Effects of Blended Learning, Using Online Data Searches and Action Learning, upon Academic Achievement and Searching Skills of Nursing Students

Vorawan Vanicharoenchai, Tipa Toskulkaew

Abstract:
Purpose: The purposes of this research were to study academic achievements and searching skills of students who studied through blended learning based on action learning, and students who studied through traditional learning, and to study the opinions about the blended learning based on action learning.

Design: Quasi-experimental Research

Methods: The subjects were 128 undergraduate students from the 2nd year at the Faculty of Nursing, Mahidol University. The subjects were selected by purposive sampling and separated into 2 groups: 64 students in a control group, which studied through traditional learning; and 64 students in an experimental group, which studied through blended learning based on action learning. The data were analyzed by using mean, standard deviation, dependent t-test, and independent t-test.

Main findings: The research results showed that both groups had higher achievement scores in the posttest than the pretest; the difference was statistically significant at the .01 level. The experimental group had higher achievement scores and searching skill scores than the control group; the difference was statistically significant at the .01 level. The subjects were highly satisfied with the blended learning based on action learning methods.

Conclusion and recommendations: Blended learning is an effective teaching and learning method. The learners could proceed with the learning at their own rate and ability. The learners worked together to analyze the problems and share knowledge with each other, propose a solution to the problem, and take action. Consequently, their knowledge and searching skills increased.

Keywords: blended learning, action learning, searching skill, teaching and learning
Introduction

The rapidly evolving and deploying evolution of information technology brings many new opportunities for developing and supporting education. The internet is used for teaching and learning because the internet is a computer system that allows millions of computer users around the world to exchange information by using the same protocol. It brings about a rapid and convenient way to send and receive information in many formats such as text, picture, animation, and sound. For this reason, many learning methods and styles use the internet such as distance learning, web-based instruction, web-based CAI (computer aided instruction), blended learning, flexible learning, etc.

Blended learning is an opportunity to integrate online learning with interactive learning such as via multimedia technology, and discussion via web board, in conjunction with the traditional form of classroom training. While traditional learning is a teacher-centered classroom where instructors control their teaching, action learning is a powerful process that involves students solving real problems, while at the same time focusing on what they are learning. Action learning can be applied as a powerful teaching aid. If the learners have an adequate searching skill, they will seek more knowledge. The learners must be familiar with the techniques for data searching, how to identify appropriate keywords, and how to select appropriate electronic databases and sources. Thus, the use of blended learning combined with action learning will promote learners to be independent, and self-directed, and allow them to practice their skills and act in the development of their own efficient learning.

Background

Blended learning is an effective teaching and learning method. It combines several delivery methods with the goal of providing the most efficient and effective instructional experience. Singh described the term of blended e-learning from a course design perspective. A blended course can be designed to be both fully face to face, and fully via online learning environments. Blended learning is a mix of multimedia technology, video streaming, virtual classrooms, email, et al. All these adapt and are combined with traditional forms of face to face classroom training. With the rapid progression of information technology, communication tools are used to help the learners to have an interaction both synchronous and asynchronous, utilizing, for example, chat rooms and web boards. Online learning uses the benefits of information technology by encouraging the searching of data for self-learning and meets the needs of the student centered concept of learning. This concept suggests teaching is not just where teachers transfer knowledge to the learners, but where the learners must learn by themselves through several methods, and can occur anytime and anywhere. This learning encourages the participants to learn and solve problems by themselves.

Effective blended learning begins with identifying the core learning need appropriate for each student, recognizing the different learning styles, looking creatively at the potential of using different forms of learning, identifying learning objectives, developing a user-friendly demonstration, and setting up a monitoring process to evaluate the effectiveness of the delivery. Thus, the use of blended learning in nursing education will promote the learners to be independent and self-directed. In addition, experiential learning will help the learners better understand new knowledge because learning begins from obtaining concrete experiences and expanding this to abstract learning, which thus enhances thinking, practicing, and performance. Experiential learning conforms with action learning. Action learning is both a process and a powerful program that involves a small group of people solving real problems, while at the same time focusing on what they are learning and how their learning can benefit each group member and the organization as a whole. Action learning enables people to effectively and efficiently learn and to simultaneously handle difficult real life situations. Action learning is built on the application of new questions to existing knowledge, as well as reflection about actions taken during and after the problem-solving sessions. Action learning supports the concept of Revans in that there is no real learning unless or until action is taken. Action learning provides effective learning for the learners and simultaneously presents the complexity of real-life situations.

