

The First Year Nursing Students' Achievement and Critical Thinking in Local Wisdom Course Using Problem Based Learning Process

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Abstract The purpose of this one group—pre test post test design classroom research was to examine learning achievement, critical thinking and satisfaction of first year nurse students at school of nursing during academic year 2011. In the research activity, 94 students participated in three weeks for each scenario in Local Wisdom and Health Care which composed of 4 scenarios. Problem based learning process were included the preparation of facilitators, preparation of learners, and problem/scenario based assignments. The instruments composed of 1) 135 items, 4 multiple choices test which were covered behavioral objectives and blue print of test and validated by course lecturers 2) opinion evaluation form, open ended questionnaire and 3) the critical thinking questionnaire, 80 items in five domains which are Inference, Recognition of Assumption, Deduction, Interpretation, and Evaluation of Argument with internal consistency of .73. Data were analyzed using frequency, percentage, mean, standard deviation, percentile, *t* test and χ^2 test. It was found that the highest score of learning achievement was 88.79% while the lowest score was 70.33%, average learning achievement score was 80.60 (± 3.47)%. The highest grade levels were B+ and B equally (41.49%). Students demonstrated higher overall critical thinking (49.62 ± 5.78) after undergone problem based learning process than before the problem based learning process (46.69 ± 6.00) statistically significance ($t = 4.443, p < .05$). Inference and Recognition of Assumption domain after PBL process were better than their own thoughts before PBL process significantly ($t = 2.288, p < .05$; $t = 6.287, p < .05$, respectively). The ability of critical thinking was found that the high, moderate and low level (percentile $> 75, 25 - 75$ and < 25) after PBL were difference from the ability before the process significantly ($\chi^2 = 12.219, p < .05$).

Keywords PBL · Critical thinking · Nurse students

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1 Introduction

Learning reform is the heart of educational management process in Thailand. The important goal is potential development for students become systematically thinkers. The National Education Act in year 1999 and additional correction in year 2001 provided guideline on educational management learning process which is stated that institute have to manage skills practice, thinking process, authentic instruction and knowledge integration for preventing and correcting problems. National Education Committees [1] gather concepts on learning theories and stated that teachers must change their lecture role in decreasingly, learners and teachers should collaborate to take sciences processes for seeking knowledge. Learners have to learn from real situations related real lives, learn by their own ways from various resources. Teachers have to motivate learners to learn effectively and learners become critical thinker, finally.

Critical thinking is the first needed skill for nursing students [2]. It is the advance process of cognitive domain for decision making upon caring patients. The affective disposition of a critical thinker includes being inquisitive, systematic, judicious, truth seeking, analytical, open-minded, and confident in reasoning [3].

For Nurse Education Institute should have policy to promote student to be active learner by getting critical thinking since they are nurse students. Teachers should have various techniques for teaching by emphasizing students to think and solve problems. Problem based learning is the one of method which teach student to learn by simulator situation. The new atmosphere of learning will promote student to be reasonable learner. They will get freedom to explain their thought relaxing for learning without fearing. These It will enhance the self confidence and self esteem factors among students [4].

Problem based learning process is the best method for teaching nurse students underneath nursing care context. It is the method to make student to be active learner, enthusiastic person to seek for answering the question or solving problem [5] The method make the meaningful of learning and make the learner to develop skill to thinking critically as well as able to learn lifelong [6]. As a teacher in school of nursing, researcher believe that nurse who have skill to thinking, will be critically competence and also believe that the first year nurse students are alike white clothes which we can paint whatever we want them to be. Thus, teacher has to give opportunity for students to practice themselves to systematically think since they come in the nurse profession which this process should be focused on student center. Researcher is interesting to study nurse students' achievement so researcher study the outcome by using problem based learning process.

2 Research Objectives

In this paper, The objectives were 1) to examine learning achievement in the Local Wisdom course of the first year nursing students after implementing the problem based learning process. 2) to compare critical thinking of the first year nursing students before and after undergone problem based learning process in the Local Wisdom course and 3) to evaluate students' opinion on problem based learning.

3 Research Methodology

3.1 Population and Samples

Population and Sample was purposely selected 94 first year nursing students in Bachelor program, enrolled in the Local Wisdom course in second semester of 2011 at School of Nursing, Mae Fah Luang University, Thailand.

3.2 Participation Preparation

Regarding changing their roles which they might not familiarize to the process of problem based learning, researcher prepared both teachers and students to participate in this research and also made guideline for learning. The details were as follow:

3.1 The problem based learning process in Local Wisdom course composed of:

- 1) Facilitators preparation by informing about their roles as facilitator and explaining them about the guideline of problem based learning process
- 2) Learners preparation by introducing course objectives, teaching and learning activities, evaluation methods.
- 3) The problem based learning process was employed during the one semester which including 15 weeks. It had taken the first 3 wks for introduction the course and how to learn and also giving knowledge about team working and local wisdom. It had taken 3 weeks for problem based learning process per each region, 4 regions totally. The process of PBL were giving a scenario to the learners and informed them to search needed information during the period of time in each scenario. They had to join the group in each week.
- 4) The steps of learning by PBL were 1) for 3 hours at the first week to initialing problem, problem analysis, task formulation, problem delimitation and concluded for searching for needed information 2) for 3 hours at the second week to share and discuss all information for dissolving the problem and concluding to search for the further needed information 3) for 3 hours at the third week to gather all information and discuss, consider and conclude how to solve the problem in the scenario.

