DEVELOPMENT OF INTERACTIVE MIDWIFERY WEB-BASED LEARNING UNITS FOR IMPROVING NURSING COMPETENCIES AND REDUCING STRESS IN NURSING STUDENTS

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Thesis
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Sailom Gerdprasert

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DEVELOPMENT OF INTERACTIVE MIDWIFERY WEB-BASED LEARNING UNITS FOR IMPROVING NURSING COMPETENCIES AND REDUCING STRESS IN NURSING STUDENTS

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ABSTRACT

This study aimed to develop two web-based learning units on mechanisms of labour and intrapartum nursing care. These media were developed based on integrating principles of midwifery nursing care with the 5Es inquiry cycle, Keller's ARCS model and interactive features of information technology. In this study, two web-based learning units were used to supplement the conventional lecture in traditional teaching. The first unit on mechanism of labour was tried on 85 third year nursing students. The students' achievement was assessed by using the factual knowledge test. The second web-based learning was tried on 84 fourth year nursing students. The conceptual knowledge test, performance skill observation checklist, and competency test were used for assessing the outcomes of the study. Intrapartum nursing care web-based learning unit was used supplementally to reduce stress due to a deficit of knowledge prior to practice on the ward. At the end of the study, perceptions toward the web-based learning units were evaluated. Supplementation with the mechanism of labour web-based learning was found to be significantly more effective than traditional lecturing only ($p < 0.001$). In the second unit on intrapartum nursing care, the results showed that the students who had the supplemental web-based course had significantly higher scores in conceptual knowledge ($p< 0.001$) and performance skill ($p<0.01$). Additionally, the students from supplement group showed significant lower stress scores than those from the traditional group ($p< 0.05$). The students also showed a positive attitude toward the two web-based learning units.

KEY WORDS: MECHANISM OF LABOUR/ INTRAPARTUM CARE/ WEB-BASED LEARNING UNIT/ NURSING STUDENT

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การพัฒนาบทเรียนอิเล็กทรอนิกส์ทางอินเทอร์เนตเรื่องปฏิบัติการพยาบาลสตรีระยะคลอดเพิ่มสมรรถนะทางการพยาบาลและลดความเครียดของนักศึกษาพยาบาล

DEVELOPMENT OF AN INTERACTIVE MIDWIFERY WEB-BASED LEARNING UNITS FOR IMPROVING NURSING COMPETENCIES AND REDUCING STRESS IN NURSING STUDENTS

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บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อพัฒนาบทเรียนอิเล็กทรอนิกส์ทางอินเทอร์เนต เกี่ยวกับการปฏิบัติการพยาบาลสตรีในระยะคลอดและศึกษาผลของการใช้สื่อดังกล่าวต่อการเรียนการสอนของนักศึกษาพยาบาล การศึกษานี้ได้พัฒนาสื่ออิเล็กทรอนิกส์ 2 หัวข้อ คือ กลไกการคลอดและการปฏิบัติการพยาบาลระยะคลอด ในการพัฒนาสื่อได้นำเอาทฤษฎีการเรียนรู้ 5Es และทฤษฎีแรงจูงใจ ARCS model และลักษณะปฏิสัมพันธ์ของมัลติมีเดียมาเป็นกรอบในการพัฒนา สื่ออิเล็กทรอนิกส์ทั้ง 2 ตอนใช้สำหรับเสริมการสอนภาคปกติ โดยตอนที่ 1 ศึกษาในนักศึกษาพยาบาลปีที่3 จำนวน 85 คน เครื่องมือที่ใช้ในตอนที่ 1 ประกอบด้วยแบบทดสอบความรู้และการสัมภาษณ์ เครื่องมือที่ใช้ในตอนที่ 2 ประกอบด้วยแบบทดสอบความรู้ แบบสังเกตการปฏิบัติการพยาบาลระยะคลอด แบบทดสอบสมรรถนะหลังการฝึกปฏิบัติ ในตอนที่ 2 นี้มีการศึกษาความเครียดของนักศึกษาโดยใช้แบบสอบถามความรู้สึกเครียดจากการมีความรู้ไม่เพียงพอก่อนขึ้นปฏิบัติการพยาบาลด้วย เมื่อจบการศึกษา นักศึกษากลุ่มที่เสริมด้วยบทเรียนบนเว็บทั้งสองกลุ่มได้รับการสัมภาษณ์ความรู้สึกจากการเรียนเสริมด้วยบทเรียนบนเว็บ ผลการศึกษาพบว่า นักศึกษาที่เรียนเสริมด้วยบทเรียนบนเว็บเรื่องกลไกการคลอดมีคะแนนความรู้มากกว่ากลุ่มที่เรียนด้วยวิธีปกติอย่างมีนัยสำคัญทางสถิติ ($p < 0.001$) นักศึกษาที่เรียนเสริมด้วยบทเรียนบนเว็บเรื่องการปฏิบัติการพยาบาลระยะคลอด มีคะแนนความรู้และคะแนนการปฏิบัติการพยาบาลระยะคลอดมากกว่ากลุ่มที่เรียนด้วยวิธีปกติอย่างมีนัยสำคัญทางสถิติ ($p<0.001$ และ $p< 0.01$) แต่คะแนนสมรรถนะหลังการฝึกปฏิบัติไม่แตกต่างกัน นักศึกษากลุ่มที่ศึกษาบทเรียนบนเว็บเรื่องการปฏิบัติการพยาบาลระยะคลอดก่อนขึ้นปฏิบัติงานบนหอผู้ป่วยห้องคลอดมีคะแนนความเครียดเนื่องจากความรู้ไม่เพียงพอน้อยกว่ากลุ่มที่เรียนด้วยวิธีปกติ นักศึกษาที่ศึกษาด้วยบทเรียนบนเว็บเสริมความรู้มีคะแนนความพึงพอใจการเรียนเสริมด้วยวิธีนี้อยู่ในระดับสูงมาก

