

## EFFECTIVENESS OF A NURSING CAPSTONE PROJECT COURSE IN ENHANCING NURSING STUDENT CREATIVITY

Pei-Yu Lee<sup>1</sup>, Chin Tang Tu<sup>2</sup>, Man-Hua Shen<sup>3</sup>, Ya-Lie Ku<sup>4</sup>



1. RN, PhD, Assistant Professor, Department of Nursing, Fooyin University
2. PhD, Associate Professor, Center for Teacher Education, National Kaohsiung Normal University
3. RN, MSN, Instructor, Department of Nursing, Fooyin University
4. RN, MSN, Assistant Professor, Department of Nursing, Fooyin University

### ARTICLE INFO

#### Corresponding Author:

Ya-Lie Ku,  
Assistant Professor  
151, Chin-Hsueh Rd., Ta-Liao  
District, Kaohsiung City 83102,  
Taiwan, ROC.  
ns126@fy.edu.tw

**Key words:** creativity, project,  
nursing



DOI:<http://dx.doi.org/10.15520/ijmhs.2016.vol6.iss3.115>.

### ABSTRACT

**Aims:** The purpose of this study was to explore the effectiveness of a nursing capstone project course in enhancing nursing student creativity. **Design:** This study involved a pre–post-test design. **Methods:** Samples were tested through a questionnaire on factors influencing creativity during the first and final weeks of the course. The questionnaire included questions on nursing student characteristics, abilities, barriers, and motivations. This study was conducted from September 2014 to January 2015. A total of 300 nursing students were recruited, and 150 completed the pretest and posttest, indicating a 50% return rate. Of the 150 enrolled students, more than 90% had not participated in nursing project training or conferences or conducted nursing projects. **Results:** The nursing students exhibited significant differences in characteristics and abilities before and after the nursing capstone project course and showed enhanced positive characteristics and creative abilities by the end of the training course. However, the factors of barriers and motivations in creativity were not significantly different. The students also failed to enhance their creative motivations. Furthermore, the results of a multiple regression analysis revealed that before the nursing capstone project course, the students perceived the strongest predictors of their creativity to be abilities and barriers; by contrast, they perceived characteristics and motivations as the strongest predictors after the course. **Conclusions:** The nursing capstone project course affected the influencing factors of nursing student creativity. This study thus validates the effectiveness of the 18-week nursing capstone project course in enhancing the creativity of the nursing students, as indicated by the significantly increased creativity scores after the training course compared with those before the course.

©2016, IJMHS, All Right Reserved

### INTRODUCTION

Following the Ministry of Education's (2004) advocation of creative education, all Taiwanese technical

institutions and universities have implemented project-related creative courses aimed at increasing opportunities for industry–university cooperation in fostering technological innovations, receiving patents, and ultimately establishing a sustainable development model for universities. Furthermore, the Southern District Center of Industry–University Cooperation has encouraged its partner schools to actively foster industry–university cooperative research projects by teachers and students to cultivate innovative thinking, as well as to extend and reward excellent project outcomes that reflect the effective capitalization on technical and vocational education.

Apart from the education field, creativity has gradually become a globally recognized concept in nursing. The opportunity to be creative and original was one of the factors influencing the choice of nursing as a career in a survey of 220 Iranian baccalaureate nursing students (Varaei, Vaismoradi, Jasper, & Faghihzadeh, 2012). Additionally, Licen and Plazar (2015) systematically reviewed articles on nursing competence assessment tools following PRISMA guidelines, and they identified advancement, creativity, freedom of thought, and originality as the main components of nursing competence in Slovenian nursing education. In Taiwan, professional nursing organizations have encouraged nurses to develop creative thinking in order to implement innovative projects for producing creative products to improve the quality of patient care, comfort, and satisfaction. For example, 139 innovative nursing products were selected between 2004 and 2012 during the annual innovative nursing competition, according to information derived from the National Union of Nurses' Association (Taiwan Nurse Association Message, 2005; Nursing Magazine, 2004–2012).

