Effect of a Cooperative Learning Module on Nursing Students' Inquisitiveness in a Thai University

Jettana Wongsasung, Sudaporn Satityudhakarn, Suwadee Takan, and Suchewa Nutong

Abstract

The inquisitiveness of nursing students before and after implementation of a cooperative learning module was tested among a group (n = 40). An Inquisitive Questionnaire was developed with a Cronbach's alpha coefficient of 0.93. The process of attempting to raise inquisitiveness was accomplished by adoption of the Student Teams-Achievement Divisions teaching strategy. Involved was a group process emphasizing shared learning, rewards, and grades. The focus was also on learning together as a group that involved reviewing, explaining, delegating, working together, submitting their assignment, and being evaluated as a group. This process was applied to the intervention group for three days a week over two weeks. The inquisitiveness of students was assessed before and after the intervention by using the developed questionnaire. Results demonstrated that the inquiry level and inquisitiveness of students improved after receiving cooperative learning intervention. Significance was at the .05 level ($t = 6.80$, $p < 0.05$). Cooperative learning promotes inquisitive learning process development, and facilitates nursing practice in accordance with established objectives. Nurses become more knowledgeable and competent in nursing subjects, skillful in nursing practice, and successful in nursing careers.

Keywords: *Cooperative learning, inquisitiveness*

Introduction

Education in a nursing career focuses on innovative instructional strategies that will encourage professional students to learn and practice cognitive skills through analysis, problem solving, and decision making in all types of situations. Nursing students must continuously embrace the learning process by applying proper logical thinking in a variety of settings (Kunka, Phuriwitateera, & Phomput, 2013). In order to produce nursing graduates with the desired characteristics, graduates must fulfill nursing practice standards set by their university in moral, ethical, responsibility, communication, information technology, analytical, intellectual, interpersonal, and professional practice skills.

Thailand is facing issues in higher education instruction in many areas. Teachers tend to use instructor-centered educational approaches that focus on lectures, theories, and memorizing rather than on practice; this can potentially impair student levels of interest and creativity (Ponsalum & Tephatsadin, 2000). Furthermore, higher education lacks diversification, and hence does not meet student needs. Education programs do not encourage students to develop critical thinking skills or the ability to become self-directed learners. Evaluation in various courses reflected the fact that students were receivers, lacking communication and team cooperation skills (Mingsiritham, 2009). Cooperative learning becomes an appropriate model in higher education – and particularly in a nursing program – because it encourages teamwork and incorporates critical thinking and practice. It also allows students to express and exchange ideas within or among groups. It will also help them learn to develop logical reasoning, collaboration, social, and positive interpersonal skills. Learning directly from personal experience with a teacher who encourages and provides program structure and resources will enhance the learning process, and promote higher achievement and performance. In cooperative learning, a teacher has many other important roles besides teaching. Most important is the change from giving information to facilitating student learning. This form of learning requires interface with multiple parts of projects and interaction with other groups. Students acquire knowledge from their peer experiences involving different resources. They encourage each other to learn (think-pair-share structure). This enables students to attain higher learning achievement (Satiman, 2007).

Classroom-acquired knowledge and related subjects can be used to improve basic nursing practice in clinical settings. This empowers nurses to provide better service to patients of all ages,

conditions, and levels of healthcare in diversified cultural environments. Holistic and evidence-based nursing are practiced in harmony with legal and ethical standards in the nursing profession. Nursing graduates are equipped to exercise logical reasoning, critical thinking, and creative problem solving. They are also competent to practice in other situations by adopting appropriate analytical skills in mathematics and statistics. Other valuable traits in quality nurses are high moral and ethical standards, respect for people and rules, responsibility, caring, empathy, good interpersonal relations, leadership, effective communication and multidisciplinary team work. They must be able to perform basic computer operations and health management tasks, using information technology for communication and nursing practice. In addition, nurses must have self-esteem, faith in the nursing profession, and confidence in providing quality healthcare. They need also to pursue continuous personal, professional and social development.