3.2 Problem based learning guideline

Teaching and learning guideline for problem based learning method was developed by researchers. Researchers and facilitators met to discuss about the guideline for necessary revision.

3.3 Instruments

- 3.1 The 135 items, 4 multiple choices test validated content and language by 16 course lecturers. The score was 1 score for the corrected choice and 0 for uncorrected choice.
- 3.2 The Critical Thinking questionnaire developed by Chaiya [7]. This questionnaire composed of 80 items in five domains which are Inference, Recognition of Assumption, Deduction, Interpretation, and Evaluation of Argument. Internal consistency reliability of this Critical Thinking questionnaire is .73. Three levels of critical thinking are identified using percentile: > 75 percentile identifies high critical thinking, 25–75 percentiles identifies moderate critical thinking and < 25 percentile identifies low critical thinking.
- 3.3 Open ended opinion evaluation.

3.4 Data Collection

Data collection was conducted by the researchers after the research project was approved by the academic committees of school of nursing. The researchers informed the students enrolled in the Local Wisdom course about the research project for asking voluntarily participated in the study. They had their right to withdraw from the study at any time and that would not affect the course achievement. The students who were willing to participate this project were asked to respond to The Critical Thinking Questionnaire before the beginning and the end of the course. After finishing the course, the students were asked to evaluate in the opinion evaluation.

3.5 Data Analysis

Demographic data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation). Learning achievement was analyzed using percentile and T-score of the 135 items, 4 multiple choices test. Critical thinking was analyzed using descriptive statistics (frequency, percentage, mean, standard deviation, and percentile). Paired t test and chi square test were used to compare critical thinking before and after the problem based learning process. Content analysis was done for opinion evaluation.

4 Results

4.1 Demographic Data

Most of the students were female (96.81 %), aged 19 years old (63.84 %), got first semester grade from 3.00 to 4.00 (62.77 %).

4.2 Learning Achievement

Learning achievement in the Local Wisdom course after the problem based learning process revealed that the highest score was 88.79 % and the lowest score was 70.33 %. The average score was 80.60 ± 3.47 . From the aforementioned percentage, the highest T-score was 76 and the lowest T-score was 25. Most of the students got equally grade B+ and B (41.49 %). (Table 1)

4.3 Critical Thinking

Results revealed that critical thinking after the problem based learning process was 49.62 scores from 80 full scores (62.03 %) and higher than that of before (49.62 ± 5.78 , 46.69 ± 6.00 , respectively) which was significantly difference ($t = 4.443$, $p < .05$). (Table 2)

Results showed statistically significantly higher critical thinking after undergone problem based learning process compared with that of before the problem based learning process in two domains: Inference ($t = 2.299$, $p < .05$) and Recognition of Assumption ($t = 6.287$, $p < .05$) (Table 3).

Regarding the level of critical thinking, the results showed that the most critical thinking level was at the moderate level both before (51.06 %) and after (46.81 %) the problem based learning process. However, the percentage of high critical thinking level was statistically

Table 1 Frequency and percentage of T scores, score percentage, and grade (N=94)

T score	Score percentage	Grade	Frequency	Percentage
64–76	85.50–90.99	A	8	8.51
50–63	81.00–85.49	B+	39	41.49
36–49	75.50–80.99	B	39	41.49
25–35	70.00–75.49	C+	8	8.51

Table 2 Paired t test of critical thinking before and after the problem based learning process

Critical thinking	N	\bar{X}	SD	t test	p value
After PBL	94	49.62	5.78	4.443	.000
Before PBL	94	46.69	6.00		

Table 3 Paired t tests of critical thinking of each domain before and after the problem based learning process

Critical thinking	Before PBL		After PBL		t test	p value
	\bar{X}	SD	\bar{X}	SD		
Inference	4.82	1.697	5.37	1.945	2.288	.024
Recognition of assumption	10.19	2.904	12.01	2.421	6.287	.000
Deduction	11.89	2.202	12.15	2.089	1.024	.309
Interpretation	10.99	1.948	11.01	1.835	0.088	.930
Evaluation of argument	8.80	2.289	8.87	2.733	.221	.825

Table 4 Chi square tests of critical thinking levels before and after the problem based learning process

Critical thinking levels	After PBL		Before PBL		χ^2
	N	%	N	%	
High	26	27.66	14	14.89	4.57*
Moderate	48	51.06	44	46.81	.34
Low	20	21.28	36	38.30	6.51*

* $p < .05$

significantly higher after (27.66%) the problem based learning process compared to that of before (14.89%) the problem based learning process ($\chi^2 = 4.57, p < .05$). Similarly, the percentage of low critical thinking level was statistically significantly lower after (21.28%) the problem based learning process compared to that of before (38.30%) the problem based learning process ($\chi^2 = 6.51, p < .05$) (Table 4).