Most studies on creativity in nursing education have focused on teaching strategies and learning styles; hence, most nursing education programs lack courses specific to creative projects. Therefore, Ku and Kuo (2014) developed a teaching framework for creative thinking in nursing education in Taiwan. In addition to this framework, they developed and validated a questionnaire on factors influencing creativity among RN-BSN students in Taiwan

(Ku, Lee, Tu, Shen, & Kuo, 2015); they also constructed and evaluated a nursing capstone course designed to cultivate creativity among Taiwanese RN-BSN students (Ku, Lee, Shen, & Kuo, 2014; Ku Shen, Lee, Kuo, & Lee, 2014). However, whether this nursing capstone course influences the creativity of nursing students is unclear.

### **Purpose of the Study**

The purpose of this study was to explore the effectiveness of a nursing capstone project course in improving nursing student creativity.

### **Definition of Nursing Student Creativity**

Nursing student creativity was defined as the self-perception of creativity as measured on a 1–10 visual analog scale and on the basis of the changes among four factors (abilities, characteristics, barriers, and motivations) influencing creativity before and after the nursing capstone project course.

### **Literature Review**

Education on creativity has shifted from traditional learning to a colearning process comprising the four characteristics of deep thinking, passionate work, clear purpose, and courage in addition to creative activities such as games and role playing (Story & Butts, 2010). Hydo, Marcyjanik, Zorn, and Hooper (2007) applied art in liberal nursing education for 91 nursing students, and they identified four themes, namely teamwork, personal boundaries, professional boundaries, and sharing experience-based art and creativity, which could promote student self-awareness. Furthermore, Nemeč and Sullivan-Soydan (2009) developed flexible and creative clinical practice assignments for medical doctors to complete their internships through their own patterns without concrete guidelines. Finally, Logan (2012) introduced YouTube as an innovative teaching platform for engaging learners, which could enhance critical thinking, creativity, and decision-making skills among perioperative nurses.

Apart from teaching strategies, Chan (2012) systematically reviewed 1929 articles from different data resources and identified four themes, namely freedom, confidence in learning, diversity, and group learning, for improving creative thinking and creativity among nursing students. To approach these four themes, learner-centered,

self-directed, and problem-based learning were revealed as effective teaching methods for increasing the creative thinking and creativity of nursing students. Kramer et al. (2007) identified four types of learner-centered learning as service-, team-, discussion-, and structured research-based learning that could cultivate the abilities of engagement, critical thinking, application of innovations, and clinical reasoning in nursing students in addition to promoting faculty creativity. Regarding self-directed learning, Klunklin, Viseskul, Sripusanapan, and Turale (2010) indicated that 272 Thai nursing students engaging in self-directed learning exhibited high levels of self-perception as active, independent, and respondent learners, and that they possessed creativity and problem solving skills.

Regarding problem-based learning, Harley (2011) determined a means of creative problem solving according to the flexible interactions between a female patient undergoing home peritoneal dialysis and her family and home care nurses on the basis of innovative thinking. Moreover, Klunklin, Subpaiboongid, Keitlertnapha, Viseskul, and Turale (2011) applied problem-based learning in a study of 25 Thai nursing students who reported satisfaction in learning creativity, working as group, and developing leadership skills, according to content analysis data. Furthermore, Chan (2013) conducted a qualitative study to explore the meaning of creativity among 36 Hong Kong nursing students, identifying three themes: revision of the meaning of creativity, partners or rivals in creative processes, and the practicality of creativity. Chan (2014) subsequently applied three innovative learning activities, namely poem writing, song composition, and role playing, in problem-based learning classes and revealed an improvement in student learning motivation, creativity, clinical reasoning, empathy, and team spirit, as evidenced by the reflective notes of 38 Hong Kong nursing students and reviewer commentary. Regarding innovative learning activities, Chan (2013) explored the attitudes of 100 Hong Kong nursing students toward problem-based learning, critical thinking, and creativity. Qualitative content analysis indicated that innovative learning groups were

associated with a closer relationship between critical thinking and nursing care as well as between creative thinking and nursing care; furthermore, students perceived critical thinking as more crucial than creative thinking is in problem-based learning and clinical practices.

