

Mobile Collaborative Learning: An Innovation in Nursing Education

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Abstract The theory on Mobile collaborative learning: An innovation in nursing education is formulated as a guide and constant reminder to nursing educators and institutions to continuously update their modes of instruction for the improvement of quality nursing education and the attainment of quality nursing care. Technology is more commonly applied to every field of study and this inspires institutions to widen their horizon regarding innovations as they adapt to the changing environment of the educational system. It is well established that small-group collaborative activities wherein members of the group work together towards the attainment of common goals are efficient and effective tools for facilitating both academic and social achievements. Thus, the integration of technology (mobile phones) with small group collaborative learning would improve nursing education. This would make nurse graduates competent in the field of nursing.

Keywords Collaboration, Innovative Learning, Quality Education, Quality Nursing Care, Teamwork

Introduction

Nursing education started out as a simple and rudimentary way of teaching nursing concepts which focused on patient care, sanitation, and public health. Later on it evolved into a more sophisticated discipline with the introduction of other subjects such as anatomy and physiology, pharmacology and many more. Today, one can witness nursing education at its best with the inclusion of a vast array of concepts including bioethics, transcultural nursing, and information technology, making nursing education more holistic and responsive to the changing needs of the patient.

Traditionally, students get theoretical information from the lectures of their instructors and expand their knowledge and understanding about nursing by reading books. This is also supplemented by clinical experience in the hospital and community for the students to gain deeper understanding of the concepts learned in the classroom. Critical analysis is used in this area as students are exposed to actual cases and with the application of the nursing process which includes assessment, nursing diagnosis, formulation of goals, intervention and evaluation, and related learning experience becomes more comprehensive and organized. The nursing educators, with their

collaborative efforts primarily assist and guide the students to gain more interest in learning about nursing and broaden their perspectives with respect to health.

At present, with the influx of information from various disciplines needed to enhance the knowledge base of nursing, nursing educators are faced with the dilemma of choosing the proper methodologies for students to benefit better. Hence, various strategies are introduced, revised or reinvented to suit the objectives of the educator. Policies are revisited that would align the curriculum to national or regional goals. Such is the scenario when the millennium goals were introduced. Roadmaps were constructed for the nursing profession to be at par with other professions while responding to these goals.

Thus in essence, innovations must be introduced that would improve the learning of students of nursing. This would mean looking at different worldviews or perspectives of health and nursing, revising the curricula periodically to make it relevant, sourcing out information from non-traditional sources such as research and collaborating with centers for excellence for best practices, to name just a few. These would not replace traditional methods but strengthen them so that in the end, schools would be producing graduates who are competent and world-class.

According to Rogers (1983), “an innovation is an idea, practice, or object that is perceived as new by human individual or other unit of adoption. If the idea seems new to the individual, it is an innovation” (p.11). In addition, Rogers (1983) said that innovation and technology are often used as synonyms.

According to P. Kelly (2008), innovation can be defined as the process of creating new services or products. According to Shortell and Kaluzny (2006), cited by Kelly (2008), Innovation is restricted to new modifications of ideas or practices. According to T. Kelly, (2005), as cited by P. Kelly (2008), he stressed that the innovative process is now recognized as a pivotal management tool in all industries, including health care. T. Kelly further emphasized that innovation is a team event that is made up of individuals who possess and have different strengths and points of view which in turn result in new innovative ways to effectively solve problems.

According to (Blakeney, Carleton, McCarthy, & Coakley, 2009; Christensen, Bohmer, & Kenagy, 2000) as cited by Murray (2013) innovation is the process of inventing something new or improving practices that are already existing. Murray stated that innovations in nursing education includes the use of technology, partnership, and innovative curricular, clinical and classroom teaching strategies.