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CHAPTER I
INTRODUCTION

1.1 Background

Labour and birth is one of the most exciting and anxious time not only for the parturient woman but also for the new nursing student. The experience of childbirth is noteworthy as women remember their childbirth for most of their lives (Simkin, 1996). The health of mothers and infants are significant factors for developing of the country. Therefore, there is a need to improve mothers and infants health status, through well design nursing education.

Nurse midwifery is the important person who facilitates the good health of mother and infants because the healthy human started at the fertilization period, birth and through entire of their life. To be good midwives, nursing students must comprehend what are normal or what deviate from the regular parameters. They also have to know how to assess and to prevent risk factors interrupting the normal progress of labour as well as doing a prognosis of the childbearing woman. These kinds of knowledge are difficult for students who have never learned before and available textbooks may not be proper explainers. Therefore, nursing student preparation is crucial. In addition, there is an expectation that Thai graduate nurse must be master in midwifery skill, appropriate decision making, and timely intervention. Moreover, nurse students must be able to combine competence with caring and critical thinking. To better facilitate this situation, nursing students need to encounter real-life situations where they can experience the pressure of pregnant care environment.

Understanding factors affecting the process and mechanism of labor and intrapartum care are important principles for providing care for childbearing women either in normal or abnormal deliveries (Pillitteri, 2007). These subjects are difficult for nursing students, especially, Thai nursing students who acquire such knowledge mainly from lecture and tutorials, which cannot provide adequate understanding.

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A demonstration with a static plastic model is given only once due to constraints in budget and staff.

In Thailand, nursing and midwifery programs are an integral part of the bachelor nursing curriculum. Once students finish the program, nursing and midwifery licenses are granted, so all nurses are also midwives at the same time. Every registered nurse thus also becomes a licensed midwife at the initial registration. Thailand Nursing Council (1997) has set fourteen core competencies as a standard performance for registered nurse and midwives. These are used as a guideline for nursing schools to improve the curriculum and produce qualified graduated nurses. Midwifery knowledge and practice is one of the core competency that divided into 5 subcompetencies, i.e., assesses, plans, develop effective strategies, safe and effective midwifery care, midwifery practice on ethical decision making. Advocate protecting the rights of women, families and communities, practice, accepts accountability and responsibility for own actions within midwifery practice. All new Thai graduates' competencies including maternal and newborn and midwifery will be evaluated in comprehensive and national licensed examination before they can be registered and practice legally as most country (Lin, 2003).

At present, a shortage of nursing staff has been a major public health problem and several nursing schools have to produce more nursing graduates. Due to limitations of training places and faculty, the nursing students are divided into subgroups shuttling between several wards: midwifery, paediatrics, screening, community health practice etc. This situation has led to a wider gap between theory and practice on the labour ward (Carlott et al. 2003).

Moreover, the labour process sometimes does not exactly follow the theory and thus requires close supervision and immediate feedback. Some students are over anxious and often under perform. The students feel that they are not sufficiently prepared for the emotional hardships of clinical training and they are stressed when they have to conduct normal labour: it is well recognized that nursing is a stressful occupation (Jones & Johnston, 2000; McVicar, 2003). Confrontation with difficult emotional situations without proper preparation, due to lack of knowledge, may create anxiety and fear (Chamberlain, 1997).

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Thus, there is a need to find alternative ways for students to call up nursing knowledge and experience to meet midwifery competency. In order to support the students to integrate theory and practice, there is a need for a suitable instructional material that helps learners recognize the signs of clinical deterioration and rehearse the management of labour patients.