**Method**

This study involved a pre-posttest design. The study sample comprised 300 Taiwanese nursing students enrolled in 2-year nursing programs and attending the nursing capstone project course during the day and at night. The students were tested with the questionnaire on factors influencing creativity during the first and final weeks of the course. The 27-item questionnaire investigated RN-BSN student characteristics, abilities, barriers, and motivations. This study was conducted from September 2014 to January 2015.

The validity and reliability of the questionnaire were confirmed by exploratory factor analysis; before validation, 33 items were devised to assess student characteristics (9 items), abilities (10 items), barriers (7 items), and motivations (7 items). Cronbach’s alpha values ranged from .86 to .92 for each scale, and the total explanation of variance ranged from 52.95% to 65.4%. Confirmatory factor analysis was conducted, and 27 items among 4 subscales were validated (all  $2/p > 0.05$ , goodness of fit index [GFI]  $> 0.9$ , root mean square residual  $< 0.5$ , root mean square error of approximation  $< 0.5$ , and adjusted GFI  $> 0.9$ ). Because of its high validity and reliability, the questionnaire was considered a concise and useful tool (Ku, Lee, Tu, Shen, & Kuo, 2015).

The nursing capstone project course was held during a single semester (18 weeks) at 2 h per session with the objective of completing a professional nursing-related practicum project through groups. Apart from lectures on project production and rationale, this course focused on introducing and discussing innovative strategies and interventions in domestic and foreign nursing practicums. Table 1 presents the structure of the nursing capstone project course.

**Table 1 The course content/teaching strategies of nursing capstone project course**

| Week | Course Content | Teaching Strategies |
|------|----------------|---------------------|
|------|----------------|---------------------|

## Ku/Effectiveness of a Nursing Capstone Project Course in Enhancing Nursing Student Creativity

|      |  |   |
|------|--|---|
| 1    | Course description and Playing game  | -Lecture<br>-Playing game of nine rectangle grid  |
| 2    | Creative problem-solving-I for understanding problems<br>- clinical plight<br>- motivation and purpose of design   | -Creative problem-solving teaching strategies<br>-searching and reviewing the literature related to nursing professionals   |
| 3    | Creative problem-solving-II for inspiring ideas<br>-creative ideas<br>-ATDE model merging into the concepts of fluencies, flexibility, uniqueness<br>-divergent and convergent     | -Teaching strategies of Asking, thinking, doing, evaluation (ATDE) teaching model merging into the concepts of fluencies, flexibility, uniqueness<br>-Teaching strategies of association/connection, constitution, replacement, transformation<br>-searching and reviewing Taiwan Patent Searching System |
| 4    | Creative problem-solving-II for preparing action<br>-design content/drawing picture<br>-naming the project<br>-searching supported rationale and principle<br>-applicable analysis | -critical thinking teaching strategies<br>-creative thinking teaching strategies  |
| 5    | Evaluation criteria of nursing project production products   |   |
| 6-15 | Each of four instructors lead a group of nursing students to complete a nursing project as producing a nursing product   | -inspiring, leading, probing, thinking, discussion, brainstorming, team-cooperation<br>-instructing, demonstrating, real production, and modification   |
| 16   | Group reports ①②   | Lead group reflect, critique, discussion, and sharing   |
| 17   | Group reports ③④   |   |
| 18   | Group report⑤<br>Group post-cognition reflective activities  |   |

Before the start of the course, the investigator trained five teachers as the core respondents for the course. Subsequently, each correspondent teacher trained four instructing teachers for each class, and each class comprised five groups. The training grants and projects were provided for the instructors during course development.

### Results

Among the recruited nursing students, 150 completed the pre- and posttests without any missing data, indicating a 50% return rate; these students were thus enrolled in the study. The average age of the students was 21.2 years (SD = .76). Most of the students were female (95.3%); moreover, all of them (100%) were enrolled in the daytime program, 92.7% had never participated in nursing project training or conferences, and 96% had never conducted a nursing project. Table 2 presents the demographics of the study sample.