Collaborative learning according to Liu, Wei, Lin & Wu (2015), is defined as a structured and systematic teaching strategy. Through collaborative learning, teachers can put together students regardless of their gender, race and diverse abilities. The goal of collaborative learning is for students to learn as one. In addition, collaborative learning is applicable to different subjects and different students regardless of age. Furthermore, Liu et. al (2015) said that collaborative learning is rooted on behavioral learning theory which emphasizes the provision of an atmosphere suitable enough to stimulate and enhance learning behavior. In addition, collaborative learning has an important characteristics in helping students to become interdependent learners, builders of interpersonal relationships and cognizant to the significance of team processes.

“A collaborative work supported by technology is known as computer-supported collaborative learning (CSCL). Computer assisted collaborative learning is an approach oriented towards the development of computer programs which facilitate interaction between peers and group work” (Nussbaum, 2010, p.297). According to Kumar (1996) as cited by Nussbaum et.al (2010), in CSCL, the technology intervenes with the interaction among the participants through delivery of information, regulation of tasks being performed, mediation as regards the acquisition of new knowledge and administration of roles and rules. The purpose of CSCL is for technology to proffer a medium for discussions in the classroom that would facilitate involvement, participation and social interaction between the teacher and students (Lipponen, Rahikainen, Iialimo, & Hakkarainen, 2003 as cited by Nussbaum et. al (2010) at the same time to increase the efficiency of communication among peers (Dillenbourg, 1999 as cited by Nussbaum et. al (2010).

According Roschelle, Rosas & Nussbaum (2005) as cited by Nussbaum et.al (2010), the use of portable technologies that offer assistance to students individually is a great opportunity for the expansion of computer access that does not limit students to individual use of desktop computers. Portable technologies when used with appropriate pedagogical designs would support development of collaborative dynamics, facilitate communication between peers and motivate interactions. The growth of portable technologies gives rise to the concept of mobile learning.

Mobile learning according to Nussbaum et.al (2010) is based on mobile computers that support wireless communication which is low cost (Savil-Smith & Kent, 2003 as cited by Nussbaum et.al 2010), portable that can be used anywhere and anytime, including in the classrooms (Rochelle, Pea, Hoadley, Gordon, & Means, 2001 as cited by Nussbaum et.al 2010), permits face-to-face- interaction between students within a single group (Cortez, Nussbaum, Rodriguez, Lopez, & Rosas, 2005 as cited by Nussbaum et.al, 2010), and efficient for facilitated learning activity (Zurita & Nussbaum, 2004b as cited by Nussbaum et.al 2010).

Mobile learning is a pedagogical proposition that will utilize technology to support processes of teaching. It is also portable which promotes face-to-face communication, thus ensuring mobility which will permit random formation of small groups within the classroom. Eduinnova methodology is a pedagogical strategy with an approach similar to a face-to-face small group collaborative work mediated by technology which shifts from instructor-centered approach to student-centered approach as the teacher functions only as a mediator (Nussbaum et al., 2010).

According to Murray (2013) the continuing current and future demand for nurses translates into the need for an educational program that can mold student nurses to become effective nurses someday. He further stated that technologies as innovative pedagogic approaches are believed to enhance and strengthen the educational process and balance the challenges associated with the faculty shortage and limited classroom and clinical space.

According to Zunenshine (2012), collaborative learning is a superior method for teaching. It is a feedback-based system where the instructor acts as facilitator among the students. Collaborative learning is a group activity oriented approach where cooperation is the key to sharing and achieving knowledge while every student builds up independence. Zunenshine (2012) further added that if collaborative learning is used in nursing education, it will provide every future nurse an advantage because such type of education has the same principle in the practice of nursing. Furthermore, nurses being parts of the allied health team should practice collaboration and teamwork as the core of a good output in the clinical setting.

