Inquiry-Based Learning as a Teaching-Learning Strategy for Critical Thinking in Mie Prefectural College of Nursing

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【Abstract】 In Mie Prefectural College of Nursing, IBL was utilized for almost every nursing course[1]. IBL was instituted for the freshmen in their fundamental nursing course. The validity of IBL was assessed through class assessment of the students. IBL was evaluated through class evaluations. The evaluation is a 5 level Likert scale of 16 items with open ended answers. These include items such as, "I could collaborate with other students in the group", and "I enhanced my thinking ability" which received high score. "I feel safe", "I was not sure how to develop IBL", and "I got closer to the faculty" recieved lower scores. According to these answers, learning in high school is a passive actively which students are exposed to, such as lectures. It is difficult to change the learning style from the lecture method to self-learning, and it also may lead to some confusion. However, the students were interested in this learning method and they found it interesting. This demonstrates that this learning method stimulates knowledge, as students researched areas by themselves as well as collaborated with others.

【Key words】 Inquiry-Based Learning, Teaching-Learning Strategy, Critical Thinking

Introduction

With the information explosion of the modern age and the complexity of the healthcare system, nurses face the difficult challenge of processing this information to make independent judgments in the clinical setting.[2] Nursing education, therefore, must prepare students to think critically and act independently.[3] A curriculum that merely conveys knowledge is not enough. Current knowledge in the healthcare field becomes outdated rapidly, and specific information learned in the educational setting can be quickly forgotten.[2] In addition, advances in a field may require a whole new realm of knowledge that could not be predicted. These kinds of limitations in the educational process, coupled with the demands of a rapidly changing healthcare system, require us to focus away from didactic pedagogy with content mastery that will be of little use to today's nurses, who will need to gather, analyze, synthesize, and carefully evaluate information.[2,3]

Miller[4] argues for a greater emphasis on the mental process needed to solve nursing problems and less emphasis on the mere identification of the correct answers. Miller[4] also stresses the importance of critical thinking skills in the process of deriving clinical inferences from available data, such as deductive reasoning, recognizing unstated assumptions, weighing evidence, and distinguishing between weak and

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strong arguments. As an educational model and strategy, inquiry-based learning (IBL) presents the opportunity to assess and refine the mental processes of students as they problem-solve clinical situations.

The thinking skills outlined by Miller[4] and the educational outcomes cited by the NLN in 1992[5] are integral components of the IBL method.

Inquiry-Based Learning

In 1992, the University of Hawaii at Manoa, School of Nursing (UHMSON) adopted the following definition of IBL:

An orientation toward learning that is flexible and open and draws on the varied skills and resources of faculty and students, in which faculty are co-learners who guide and facilitate the student-driven learning experience to achieve goals of nursing practice. This includes an interdisciplinary approach to learning, problem solving, critical thinking, as well as self learning.

IBL in U.H. community mental health graduate program is, to a large extent, modeled on problem-based learning (PBL) curricula used by medical educators across the United States and by nurse educators in Australia. Although minor differences between IBL and PBL exist, both methods are founded on the same educational principles and goals.[6]-[9] The graduate faculty of U.H. nursing school adopted the major principles and goals of PBL[10] and at the same time it "adapted" certain techniques (e.g., nursing situations rather than medical problems) to best fit the nursing discipline and the diverse needs of their clients in Hawaii.

IBL is designed to help students acquire content knowledge in the context of problem solving in clinical situations. The educational objectives of the IBL method are to:[2]

· Develop critical thinking and reasoning skills;

· Promote integration of relevant knowledge in a usable form;

· Develop independent learning and research skills;

and

· Motivate student learning in collaborative groups.

Aim of the research

In Mie Prefectural College of Nursing, we utilized IBL for almost every nursing course[11]-[14]. We also used IBL for the freshmen in their fundamental nursing course. This study will examine the validity of IBL through evaluation of the process. The problems and prospects concerning IBL in our college are identified and evaluated.

Method

The fundamental nursing IBL is introduced to the students soon after they enter the college.[13] The students are involved in the learning method called IBL which aims to teach the basic human needs as the study subject. Therefore, we provide a case that is easy to imagine and is interesting for the students. In 1999, the life of a 19 year-old male college student was chosen as the case. The case consists of four parts; each part is expressed in few lines, and each part has more information than the previous part (table 2). In one day 4 parts are presented in 180 minute segments. The next week 90 minutes is used for the presentation in the group and the other 90 minutes for class presentation, feedback and evaluation.