**Table 2 Demographics of the Studying Samples**

| Demographic Variables   | Category | Frequency | Percentage |
|---|----------|-----------|------------|
| Sex   | Female   | 143       | 95.3%      |
|   | Male     | 7         | 4.7%       |
| Program   | Day      | 150       | 100.0%     |
|   | Night    | 0         | 0.0%       |
| Have ever participated in nursing project training or conference? | Yes      | 11        | 7.3%       |
|   | No       | 139       | 92.7%      |
| Have ever been the experiences of conducting nursing project      | Yes      | 6         | 4.0%       |
|   | No       | 144       | 96.0%      |

A paired *t* test was conducted, and according to the 1-10 visual analog scale, the creativity perceived by the enrolled nursing students significantly improved by the conclusion of the course ( $p < .001$ ). In addition, the influencing factors of characteristics ( $p < .05$ ) and abilities ( $p < .001$ ) regarding student creativity significantly improved by the end of the course. The influencing factor of barriers in student creativity also decreased by the conclusion of the course, but it did not approach the level of significance. However, the influencing factor of motivations in student creativity remained unchanged by the end of the course. Table 3 presents the paired *t* test findings of the pre- and posttests on creativity as well as the influencing factors of creativity during the nursing capstone course.

**Table 3 The creativity and influencing factors of creativity for nursing students**

| Variables  | Pretest |      | Posttest |      | t     | p      |
|------------|---------|------|----------|------|-------|--------|
| Creativity | 26.43   | 6.63 | 33.66    | 7.05 | -8.72 | .000** |
| Characters | 30.04   | 3.20 | 31.03    | 3.55 | -2.54 | .012*  |
| Abilities  | 29.21   | 3.09 | 31.32    | 3.61 | -5.27 | .000** |
| Barriers   | 25.87   | 4.46 | 24.63    | 5.83 | 1.96  | .052   |
| Motivation | 30.93   | 3.28 | 30.77    | 4.36 | 0.36  | .717   |

Regarding the multiple regression data, the nursing

students perceived that the influencing factors of abilities and barriers could predict their creativity before taking the course. However, after taking the course, the students perceived that the influencing factors of characteristics and motivations could more accurately predict their creativity. Tables 4 and 5 present the multiple regression data for the influencing factors predicting the nursing students' creativity.

**Table 4 The influencing factors of creativity for nursing students**

| Variables | R   | R <sup>2</sup> | ΔR <sup>2</sup> | B     | β    | tolerance | VIF   |
|-----------|-----|----------------|-----------------|-------|------|-----------|-------|
| Constant  |     |                |                 | 13.65 |      |           |       |
| Abilities | .31 | .10            | .10             | 0.68  | .32  | .998      | 1.002 |
| Barriers  | .36 | .13            | .03             | -0.27 | -.18 | .998      | 1.002 |

**Table 5 The influencing factors of creativity for nursing students**

| Variables  | R   | R <sup>2</sup> | ΔR <sup>2</sup> | B   | β   | tolerance | VIF   |
|------------|-----|----------------|-----------------|-----|-----|-----------|-------|
| Constant   |     |                |                 | .13 |     |           |       |
| Characters | .50 | .25            | .25             | .63 | .32 | .554      | 1.805 |
| Motivation | .55 | .30            | .05             | .46 | .28 | .554      | 1.805 |

**Discussion**

Previous studies on creativity and nursing have mainly emphasized courses on problem-based learning held either in the classroom (Chan, 2011; 2012; 2014; Klunklin, Subpaiboongid, Keitlertnapha, Viseskul, & Turale, 2011) or through clinical teaching (Harley, 2011). Rather than focusing on problem-based learning, this study aimed to cultivate the creativity of nursing students through the nursing capstone project course, which was focused on producing creative products. Moreover, game playing, poem writing, song composition, role playing, applied arts, YouTube, and flexible clinical teaching assignments have been introduced in previous studies as innovative teaching components (Chan, 2014; Hydo et al., Logan, 2012; Nemeč & Sullivan-Soydan, 2009; Story & Butts, 2010). Innovative teaching strategies, including the nine-rectangle grid game, three stages of creative problem solving (i.e., understanding problems, inspiring ideas, and prepared actions; Shen, 2008), and the Asking, Thinking, Doing, Evaluation creative teaching model (Chen, 2008), have been adapted from various education fields and applied in nursing education (Ku, 2015; Ku, Chang, Kuo, & Sheu, 2010).