According to Nussbaum et.al (2010), the Eduinnova methodology is inspired by the notion of assessment for learning. It is technology-supported face-to-face small-group collaborative learning. The application of Eduinnova begins with the planning of a class, including a learning activity. The teacher will prepare, arrange and organize the activity with a specific objective in mind and then select the desired content from a Web system accessed through the internet. The Eduinnova's Web-based content management allows an instructor to 1) revise, correct or

edit, review, and arrange different areas of learning; 2) store and create questions in a specified learning area or subject matter; 3) choose desired questions to construct activities that can be stored and can be used afterwards

Based on the findings of study conducted in schools where Eduinnova was implemented, it was found out that this method proves to be effective and was given positive feedbacks by teachers and students. Teachers recognized that students answering questions on their own before grouping together and coming up with one final answer, established cooperation, and group work was easier to achieve. Thus, collaborative work is defined, appreciated and differentiated in this method on the basis of the interaction among the members of each group. Collaborative work is also a significant method for the members to arrive at a common objective. Moreover, 80% of the students who participated in the study had desire to have more classes with portable technology and some wanted the employment of Eduinnova methodology rather than the traditional method of teaching (Nussbaum et al., 2010).

In addition, the Eduinnova methodology is an interesting scheme which builds cooperation and participation among teachers and students. Instructors act as active facilitators, thus they do not only deliver information but they also assist in the knowledge construction. Being facilitators also make teachers providers of support and they become more reachable. Thus, collaborative learning is more appreciated as teachers devote more time to students and the burden is lesser compared to traditional class (Nussbaum et al., 2010).

With the use of Eduinnova methodology, students claimed that they perceived more support from the teachers. Students on the other hand became active in carrying out their roles as they widen their knowledge. They also became more protagonists, motivated and enthusiastic. Student's cognitive and communication skills were highly valued. Moreover, socioaffective skills like respect and tolerance to one another were also developed. Furthermore, mutual support was also enhanced through resolution of problems. New aspects of personality among the members of the group were also recognized. In addition, the students

had gained self-esteem and concentration and discipline were better. Improved learning was achieved aside from the fact that students became active agents in their own learning processes (Nussbaum et al., 2010).

Based on the above findings, the principles of Eduinova methodology could be adopted as one of the methods to enhance learning in nursing instruction. The development of software (*Mobile collaborative learning nursing educ system*) with the aid of a program developer could be an innovation in the field of nursing education.

). A mobile collaborative learning through the adoption of the principles of Eduinova methodology has defining characteristics ; a) face-to-face small group collaborative approach, b) mediated by a portable technology through the use of mobile phones and a local network, c) a student-centered approach and d) teacher acts as facilitator and mediator (Nussbaum et al., 2010).

Philosophical Underpinnings

This theory was inspired by the author's eagerness to create an innovation centred on nursing education. One of the four elements included in Roger's Theory on Diffusion of Innovations is the idea of innovation. While Rogers' theory is much concerned about the processes involved in the transmission and communication of innovations within a social system, the author's main notion on the other hand is the creation, implementation, and evaluation of a specific innovation in nursing education. However, the author still finds her stance in conformity with Rogers' points of view. Rogers allowed others including himself to criticize his work because he believed that through criticisms, he could lay out directions for the future that are different from the past. Furthermore he would continuously challenge himself including the scholars of the future to move beyond proven methods and modes of the past, to recognize shortcomings and limitations, and to continuously broaden his theory on diffusion of innovation. This inspired the author to come up with a theory on "Mobile collaborative learning: an innovation in nursing education. This theory would not

only imply the benefits of mobile collaborative learning for the improvement of learning but it would also serve as a continuous reminder that educators and nursing education institutions should embrace the principle of innovativeness in meeting the challenges and opportunities of the modern time. Moreover, implementing innovations in nursing education like the mobile collaborative learning advocates improvement through constant and continuous evaluation. The author envisions educators and nursing education institutions developing a culture of innovativeness incorporated in their methods of instruction to achieve quality education which has always been the core aspect in attaining quality nursing care.

Description of the Theory

Mobile collaborative learning: an innovation in nursing education is a theory which is based on the review of literature regarding collaborative learning, computer supported collaborative learning and mobile collaborative learning through adoption of Eduinova methodology. This is a middle-range theory that depicts details specific to nursing education through mobile collaborative learning.