The concept of action learning can be applied to arranging teaching and learning method for learners. Teachers provide the experimental learning situations to the learners. The learners explore the situation by themselves and then reflect on and discuss that situation. From this, learners conclude the concept ideas and principles, and form a hypothesis from the experience. Then they bring these concepts to use in any new situation that presents itself. The teachers evaluate and give the learners opportunities to share their ideas with each other in order to expand the body of knowledge.

Nursing education is professional education that focuses on producing professional nurses to provide healthcare for people in order to improve quality of life. The purposes of teaching and learning in nursing institutions are to guide the learners to obtain knowledge.
based on a nursing curriculum. In order to have efficient learning, the learners must seek more nursing knowledge. Thus, their skill in searching for information is very important in obtaining new knowledge. In a real life situation, learners often have inadequate searching skills. They lack principles in knowledge of how to search for data, as well as in screening and selecting appropriate electronic databases. Most learners can’t identify appropriate keywords for use in data searches. Moreover, most teachers use lecturing methods for teaching in classrooms and this may not stimulate learners to feel enthusiastic for learning. Thus, the purpose of the present study is to explore effectiveness of a blended learning method based on action learning that utilizes the internet for data searches, in order to allow the learners to be independent in their learning and to practice searching skills. The results of this study will be used for improving teaching and learning methods for nursing students, as well as students in other areas.

**Purposes of the study**

1. To compare achievement scores between the pretest and posttest of students who studied through blended learning based on action learning, and to compare achievement scores between pretest and posttest of students who studied through traditional learning.

2. To compare achievement scores in the posttest of students who studied through blended learning based on action learning and that of students who studied through traditional learning.

3. To compare scores in the searching skill at posttest of students who studied through blended learning based on action learning and that of students who studied through traditional learning.

4. To examine the opinions towards the blended learning method based on action learning of students who studied through blended learning based on action learning.

**Methodology**

This study is of a quasi-experimental design with two-group comparison. The experimental group underwent blended learning teaching based on action learning whereas the control group received traditional instruction.

**Subjects:** The subjects were 128 second year undergraduate nursing students in the second semester of the 2007-2008 academic year at the Faculty of Nursing, Mahidol University. The classroom was divided into 2 groups by curriculum course. Thus, the subjects were selected by purposive sampling and divided into 2 groups: 64 students in the control group, and 64 students in the experimental group.

**Instruments:** The four instruments in this study were developed by the researchers.

1. **The web-based instruction** entitled “Searching for data from the internet” consisted of 2 lessons. **Lesson one** was an electronic lesson that could be accessed via a Learning Management System. **Lesson two** was practice of searching skills as taught by instructors in the computer lab. Content validity of this instrument was obtained from three experts in the field and revised according to the suggestions of the experts. It was tested with 10 second year undergraduate nursing students in the first semester of the 2007-2008 academic year at the Faculty of Nursing, Mahidol University in order to assess problems that students were likely to detect and was revised based on students’ suggestions.

2. **The academic achievement test** consisted of 20 multiple choice questions that dealt with knowledge about searching for data from the internet. Each question was assigned a value of one score, and the score for this test ranged from zero to 20. Content validity was also obtained from three experts in the field and was revised based on the experts’ suggestions. The reliability coefficient of the test was 0.633.

3. **The measurement of searching skills** was an open-end report form. Students recorded the data they collected from the internet in this form. The researchers evaluated this report form by using a rubric score. The search results were analyzed by keywords used, electronic journal databases selected, bibliography format, and quality of search results, each criterion was obtained from three experts in the field and evaluated with a score ranging from 1 to 3. Content validity of this instrument was also revised based on the experts’ suggestions. Avoiding a bias in giving the scores, the researcher evaluated this report form 2 times. Pearson product moment correlation was used to analyze the reliability in giving the scores. The reliability coefficient was 0.969 in the experimental group, and 0.959 in the control group.