A review of current national and international related literature shows that innovative teaching involves application of some form of the cooperative learning technique, which allows students to learn from each other in group projects and hence to gain important interpersonal skills. It focuses on the learning environment and integrates academic materials and interdependent social skills (Nelchaleaw, 2009). Everyone in the group works on an assigned task as a team, supports/ encourages each other, and then shares knowledge and resources. The high achievers will help others who need assistance. Group members have their own responsibilities and they are held accountable for aiding the completion of the assignment. Success is dependent on the work of everyone in the group. Each individual will learn and develop skills in working with others to solve problems, make decisions, acquire new information, and accept each other (Khammani, 2010). Students learn theory, skills, and new knowledge in nursing practice while promoting morality, ethics and learning ability through working with peers.

Enthusiasm and self-motivation to learn are essential characteristics of an inquisitive person who is intellectually curious, eager for knowledge, and likes to inquire, research, and ask questions. All students should be encouraged to become self-motivated and enjoy learning (Chogrungreang & Inklub, 1999). Cooperative learning improves personal attitudes and promotes development of positive interpersonal skills among nurses. Studies suggests that it also creates positive interpersonal relationships that enhance the development of a better learning atmosphere (Maneechot, 1997). These are the key attributes to higher personal achievements in attitude, behavior, happiness, development skills, and inter-relationship in all situations.

In the present study, the researchers were interested in studying the effects of cooperative learning strategies on nursing students' mastery of subject matter content and subsequent performance of nursing skills.

Objectives, Conceptual Framework, and Definitions

We compared the inquisitiveness of nursing students before and after implementation of a cooperative learning technique.

Hypothesis

Higher inquisitive learning levels would be achieved by nursing students after implementation of a Cooperative Learning Module (CLM).

Operational Definition

Cooperative learning is a process whereby students work collaboratively in a group to achieve a specific task (Johnson & Johnson, 1994). The five most basic elements of cooperative learning are:

a) Positive interdependence: Every member is equally important, feels and depends on each other to accomplish the common task.
b) Face-to-face (promotive) interaction: Students interact to share, discuss and help each other on specific topics.

c) Interpersonal and small group social skills: Students work together to promote learning and improve interpersonal social skills.
d) Group processing: Students assess and discuss the task work assignment.
e) Individual accountability: Students learn together; outcomes are assessed individually or as a whole group.

Conceptual Framework

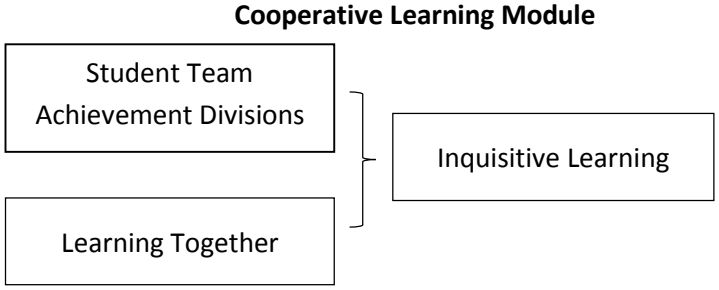

Figure 1. Conceptual Framework of Inquisitive Learning

The cooperative learning method was applied by using Student Teams Achievement Divisions (STAD) in conjunction with Learning Together (LT).

Inquisitive learning indicates that nursing students have a desire to know or learn more, show an interest in learning things, explore or search for information, are curious, self-motivated, and inclined to ask questions. They are able to search, differentiate, compare, and analyze information. Inquisitive learning was evaluated by an inquisitive vocational nursing questionnaires adapted from Maneechot (1997). It consisted of inquisitive learning in academic and vocational nursing environments:

1) Inquisitive learning in an academic setting refers to self-motivation, interest and desire to explore knowledge in nursing and related subjects in response to intellectual curiosity and knowledge gain. Students search for answers to questions from textbooks, documents, research publications, online media and technology, and discuss experiments with experts.

