



Challenge Based Learning nurtures creative thinking: An evaluative study

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ARTICLE INFO

Keywords:

Challenge Based Learning
Innovation and creativity
Measure of creativity and innovativeness
Undergraduate nursing students

ABSTRACT

Background: The demand for more creative and innovative nurses and together with the rapid expansion of nurse education in Mainland China have called for new approaches to student learning. Challenge Based Learning, an active student-directed approach was incorporated into an elective course in an undergraduate nursing programme. Initially, the students were given some big ideas about the real world. They worked together in small groups to identify the most challenging problems from these ideas, develop some innovative solutions, formulate an action plan for a selected solution, carry out the actions and evaluate the outcome.

Objectives: To evaluate the effectiveness of Challenge Based Learning on students' creativity and innovativeness.

Design: Quasi-experimental.

Settings: A medical university in Guangzhou, China.

Method and Participants: A convenience sample of 48 undergraduate nursing students from the bilingual class, who enrolled in the elective course, Innovation and Creative Thinking was invited to participate in the evaluative study. They completed the Creativity and Innovation Effectiveness Profile before and after the course.

Results: Apart from descriptive statistics, the mean scores of the Creativity and Innovation Effectiveness Profile between the pretest and posttest assessments were analyzed using the Wilcoxon signed ranks test. The results showed that the mean scores of all 7 domains (i.e. creative consciousness, levels of curiosity, pattern breaking skills, idea nurturing ability, willingness to experiment and take risks, courage and resilience and energetic persistence) of Creativity and Innovation Effectiveness were significantly higher in the posttest.

Conclusion: Students can enhance their ability to innovate and create through learning. The successful practical experience of using CBL in the study provides a good reference for nurse teachers who want their students to be self-directed, creative and innovative.

1. Introduction

In present day globalized society, with its knowledge-based economy, there is an increasing requirement for individuals to use creative thinking skills. To ensure advances take place in modern society, creative thinking has become relevant across many areas of modern life including education, medicine and art. It is intrinsic in human beings. Recent evidence has suggested that the skills of creative thinking can be learnt and taught (Chan, 2013a, 2013b; Mahdi et al., 2015; Saliceti, 2015), which in turn would strengthen our problem solving skills (Kaufmann, 2001; Kaya et al., 2015). There is an increasing trend and importance placed on finding new ways to stimulate creative thinking across societies.

Globally, the shortage of nurses and with a universal aging

population have given rise to a projected demand for more nurses in the future who will be exposed to an increasingly complex health issues. China is of no exception. It has aged rapidly with large elderly population because of decades of strict one-child family planning. In 2015, the aging population (≥ 60 years) is 222 million, whose ratio is 14% of the total population (Guo, 2017). There were 3.241 million registered nurses then. Although this already represented an increase of 1.9 million since 2010 (Guo, 2017), it is still far from meeting the care demand. Hence, many Chinese nursing schools are trying to address this issue by stepping up recruitment activities (Guo, 2017). Similar to other industries, the Schools also search for creative ways to guide their students. Nursing professionals, as key healthcare providers, increasingly are faced with more complex problems, due mainly to diversification of modes of nursing delivery and emerging technologies. Rather

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<https://doi.org/10.1016/j.nedt.2018.09.004>

Received 22 November 2016; Received in revised form 27 July 2018; Accepted 6 September 2018

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than following the traditional, often dated, nursing procedures, attention could be given to creativity and creative problem solving in nursing practice. In nurse education, lecturers increasingly endeavor to develop and produce qualified nurses with the ability to creatively think and innovate (Chan, 2013b; Murray, 2013).

Despite these educational aspirations, evidence has suggested that efforts to make Chinese nursing student innovative and creative remains poor (Li and Cao, 2011). Traditional teaching methods, like didactic teaching in the classroom, spoon-feeding approaches to teaching, big class sizes and assessment via summative final examinations could be perceived as potentially inhibiting students' creativity; however these methods of teaching and learning are still predominate in Mainland China (Zhou, 2012; Ke et al., 2014; Zhou et al., 2016; Gao et al., 2017). To address this issue, innovative Chinese nurse educators are striving to overcome potential obstacles and to find new ways to nurture creative thinking in nursing students. Little is currently known about creative thinking in Chinese undergraduate nursing students. This study presents the findings of an evaluative study on the implementation of a newly developed Innovation and Creative Thinking course, which adopted Challenge Based Learning as the method of learning and teaching. It examines the effectiveness of this form of teaching and learning on students' innovativeness and creative thinking.

2. Background

In recent years, creative thinking has emerged as an essential component in solving problems (Chan, 2013a). The concepts, assessments and application of creativity have been widely studied (Chan, 2013b).