4. **An opinions questionnaire** consisted of 12 questions under a Likert scale ranging from 1 to 5. Content validity of this instrument was also obtained from three experts in the field. This instrument was revised with the experts’ suggestions.

**Data Collection:** The subjects took the pretest prior to accessing the instruction by using an academic achievement test. No significant difference in the pretests was detected between the two groups (t = -576, p-value = .566). This indicated that both groups were
equivalent. Duration of the data collection was 3 weeks: 2 hours in each week. In the first week, 64 students in the experimental group studied, by themselves, the assigned topic “Searching for data from the Internet”; a web-based instruction that could be accessed via the Learning Management System; and practiced searching skills taught by an instructor in the computer lab. During the second week, the students searched for data from the internet and recorded their results in searching skill report form. They were divided into 6 groups, with the number of students at 10-11 per group, to discuss results in the web board. In the last week, the students searched for data from the internet, recorded the results in the searching skill report form, and answered the opinions questionnaire. The control group studied for the same duration as the experimental group. In the first week, they studied the “Searching for data from the Internet” topic and practiced searching skills in the computer lab as directed by an instructor. In the second week, they searched for data from the internet and recorded the results in the searching skill report form, and received advice from an instructor. During the last week, the students searched for data from the internet, and recorded the results in the searching skill report form. After the experiment was completed, all students took the posttest by using the same academic achievement test.

**Data analysis:** Achievement scores in the pretest and posttest of the experimental group and the control group were analyzed by using a dependent t-test. Achievement scores and searching skill scores in the posttest between the experimental group and control group were analyzed by using an independent t-test. The opinion scores regarding the blended learning based on action learning methods were analyzed by using averages and standard deviations.

### Findings

**Table 1** The differences between the pretest and posttest in achievement scores of the experiment group and control group

<table>
<thead>
<tr>
<th>Achievement Scores</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>dependent t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Experimental group</td>
<td>64</td>
<td>9.67</td>
<td>2.30</td>
<td>16.61</td>
<td>1.53</td>
</tr>
<tr>
<td>Control group</td>
<td>64</td>
<td>9.78</td>
<td>2.41</td>
<td>14.11</td>
<td>2.47</td>
</tr>
</tbody>
</table>

After the experiment was completed, achievement scores were analyzed by using a dependent t-test and it was found that both groups had higher achievement scores in the posttest than the pretest; the difference was statistically significant at the 0.01 level (Table 1). This indicated that both methods of learning helped the students obtain the same higher achievement scores. The learners didn't have prior knowledge about searching for data from electronic databases. Thus, both methods of learning allowed the learners to increase their knowledge about searching for data from electronic databases. Comparing the experimental group and control group, achievement scores were analyzed by using an independent t-test. Findings showed that the experimental group had higher achievement scores than the control group; the difference was statistically significant at the 0.01 level (Table 2).

A comparison of the posttest in searching skill between the two groups showed that the experimental group had higher searching skill scores than the control group; the difference was statistically significant at the 0.01 level (Table 2).

Analysis of the searching skill of the experimental group revealed high scores, while
Table 2  The differences between the posttest in achievement scores and searching skill scores of the experimental group, and control group

<table>
<thead>
<tr>
<th>Posttest Scores</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Independent t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement Scores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>64</td>
<td>16.61</td>
<td>1.53</td>
<td>6.886</td>
<td>0.000</td>
</tr>
<tr>
<td>Control group</td>
<td>64</td>
<td>14.11</td>
<td>2.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Searching Skill Scores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>64</td>
<td>23.02</td>
<td>2.80</td>
<td>7.248</td>
<td>0.000</td>
</tr>
<tr>
<td>Control group</td>
<td>64</td>
<td>19.48</td>
<td>2.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3  Mean and standard deviation in searching skill scores of the experimental group and control group