2) Inquisitive learning in vocational nursing refers to self-enthusiasm, satisfaction, and proactively developing knowledge, skills and attitudes in the nursing profession. The goal is to establish a stable nursing career, to engender a striving for excellence at the work place, and a desire to explore innovative ideas to advance the profession.

Methodology

Design

A quasi-experimental research protocol was adopted to determine the effect of a Cooperative Learning Module (CLM) on the inquisitive learning behavior of third year nursing students at Mission Faculty of Nursing, Asia-Pacific International University. The students completed the assignment at Prasat Neurological Hospital and Institute, Bangkok. They were given a group pretest and posttest.

Population and Sampling

The sampling group consisted of third year nursing students of Mission Faculty of Nursing enrolled in NSSC 3803 Clinical Practice in Adult Nursing II for the second semester of the 2015-2016 academic year. Practicum sites were the male neurological medicine and female neurological surgery ward at Prasat Neurological Hospital. The sample of 40 students was divided into six groups with 6-7 students per group. A Purposive Sampling Technique was used to randomly select nursing students with a Cumulative Grade Point Average (CGPA) as shown in Table 1. Score averages were similar for each group.

Table 1. Distribution of Clinical Practice Groups

	Group Distribution by CGPA					
Group	1	2	3	4	5	6
Sequential Grade Score	3.8	3.6	3.5	3.3	3.0	3.0
	2.8	2.8	2.9	2.9	3.0	3.0
	2.8	2.8	2.7	2.7	2.7	2.7
	2.6	2.6	2.5	2.5	2.5	2.5
	2.5	2.5	2.5	2.5	2.5	2.5
	2.3	2.3	2.1	2.1	2.1	2.0
	2.0	2.0	2.0	2.0		
Average of CGPA	2.63	2.61	2.60	2.58	2.68	2.68

Measures

The tools used in this study were the Student Teams-Achievement Divisions (STAD) teaching plan and the Inquisitiveness Questionnaire.

Inclusion Criteria

1. The students were enrolled in NSSC 3803 Clinical Practice in Adult Nursing II
2. The students completed their practical training in the neurological medicine and neurological surgery wards, Prasat Neurological Hospital and Institute, Thailand.

Exclusion Criteria

The students were enrolled in NSSC 3803 Clinical Practice in Adult Nursing II, but they completed their practical training at Phramongkutklao Hospital, Thailand.

The content validity of the STAD teaching plan was first reviewed and edited by a research committee for content and language usage, and then forwarded to three experts in clinical nursing for content relevancy and language clarity and appropriateness. The teaching and activities were revised and re-edited as per the recommendations received.

The cooperative learning techniques were implemented on a ward with actual patients. STAD activities were created for designated groups to work together to accomplish a shared learning goal. Students were rewarded with prizes or grade scores. Learning Together component activities involved each student being responsible for the assigned task within a group. The score achieved was determined by the outcome of group work consisting of review, discussion, role assignment, performance, evaluation, and task submission.

The Inquisitiveness Questionnaire (IQQ) was derived from a study of cooperative learning by Maneechot (1997) covering aspects of both academic and vocational cooperative learning. A five-point Likert rating scale was used to calculate the cooperative learning competence from 30 questions.

Before administering the Inquisitiveness Questionnaire, it was first examined by three expert instructors in clinical nursing for content validity, relevancy to objectives, and content being measured, including script clarity and conciseness. The questionnaire was modified according to recommendations received. The Content Validity Index (CVI) was calculated and the result was 1.0. Reliability was tested on 30 third-year students (NSSC 3803 Clinical Practice in Adult Nursing II course) during a practicum covering orthopedic, Ear, Nose, Throat, and urological nursing at Phramongkutklao Hospital, Bangkok. The Cronbach's alpha from this data set was 0.93.

