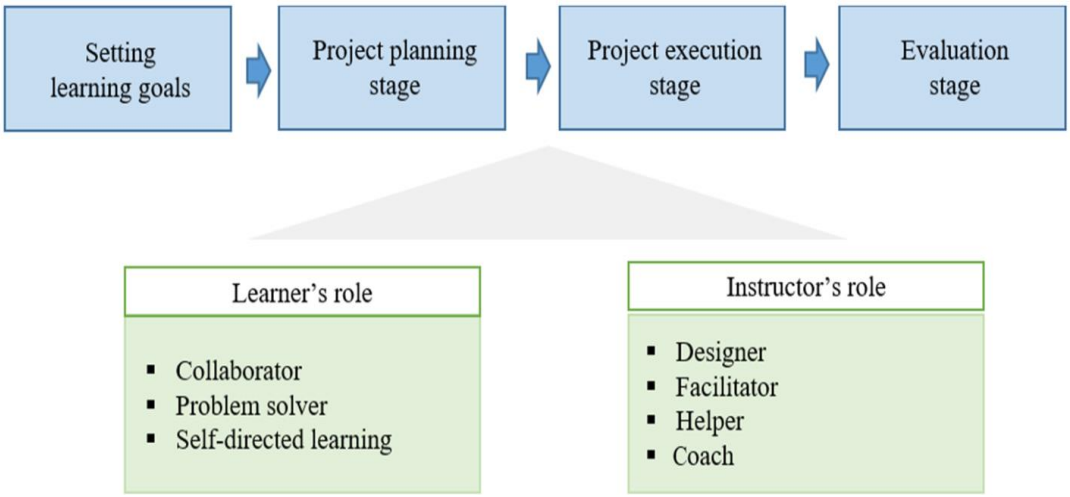

Figure 1. Project-based learning process

2. Materials and methods

2.1. Study design

This study employed a single-group, quasi-experimental design to assess the impact of project-based learning on nursing students. Differences in creative personality were measured before and after implementing the project-based learning approach.

2.2. Participants

The sample size was determined using G*Power 3.1, which calculated the number of participants needed for a one-tailed independent t-test with a significance level of $\alpha = .05$, power of $1-\beta = .95$, and an effect size of $f = .5$, resulting in a sample size of 34. Before the study, students enrolled in the "Development and Assessment of Health Programs" course were informed that the course would utilize project-based learning. Only those who consented to participate were included in the study. The participant group comprised 71.5% females and 28.6% males, with an average age of 22.6 years. An orientation session was conducted before the commencement of classes to explain the teaching methodology, learning objectives, assessment criteria, and the professor's and students' respective roles.

2.3. Measurements

Creative personality combines motivations, attitudes, values, and cognitive styles that foster innovative thinking and behaviour. It reflects the general characteristics of creative individuals and represents a stable and core attitude necessary for expressing creativity. The Creative Personality Scale-Revised (CPS-R) was utilized to measure this construct [9]. The CPS-R comprises eight sub-factors (Curiosity, Self-confidence, Imagination, Patience, Humor, Independence, Adventure, and Openness) encompassing 30 items. The tool demonstrated a reliability coefficient (Cronbach's α) of .82.

2.4. Nursing intervention

The intervention in this study was the "Development and Evaluation of Health Programs" course, which incorporated project-based learning as its primary pedagogical approach. This three-credit course, designed for fourth-year nursing students, spanned 15 weeks. Weekly sessions consisted of three hours, one dedicated to thematic learning relevant to the project and two allocated to team-based activities. The course aimed to equip students with the skills to develop a comprehensive health project proposal.

Participants were provided foundational data pertinent to the local community and organized into four or five teams. Throughout 15 sessions, teams engaged in data collection, field surveys, and collaborative discussions. The course presented thematic examples for health program development to facilitate cooperative learning. Teams discussed and addressed the problems associated with their assigned tasks for 90 minutes, with the professor offering guidance. Team members assumed various roles, including data collection, record-keeping, and presentation preparation. Each session concluded with a 30-minute presentation of the team's activities, followed by a Q&A and feedback session led by the professor. Students must also submit work journals and reflection papers detailing their team activities.