<table>
<thead>
<tr>
<th>Searching Skill</th>
<th>Experimental group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1. Keyword used</td>
<td>2.00</td>
<td>0.38</td>
</tr>
<tr>
<td>2. Electronic journal databases</td>
<td>2.63</td>
<td>0.65</td>
</tr>
<tr>
<td>3. Writing Bibliography format</td>
<td>2.30</td>
<td>0.55</td>
</tr>
<tr>
<td>4. Quality of searching results</td>
<td>2.43</td>
<td>0.43</td>
</tr>
<tr>
<td>Total</td>
<td>2.39</td>
<td>0.26</td>
</tr>
</tbody>
</table>

the control group revealed moderate scores (Table 3). It indicated that the experimental group held discussions via the web board concerning analysis of the keywords and searches for data in the electronic databases; they reflected on their search experiences, proposed a method of searching, and took the appropriate actions. Thus, the experimental group gained higher searching skill scores than the control group. Additionally, the experimental group was highly satisfied with the blended learning method based on action learning methods. (Mean = 4.01, SD = 0.35)

Discussion

Based on results of the data analysis it can be seen students who studied through a blended learning method based on action learning and students who studied through traditional learning had statistically significant higher achievement scores in the posttest than the pretest at the 0.01 level. This indicates that learning from an online lesson helped the students gain the same achievement scores as traditional learning. The finding was consistent with Wannapiroon where students who studied through a blended learning method based on problem based learning, in order to develop critical thinking skills, had higher achievement scores in the posttest than pretest. Consideration of the mean in the posttest scores indicates that students who studied through a blended learning method had higher achievement scores than students who studied through traditional learning. This may be because students who studied through blended learning could proceed with the learning at their own pace, ability, and perception, and repeat the lesson as often as necessary, which thus increases their knowledge.

Students who studied through a blended learning method based on action learning had statistically significant higher achievement scores than students who studied through traditional learning, at p 0.01. This finding indicates that blended learning combining a blended online lesson, demonstration, and communication tools for sharing knowledge enhance the students’ achievement scores more than students who study through traditional learning. The finding is consistent with EL-Deghaidy.
and Nouby, who reported that students who studied through blended learning had higher achievement scores than students who studied through traditional learning. Davis and Fill stated that blended learning is the combination of traditional face-to-face teaching methods with authentic online learning activities and has the potential to transform experiences and outcomes of learning by the students. Regarding learning results, the students increased their capability for collaborative learning, searching skills, academic achievement scores, and communication between the teachers and learners. In addition, using online communication tools for sharing knowledge encourages the interaction between the learners, as well as between teachers and learners. Learners can discuss the problem, and concept, and receive answers that enhance the learners' understanding of the problem and encourage the learners to share their opinions.

Students who studied through a blended learning method based on action learning had statistically significant higher searching skill scores than students who studied through traditional learning, at p 0.01. This finding indicates that action learning enhanced the students' skills by encouraging practice. Because action learning provided a situation for group learning while analyzing the problems, it stimulated continuous learning and reflection on experiences. The students learning together to propose a way of solving the problem, and taking action. In this research, the researcher divided the subjects into small discussion groups to discuss and identify keywords, via the web board, to be used for searching for information. These students were also allowed to share their findings with the other groups. This method demonstrates a process of sharing experiences, knowledge, and opinions with each student in order to create new knowledge, and apply this knowledge to practicing searching for information from the electronic database. The students learned a way of identifying several keywords that could be used for searching for information, and selecting the most accurate results. For this reason, students who studied through blended learning gained higher posttest scores in searching skills than students who studied through traditional learning. This finding was consistent with Lamluk, who found that non-formal education learning based on the action learning concept encouraged village health volunteers to increase hypertension knowledge, leading to higher screening and referral of patients in their assigned area after training than before training. This is also consistent with Heidari and Galvin where action learning was the important component of training that fostered the mechanisms for linking theory and practice knowledge.