Research Ethics

This research study took ethical issues into consideration. All participants received information about the research objectives and methodology. All data was treated as confidential, and used only for the purposes of this research study.

Data Collection

Data was collected from 40 nursing students as indicated in the Population and Sampling section. The experiment was conducted among students who completed a clinical rotation for two weeks. They spent the first week at a male neurological ward, and the second week at a female neurological surgery ward. The IQQ was distributed to the intervention group as a pre-test questionnaire to assess the cooperative learning ability.

Cooperative learning activities was implemented by undertaking the following key steps, as summarized in Table 2.

Step 1: Review and Explanation

The instructor met with the students to let everyone become more acquainted and to remove any behavioral barriers. Common issues experienced in internal medicine and neurosurgery were discussed. The working atmosphere in the wards and the objectives of this study were explained and reviewed. The structure the cooperative aspects of their work was emphasized, with special attention given to the components of team work and positive interdependence. It was noted that high achievers would help any team member who needed assistance.

Step 2: Task Delegation and Teamwork

The intervention group was assigned one patient per group one day before the training. The students had opportunity to discuss the strategies, task delegation, and then search for information and brainstorm in order to provide care to the patients treated in the wards. The Neuman Theory (Neuman & Fawcett, 2011) was adopted to assess the physical, health, social, and spiritual conditions of the patient. Patient care strategies were discussed with the instructor for approval prior to proceeding. The plans were implemented with the assigned patients. The groups collected data and results coming from the care rendered, and then they discussed improvements that might be implemented.

Step 3: Task Evaluation and Submission

The instructor evaluated and scored the assigned reports submitted by the groups based on their performance. Every group member received the same score as the whole group.

Step 4: Posttest

Upon completion of this cooperative learning skills study, the instructor performed a posttest using the IQQ to evaluate the inquisitiveness of 40 students in the intervention group.

Table 2. Training Procedures

Week/Day	Training Activities
Prior to Training	**1. Assessed students' inquisitive knowledge level before training**
	2. Reviewed and explained
	2.1 Reviewed learning objectives and training preparation
	2.2 Met with students, explained training protocol and assessment
	2.3 Took a tour of training locations and equipment
	3. Task Delegation and Teamwork
	3.1 One case study per group was assigned and monitored by clinical instructor. Students had group meeting and tasks were delegated.
	3.2 Students brainstormed, planned, and discussed strategies for providing patient care using the Neuman Theory framework.

Week/Day	Training Activities
Week 1 Day 1	**Task Delegation and Teamwork** 1. Students participated in clinical practice and were assigned task of patient care according to the plan. 2. Students collected data during process, documented issues, and evaluated care results. 3. Students reviewed the results and explored solutions for improvement.
Week 1 Day 2	**Task Delegation and Teamwork – Cont'd** 1. Students participated in clinical practice with new solutions suggested from their previous group discussion. 2. Summarized group performance.
Week 1 Day 3	**Task Submission and Evaluation** 1. Submitted the training report of the group to clinical instructor 2. The clinical instructor evaluated and scored the report for each group
Week 2 Day 1	**Reviewing and Explaining** 1. Clinical instructor commented the first week group task performance and described the second week task process **Task Delegation and Teamwork** 1. Clinical instructor assigned second task to the group 2. Students participated in the assigned task as planned 3. Students collected data of the process, documented issues and evaluated 4. Students reviewed result and explored solutions for improvement
Week 2 Day 2	**Task Delegation and Teamwork** 1. Students participated in clinical practice with new solutions from previous group discussion 2. Summarized group performance
Week 2 Day 3	**Task Assessment and Submission** 1. Submitted the training report of the group to the clinical instructor 2. Clinical instructor evaluated and scored the report for each group
Post Training	**Test the inquisitive knowledge level of students after the training**

Data Analysis

Descriptive statistical analysis such as frequency and percentages was used in calculations for demographic data of the nursing students. Mean and standard deviation (S.D.) were employed in calculations for inquisitiveness scores on the pretest and posttest. Lastly, a paired t-test was utilized in comparing the means generated by the inquisitiveness questionnaire.

