ASSESSMENT OF PROJECT-BASED LEARNING IN HOME HEALTHCARE STUDY

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Abstract— The purpose of this study was to examine the effects of project-based learning on students' academic achievement and attitudes towards home healthcare study. The research was carried out in second semester of 2014 academic year. Totally 21 undergraduate students in First Aid course of the Department of Health Management Technology, Faculty of Science and Technology, Phranakhon Rajabhat University participated in the study. The results of the research showed a mean value difference between the scores of before and after program. On the other hand, it was also found out that project-based learning was more effective in the positive development of the students' academic achievement levels. At the end of the research, it was revealed that the students who were educated by project-based learning expressed positive attitude on the projected-base learning.

Keywords— Project-based learning, academic achievement, attitudes towards lesson, Home Healthcare

I. INTRODUCTION

Project-based learning is an instructional method centered on the learner and increasing widespread interest in higher education [1]. Students drive their own learning through inquiry, as well as work collaboratively to explore and create projects that reflect their knowledge [2]. The method is a creative approach to learning that teaches a multitude of strategies critical for achievement in the twenty-first century. The benefits of learning by perform have long been shown [3]. The beginning of the idea go back to many instructors for over hundred years such as John Dewey who noticed on the advantages of experiential, hands-on, student-directed learning. Most lecturers, knowing the value of engaging, challenging projects for students, have planned field trips, laboratory investigations, and interdisciplinary activities that improve and extend the curriculum [4].

Currently, project-based learning is described by various definitions. Every of these meanings contain explanation of a problem by the group of students [5]. Moreover the work of learners is commonly ended by the construction of some creation, what can be thesis, report, model or multimedia presentation [6]. The method enables the expression of diversity in learners, such as interests, abilities and learning styles. Therefore, in the end, students present their newly obtained knowledge and are recommended by the instructors in terms of what they have acquired and how well they present it. According to this method, the teacher's role is to guide and advise the students on how to become more effective learners and apply the learning materials rather than to get involved and to supervise students' project. In addition, the use of project-based learning in class is possible after providing the information that is needed for the mission. The classroom activities should be student-centered, cooperative, and interactive. Group members are responsible for their own learning. The teacher plays the role of the collaborator, the facilitator and the learner. Thus, a learning approach based on the project not only establishes a profound and high level of knowledge among students, but also creates opportunities in which students can learn in a self directed manner and in accordance with learning objectives [7].

Home healthcare engages a relatively unique situation in the healthcare study. In most healthcare settings, with the relatively rare exception of practitioner home visits, the patient or client travels to and, in many cases, remains in a provider setting to receive healthcare and other support services. In home healthcare, the provider travels to the patient's home, where care provision can be influenced by various circumstances and attributes not typically encountered in most other types of healthcare [8]. Effectiveness of care depends not only on the provider's healthcare expertise but also on patient and family knowledge, adherence to treatment regimens, physical characteristics of the home environment, and the combined ability of provider and family to communicate and motivate [9]. Although the potential merits of home healthcare are substantial, relatively little precise information has been obtained on its effectiveness, especially in the form of studies that control for the variety of factors that can influence its effectiveness [10]. In the past few decades, changes in healthcare delivery and advances in medicine have increased demands on academic faculty, resulting in less time for teaching than has previously been the case. Changes in sites of healthcare delivery, from acute care institutions to community-based settings for chronic care, have required adaptations in educational venues [11].

Recently, project-based learning is used in many health field studies. Researchers have reported that students can make significant gains when investigation activities are incorporated in the learning process [12]. In this study, project-based learning was implemented after providing the information that is needed for the project. At the

beginning stage of this study, the class teacher, who was also the researcher, discussed the topic with the students to find out what experiences they had and what they already knew about. Then, students worked on the project in groups of five or six. The students in each group designed a project of their own. In the last phase, each group made the model of their project and teacher as well as member of each other groups evaluated their ability to organize the project.

The study aims to evaluate the effectiveness of the project-based learning which takes advantage of simulation experiment and to measure students' academic achievement and attitudes towards home healthcare study. The following research question was proposed: How effective is the reality-based project in engaging students in meaningful learning and enhancing their motivational attitude, especially when integrated with project-based simulation?

