

## Determining the Effectiveness of Three Teaching Methods for Blood Pressure Measurement Skills

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### Abstract

The purpose of this study was to examine the effectiveness of the following three methods for teaching blood pressure measurement: 1) lecture, 2) demonstration and 3) self study using video, and to measure the effect of each method on acquired knowledge, skill performance and learning satisfaction of the nursing students at Asia-Pacific International University. The participants of this study were 90 undergraduate nursing students who had never taken the fundamental of nursing courses, in which they were assigned to one of three groups by cluster randomization. This experimental study used a Cognitive learning theory as a conceptual framework ANOVA was used to determine any statistical significance of knowledge, skill performance and satisfaction after three teaching methods were applied. There was no significant difference between the three teaching methods, though the lab demonstration produced the highest satisfaction score among the three. Nonetheless, a further study with a larger group of students may yield different results.

**Keywords:** Teaching effectiveness, Teaching methods, Blood pressure measurement skills

### Introduction

Teaching today is a complex process which requires the highest forms of professional practice (Hoban, 2002). In Thailand, it was found through the first external evaluation by the Office of National Education Standards and Quality Assessment (ONESQA) that only nineteen percent of schools were able to pass their evaluation at the good level and only half of the teachers could pass the standard of teaching and learning, even though almost all of the teachers were qualified (Anukulboot, 2004).

Acknowledging that teaching requires meticulous preparation to appropriately equip students, this study aims to explore suitable teaching methods used in nursing education. This field is a high-risk one in that lives of patients are at stake. The study of methods and approaches for teaching in nursing education is very relevant to clinical nursing practicums. Prior to actual practice in the ward on patients, nursing students must know how to give nursing care correctly and appropriately, and have to practice to increase their clinical skill performance in both the laboratory and hospital setting. For undergraduate nursing students, clinical practice makes up 55-60 percent of the total credits (Eiamla-or, 2004). One of the required nursing subjects is Fundamental of Nursing, a very important foundation subject, which aims to teach many clinical skills to the students. In order to prepare them for authentic setting, nursing educators should identify teaching methods which are the most appropriate for nursing students to enhance and apply the knowledge to practice appropriately.

### Purpose of the Study

Measuring a person's blood pressure is one of the basic skills that nurses, and other medical practitioners need to know. In the teaching of measuring a patient's blood pressure, a nurse educator may choose various method for the purpose of teaching and demonstration. This serves as the foundation of the study, whereby three teaching methods: 1) lecture, 2) demonstration, and 3) self study using video, are used and its

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effectiveness is determined by evaluating the acquired level of knowledge, skills, and satisfaction. These three constructs are aspects which operationalizes 'effectiveness' within the parameters of this study.

## Research Scope

There are three research questions this study seeks to answer. First is to determine the relative effectiveness of lecture, demonstration, and self study using video for knowledge improvement. Second is to determine the relative effectiveness of lecture, demonstration, and self study using video for skill improvement. Finally, this study also seeks to determine any significant correlation between effectiveness of lecture, demonstration, and self study using video to improve satisfaction of learning how to take blood pressure measurement.

## Literature Review

### *Teaching Effectiveness*

One way to enhance nursing education is to evaluate the effectiveness of teaching methods in nursing education programs and implement the best methods. Assessment of teaching effectiveness in nurse preparation programs includes determining effective teaching skills, teachers' and students' beliefs about the teaching and learning process, criteria for assessing teaching effectiveness, people responsible for evaluating the various aspects of teaching, and other important elements for guiding the assessment of effective teaching in nursing education. Identifying these components is necessary for educators to improve their teaching, and, ultimately, for helping aspiring nurses acquire the satisfaction, skills, and knowledge that are needed in nursing practice.

There are many teaching approaches that a nursing educator can choose from, from traditional oral or lecture approaches with the aid of technology, to hands-on activities. The pedagogical choice needs to be an informed, though, as teachers, is partly accountable for the students' learning. Many studies have sought to determine whether an approach is appropriate.

Today's world has seen an influx of classroom technological aims. In line with today's technological advancement, studies on the efficacy of incorporating technology in the nursing class have been conducted. Cogo et al. (2007) in Brazil developed digital learning objects in nursing, and ten faculty and forty-four undergraduate nursing students evaluated their usage. The study found that the teachers and students were satisfied with the design of visual presentation and the content appropriateness of the digital learning objects. Computer technologies and visual presentation seem to encourage students to be more active both in the lecture and laboratory settings. Similarly, Cindy (2000) surveyed the use of videotape programs in classroom instruction by faculty members of the University of Kentucky Community College System (UKCCS). Fifty-two percent of faculty members from fifteen UKCCS campuses responded to the survey. The study found that most faculty members use video occasionally to show visual examples of the teaching topics and to stimulate classroom discussion, and the instructors in the humanities use video to enrich student understanding of literary works and history and focus on active learning activities. The relationship between teaching styles and how instructors used video in the classroom had a positive correlation. This suggests that technology could stimulate and motivate students to have an active part in the classroom. Another study which may concur with these findings is that of Salyers' (2007) where a skills laboratory course was developed using a web-enhanced approach and two teaching methods were compared. The study evaluated skill performance and found that the group who learned course content by using a web-enhanced approach performed better on the final cognitive examination than the group who attended weekly lectures, observed skill demonstration by faculty, and practiced skills.