Chan (2012) proposed freedom, diversity, group learning,

and confidence in learning as four major themes for improving creativity among nursing students. Consistent with these proposals, the nursing capstone project course composed of 10 discussion sessions, with a group being led by one instructor a to complete a project; the aim of the project was to create nursing products by using the teaching strategies of instructing, inspiring, leading, probing, thinking, discussing, brainstorming, engaging in team cooperation, and conducting the real production and modification of products. Finally, learner-centered and self-directed learning strategies were suggested to enhance nursing student creativity (Chan, 2012; Klunklin, et al., 2010; Kramer et al., 2007). Rather than applying a student-centric perspective, this study employed team cooperation between teachers and students in tandem with diverse teaching strategies.

**Conclusions**

In conclusion, this study validates the effectiveness of the 18-week nursing capstone project course in enhancing the creativity of the nursing students, as indicated by the significantly increased creativity scores after the completion of the training course compared with those observed before the course; this signifies that the effectiveness of this course approaches those of teaching-based experiments. Furthermore, the nursing students exhibited significant differences in their characteristics and abilities before and after the nursing capstone project course, implying that their positive characteristics and creative abilities were enhanced by the conclusion of course training. However, the influencing factors of barriers and motivations in student creativity were not significantly different by the end of the course; the nursing students failed to change their perceptions of barriers and enhance their creative motivations. Furthermore, the results of the multiple regression analysis reveal that before the nursing capstone project course, the nursing students perceived the strongest predictors of their creativity to be abilities and barriers; by contrast, they perceived characteristics and motivations as the strongest predictors after the course. Therefore, the nursing capstone project course affected the influencing factors of nursing student creativity.

This paper is relevant to clinical practice because it presents a relationship between in-class teaching and clinical setting requirements in creativity development in addition to providing implications for improving clinical medical intervention. Although nursing student motivations and barriers did not significantly improve after taking the nursing capstone project course, this paper highlights the importance of addressing creativity. Furthermore, it provides nursing students with appropriate guidelines for initial contact in the course, reducing the gap between in-class teaching and clinical setting requirements.