II. METHODOLOGY

The present study was done based on the project-based learning which identified that learning has occurred when learners evidence the appropriate reinforcement of an association between a particular response and stimulus. Learning is, therefore, focused on learning achievement in project-based learning. In this study, implementation of assignment with academic activities within and outside the classroom was used for learning outcome improvement of the learners. The participants of this research were undergraduate students of Department of Health Management Technology, Faculty of Science and Technology, Phranakhon Rajabhat University which contained 21 students. The research was conducted in the second semester of 2014 academic year. The students were enrolled in the First Aid course; they met in class one times a week. Each time covered 150 minutes. The length of the topics was three weeks.

This study employed a mixed method design integrating both qualitative and quantitative data. Through the collection of both types of data, a more comprehensive understanding of a research problem is possible. Qualitative data sources included scores of student discourse while they were engaged in communications related to working on group projects. Quantitative data included project ratings and student responses to a Likertscale questionnaire.

Three instruments were used in this study. These were 1) the pre-test and the post-test and 2) the instructor observation scale used for evaluation the ability to organize the project gathering information about the students' achievement and 3) the questionnaire used for satisfy evaluation towards project-assisted home healthcare learning.

The pre-test and post-test were composed the questions designed to assess the students' home healthcare proficiency, covering the content in the textbook which was used for the First Aid course in the second semester of 2014 academic year. After the test was created, it was given to three experts of medical, nursing and public health experts. The experts were also asked to rate each item so as to see whether it was congruent with the objective. Then, the Item-Objective Congruence (IOC) Index was calculated by assigning scores to three kinds of answers: congruent = 1, questionable = 0, incongruent = -1. In this study, all items were rated higher than 0.5 of the IOC index, indicating that they were acceptably congruent with the objectives. According to the criteria, the test items of which difficulty indices range between 0.20 and 0.80, and the discrimination of indices which are equal to or higher than 0.20 were chosen for the main study. The reliability coefficient of the overall test calculated by Kuder-Richardson-20 formula (KR-20) was 0.79, which can be interpreted that the test had high reliability. However, many items were removed due to difficulty and discrimination. At this stage, there were 15 questions left which can distinguish achievement of home healthcare knowledge.

The next tool was a measurement of skill and attitudinal questionnaire relative to project-assisted home healthcare about ability to organize the project and satisfaction questionnaire investigating how the students felt about it. The Likert five-rating scale (1= strongly disagree, 2= disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree) was used for a post-study survey. The draft attitudinal questionnaire items were checked for content validity by three experts in medical, nursing or public health field. The items with IOC index higher than 0.6 are acceptable. In order to test the proper reliability, the questionnaire was piloted with 25 undergraduate students who were not the target group and calculated by using Cronbach's Alpha. According to Cronbach and Shevelson [13], coefficient ranges in value from 0 to 1. The higher the score, the more reliable the generated scale is. They have also indicated 0.7 to be an acceptable reliability coefficient. The coefficient value of the overall questionnaire was 0.86. After that, the questionnaire was distributed to students in the experimental group at the end of period on the last week.

III. RESULTS AND DISCUSSION

"High quality" learning outcomes should consequence from the interplay between students' learning efforts, the curricula and the teaching methods used. It is possible to infer the achievement of the desired learning outcomes by observing (through assessment) improvements in the way students acquire process and synthesize information and subsequent improvements in their skills. These sorts of outcomes occur when students adopt a deep, rather than a surface approach to their learning [14].

This study was carried out to determine whether the use of projected-base learning approach was effective in enhancing students' understanding. In

order to see how much improvement before and after projected-based learning implementation of the experimental group had from the pre-test to the post-test were conducted. Table 1 shows descriptive statistics for the results of the pre- and post-tests for experimental groups. Before the intervention of projected-base learning, the home healthcare knowledge mean scores of students were 6.23 with 1.89 of standard deviation, and those scores increased to 10.61 with 2.49 of standard deviation, after projected-base learning application. This means that the students in projected-base improved their knowledge.

Table 1: Comparison of pre-test and post-test mean scores and standard deviation (SD) of student's academic achievement on home healthcare notion

Students' academic achievement on home healthcare notion	Pre-test		Post-test	
	Mean	SD	Mean	SD
	6.23	1.89	10.61	2.49

The increased score in experimental groups after projected-base learning application provides sufficient support that the use of training can help students improve their healthcare knowledge. This might be because students had a chance to practice and work on skill they had learned. Project-based learning engaged in academic activities within and outside the classroom plays an important role in skill development, especially when new perception was introduced. This is probably because project assignment can build learning environment where students can study outside the classroom. Moreover, doing assignment on healthcare seemed to be motivating when compared with only paper-based exercise. The old way of teaching was probably the cause of boredom. They seemed to have less motivation in learning and were controlled by time. Teaching home healthcare skill is not an easy task; students always feel discouraged because of the traditional learning process which does not support learning.