Nonetheless, the use of technological aid in the nursing classroom is not necessarily a direct cause for the successful learning of a nursing concept. Powell, Canterbury & McCoy (1998), from the University of Mississippi) studied the differences in baccalaureate nursing students' ability to accurately administer medication. Nursing students were taught using a faculty-assisted (control group) method versus a self-directed (experimental group) method. Students (n = 50) in the control group received faculty instruction on medication administration during the laboratory practice while students (n = 48) in the experimental group viewed a faculty-generated videotape on medication administration prior to laboratory practice. The result of this study showed no significant difference ( $p < .05$ ) between the two groups. Perhaps this begs the question of whether or not technological aid is really necessary to improve or increase the efficacy of

teaching approaches. This assumption is pertinent to Wellard, Woolf and Gleeson's (2007) study, where they discovered that lectures in the laboratory led to better acute care in other areas of practice. The study also showed a need for rigorous investigation of teaching methods to support nursing students in preparation for clinical practice. In teaching undergraduate students, teachers should examine their practices to ensure that a theoretical basis is present when teaching in laboratory, clinical, and classroom settings. Moreover, as observed from relevant studies, educational innovation may increase teaching and learning effectiveness. Being effective also increases motivation among students, and it makes learning more enjoyable.

## Theoretical framework

### *Cognitive Learning Theory*

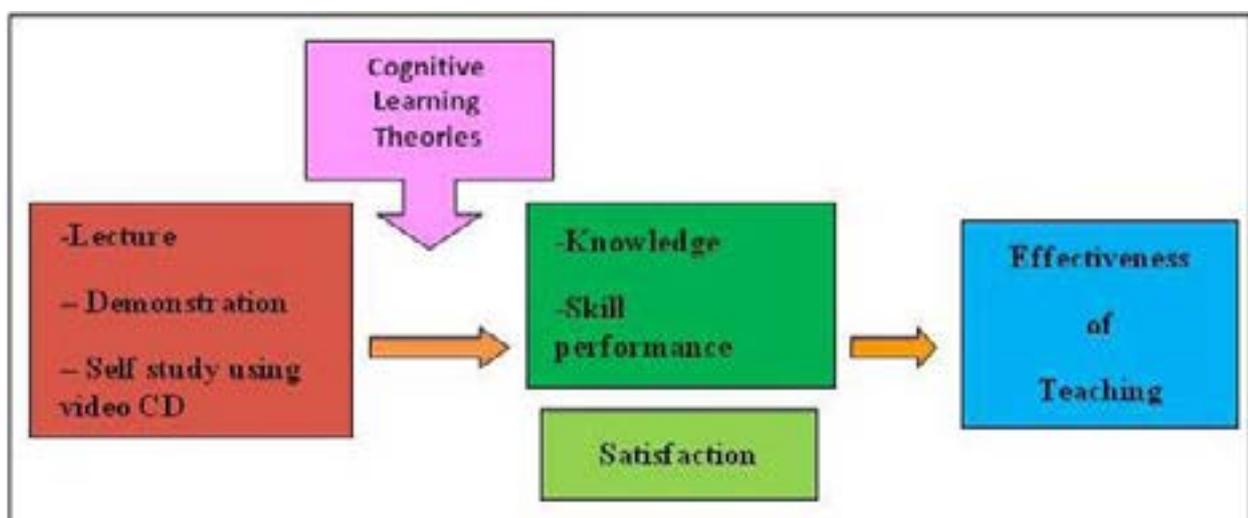
The theoretical framework that underpins this study is Cognitive learning theory. This theory is the cornerstone for the analysis of the study in which it helps in measuring the effectiveness of the teaching methods for blood pressure measurement skills.

Cognitive theory defines learning as an active, cumulative, constructive process that can be indicated from behavioral indices (Shuell, 1986). In the early 1900s, Gestalt psychologists initially focused on the cognitive aspects of learning, and they believed that people respond to a whole situation or pattern rather than parts (Shuell, 1986). Dembo (1988) studied that when a person's perception is disorganized, order is restored by restructuring problems into a better gestalt (pattern); the restructuring may occur through a process of trial and error. Cognitive psychology was developed to explain particular aspects of learning behavior and seeks factors that explain complex learning which are concerned with meaning rather than behavior. The specific focus is on mental processes including perception, thinking, knowledge representation, and memory with emphasis on understanding and acquisition of knowledge and not merely on acquiring a new behavior or learning how to perform a task. Students have active rather than passive roles in the instruction and a new responsibility for learning. They must discover meaning by using information-processing strategies, memories, attention and motivational mechanisms to organize and understand meaning. (Billings & Halstead, 2005). The outcomes include more understanding and acquisition of knowledge.