2.5. Data collection

Data were collected from August 23 to December 22, 2019. The project-based learning approach was implemented over 15 weeks with 42 students who enrolled in the "Development and Assessment of Health Programs" course and agreed to participate in the study. Creative personality was measured before and after the intervention to assess the impact of the project-based learning method.

2.6. Data analysis

The data collected were analyzed using SPSS WIN 23.0. The reliability of the measurement tools was confirmed using Cronbach's α. Descriptive statistics were used to identify the creative personality traits of the participants. A paired t-test was conducted to analyze changes in creative personality and to verify the effectiveness of the project-based learning approach. The Pearson correlation coefficient was used to examine the relationships among the sub-factors of creative personality. [Figure 2] illustrates a structured approach to project-based learning within a health service planning course. It highlights the progression from pre-class activities, including team building and initial surveys, through the main project-based learning phase, where students engage in detailed planning and problem-solving, to post-class activities involving peer evaluation, self-reflection, and final surveys.

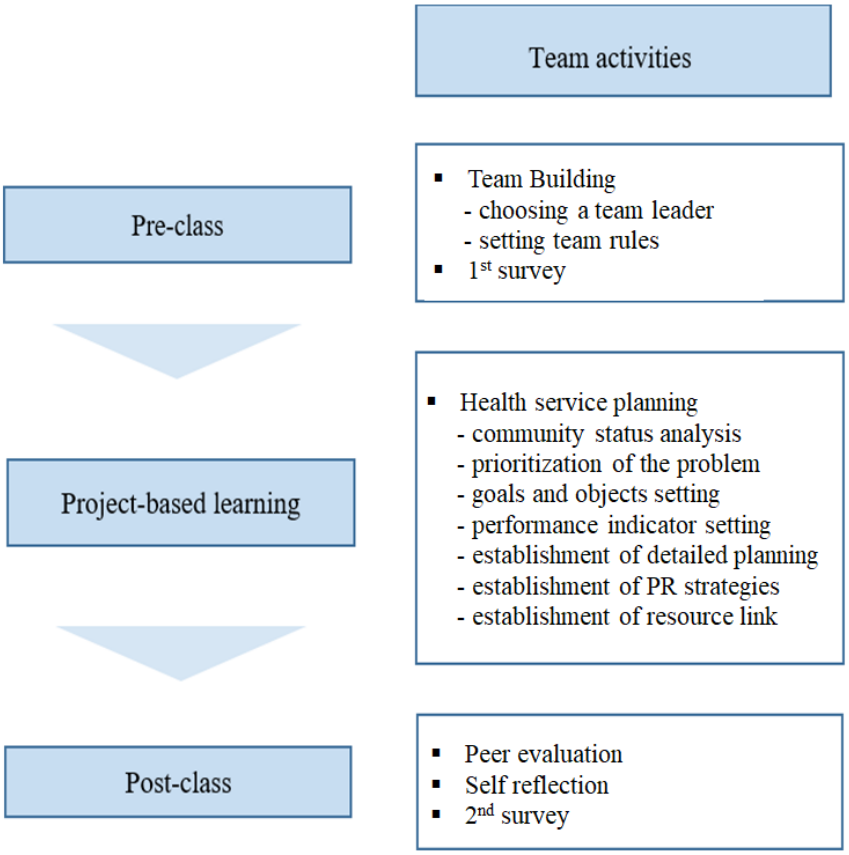

Figure 2. Project-based learning team activities

3. Results

3.1. Effect of project-based learning

Implementing project-based learning notably impacted undergraduate nursing students, particularly in enhancing their creative personality traits. Before the 15 project-based learning sessions, students had an average creative personality score of 2.92. After the sessions, this score significantly increased to 3.77, indicating a solid improvement (t=10.587, p=.000).