Fig.1 Academic activities outside the classroom during project-based learning application

More specifically, the assessment activities guided students by requiring them to recognize when their understanding was limited – and then to engage them in thinking approaches that would develop that understanding further. By providing a framework of thoughts, ideas and information, researcher sought to progressively enhance the sophistication of learners' thinking. Thus, the assessment required students to integrate, synthesize and construct their understandings in ways consistent with the discipline and the professional pathways on which they had embarked [15].

For this study, in order to obtain the ability to organize the project during the study related to the effects of project-based learning on their achievement, the students were observed and scored by instructor and member of other groups.

The students were assigned to one of four groups (each group consisted of 5-6 students). Each group was given an individual profile along with the students' specifications in a file. It is to note that the students were assigned to groups based on factors such as gender and proficiency levels, so that each group involved both male and female students of various abilities (low, mid, and high). In this phase, the instructor provided the students with an explanation of group workings and the rules for working in a group, including respecting the other students' views, allowing them to express themselves, and dividing the tasks among each other proportionately. For example, each group consisted of a president and a spokesman. These roles were also transferred to other group members.

Students determined the objectives of the assignment based on the concepts of the lesson. They initially designed the plan of the project while receiving assistance from their teacher. Students explored the resources in order to create a frame for the project they stated questions about. They also created interesting questions and categorized the problems. Most of the points and materials of the project were key questions which were essential to understanding the concepts. Some of these key points were: where should it be started?, what is the main problem?, what implementations must be done to remove the problems?, and so forth. In fact, students determined their objectives in their project plans. Students proposed a situation in which they liked to carry out their projects in accordance with the course content. The students, in each group, analyzed their suggested situations systematically.

In presentation step, students presented their project results in terms of prepared software, tables, posters, charts and diagrams, movies, photos and images, etc. Students then discussed possible applications of the project which might benefit their own classes, other schools, seminars and any other organization. In this phase, as in the previous phases, the role of the teacher was to guide students along

and determine criteria for the application of the project, such as how and when to present them.

The evaluation procedures used in the project-based learning strategy are totally different from that of its counterpart, the traditional method (i.e. conventional teaching). Generally speaking, assessment and evaluation in project-based learning is almost qualitative. In the evaluation phase of this study, the teacher was not the only one who evaluated the projects. Group members also took part in evaluating each other, and members of each group also compared their own projects with those of other members within and out of their group. The role of teacher, in this phase, was to determine the criteria for evaluation and to produce or withdraw from other students' opinions. These criteria included applicable, creative, and interesting resolutions.

The result of the evaluation showed that students have high score of the ability to plan and manage as well as present their understanding in each group assignment. Each group project was evaluated using rubrics that were designed to assess the presence and quality of key elements according to the project requirements. The capability to organize the project scale was used in order to measure students' achievement towards home healthcare lesson. The scale was arranged by having done the reliability and validity studies and used to evaluate the attitudes of students towards home healthcare skill by the researcher.

The approach scale test is a five-point Likert type scale (which was used to differentiate orientations from 1 as low and 5 as high). Table 2 showed the overall level of the ability to organize the project at a positive level in each group. When considering each project, it was found that the highest mean score was the Health Promotion project (M = 4.62), followed by the Pay attention to promoting dietary habits project (Mean = 4.14). Therefore, useful activities can be provided for improving not only knowledge, but also other skills.

Table 2 Mean, Standard Deviation, and Level of Attitudes of the Students

Project	The ability to organize the project			Score	Level
	Work plan	Operations	Presentation		
DM foot care	4.00	3.85	3.25	3.70	Good
Food behavior	4.00	4.42	4.00	4.14	Good
Health Promotion 3 Subject	4.16	4.71	5.00	4.62	Very good
Exercise Project	3.83	4.00	4.00	3.94	Good

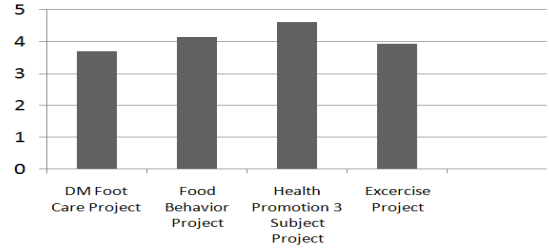


Fig. 2 Assessment of the ability to organize the project of students on the projected-base learning

However, in designing the course that uses project-based learning, an adjusted pedagogy is not the only issue to be considered, but other factors should be taken into account such as choosing activities that fits students' needs, the appropriateness of activities, the readiness of learners' learning tools etc. All these can affect the success of learning development. However, the teachers should consider the amount of time students have to spend on it. Joining too many activities or doing a lot of assignments may be a big burden for them and can build boring learning environment [16, 17].