2.1. Innovation and Creativity

As a word, creativity can be used interchangeably with the word innovation, although linked they do have different and distinct meanings. People are most likely to use creativity in education, art, psychology, and to use innovation in economy, management and politics (Kabukcu, 2015). Kabukcu (2015) also suggested that creativity is a way to develop new ideas and identify new perspectives on problems and opportunities. Being creative denotes having the power to freely look at the world from different perspectives (De-Brabandere and Iny, 2010). Conversely, innovation mostly relates to the development of the new products, devices, processes or methods to create value and provide applications. Innovation begins with creativity and creativity brings innovation (Janků and Růžena, 2015; Squalli and Wilson, 2014). Creativity, with innovation, emerges from a situation where diversity, collaboration and communication are present (Cocu et al., 2015). In nursing education, lecturers try to teach their students to think more creatively by discovering new teaching methods, designing different learning activities and creating free and open environments. For some teachers, Creative Problem Solving (CPS) has become the main focus of their teaching and learning process to develop creative and innovative nursing students', with the ability to problem solve. Nursing students are increasingly being encouraged to be creative in relation to problem solving in a rapidly changing world.

2.2. Challenge Based Learning (CBL)

Increasingly, the use of technology has permeated into the everyday academic life of students. One recent survey highlighted the extent of digital technology use in health science education, 98.3% regularly using laptops and 86.5% using smartphones (Thorell et al., 2015). However, despite these technological advances, some teachers still limit the use of technological devices or even prohibit the use of them in the traditional classroom setting. On the other hand, online learning, including Massive Open Online Courses and podcasts, are widely used in

nursing education across Europe and America (Aydemir et al., 2013; Gipson and Richards, 2011; Schmetter et al., 2014). Students can access network resources for educational purposes anywhere, gaining a fuller perspective on world issues than previously possible. Educators are paying increasing attention to the curiosity levels and desires of their students to learn something new and useful, with practical applications in the real world (Johnson and Adams, 2011; Johnson et al., 2009).

In this context, Challenge Based Learning has emerged as a relatively new approach to engage students in creative and innovative learning (Johnson et al., 2009). CBL, as a teaching and learning method, incorporates technology, team work, self-directed learning, peer learning, real-world problem solving and reflective learning into its learning activities, which can extend from the classroom into the local community (Johnson and Adams, 2011). It has been suggested that using CBL could help students develop skills, engage in learning, understand material and broaden their abilities (Apple Inc., 2009; Johnson and Adams, 2011; Johnson et al., 2009). CBL has been explored from a number of perspectives since it was developed. For example, a CBL model via cloud technology and social media was developed by Yoosomboon and Wannapiroon (2015) and found to enhance students' information management skills. Another CBL study designed with iPad mobile learning technology was exemplified by its opportunities for students to share their learning experience and insights (Marin et al., 2013). CBL increased group interaction and students performed better in relation to integration and synthesis of concepts (O'Mahony et al., 2012). It has attracted more attention from educators with its favorable learning outcomes (Cheung et al., 2011; Blevis, 2010).

2.3. Course Design - Innovation and Creative Thinking

To date, few studies have monitored the effect of adopting CBL for development of creative thinking in nurse education. Based on the CBL framework (Fig. 1), the teacher who was a member of the research team designed an elective course, 'Innovation and Creative Thinking' with an aim to nurture students' ability to innovate and create. In the course, students are required to work on a project in a team and learning activities consist of seven elements: (1) Big Idea, a broad concept that can be explored in multiple ways and has the importance to students and society; (2) Essential Question, which reflects the interests of students and the needs of their community within the big ideas; (3) the Challenge, which calls upon students to create a solution that can result in concrete and meaningful action; (4) Guiding Questions, Activities and Resources generated by students themselves to successfully develop a solution and guide the learning process; (5) Solution and Implementation which can be a variety of concrete, meaningful and feasible solutions attainable in the local community, putting the plan into action in the real life setting; (6) Evaluation/Assessment, through which students can assess the outcome of implementation using a variety of methods including survey, interviews and videos, these steps can help the students identify the final step to take; (7) Publishing, whereby students document and disseminate their experience through blogs, videos and other tools for reflection and assessment (Apple Inc., 2009). With relatively little currently known about the use creative thinking in the Chinese undergraduate student population, this study set out to explore and examine how the process of CBL could nurture nursing students' creative thinking skills.

3. Design and Method

This study adopted a quasi-experimental design using an evaluative method to examine the effectiveness of CBL on students' innovativeness and creative thinking. Prior to the conduction of the research, full ethics approval was obtained through the Dean's Office and University Ethics Committee. All 60 students from the bilingual class of the Bachelor of Nursing programme in September 2015 who registered for the

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