Results

Data obtained from the experimental group showed that 87.5 percent of the intervention group of 40 students was female, and half were 21 years old ($\bar{X}$ =21.33). Most respondents (72.5%) enjoyed Practical courses over Theory courses and 87.5 percent of them preferred the Child and Adolescent Nursing course.

Table 3 shows the average inquisitiveness scores on the pretest and posttest. A paired t-test showed that the inquisitiveness scores in the tests differed at the 0.05 level. Not surprisingly, after the intervention, the inquisitiveness scores were higher than those achieved prior to it.

Table 3. Comparison of Inquisitiveness Score of Pretest and Posttest of Cooperative Learning

Inquisitiveness Scores	Mean	S.D.	t-test	p-value
Pretest	118.60	9.86	6.802	0.000
Posttest	134.38	12.26		

Discussion

The results reveal that the intervention students demonstrated higher inquisitiveness after implementation of cooperative learning. The group shared-learning among those with different abilities, and this involved team recognition and group responsibility for individual effort. Students worked as a team in assessing the situation and searched for the best possible solutions to care for each particular patient. Every step of the procedures adopted was closely monitored with emphasis on learner-centered or student self-directed learning.

This approach stimulated higher inquisitive levels among students. The results agree with the research of Maneechot (1997), who studied the relationships between participative instruction and inquiry behavior of nursing students. The objective of this study was to identify the relationship of cooperative learning and inquisitive behavior of 4th year nursing students at the College of Nursing, Ministry of Health. The inquisitiveness level of these nursing students was rather high due to the positive impact of their cooperative learning experience. This result was also consistent with the research by Tulaphan (2007), who studied the effects of the STAD method on instruction; this was done in an Artificial Flower Course at Jaehom Vitaya School in Lampang Province. The inquisitiveness score of both individuals and the whole group was higher following application of the procedure.

Additionally, Tongnuag (2010) revealed a positive impact of the implementation of a learner-centered instructional method on nursing students in a Pathophysiology course. The combined wisdom from these studies is that cooperative learning is the best strategy in helping students develop self-motivation and become more behaviorally proactive in their own learning processes.

Problem Based Learning (PBL) enhances inquisitiveness and is an essential element in problem solving skills to care for patients in nursing (Tipteangtea, Chujai & Chamneang, 2000). These researchers compared learning behavior before and after employing PBL in problem solving among nursing students. The students in this study acknowledged that they gained higher inquisitiveness after implementation of PBL. Students applied different problem-solving strategies before and after PBL, and inquisitiveness improved after the use of PBL (p=0.05). Students stated that PBL requires guidance from an experienced instructor. Students must also be self-directed and motivated in the learning process. In the case of cooperative learning in training, a small group size offers a better opportunity to learn, communicate, collaborate, and build interpersonal relations. Evidence indicates that students with good grades or high achievement levels are more inquisitive too, and are ready to help group members. They can adapt, interact constructively among members, and lead the group to accomplish the task. This will encourage students with low grades to improve learning skills by using the brainstorming technique. In turn, they become more enthusiastic, confident, self-esteem rises, they are attentive to learn, and are able to apply knowledge and skills to accomplish better patient care outcomes. Group success depends on every member taking responsibility to achieve the common goal. Positive group experiences have been shown to contribute to student learning, retention, and to overall learning success.