In addition, the student is now recognized as the principal 'stakeholder' of the higher education. Student feedback of some sort is usually collected as a tool for planning and implementing continuous improvement activities. It can be considered as managerial tools, guiding instructor and institutions to adapt to the changing circumstances of learning [18]. Student perceptions of the project-based collaborative learning experiences were elicited using a Likert-scale attitude questionnaire. In order to acquire the students' feelings and opinions in relation to the effects of project-based learning on their attitude towards home healthcare, an attitudinal questionnaire and open question were applied in this phase. All the students stated that project-based learning considerably improved their attitudes toward home healthcare understanding. The effectiveness of project assisted learning is also supported by positive attitudes students demonstrated the satisfaction of students on the projected base learning. The students in the experimental group were asked to express their attitudes towards project-assisted home health care understanding. Table 3 summarizes the results from the attitudinal questionnaire, showing the overall attitude at a positive level (Mean = 4.53). When considering each item, it was found that the highest mean score was the benefits of learning (M = 4.30), followed by the learning management (Mean = 4.55). The attitudes in all items were found to be positive.

Table 3 Assessment of the satisfaction of students on the projected base learning

Assessment	Mean	SD	Level
The learning atmosphere	4.44	0.38	Good
The Learning management	4.55	0.42	Very Good
The benefits of learning	4.60	0.38	Very Good
Total	4.53	0.32	Very Good

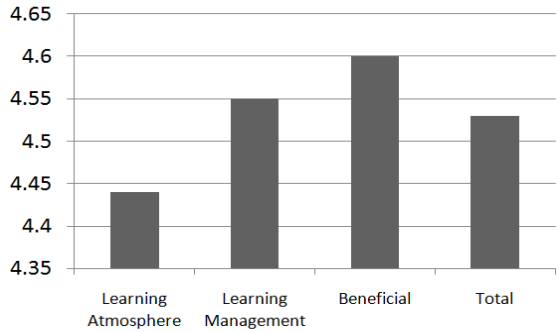


Fig. 3 Assessment of the satisfaction of students on the projected base learning

In analyzing the positive responses of the class, the researcher felt that comments concerning the authentic, performance orientation of the course could not be directly attributed to the use of a project-based learning. The researcher felt that the authentic nature of the course was more a feature of the problem-based instructional system employed by the instructor. However, given the comments about group skill development, researchers found a basis in the literature that substantiated a relationship between the use of project-based learning and the cultivation of group processing skills. There is at least some indication in this study that students developed and utilized skills independent of instructor directives or project design. It is the belief of the researcher that these skills may be inherent in project-based instruction. As one student commented, "The use of project to explore the interaction of the group to arrive at answers coupled with the usefulness of the product is what I liked best about the course."

The findings from this study have provided valid evidence that to a certain extent, the project-based learning strategy is superior to the conventional teaching strategy. The application of the project-based learning strategy in classrooms can be beneficial to students, as this instructional strategy has been proven to improve student's performance and basic skills.

CONCLUSION

In summary, the overall design of the assessment items and associated resources make it possible to ask many "what - if" type questions designed to guide the constructive development of critical thinking processes. Specifically, through the nature and sequence of the assessment tasks, we were able to oblige the students to synthesized a broad range of information, identify useful resources, formulate and test hypotheses and, ultimately, to apply their developing understanding to novel problems. Thus, the cognitive tasks required to successfully complete the assessment items derive from an engagement between the students and the learning materials which is driven by those assessment tasks. The quantitative and qualitative analyses from this study confirmed that project-based learning had achievement in home healthcare knowledge. Considerably better performance of the students was attributable to the potential of the project-based learning to make understanding better by engaging students authentic and real life problems, providing interdisciplinary environment, providing making the product of the study, and creating group work environment.

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