To carry out IBL, each student is assigned either a "facilitator", "recorder", "time keeper" or "member" role (table 3). The "facilitator"

may say "please read part one of this case out loud" and the members respond to it. The "recorder" uses the work sheet (see table 4) on a large piece of paper and writes down member's answers or responses using the major areas such as "fact" "hypothesis" "information needed" "learning issues". The "time keeper" keeps the time for each item in 5–10 minute discussion segments and each part is completed in about 40 minutes. At the end, "learning issues" are assigned to the student members. Then, the students and the tutor review the IBL for 10-15 minutes. The total time required for each tutorial is 180 minutes.

The next week, the learning issues are presented in the group. The aim is for the students to think critically about the case while they share their information. The student is stimulated by other group members and explains his/her own synthesized information to the other students.

Results

Class evaluation by the students is completed with a 5 point Likert scale for 16 items and open-ended answer. The levels in the 5 point Likert scale are "strongly agree" (5 points), "agree" (4 points), "neutral" (3 points), "disagree" (2 points), "strongly disagree" (1 point). The results for the fundamental nursing IBL completed by the students in 1998 and 1999 is shown on table 5. The items 5), 7), 16) were converted to positive expression because they were expressed in a negative manner. Therefore, if the students had high evaluation, the total score would be higher.

According to the results in 1998 and 1999, the high scores were 10) I could collaborate with other students in the group=4.3 points, 5) the faculty paid attention to student's response=4.2 points, 11) the number of member

students is appropriate=4.2 points, 12) I would like to recommend this class to freshman =4.2 points, and 13) I enhanced my thinking ability=4.2 points (table 5).

On the other hand, the items with lower score were 6) I feel safe=3.1 points, 7) I was sure of how to follow the IBL process=3.1 points, 2) I got closer to the faculty=3.7 points, and 9) I would like to learn more from this faculty=3.7 points.

Discussion

The low scores on the items 6) I feel safe, and item 7) I was sure of how to follow the IBL process, could be due to the confusion about the differences between college education and education they received until high school. The learning method in high school is passive with information gained through lectures. The method of study for the majority of students was to prepare for the entrance examination for college. Very few students received a self-learning style education, such as thinking for themselves, questioning and acquiring the information by themselves. For the students who just entered college, switching from lectures to self-learning is difficult and confusing.

There was some difficulty in the small number of students and the group-learning setting. Japanese people traditionally do not want to call attention to themsevles, are not self-assertive, and are not likely to express their opinion in group work. Since the requirement of IBL is to give opinions in limited time with little emphasis on relationships within the group, the students may have been confused about what roles to assume in the group.

The evaluation items, "I got closer to the faculty" (item 2) received a low score, but "faculty paid attention to student's response" (item 5), had a high score. This may mean that the

faculty paid attention to the students, but were not close to the students. Because the tutor's role in IBL is to refrain from lecturing directly to the students and display a different type of supportive attitude, the students who were not used to this learning method, may felt insecure. Tutors were more involved in fostering critical thinking and the group process. However, this area may need to be developed further.

The class evaluation, 12) I would like to recommend this class to freshman, and 14) the class was interesting, scored high. Also 10) I could collaborate with other students in the group, 13) I enhanced my thinking ability, and 16) desire to learn increased, scored high. Therefore, although the students may have been confused, they found the IBL method interesting. As the purpose of this learning method was to stimulate knowledge, the result of increasing research and collaboration with others was accomplished.

One of the difficulties performing IBL is the role of the tutor. The tutor has as important role in IBL. According to the student's evaluation, the tutor's contact with them could be one of the reasons for the low scores on item 6) I feel safe, and 7) I was sure of how to follow the IBL process. Although we had three training sessions on IBL twice before starting and once after, this may have not been enough. Also, differences among the faculty members educational view, values and ability as a teacher may have contributed to different scores. This may contribute to the differences even though we prepared a standardized tutor guide.[5] Some faculty members have difficulty embracing IBL. To perform IBL successfully as a college, continuously tutor training is required. As a future goal, we will try to raise the score of items 6) I feel safe and 7) I was sure how to follow the IBL process by focusing on tutor development and student attitudes, and group process.

In summary, we found several problems related to this study. However, we assume that IBL contributes to the student's progress in critical thinking ability and a future study is in process. Presently, the IBL process involves only one case over a period of 2 days for each class. The third year comprehensive course involves a case over 3 weeks. In future we plan on increasing the number of cases and IBL process in all of our classes after further tutor development and evaluation of effectiveness.