The widespread availability of the internet has greatly empowered many areas of education, including nursing education, especially, for students who are independent and self-directed. Using web-based learning resources to support health study has been common practice for a number of years. The use of multimedia leads to enhanced learning: acquisition of content, development of skills, efficiency of learning and satisfaction with instruction. To encourage conceptual understanding, retention and retrieval of knowledge, the multimedia web-based learning is recognized as one of the alternative teaching techniques to supplement or replace the traditional classroom style. It allows the learner to engage in educational activities as often as they like, whenever and wherever they choose. Gerdprasert et al. (available on line) found that supplementing of mechanism labour web-based learning could enhance posttest score of nursing student by incorporating graphics, animations, photographs, audio, and video materials together with learners' interactions, control and stimulated experiences. Horiuchi et al. (2008) found that even though web-based learning and face-to-face learning produced the same outcomes in knowledge scores the students preferred the flexibility of the web-based learning and the dropout rate was lesser when compared to the face-to-face method. Supplementation of computer assistance learning on vital sign has been shown to enhance performance skills in vital sign assessment of the nursing students (Kaveevivitchai et al. 2009). Jeffries (2005) has shown that the nursing students successfully completed an online the course on basic critical care with passing score and met all the required competencies. In addition, Leppa (2004) found that the online learning questions could be used to access nursing students' critical thinking. Daroszewski et al. (2004) have used online journaling method to promote reflecting clinical experience in community health; this strategy enhanced discussion and critical thinking.

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This study aimed to develop two web-based learning units on process and mechanism of labour and intrapartum nursing care to enhance conceptual understanding on maternal-new born nursing cares and midwifery practice. These learning units were used to supplement the traditional lecture for nursing student who undergoing midwifery practice. The effects of the web-based learning units in improving competencies and reducing stress for nursing student was evaluated.

1.2 Objectives

This study has four principal objectives

1.2.1 To develop two web-based learning units on process and mechanism of labour, and intrapartum nursing care that relevant to the course for nursing students who undergoing midwifery practice.

1.2.2 To study the effect of supplementing the web-based learning units on the nursing students' achievement: conceptual knowledge, and performance skills and competencies.

1.2.3 To determine whether the web-based learning units on intrapartum nursing care can reduce stress of nursing students before practice on the labour ward.

1.2.4 To evaluate the perception of nursing students toward the newly developed multimedia web-based learning units.

1.3 The conceptual framework of this study

Childbirth is a natural process. Every midwife is expected to understand the mechanism of labour: engagement, decent, internal rotation, flexion, external rotation, restitution, and external rotation, thus this has to be including in the nursing curriculum. Mechanism of labour describes the movements of the fetus (passenger) in response to the bony structures and soft tissues (passage) of the birth canal and the power of uterine contraction as well as push force (power) during labour. The factors (passage, passenger, power and psyche) affecting process and mechanism of labour was assessed progress and the events during labour.

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During the intrapartum period, nurses use knowledge of physiologic and psychosocial aspects (psyche) of birth to provide comprehensive care for women and families. Major roles of the nurse caring labouring women include a thorough admission assessment to postpartum nursing care. Nursing student knowledge and their interpretation have a profound impact on their practice (Bryar, 1995). The understanding of the mechanism of labour and intrapartum nusing care knowledge will affect how they practice. The understandings will help the nursing students to decide how labour should be monitored, how progress should be assessed; and they will also affect delivery technique. The understanding of the mechanism of labour and intrapartum nusing care has directed implications for nursing students practice.

Because of limited patient material and partly because the mechanism of the labour are abstracted knowledge that ignored the role of woman as a whole, the web-based learning became fashionable on many subjects in nursing teaching. However, the instructional design and maintain students attendance are very challenges.

In the present study, the 5Es learning cycle (Bybee et al., 2006), the Keller's ARCS Model of Motivational Design (Keller, 1979) were employed as the theoretical framework to develop web-based learning and evaluate knowledge, performance skills of nursing students.

The 5Es learning cycle based on constructivism as its theoretical foundation assumes that students must be actively involved in their learning. Concepts are not directly transferred from teacher to students but rather constructed by the student. Colburn and Clough (2007) also recommend the 5Es inquiry cycle as an effective means to help students enjoy science, understand content, and apply scientific processes as well as concepts to authentic situations needed for clinical problem solving.

Motivation theory provides a framework for the knowledge accumulates about human motivation, how it related to learning, how it supports strategies for making instruction appealing for the learner. Keller (1987) suggested that learning motivation is affected by four perceptual components: Attention, Relevance, Confidence, and Satisfaction. Keller clams that if motivation is to be applied effectively to instructional design, it should be gain and sustain the learner's

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attendance. The relevance to the course is a powerful factor in determining what are motivated to learn, or what we are willing to continue paying to after attendance has been aroused. Providing the learner the opportunity to practice and acquire new skills under low-risk conditions was a key component of web-based design. To ensure the learner's satisfaction, the web-based learning units was designed for helping the learner fell positive about the user interface and content achievement by using navigator options and helpful guidance and feedback exercise.