Middle-range theories are less abstract as compared to grand theories. However, these have higher levels of abstraction than empirical findings (Merton, 1968). Middle-range theories have certain phenomena (Meleis, 1997); they usually have limited number of concepts and propositions (Fawcett, 2005); they are more operational and amenable to testing (Walker and Avant 2005) and provide a limited view of reality (Smith and Liehr, 2003). Moreover, other concepts are found to have more elaborated discussions of knowledge and its development, which may contribute to the understanding of nursing theoretical works (Octaviano & Balita, 2008).

This theory draws specific attention to the introduction of mobile collaborative learning as an innovation in nursing education. This innovation would promote the realization of quality education and orient teachers and learners about the integration of technology which would enhance the learning process that is free of limitations and continues beyond boundaries.

Assumptions of the Theory

This theory was based on the following assumptions:

1. Nursing education is the foundation towards the achievement of quality nursing care.
2. Innovation in nursing education is crucial in order to meet the challenges and opportunities brought about by the modern world.
3. The world is continuously evolving, thus nursing education also welcomes changes which will initiate transformations in the existing teaching methods and remodel traditional modes of instruction.
4. Nurse educators should abide by the innovative way of teaching and encourage themselves to become parts of the evolving world.
5. Mobile collaborative learning is an innovative way of teaching nursing. It can improve learning leading to quality nursing education.
6. Introduction of Innovative methods of teaching nursing should be a continuous practice. In this regard, a culture open to changes must also be developed.

Key Concepts

The Mobile collaborative learning: innovation in nursing education model is composed of key concepts and is hereby operationally defined:

- **Internal factors** are basic determinants in the recognition of the need for instructional change. It includes innate attribute for quality education including the values and culture of an educator and an institution for nursing in general. External factors include global standards, accreditations, licensing, legislations and mandates.
- **External factors** are basic determinants in the recognition of the need for instructional change which include global standards, accreditations, licensing, legislations and mandates.
- **Need for Instructional change** is a perception that

something has to be modified in the method of teaching and this includes introduction of innovation to the nursing education.

- **Mobile collaborative learning** is a concept designed to use technology as an instrument which will innovate the methods of teaching. It will be implemented in line with the use of mobile phones and the internet. Interdependency is promoted and the learning gaps between students will be lessened through the utilization of a face to face small group collaborative approach. Moreover, the teacher being the facilitator and mediator not just only controls and manages the software but also makes him or her readily available to students for them to succeed in the learning process. The programs in the software will specifically cover the core of nursing concepts.
- **Mobile collaborative learning expected outcomes** are the results of the said innovations like increased knowledge absorption, development of respect and protagonist behavior; enhancement of mutual support, increased self-esteem, and improvement of communication skills.

- **Quality education** is the result of mobile collaborative learning development
- **Quality nursing care** it is the result of quality nursing education
- **Continuous evaluation** is a constant assessment of the effectiveness of the mobile collaborative learning. It is also a way to determine the pros and cons of the mobile collaborative learning if it had been useful, effective and operative in terms of its use and practice.

Propositions

The concepts that were mentioned are the pillars of this theory. The concepts are interrelated and the relationship to another is explained in the following propositions, which is also represented by a graphical

If external and internal factors are recognized needs for instructional change are considered.

If needs for instructional change are considered, specific identification of what to change is known.

If specific identification of what to change is known, a necessity to expand knowledge on innovative education is perceived.

If innovative education is perceived, specific innovation like mobile collaborative learning in academic nursing institution will be implemented.

The implementation of specified innovative ways in teaching nursing like mobile collaborative learning will lead to the following expected outcomes namely; improvement of learning and knowledge absorption, development of respect, enhancement of mutual support, increased self esteem, development of communication skills and a protagonist behavior.

If expected outcomes of mobile collaborative learning will be attained, quality nursing education will be achieved.

If quality nursing education will be achieved, quality nursing care will also be realized.