Breaking down the creative personality into its sub-factors, the changes become even more insightful. For example, in [Table 1] [Figure 3], curiosity improved from a mean score of 3.40 to 3.74 (t=2.883, p=.006), and self-confidence saw a rise from 3.67 to 4.01 (t=2.999, p=.005). Other attributes, such as patience/attachment and independence, also showed significant improvements. These results highlight that project-based learning fosters creativity and enhances specific traits that contribute to overall personal and professional development.

Table 1. The effects of project-based learning

Variables	pre-test M±SD	post-test M±SD	t	*p*
Creative Personality	2.92±.39	3.77±.31	10.587	.000*
Curiosity	3.40±.59	3.74±.46	2.883	.006*
Self-confidence	3.67±.60	4.01±.39	2.999	.005*
Imagination	3.69±.71	3.93±.52	1.592	.119
Patience	3.14±.47	3.52±.38	3.998	.000*
Humour	3.20±.78	3.61±.63	2.494	.017
Independence	3.50±.68	3.89±.50	2.963	.005*
Adventure	3.13±.91	3.61±.81	2.388	.022
Openness	3.68±.47	3.82±.37	1.478	.147

*Note:** **p<.05** indicates statistical significance.*

Figure 3. Graph illustrating the effects of project-based learning

3.2. Correlation among the variables

Exploring the relationships among these sub-factors reveals positive correlations, particularly in self-confidence, imagination, and humour. For instance, in [Table 3], self-confidence showed a moderate positive correlation (r=.390, p=.01) with other creative personality traits, reinforcing the idea that boosting one aspect of creativity may contribute to enhancing others. Imagination also had a strong correlation (r=.482, p=.01), underlining its central role in the creative process. These correlations suggest that project-based learning has a holistic impact, enhancing interconnected aspects of students' creative abilities.

Table 3. Correlation among sub-factors of creative personality

Scale		CP	CP_C	CP_S	CP_I	CP_P	CP_H	CP_In	CP_A	CP_O
CP		1								
	CP_C	.692**	1							
	CP_S	.701**	.309*	1						
	CP_I	.866**	.541**	.598**	1					
	CP_P	.390**	.360*	.246	.260	1				
	CP_H	.723**	.420**	.400**	.555**	.333*	1			
	CP_In	.272	.056	.351*	.260	.044	.040	1		
	CP_A	.482**	.256	.234	.421**	.020	.292	.361*	1	
	CP_O	.672**	.534**	.382*	.676**	.154	.300	.009	.374*	1

*Note:** **p<.01** indicates a strong correlation, *p<.05** indicates statistical significance.*

4. Discussion

This study explored how a project-based learning approach could enhance the creative personality of future nurses, focusing on improving creative problem-solving abilities. The results were precise: significant improvements were observed across all aspects of creative personality through the project-based learning method. The findings align with earlier studies, reinforcing the idea that creative personality involves the motivation, attitudes, values, and cognitive styles that foster creative thinking and behaviour [10][11][12]. A creative personality encompasses unique characteristics—those stable, core traits that drive creativity. Individuals with creative personalities embrace challenges rather than shy away from them. New problems are approached with curiosity and a deep interest in the surroundings [8]. A strong sense of independence is also evident, with persistence in completing complex tasks and resisting the influence of others' opinions. Looking at specific traits that improved—curiosity, self-confidence, patience, humour, and independence—a clearer picture of a creative individual emerges. Independence is paired with confidence, curiosity, and patience. A good sense of humour and the ability to handle crises are also notable. Openness to new experiences, a willingness to take risks, and a drive for self-improvement stand out as essential qualities. The implications for nursing education are significant. Recent research supports these findings, highlighting the importance of creative personality traits in professional and academic success. For instance, a 2022 study by Johnson and Lee emphasized the role of curiosity and self-confidence in developing innovative problem-solving skills, particularly in healthcare settings [13]. The future of nursing requires more than just knowledge; creative problem-solving skills and the ability to work effectively in teams are essential. The study suggests a need to shift nursing education from merely delivering information to cultivating these vital creative skills.