This study explored the effects of supplementing a web-based learning to a traditional teaching. The web-based learning on mechanism of labour and intrapartum nursing care were developed. The process began with selection of concept and content and objective of the program. The next step was the development of the story board that provided the blueprint of entire program. The author, as content expert, consults instructional design and programmer to construct the interactive web-based course. The lessons were revised according to the feedback from students and expertise. The web-based learning units were implemented to the target group and evaluated.

The research design is illustrated in Figure 1-1.

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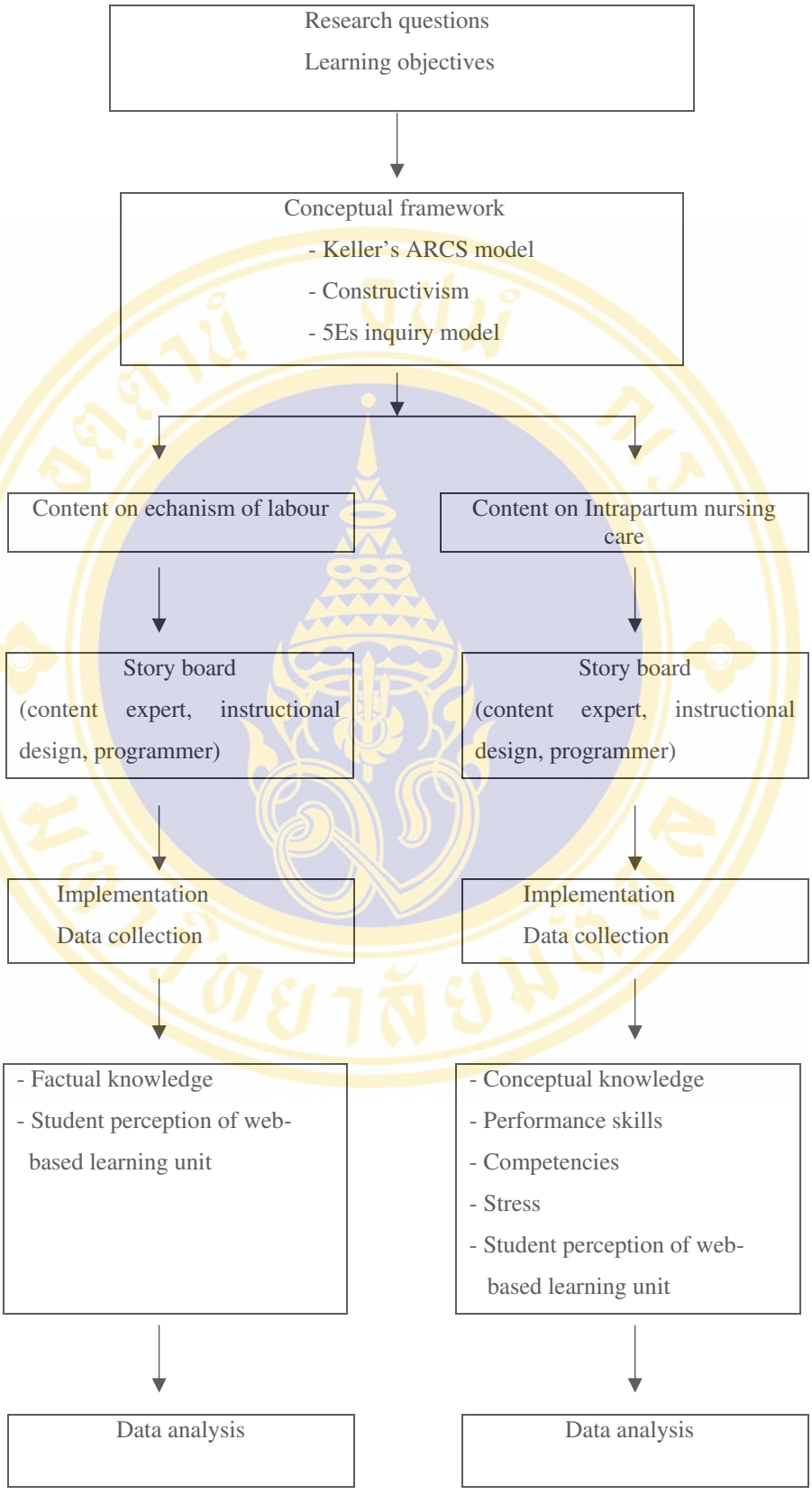

Figure 1-1 Schematic diagram of research design flow

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1.4 Research Questions

The research questions are as follows:

1.4.1 What effects do the web-based learning units have on students' knowledge of the process and mechanism of labour?

1.4.2 What effects do the web-based learning has on students' knowledge and psychomotor of the intrapartum nursing care?

1.4.3 What are the students' attitudes toward the web-based learning unit?

1.4.4 What affects do the intrapartum nursing care web-based learning has on reducing stress of nursing students?

1.5 Expected outcomes and benefits

This study will address the following research benefits.