Models in nursing are conceptual tools and devices that can be used by a person to understand and put multifaceted phenomena into perspective. It gives the viewer an indication of what the real thing is like (McKenna, 1997). Models are also representation of reality (McFarlane, 1986a), or simplified way of organizing complex phenomenon (Stockwell, 1985). Fawcett(1992) states that models are sets of concepts and assumptions that integrate them into a meaningful consideration. Furthermore, Rambo (1984) believes that a model is a way of representing a situation in logical terms in order to show the structure of the original subject or idea. This theory was created using a post-positivist view. It intends to design, implement and evaluate an innovation in teaching nursing specifically the mobile collaborative learning. It explicates that through continuous innovation and evaluation of the different instructional methods of teaching nursing, quality education will be achieved, hence quality nursing care follows.

The above model shows the process how innovative teaching could be perceived by a particular nursing institution. The approach will start from the internal and external factors which are the basic determinants of the recognition of the need for instructional change. Internal factors include innate attributes for quality nursing education like the values and culture of an educator and an institution of nursing in general. External factors include global standards, accreditations, licensing, legislations and mandates.

The next process is the specific identification of what to change. This means that innovations are not totally changing the old ways of teaching nursing. There are cases that some of the traditional ways of teaching nursing need to be retained especially those which are considered basic and fundamental. Furthermore, there is also a need to update the methods of instruction in order to meet that the demands of the changing environment of the academe.

What comes after is the perceived necessity to expand one's knowledge on innovative education to meet the challenges and opportunities of the time. This is an opportunity to introduce and promote new concepts in teaching nursing.

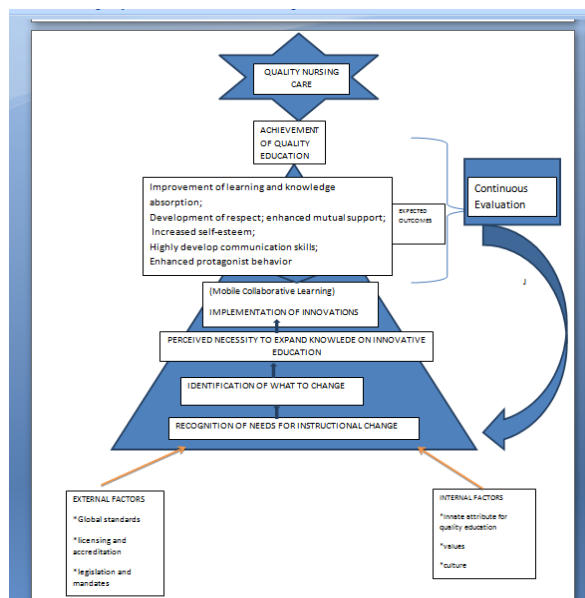


Figure 1. Mobile collaborative learning: innovative nursing education model

Implementation of specific innovative ways in teaching nursing like the mobile collaborative learning would be the next process. Expected outcomes may follow like improvement of learning and knowledge absorption, development of respect, enhancement of mutual support, increase in self esteem, and development of communication skills and a protagonist behavior.

Following the implementation of the specified innovation (mobile collaborative learning) would result to the achievement of quality education. Furthermore, quality education is enhanced through innovations with the intention of rendering quality nursing care. Quality education will lead to the realization of quality nursing care. The enhanced learning in the academe will obviously be reflected in the different health care institutions.

Lastly, for every change implemented, there should always be an evaluation. This is to determine the pros and cons and how the innovation like the mobile collaborative learning had been useful, effective and operative for continuous use and practice.

Meta-paradigm

Mobile collaborative learning: innovative nursing education model views the 4 nursing meta-paradigms in such manner:

Person. Person is defined as the human being. Both the nurse educator and the student are human beings. A human being is exceptional, societal, and unique who continuously acquires knowledge; and who is also open to changes ; and is capable of developing, adapting and innovating ways and skills to enhance the level of education amidst global challenges.