### REFERENCES

1. Chan, Z. C. Y. (2012). A systematic review of creative thinking/creativity in nursing education. *Nursing Education Today, 33*, 1382-1387.
2. Chan, Z. C. Y. (2013). Critical thinking and creativity in nursing: Learners' perspectives. *Nursing Education Today, 33*, 558-563.
3. Chan, Z. C. Y. (2013). Exploring creativity and critical thinking in traditional and
4. innovative problem-based learning groups *Journal of Clinical Nursing, 22*,
5. 2298-2307.
6. Chan, Z. C. Y. (2014). Students' and experts' perspectives on three learning and
7. teaching activities. *Nursing Education in Practice, 14*, 449-454.
8. Chen, L. N. (2008). *Creative Thinking Teaching Theory and Practice*. Taipei, Taiwan: Psychology Publication.
9. Harley, L. (2011). Thinking outside the box: An extraordinary woman on home
10. peritoneal dialysis. *The CANNT Journal, 21*(2), 44-46.
11. Hydo, S. K., Marcyjanik, D. L., Zorn, C. R., & Hooper, N. M. (2007). Art as a
12. scaffolding teaching strategy in baccalaureate nursing education. *International Journal of Nursing Education Scholarship, 4*(1), 1-13.
13. Klunklin, A., Subpaiboongid, A., Keitlertnapha, P., Viseskul, N., & Turale, S. (2011).
14. Thai nursing students' adaption to problem-based learning: A qualitative study.
15. *Nursing Education Today, 11*, 370-374.
16. Klunklin, A., Viseskul, N., Sripusanapan, A., & Turale, S. (2010). Readiness for self-directed learning among nursing students in Thailand. *Nursing and Health Science, 12*, 177-181.
17. Kramer, P., Ideishi, R. L., Kearney, P. J., Cohen, M. E., Ames, J. O., Shea, G. B., Schemm, R., & Blumberg, P. (2007). Achieving curricular themes through learner-centered teaching. *Occupational Therapy in Health Care, 21*(1/2), 185-198.
18. Ku, Y. L. (2015). Evaluating creative thinking of RN-BSN students in the course of clinical case study and practicum. *Innovations in Education and Teaching International, 52*(3), 290-299.
19. Ku, Y. L., Chang, C. F., Kuo, C. L., & Sheu, S. (2010). The application of creative
20. thinking teaching in nursing education. *Journal of Nursing, 57*(2), 93-98.
21. Ku, Y. L., & Kuo, C. L. (2014). Develop a teaching framework of creative thinking in nursing education on the creative process of clinical nurses in Taiwan. *Innovations in Education and Teaching International*, published online at ID: 949282 doi:10.1080/14703297.2014.949282
22. Ku, Y. L., Lee, P. Y., Tu, C. T., Shen, M. H., & Kuo, C. L. (2015). Validating the questionnaire of factors influencing creative process for RN-BSN students in Taiwan. *Journal of Nursing Education and Practice, 5*(5), 55-64.
23. Ku, Y. L., Lee, P. Y., Shen, M. H., & Kuo, C. L. (2014). Constructing and evaluating a nursing capstone course for cultivating creativity in RN-BSN students in Taiwan. *Journal of Nursing Education and Practice, 4*(7), 1-10.
24. Ku, Y. L., Shen, M. H., Lee, P. Y., Kuo, C. L., & Lee, P. Y. (2014). The application of creative thinking teaching in the course of nursing capstone project. *Chung Gang Nursing, 25*(2), 157-166.
25. Licen, S., & Plazar, P. (2015). Identification of nursing competency assessment tools as possibility of their use in nursing education in Slovenia-A systematic
26. literature review. *Nursing Education Today, 32*,

- 602-608.
27. Logan, R. (2012). Using YouTube in perioperative nursing education. *AORN Journal*, 95(4), 474-481.
28. Ministry of Education. Taiwan Creative Education, 2004. Available from: <http://www.creativity.edu.tw>
29. Nemec, P. B., & Sullivan-Soydan, A. (2009). Teaching flexibility and creativity through student project development. *Psychiatric Rehabilitation Journal*, 32(4), 319-322.
30. Nursing Magazine. The National Union of Nurses' Association, 2004-2012. Available from: <http://www.nurse.org.tw>
31. Shen, T. L. (2008). *Creative Principle and Design*. Taipei, Taiwan: Wu-Nan Publication.
32. Story, L. & Butts, J. B. (2010). Compelling teaching with the four Cs: Caring, comedy, creativity, and challenging. *Journal of Nursing Education*, 49(5), 291-294.
33. Taiwan Nurse Association Message. Taiwan Nurse Association, 2005. Available from: <http://www.twna.org.tw>
34. Varaei, S., Vaismoradi, M., Jasper, M., & Faghihzadeh, S. (2012). Iranian nurses self- perception- factors influencing nursing image. *Journal of Nursing Management*, 20, 551-560.
- 35.

**How to cite this article:** YA-LIE KU, Pei-Yu Lee Chin Tang Tu, Man-Hua Shen. Effectiveness of a Nursing Capstone Project Course in Enhancing Nursing Student Creativity. **Innovative Journal of Medical and Health Science**, [S.l.], v. 6, n. 3, may. 2016. ISSN 2277-4939. Available at: <http://innovativejournal.in/ijmhs/index.php/ijmhs/article/view/115>>. Date accessed: 09 Jun. 2016. doi:10.15520/ijmhs.2016.vol6.iss3.115..