1. These web-based learning units on process and mechanism of labour and intrapartum nursing care can be effectively used to supplement traditional learning method for self directed learning of every nursing student in Thailand that can connect to the internet.

2. These web-based learning units can be used as effective tool for nursing instructors in teaching the abstracted content of mechanism of labour and intrapartum care.

3. The interactive lesson on intrapartum nursing care in the web-based learning can be used as the effective tool for reducing stress due to lack of knowledge of nursing students before practicing on the labour ward.

4. The finding of this study can be used as the guideline for other researchers and instructors to develop other web-based approach.

1.6 Definition of variables in this study

Nursing competency means the ability of nursing students to transform their midwifery knowledge and skill into midwifery practice. It must be consistency

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and met the standard of midwifery practice. This nursing competency in this study includes the performance skill and competency.

Performance skill means the skills of nursing students from admission of pregnant women through immediate postpartum care. It was measured by observed clinical skill checklist during 4 weeks. Performance skill was assessed by using rating scale performance observation skill checklist from 1= practice correctly under every recommendations, 4= practice correctly all steps by student, the total items is 15. The high summated scores mean the students have high performance skills.

Competency means the ability of nursing students to apply the intrapartum nursing care knowledge to various midwifery situations. It was measured of normal labour, placenta delivery, and newborn nursing care competencies. The competencies were assessed by using competency test, the total scores were 30. The high summated scores mean the student have high competencies.

Factual knowledge means the basic factors effecting process and mechanism of labour knowledge that students must know to be acquainted with a discipline or solve problems in it. The factual knowledge was assessed by using factual knowledge test. The high summated scores mean the student have high factual knowledge in factors effecting process and mechanism of labour.

Conceptual knowledge means the intrapartum nursing care knowledge that learns by thoughtful, understanding, and reflective learning. The conceptual knowledge was assessed by using conceptual test. The high summated scores means the student have high conceptual knowledge**.**

Students' perception means the attitude of nursing students toward web-base learning units. It was measured in 3 attributes; usefulness, web-based earning design and online strategy. Students' perception was assessed by using Likert scale students' perception questionnaire. The high summated scores means the student have high satisfaction in web-based learning.

Stress means the stress that occur prior clinical practice. It consisted of two parts; psychological stress and physical stress. For psychological stress, it was divided into two sections; clinical stress; the stress due to atmosphere on the labour

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ward, and ignorance stress; the stress due to deficient of knowledge. The stress score level was divided by using Likert scale. The summated scores were divided into three stress level: mild, moderated and sever stress by using percentile. The lower score than 25 percentile is minimal stress. The range score from 25 to 75 percentile is moderate stress and higher than 75 percentile is defined as high stress.

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CHAPTER II
LITERATURE REVIEW

2.1 Overview of the Chapter

This chapter illustrates the theoretical basis that provides empirical evidence background regarding the web-based learning. The first section describes the related concepts, theories and researches as follows: web-based learning applying educational theories: constructivism, 5Es learning cycle, motivational theory: Keller's ARCS model, midwifery nursing curriculum management, educational research in clinical skill teaching and learning and stress. In the second section, the analysis of the constructivist view of teaching and learning underpinning the research study is discussed.

2.2 Web-based learning

Background

E-learning (or sometimes electronic learning or e-learning) is a term which is commonly used, but does not have a common definition (Dublin, 2003).. Most frequently it seems to be used for web-based distance education, with no face-to-face interaction. However, also much broader definitions are common. For example, it may include all types of technology-enhanced learning (TEL), where technology is used to support the learning process.

The interactive and dynamic medium for delivering information, the World Wide Web (Web) in combination with information technology (e.g., LAN, WAN, Internet, etc.) has found many applications wordwide. One popular application has been for educational use, such as web-based, distance, distributed or online learning. The use of information technologies to deliver or support nursing education is increasing, and distance education is becoming the norm, rather than the exception, in higher education.

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The demands of a dynamic health care environment and the changing profile of nursing students have prompted schools of nursing to change or alter course delivery. Although distance learning is not a new concept, its popularity is rapidly increasing due to advances in technology and the demand by students for flexible and convenient modes of learning. However, convenience should not be the primary factor for students to consider online learning.

One noteworthy advantage of the web-based material is that it can lead expansion the idea through multimedia features. Whereas print is better text, photography better at images, radio better at sound and television better at video, the web's advantage is that it combines all of these media reasonably well into a single package (Pantel, 1997).