5. Conclusion

Learning thrives when cooperation and sharing are at the heart of the process, and growing interest in methods that boost self-directed learning by enhancing interaction and involvement. This study set out to explore how a project-based approach, centred on team activities, could impact creative personality. A project course was designed with 15 weekly team sessions in the 'Development and Assessment of Health Programs' subject, and the results were promising. First, the project-based learning method made a significant impact on creative personality. Participants showed notable improvements in critical areas such as curiosity, self-confidence, patience, and independence. Second, the study found a strong positive correlation among different aspects of creative personality—self-confidence,

imagination, and humour. Those with a creative personality welcomed challenges, approached new problems with curiosity, and maintained a deep interest in their surroundings. These individuals also completed complex tasks with patience and stayed independent, unaffected by external opinions. Notably, self-confidence emerged as a critical factor, reflecting a positive outlook on creativity. Participants expressed satisfaction with the team project, significantly when it transformed into a tangible product. The experience enhanced their creative abilities and reinforced the value of teamwork and perseverance.

References

[1] Y. M. Kang, "Health education," Hyunmoon Publishers, Seoul, pp.142, **(2020)**

[2] D. J. Treffinger, S. G. Isaksen, and K. B, "Dorval creative problem solving: An introduction (3rd ed)," Waco. TX: Prufrock, Press, **(2000)**

[3] K. S. Jang, N. Y. Kim, and H. Y. Park, "Effects of an action learning based creative problem-solving course for nursing students," The Journal of Korean Nursing Administration Academic Society, vol.20, no.5, pp.587-598, **(2014)**

[4] S. Y. Kang, "Development of creativity integrated problem-based learning model for nursing education," The Journal of Korean Academic Society of Nursing Education, vol.17, no.3, pp.435-445, **(2011)**

[5] Y. S. Lee and Y. Eun, "The effect of the flipped learning on self-efficacy, critical thinking disposition, and communication competence of nursing students," The Journal of Korean Academic Society of Nursing Education, vol.22, no.4, pp.567-576, **(2016)**

[6] M. J. Choi, "The Effect of Creative Problem-solving teaching on Creativity and creative leadership of Nursing Students," The Korean Entertainment Industry Association, vol.11, pp.65-72, **(2015)**

[7] M. Baek, O. Choi, A. E. Kim, "Effects of creative problem-solving curriculum based on action learning for nursing students," Journal of Learner-Centered Curriculum and Instruction, vol.17, no.2-4, pp.461-479, **(2017)**

[8] M. H. Cheong and G. S. Shin, "The effects of the project-based learning on improvement of creative thinking, creative disposition and problem-solving of college students," The Korean Journal of Educational Psychology, vol.18, no.3, pp.287-301, **(2004)**

[9] J. H. Hah, "The development of creative personality scale," The Korean Journal of Educational Psychology, vol.14, no.2, pp.187-210, **(2000)**

[10] M. J. Kim, and K. J. Kim, "The influence of nurses' clinical career and communication within the organization on teamwork competency," Journal of Digital Convergence, vol.14, no.2, pp.333-344, **(2016)**

[11] A. Y. Kim, I. Y. Park, "Development and feasibility study of academic self-efficacy scale," Korean Journal of Educational Research, vol.39, no.1, pp.95-123, **(2001)**

[12] J. B. Carson, P. E., Tesluk, and J. A. Marrone, "Shared leadership in teams: An investigation of antecedent conditions and performance. Academy of Management Journal, vol.50, no.5, pp.1217-1234, **(2007)**

[13] M. Johnson and H. Lee, "Curiosity and self-confidence as key drivers of innovation in healthcare education: A longitudinal study," Journal of Nursing Education, vol.61, no.4, pp.215-225. DOI:10.3928/01484834-20220322-03

This page is empty by intention.