Environment. Environment represents the external factors that prompt educators and institution of nursing to initiate change and innovations in instructions. This is primarily to meet the challenges and opportunities of the modern world. External factors include global standards, accreditations, legislations and mandates.

Health. Health is the complete sense of wellness in every aspect of human being. The physical, emotional, spiritual, intellectual, psychological, economic, environmental and political facets are to be considered. Nursing institutions

specifically nurse educators are part of the society that have great contributions with regard to health. Furthermore, nursing institutions and educators are responsible for initiating modernization and improvement of the different instructions to facilitate better learning thus producing globally competitive nurses capable of giving quality health care services to patients of different walks of life. The health of the people lies on good educators through the incoming nursing professionals who are capable of reaching people by imparting informative and quality knowledge.

Nursing. Nursing is the act of rendering quality care to re-establish the holistic well-being of a patient. The main purpose of innovative education like the mobile collaborative learning is to render quality education for quality care to the future nurses to improve care reflected in great skills and knowledge. It will also prepare the incoming nurses to have the necessary competence for the promotion of health and prevention of illness. In addition, patients are given the quality nursing service through collaborative learning and caring.

The Goal of nursing in this theory is to promote quality care which is rooted on quality education that gained from innovative ways of teaching such as the mobile collaborative learning.

Application to Nursing Practice:

Nursing education institutions need to be opening their minds and be aware that the world is constantly changing. Society is evolving and new trends in teaching nursing are now emerging. Technology is more commonly applied to every field of study and this will inspire institutions to widen their horizon regarding innovations and adapt to the changing environment of the educational system.

However, the use of technology alone is not effective to bring about improvements in quality education (Robertson, 2003 as cited by Nussbaum et al., 2010). It is well established that small-group collaborative activities wherein members of the group work together towards the attainment of common goals are efficient and effective for facilitating both academic and social achievement.

(Dillenbourg, 1999 as cited by Nussbaum et al., 2010). Thus the integration of technology (mobile phones) with small group collaborative learning would improve nursing education. This would make nurse graduates competent in the field of nursing.

Lastly, this would also remind educators of their roles in the pursuit of excellence through constant innovation in the different modes of instruction. It is also their responsibility to continuously update themselves regarding worldwide issues as the world will soon be borderless which could not only open opportunities but also challenges as well.

Testing the Theory:

The author proposed that software (*Mobile collaborative learning nursing educ system*) will be designed. The software that will be invented contains competencies exclusively for nursing education. The realization of specific software will be made possible with the assistance of a program developer who will adopt the principle of Eduinnova methodology. The actual implementation of the specified mobile collaborative learning will be done in the college of nursing where the author is currently teaching. Analysis of the design as to its expected outcomes will be a study incorporating a mixed qualitative and quantitative design that aims to capture the perceptions of the participants and create an impact on students, educators and on the institution, respectively. The second part will be intended to verify and determine the final outcome as regards increased knowledge absorption and improvement of learning. These will be analyzed through an aptitude test. The data such as development of respect, enhancement of mutual support, increase in self-esteem, development of communication skills and a protagonist behavior will be analyzed and validated using a questionnaire.

The data for the qualitative portion of the respondent's perceptions will be collected through Key Informants Interviews (KIIs) and Focused Group Discussions (FGDs) and will be analyzed through content analysis.

Conclusion

Mobile collaborative learning: an innovation in nursing education is a middle-range theory which emerged from a post-positivist view. This aims to introduce specific innovation in teaching nursing through the combination of collaborative learning and technology like the utilization of mobile phones in group activities which is based on the methodology of Eduinnova. The design of the software is specifically intended to enhance the nursing education process. Mobile collaborative learning as a teaching strategy would result to improvement of learning and knowledge absorption, development of respect, enhancement of mutual support, increase in self-esteem, development of communication skills and a protagonist behavior. These expected outcomes are geared towards the attainment of quality nursing education which is the core of quality nursing care.

CONFLICT OF INTEREST

This paper has no conflict of interest.

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