The web-based education is not a perfect medium for education. There are disadvantages to using it. Ryan, Carlton, and Ali (1999) taught a graduate nursing course that included a mix of on-campus, traditional classroom learning plus web-based modules and compared students' perceptions of both learning experience. Students responded that in the tradition learning environment, the content was covered more adequately; more interaction and participation occurred; faculty preparation and expertise was more evident; and advanced communication skills were required. Approximately one fourth to two thirds of the course was on the Internet, and the remaining of the course was taught in a traditional setting

Additional, some of these disadvantages are of a technical nature whereas others are more people-centre. Internet access: technology problem with computer hardware, software, and internet connections are a source of difficulty for students. The inability to connect or an interruption of services causes considerable frustration and dissatisfaction for students (Ali et al., 2002). Understandability, technical difficulties may result in negative student learning experience. Moreover, it is impossible to guarantee quality of internet network service. This means that the respond speed for requests over the network can only be estimated, not guaranteed.

Synchronizing media on the web is difficult. This makes it difficult to deliver rich prescribed presentations as one might give in a traditional lecture hall. Additional, some studies mentioned on time consumer in preparation the content and design, programmer consult needed (Creedy et al., 2007).

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The benefits of computer-based learning in health sciences have been documented (Jang, 2005; Horiuchi, 2008) However, Laurillard points out the use of new technology does not guarantee improved educational out-comes (Laurillard, 1993). In these circumstances, very careful attention needs to be given to instructional design development and evaluation of teaching innovations, to ensure technology-based learning programs are effective.

2.3 Design for web-based Learning Environments

User Interface Design

For a Web-based supplemental learning environment to be successful, it is also important to effectively facilitate learner interactions with the learning environment. An effective user interface in web-based learning environments is important, because it determines how easily learners can focus on learning materials without having to make an effort to figure out how to access them (Lohr, 2000). There are a number of design approaches to the user interface, each of which has its own strengths and weaknesses.

In order to design user interfaces that are easy to use and intuitive to anyone, it is important to have good design skills as well as some knowledge of psychology, methodologies and prototyping. Therefore, the theoretical approach to interface design is characterized by an attempt to build precise and accurate users' cognitive models that represent their interaction with computers.

Computer literacy

Researchers' consistency reports a lack of computer and internet literacy among nursing students (Ali et al., 2002; Kenny, 2002). Oliffe (2001), in an evaluation of an Australian undergraduate course that used a web-based patient simulation scenario, found that not all nursing students were computer literate when they enter their programs. Similar to Ribbons and Vance (2001) finding, 67% of under graduated students had used e-mail before to enrollment in their program. This may be some nursing students in Australian were not continue learning after finishing secondary

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school. Students who enter the program immediately after secondary school have often been exposed to computer technology.

Learning online requires students to be more responsible, self-directed, and motivated. Independence, active learning, effective time management skills, and the discipline to study without external reminders describe these qualities.

Communication

Student-student and student-faculty interactions in online learning may occur asynchronously or synchronously, depending on the desired nature of the interaction. Asynchronous interactions are those that are not time and place dependent. E-mail, threaded discussions on discussion boards, and archived video streams are examples of interactions that are asynchronous. Participants involved in an asynchronous interaction can choose to access or respond to the communication at a time that is convenient for them. However, Billing, Conners and Skiba (2001) found that nursing students in the web-based course felt somewhat isolated from instructors and other students. This finding similar to Boyle and Wambach (2001) study that graduate nursing students felt disconnected with faculty and other students in the web course. Contrast to Frith et al. (2003) study, they found that students satisfaction on web-based communication than those of traditional learning method.

Synchronous interactions are those that occur in “real time” and require participants to be present at a specific time to participate in the discussions. Class meetings, teleconferencing, live video streams, chat rooms and video conferencing are examples of synchronous interactions. It is also possible to use e-mail in a synchronous fashion, if those involved in the e-mail messaging prearrange the time for sending and responding to messages.

Much institution must be considered when the decision is made to engage in web-based learning education. To successfully plan and implement online education, institutions and individual programs must identify how the needed infrastructure for online education will be sustained and how faculty and student development and support needs will be met. It is common for planning committees consisting of administrators, technology staff, student support personnel, and faculty to be charged with addressing and monitoring these issues.

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2.4 Web-based learning in nursing education

The widespread availability of Internet connectivity has greatly fostered access to higher education distance learning. Nursing education is particularly adaptable to the new, enriched (Reiser, 2001), and flexible modalities carried by broadband into any home across the nation, with its enhanced capacity for visual instruction and assessment. Distance education methods, however, differ in important ways from classroom teaching (Hyde & Murray, 2005). Online teaching is not accomplished through a simple uploading of material from the classroom to the web. It relies upon quite different methods of instructional delivery and communication, both between classmates and between faculty and students.