Students who studied through the blended learning method based on action learning were highly satisfied with the blended learning methods (X = 4.01). Blended learning helped the students understand difficult and complex content (X = 3.84). The students also stated that blended learning was an effective learning method because they could proceed with the learning at their own pace, and repeat the lesson as often as necessary, which helped the student to understand the content easier. This demonstrated effective learning, and introduced a method of conducting research and learning for the future. The finding was consistent with Wannapiroon in that students who studied with blended learning were highly satisfied with this learning method. Considering each item, blended learning could be effective applied into theoretical and practical courses (X = 4.19). Kammance also suggested that blended learning will help the learners with the understanding of knowledge because the learning begins by obtaining concrete experiences which elucidate abstract learning and thus enhance new thinking, practice, and performance. In addition, the practice in searching from the database enhanced the students effective searching skill (X = 4.17). The students also asserted that searching and exercise practice would encourage them to develop searching skills, receive new knowledge, and practice new methods that they may never have learned before. The students preferred learning through a blended learning method because learning was not only applied to theory but also used in practice of a real situation, which enhances better learning.

**Conclusion**

A blended learning method based on action learning was an effective learning method. It combined an online learning environment, and face to face learning method, as well as integrated the concept of action learning. The learners learned from the online lesson, class demonstration, and practice by analyzing the keywords, searching for data in real electronic databases, reflecting on their search experiences, propositioning a method of searching, and taking action, as a group. Finally, they obtained the information. Thus, this method helped the learners gain higher achievement and searching skill scores.
References

ผลของการเรียนการสอนแบบผสมผสาน เรื่องการสืบค้นข้อมูลบนอินเตอร์เน็ต โดยใช้วิธีการเรียนรู้จากการปฏิบัติที่มีต่อผลสัมฤทธิ์ทางการเรียนและทักษะในการสืบค้นข้อมูลของนักศึกษาพยาบาล

เนื้อหา:

วัตถุประสงค์: เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนและทักษะในการสืบค้นข้อมูลของนักศึกษาพยาบาลกลุ่มที่เรียนด้วยการเรียนการสอนแบบผสมผสานและกลุ่มที่เรียนตามปกติ ศึกษาความคิดเห็นของนักศึกษาพยาบาลทั้งสองกลุ่มต่อวิธีการเรียนการสอนแบบผสมผสาน

รูปแบบการวิจัย: การวิจัยกึ่งทดลอง

วิธีดำเนินการวิจัย: กลุ่มตัวอย่างเป็นนักศึกษาพยาบาลระดับปริญญาตรีชั้นปีที่ 2 คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล จำนวนทั้งสิ้น 128 คน โดยได้ทำการสุ่มกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) ได้กลุ่มควบคุม ซึ่งเรียนด้วยวิธีการเรียนตามปกติ จำนวน 64 คน และกลุ่มทดลอง ซึ่งเรียนด้วยวิธีการเรียนแบบผสมผสาน จำนวน 64 คน โดยใช้ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์ค่าทีในการวิเคราะห์ผลการวิจัย: พบว่าทั้ง 2 กลุ่มมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 แต่กลุ่มทดลองมีผลสัมฤทธิ์ทางการเรียนและทักษะในการสืบค้นข้อมูลหลังเรียนสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และกลุ่มตัวอย่างมีความคิดเห็นว่าการเรียนการสอนแบบผสมผสานมีความเหมาะสมอยู่ในระดับมาก

สรุปและข้อเสนอแนะ: การเรียนการสอนแบบผสมผสาน เป็นรูปแบบการเรียนการสอนที่มีประสิทธิภาพ ผู้เรียนสามารถเรียนรู้ตามความสามารถและการรับรู้ของตนเอง ผู้เรียนมีการเรียนรู้ร่วมกันในการวิเคราะห์ปัญหาและแลกเปลี่ยนเรียนรู้ซึ่งกันและกัน มีการนำเสนอแนวทางการแก้ปัญหา และนำไปสู่การปฏิบัติ ซึ่งผลที่ตามมาคือผู้เรียนมีความรู้และทักษะในการสืบค้นข้อมูลเพิ่มขึ้น

ค่าสำคัญ: การเรียนการสอนแบบผสมผสาน การเรียนรู้จากการปฏิบัติ ทักษะในการสืบค้นข้อมูล การเรียนการสอน