Conclusions

Education in the nursing profession partly consists of hands-on practice related to life and public health. Learners must be well equipped with knowledge and practical skills to provide holistic health care. The Mission Faculty of Nursing has adopted the Neuman Theory for nursing practice in educating student nurses to assess the condition of physical, mental, social, developmental, and spiritual health in relation to the environment in order to provide proper patient care. This approach empowers nurses to provide healthcare needs to individuals, families, and communities from different cultures. Learners must be inquisitive and self-motivated to learn nursing skills and must be prepared

to practice as competent healthcare professional in a highly complex, diverse and ever-changing environment. Learning process development is essential to learning success. Cooperative brainstorming is an effective and valuable strategy that calls upon teams of students to brainstorm and build upon the ideas of others. With creative groupings, students have opportunities to work together and learn important content at the same time. Student-centered learning with an instructor mentor is a more effective learning technique in nursing education due to different patient situations, constant changes of regulations, and the complexity of healthcare today. Learners must be proactive in developing skills or strategies, and in control of their learning processes and environments. An educational setting that fosters group work and collaborative accomplishments encourages students with poor grades to become motivated to learn with bright students as mentors. Cooperative learning promotes inquisitive learning process development, and facilitates nursing practice in accordance with established objectives. Nurses become knowledgeable in nursing subjects, competent, skillful in nursing practice, and successful in nursing careers.

Limitation and Recommendation

The limitation of this study is the impediment that large class sizes imposes on cooperative learning exercises. Monitoring student participation becomes more difficult, as does accurate evaluation of their achievements. Our recommendation is to implement other forms of cooperative learning, for example, peer reviewed work, laboratory assignments, or teams-games-tournaments to accommodate large classes. Teachers are tasked with encouraging cooperative interdependence among students who begin to develop a favorable atmosphere in which to learn, work, and understand each other. A variety of cooperative learning techniques may be implemented to explore other areas of nursing in either theory or practice, and to examine other potential benefits besides inquisitiveness.

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References

Chogrungreang, N., & Inklub, L. (1999). Preparing inquiry behavior of freshman nursing student between Kuakarun College of Nursing and Faculty of Nursing, Mahidol University. *Thai Journal of Nursing Council*, *14*(4), 10-23.

Johnson, D., Johnson, R., and Holubec, E. (1994). *The nuts and bolts of cooperative learning*. Minnesota: Interaction Book Company.

Khammani, T. (2010*). Art of teaching: Cognitive for learning process to be effective* (13th Edition). Bangkok: Dansuthakarnpim.

Kunka, S., Phuriwitateera, K., & Phomput, P. (2013). Attitude of junior nursing student in the teaching–Learning by using media movie in nursing a person with mental problems subject. *Ramathibodi Nursing Journal*. *19*(1), 102-113.

Maneechot, B. (1997). *The relationships between participative instruction and inquiry behavior of nursing students.* Master thesis, Mahidol University.

Mingsiritham, K. (2009*). Development of A web-based learning model integrating cooperative learning and collaborative learning to enhance self-directed learning of pre-service teachers.* Doctor of Philosophy dissertation, Chulalongkorn University.

Nelchaleaw, N. (2009). *Effect of cooperative learning on scientific mind of grade level 3 students.* Master thesis, Chiang Mai University.

Neuman, B. & Fawcett, J. (2011). The Neuman systems model (5th edition). Upper Saddle River, New Jersey: Pearson Education Inc.

Ponsalum, P., & Tephatsadin, W. (2000). *The instructional system reform in high education: Undergraduate Learning Process Development* (Research report). Bangkok: Ministry of University Affairs.

Satiman. A. (2007). *The effects of online project-based learning activity model on self-directed learning and learning achievement of higher education student*. Doctor of Education dissertation, Srinakharinwirot University.

Thongnuag, P. (2010). Effects of student centered teaching modules on learner knowledge and learner developments in pathophysiology subject among nursing students. *Princess of Naradhiwas University Journal*, *2*(1) ,73-89.

Tipteangtea, C., Chujai, R., and Chamneang, M. (2000). Preparing inquiry learning behavior to the before and after by using problem based learning of nursing student. *Boromarajonani College of Nursing Ratchaburi Journal 12* (2), 12-17.

Tulaphan, P. (2007). *STAD Cooperative learning activity in teaching artificial flower making course, Chaehom Wittaya School, Lampang Province.* Master of Education thesis, Chiang Mai University.