Web-based learning in nursing education encompasses a variety of approaches, such as drill and practice, tutorial, simulation, and basic problem solving. It also provides multiple self-assessment opportunities to allow students to explore their understanding. Since 2000, web-based learning units for nurses have evolved considerably and provided information for most areas of specialty teaching (Justham & Timmon, 2005). Results from several studies have suggested that the learner preferred sensory processing modes: visual, auditory, or motor manipulation (Kenny, 2002; Kaveevivitchai et al., 2009).

As a result of greater flexibility provided by the internet, web-based materials in many disciplines can now be used for distance learning. For example, a web-based courseware on Diabetes Mellitus has been successfully used to teach pharmaceutical students (Hall et al., 2007). A gerontology web-based courseware provided dental students with greater motivation, learning success, and knowledge retention for more than six months (Gallagher et al., 2005). In the study of Suen (2005) using seven principles of good practice as a guide to an online teaching of epidemiology, students appreciated the more flexible, stimulating, convenient and creative atmosphere when compared to the classroom lecture.

Rouse (2000) has shown that supplementing the traditional lecture by a web-based learning unit on congenital heart disease resulted in a significant improvement in knowledge. Improvements of student's knowledge and attitude have also been reported after replacing the traditional lecture by the web-based unit. Nursing students taught by web –based learning can interpret EKG recordings more

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effectively than those in the traditional lecture format (Jang et al., 2005). A web-based learning course on pharmacology had a similar enhancing effect for teaching in classroom (Beta-Jones & Avery, 2004). Online discussion has been regarded as an effective learning tool, offering several advantages over traditional classroom-based discussion in which students with more proficient verbal skill may dominate. Students with less confidence can participate more in the online mode (Kenny, 2002; Buckley, 2005).

Student satisfaction and dissatisfaction of web-based learning

Student satisfaction is an importance factor in evaluating the effectiveness of web-based courses. However, various findings related to satisfaction are found. Chen and Jones (2007), Stanley (2006) and Arbaugh (2005) all found that satisfaction was similar to traditional course delivery systems. Yet, in 2004, Kearns, Shoef and Summey found less satisfaction for students in a web-based second-degree bachelor of science (in Nursing) program when compared to the traditional course method. Billings et al. (2001) found that student who lived more than 100 miles from campus and were age 40 or older were the most satisfaction with web-based learning course. Woo and Kimmick (2000) reported no significant difference in satisfaction between graduate students taking a web-based nursing research course and those taking a face-to-face class. In contrast, Creedy et al. (2007) identified several problems resulting in student dissatisfaction with web-based learning, including technological problems, minimal and slow instructor feedback, ambiguous web site instructions, and unclear e-mail messages from instructors. Additional, course preparation for online learning takes much more time and may need professional programmers. There are concerns that some students in online learning need better self-discipline and computer skills. Arbaugh and Duray (2002) in their investigation of web-based MBA programs found that more experienced on-line students tended to be more satisfied with web-based delivery mechanisms. They also found that smaller class sizes were positively associated with satisfaction. Yet, in 2004, Kearns, Shoef and Summey found less satisfaction for students in a web-based second-degree bachelor of nursing science program than the traditional course method. In 2003, Buckley in her study on students in nutrition classes had much more neutral findings, where the students expressed both positive and negative aspects of

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the online instruction. The students may also feel disconnected from their class members (Kenny, 2002). Despite these disadvantages of web-based learning Creedy et al. (2007) found that students showed positive attitude to the experience, although some were frustrated with the computer technology and needed more technical support.

2.5 Web-based learning in nursing education of Thailand

In higher education especially, the increasing tendency is to create a Virtual Learning Environment (VLE), which all aspects of a course are handled through a consistent user interface standard throughout the institution. A growing number of physical universities, as well as newer online-only colleges, have begun to offer a select set of academic degree via the internet at a wide range of levels and in a wide range of disciplines. Some programs require students to attend some campus classes or orientations, many are delivered supplementing online. In addition, several universities in Thailand offer online student support services, such as online advising and registration, e-counseling, online textbook purchase. Although there have been many implementation of web-based learning, but little is conducted on web-based learning researches. Kaveevivitchai et al. (2009) have developed two computer-assisted learning (CAL) multimedia units; principles of physical examination and the physical examination of skin, hair, and nail for nursing students on factual knowledge and performance skills. They found that the performance skills in the groups supplemented with CAL were significantly higher than the group receiving only lecture/demonstration.