A part of this paper was presented at 1st Asia-Pacific-Conference on Problem-based Learning.
（本論は執筆依頼論文である）

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Table 1 IBL for students who entered in 1997

	First year (1997)		Second year (1998)		Third year (1999)		Fourth year (2000)	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
	···Fundamental		···psychiatric ···geriatric	···adult ···pediatric ···community ···maternity	···comprehensive IBL			
	①fundamental IBL (freshman class)		②field IBL (speciality areas)		③comprehensive IBL (junior level)			

Table 2

Recent life of Mr. Takahashi
Part 1
Mr. Takahashi is 19 years old, male. It has been a year since he entered the M university in Mie prefecture. Now he rents an apartment and lives by himself, because he is from Fukuoka prefecture. He never lived by himself before. Though he was not used to this everyday life, he is getting used to it.
Part 2
He had lived with his family (parents, grandmother, younger sister) until last year. He has friends now and seems pretty busy every day. Also he started a part time job at the convinience store. Today, a worker at the cafeteria told him "You look pale".
Part 3
He feels sluggish these days and does not have much appetite. He was aware of this and measured his weight. His weight was 60kg.
This is 5kg less than three months ago. He is beginning to sleep later in the morning and be late for his classes or not attend the classes at all.
Part 4
His major is in engineering. Recently, he bought a computer with his parents' help. He was going to use it for his classes, but now he is into getting on the internet and he is on the internet through the night until early next morning. When he goes to school, he has brunch such as set menu or noodles at the cafetria instead of having a breakfast.

Table 3

MEMBER ROLES

STUDENT MEMBERS
1. Learn to brainstorm and allow others freedom to do so
2. Ask questions about what is known or not known and how to get what is known
3. Problem solve and think critically
4. Be self directed learners, take responsibility for their own learning, with some guidance
5. Examine health care problems, identify learning issues, develop and fulfill personal learning goals and contribute to the development of other members

FACILITATOR (student)
1. Implementation of ground rules of the tutorial
2. Direct and focus on the subject matter
3. Focusing attention on segments of the case
4. Making sure everyone is heard and recorded
5. Closing of each session with summary and synthesis of the case
6. Assisting with evaluation and group progress regarding how and what learning occurred in the sessions

RECORDER (student)
1. Records brainstorming session of generating ideas, issues, hypothesis, information needed and learning issues
2. Keeps record of who will be responsible for which learning issue
3. Reports at the closing session each responsibility relevant to hypothesis

TIME KEEPER
Responsible for making sure there is enough time for each case segment and time at the end to synthesize and process

TUTOR (faculty)
1. Facilitate learning by the group
2. Guide without forcing or directing
3. Help students identify important concepts and issues and synthesize into problem formulation and management plan
4. Knowledgeable about resources available and able to advise students on study approaches
5. Assist students in selecting learning issue
6. Provide a role model of critical thinking and self—examination
7. Encourages students to take active role in the group process and a critical part in their learning
8. Summarize the case and tutorial process
9. Participate in student evaluations
10. Evaluation of best and least effective learning issues

Table 4

WORKSHEETS FOR IBL CASE

ISSUES/FACT	HYPOTHESES	INFORMATION NEEDED	LEARNING ISSUES

Table 5

Class evaluation by studens

	1998		1999		overall	
	n = 93	±se	n = 96	±se	n = 189	±se
1) I am satisfied with the class	4.1	0.07	3.9	0.07	4.0	0.05
2) I got closer to the faculty	3.6	0.08	3.7	0.08	3.7	0.06
3) I felt that I was in college level class	3.8	0.09	3.8	0.09	3.8	0.06
4) The faculty guided us appropriately	3.9	0.07	3.9	0.08	3.9	0.05
5) The faculty did pay attention to the student's response	4.1	0.07	4.3	0.07	4.2	0.05
6) I feel safe	3.1	0.09	3.2	0.09	3.1	0.06
7) I was sure of how to develop	3.3	0.10	2.8	0.11	3.1	0.07
8) I was stimulated in positive way	3.9	0.07	3.9	0.08	3.9	0.05
9) I would like to learn more from this faculty	3.6	0.07	3.7	0.07	3.7	0.05
10) I could collaborate with other students in the group	4.2	0.07	4.3	0.07	4.3	0.05
11) the number of member students is appropriate	4.3	0.07	4.1	0.07	4.2	0.05
12) I would like to recommend this class to freshman	4.2	0.07	4.1	0.07	4.2	0.05
13) I enhanced my thinking ability	4.1	0.06	4.2	0.07	4.2	0.05
14) The class was interesting	3.9	0.08	4.0	0.08	4.0	0.06
15) I gained the ability to research by myself	3.8	0.09	4.1	0.07	3.9	0.06
16) Desire to learn increased	4.1	0.09	3.9	0.08	4.0	0.06
average score	3.87	0.02	3.88	0.02	3.87	0.02