Regarding students' opinion on the problem based learning, The majority of students come up with positive feedback by remarking the PBL as enjoyable technique of learning (51.6%) and follow with team working and collaboration and problem solving (39.36 and 22.34%, respectively) (Table 5)

Table 5 The opinion of problem based learning in the course

Students' opinion	Total	Percentage
1. Enjoyable atmosphere	48	51.06
2. Team working and collaboration	37	39.36
3. Problem solving	21	22.34
4. Self assertion	18	19.15
5. Analyzing situation	12	12.77
6. Self learning and searching	12	12.77
7. Active learning	12	12.77
8. Discipline	10	10.64
9. Gaining knowledge	10	10.64

5 Discussion

Most of the nursing students' achievement were B+ and B grade, the highest score was 88.79 and the lowest was 70.33. It was found that the achievement was not different from the last year taught by lecture which was harmonious as Beers' study [8]. The average score of critical thinking after problem based learning process was 50.81 from 80 full scores, and equally 63.51 %. By percentile score, It was found that the critical thinking was moderate level score which was not different from Kampak [9] and Ratanakomol et al. [10] who found that the critical thinking score of nurse students were moderate level score. It was because nursing curricula are reading intensive which are obstacle of critical thinking. Moreover, clinical assignments have not been taught in class. Regarding lecture methodology, students get used to be share their thought by teachers. When they learnt by using student centred, they might not be familiar to learn by themselves. However, the students' satisfaction on PBL was 57 % which they thought that they can be active learners and do not get boring during learning, the same as Kocaman et al. [11] who found that PBL made the learners preparedness for self learning.

The most of the nurse students' achievement were B+ and B grade (42.86 %), the highest score was 88.79 and the lowest was 70.33 and average was 80.60 ± 3.47 (Table 1). It was found that it was similar to the achievement of the first year nurse students for this course in last year [12] which was the same course description, course objective, blue print and content, but only style of learning was different. The highest score of lecture style in the last year was 84.42 and the lowest score was 57.70 which the average score was 74.60. We are able to conclude that students who learn by problem based learning style get score or get knowledge not different from lecture style which is similarly found by Beers [8]. Beer's study was done in Adult Nursing which was compared the achievement between lecture style and problem based learning style in the academic year 2001 and 2002. The result was found that there were not different achievement between these two methods

The average score of critical thinking after problem based learning was 49.62 scores from 80 full scores or about 62.03 % which was rather high score. When we divided the ability of critical thinking scores both after and before learning by percentile, it was found that students got moderate level (51.06 and 46.81 respectively), meanwhile, the high level and the lower level were better (27.66 vs 14.89; 21.28 vs 38.30, respectively) as table 3. This finding was harmonious with Ratanakomol et al. [10] which found that nurse students got moderate level score of critical thinking. It might be caused by most of teaching and learning styles for nurse students are focused on step of practices which have huge content. The basic of learning

used to memorize. This method is an obstacle for thinking critically and nurse students are still familiar to lecture. Kammanee [6] stated that teacher are lack of skill to be facilitators and motivate students to development the process of thinking. Teaching style is still provide knowledge to students and students take role on good attendance and believe on what they are taught. Thus critical thinking is not developed. Oberski et al. [13] had evaluated the result of problem based learning by report assignment, they found that the most of subjects (62 %) realized that problem based learning motivated them to get responsibility and accountability and 33 % thought that the method made them to be reasonable person. Moreover, before problem based learning, 80 % thought that lecture would make them knowledgeable better than group working as problem based learning. After problem based learning, 57 % reversed their thought that they admired learning style by team working as moderate to high and more than sitting in class. The subjects concluded that problem based learning by team working and report assignment was meaningful for their learning. Considering for each domain, we found that the average Inference score both before and after were very low scores (4.82 and 5.37 scores, respectively) from full of 16 scores. Though it was found that after the learning process, the score was higher than that of before significantly (Table 3) which is harmonious with the studies of Ratanakimol et al. [10] and Pongsethasunt [14] who found that the ability of inference domain scores of nurse students were very low. The reason might caused by the inference domain was measured ability for decision making to identify the probability of conclusion the truth or false. The subjects had to think critically and systematically. They had to used open minded and various wide views to decide the situation. The first year nurse students are lack of these kind of abilities.

The highest ability scores was recognition of assumption which after the learning process, the score was higher than that of before significantly (12.01 and 10.19 scores) from 16 full scores. It might because problem based learning process or any situation in the assignments were for training nursing students to interpret meaning of words or problems for further studies. Thus nursing students were familiar these kind of methods and they were trained many times during the process of learning.

6 Conclusion and Discussion

The achievement of learning were not different form the classic style learning, PBL is learning style which is able to encourage student to be thinker, This process makes students gain their knowledge, experience to search various credible resources and to solve problems by their own methods. Moreover, they learn how to do as team working. The important outcome of PBL process is provided students to be lifelong learners.

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