The cognitive learning theory is appropriate for this study because the current nursing curriculum at locality where the sample is found, namely Asia-Pacific International University emphasizes the whole rather than the parts which is similar to the concept of this theory.

Blood pressure measurement is a basic clinical procedure that nursing students need to study and know how to apply correctly. Blood pressure measurement results can detect a patient's conditions such as internal hemorrhage, shock, and other blood vessel or circulation problems. To teach blood pressure measurement skill and knowledge, an effective teaching method with cognitive learning theory is deemed suitable.

Figure 1. Theoretical Framework



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## Research Methodology

### Participants

The participants for this study were undergraduate nursing students at Asia-Pacific International University (AIU). Some nursing students were excluded, though. These include students who had been nursing assistants or had experience in blood pressure measurement in health care institutions and students previously registered in the fundamental of nursing course. The sample size needed for this study was 90 students ( $n = 90$ ). The nursing students were divided into three experimental groups based on their entrance examination scores (A=85-100%; B=75-84%; and C<75%). They were randomly assigned to each group consisting of 30 students, which included 9 students from grade A, grade B, and 9 from grade C.

**Table 1.** Number and percentage of the sample by entrance examination score

Variable	N	%
A (85-100%)	27	30%
B (75-84%)	36	40%
C (<75%)	27	30%

### Measurement

This study used an experimental design that included both pretest and post test. Pretest-post test of knowledge and skill performance were done to compare the effectiveness of the three teaching methods: 1) lecture, 2) demonstration and 3) self-study using video. The satisfaction of learning to take blood pressure measurement was analyzed only in posttest.

The knowledge tool for measuring blood pressure was 20 multiple question items and short answer which included stem and 4 choices with one correct answer and three hints (Patiyatane, 1998). The tool used to measure the skill performance for measuring blood pressure was a nursing skill performance checklist of the blood pressure taking steps which was developed by five nursing faculty and consisted of 10 items with a yes and no answer. The students were examined by the researcher and two nursing faculty. The faculty received instruction and information about the research study before testing the students (Patiyatane, 1998). The students' satisfaction in this study was measured by using the Visual Analog Scale (Maxwell, 1978) which was determined along a 10-cm line, with 1 signifying very unsatisfied and 10 signifying very satisfied.

### Procedures

The researcher explained the purpose of the study and provided opportunity for the students to ask questions. The participants signed an informed consent form and were identified by a number. Students in each group had a pretest on knowledge and skill performance of blood pressure measurement. One group was lectured in the classroom about taking blood pressure measurements and the second group received a demonstration of how to take the blood pressure measurements in the laboratory setting. The third group received a video CD on how to take the blood pressure measurements for self-study. These three teaching methods were done in 30 minutes.

### Analytical strategies

Descriptive statistics which included mean, variability, standard deviation, and frequency distribution. ANOVA was used to determine the significance of differences between knowledge and skill performance and the significance of satisfaction after the three teaching methods were utilized. The results were statistically significant if the  $p$  value is 0.05 (Munro, 2005).

## Results and Discussion

Results indicated that the mean score of knowledge ( $X = 1.867$ ) and skill performance ( $X = 71.133$ ) were highest in lecture. The satisfaction scores are higher for demonstration and video compared to the lecture.

**Table 2.** Comparison of knowledge, skill performance, and satisfaction of the three teaching methods.

Variable	Lecture		Demonstration		Video	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Knowledge	1.867	2.460	1.233	2.012	1.500	2.162
Skill performance	7.133	1.353	6.767	1.455	6.900	3.209
Satisfaction	7.493	1.440	8.900	1.517	8.100	1.561

As shown in Table 2, the mean knowledge and skill performance score were highest in lecture. The satisfaction scores are higher for demonstration and video than for the lecture.

**Table 3. One way ANOVA for knowledge, skill performance, and satisfaction.**

ANOVA	Knowledge	Skill performance	Satisfaction
Df	2	2	2
F	0.62	0.22	2.73
Sig.	0.541	0.806	0.071

As shown in Table 3, there was no significant difference in knowledge at Sig 0.54 between the three methods of teaching blood pressure measurements and no significant difference in skill performance at Sig 0.81 between the three methods. The ANOVA statistical analysis that there was no significant difference in student satisfaction at 0.07 between the three methods of teaching.

Even though the difference is not significant, it appears that the lecture teaching method has a greater effect on knowledge and skill performance compared to the demonstration and self-study video methods among the sample. Student satisfaction of learning how to take blood pressure is higher for the demonstration method. Powell et al. (1998) also found no significant difference between two different methods of instruction – nursing students who received faculty instruction on medication administration during the laboratory practice and nursing students who viewed a faculty-generated videotape on medication administration prior to laboratory practice. If a larger group were studied it would be interesting to study if there were a difference between the A, B, and C students with different teaching methods.

## Conclusion

It appears that with this sample, the lecture and demonstration methods can be used to increase the knowledge and skill performance and the self-study by using video can give learners an opportunity to review and repeat the procedure as much as they need. It is necessary to determine which teaching method is the most beneficial for various types of learners and to use various methods of teaching to become a more effective teacher.

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