2. 6 Applying Educational Theories to Web-based learning

2.6.1 Constructivism

Constructivism is an alternative to traditional learning theory that was founded in the 1950's by researchers including Piaget and Vygotsky, who articulated mechanisms by which knowledge is internalized by learners. Piaget suggested that through processes of *accommodation* and *assimilation*, individuals construct new

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knowledge from their experiences. When individuals assimilate, they incorporate the new experience into an already existing framework without changing that framework. This may occur when individuals' experiences are aligned with their internal representations of the world, but may also occur as a failure to change a faulty understanding; for example, they may not notice events, may misunderstand input from others, or may decide that an event is a fluke and is therefore unimportant as information about the world. In contrast, when individuals' experiences contradict their internal representations, they may change their perceptions of the experiences to fit their internal representations. According to the theory, accommodation is the process of reframing one's mental representation of the external world to fit new experiences. Constructivism do not believed knowledge is a constant for each object or event but rather that it is constructed by individuals as they interact with an object or an event, in relation to their past experience, their beliefs and their current mental structure.

Constructivism is a view of learning based on the belief that knowledge isn't a thing that can be simply given by the teacher at the front of the room to students in their desks. Rather, knowledge is constructed by learners through an active, mental process of development; learners are the builders and creators of meaning and knowledge. For constructivists, learning is the process by which accessed information is transformed into personal knowledge. It involves an evaluation of the new information based on existing mental models, and an augmentation and reorganization of these models to reflect the new knowledge (Soloway et al., 1996). In other word, constructivism was defined by reference to four principles: learning, in an important way, depends on what we already know; new ideas occur as we adapt and change our old ideas; learning involves inventing ideas rather than mechanically accumulating facts; meaningful learning occurs through rethinking old ideas and coming to new conclusions about new ideas which conflict with our old ideas. This is a process of internal negotiation of meaning. Since all learners engage in a learning experience with differing beliefs and background knowledge, and since learning changes individuals' mental structures, it must be a personal experience. A productive, constructivist classroom, then, consists of learner-centered, active instruction. In such a classroom, the teacher provides students with experiences that allow them to

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hypothesize, predict, manipulate objects, pose questions, research, investigate, imagine, and invent. The teacher's role is to facilitate this process.

Educational curricula and teaching methods are changing. One component of the current redevelopment of all subject area curricula is the change in focus of instruction from the transmission curriculum to a transactional curriculum. In a traditional curriculum, a teacher transmits information to students who passively listen and acquire facts. In a transactional curriculum, students are actively involved in their learning to reach new understandings. The goal of instruction is to help learners develop learning and thinking strategies" and the evaluation of learning outcomes consists of determining how the student structures and processes knowledge." As explained in, a constructivist teacher's role is quite different from that of a teacher in a traditional learning environment. In a constructivist learning environment the teacher relinquishes the role of sage on the stage for one of guide on the side. Teachers assume a role of coach or facilitator, guiding learners as opposed to being the keepers and dispensers of knowledge. Much of the cognitive labour that is offloaded onto teachers in more traditional learning models is returned to the learners. This includes tasks such as summarizing and synthesizing and may also include goal setting and evaluation. Constructivist teachers are often models of the expert learner.

2.6.2 The 5Es Learning Cycle Model

The 5Es Learning Cycle Model, the learning cycle based on constructivism as its theoretical foundation. "Constructivism is a dynamic and interactive model of how humans learn". A constructivist perspective assumes students must be actively involved in their learning and concepts are not transmitted from teacher to student but constructed by the student. In the early 1960's, Robert Karplus and his colleagues proposed and used an instructional model based on the work of Piaget. This model would eventually be called the Learning Cycle. (Atkin & Karplus, 1962). Numerous studies have shown that the learning cycle as a model of instruction is far superior to transmission models in which students are passive receivers of knowledge from their teacher (Bybee, 1997). As an instructional model, the learning cycle provides the active learning experiences recommended by the United States of America National Science Education Standards. 5Es learning cycle model describes a

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teaching sequence that can be used for the entire programs, specific units and individual lessons. It applied the inquiry approach to teaching into a series of planning strategies based on the principles of social constructivist and active assessments. It's a well established model used in science and it can be effortlessly adapted to use too. The basic premise of this model is that learners have an experience with the phenomena in the learning of the concept/topic (Bybee et al., 2006). It helps students build their own understanding from experiences and new ideas. The 5Es learning cycle represents five phases of a sequence for teaching and learning; Engagement, Exploration, Explanation, Elaboration, and Evaluation as follow:

Engagement, this stage is designed to help students understand the learning task and make connections to past and present learning experiences. It should stimulate interest and prompt students to identify their own questions about the topic. Students explore the questions raised after they gain more understanding of the topic and the tools needed to investigate the ideas. Typical activities in this stage include posing a question, defining a problem, or demonstrating a discrepant event, then using small group discussions to stimulate and share ideas. To connect science to students' lives, we frequently use historical events, such as natural disasters, to stimulate curiosity and motivate learning. Instructors help students connect previous knowledge to the new concepts introduced in the unit.

Exploration, in the exploration stage students have the opportunity to get directly involved with the key concepts through guided exploration of scientific, geographic, economic, and other data sets. They begin identifying patterns in the data and connecting them to Earth processes. This further arouses student curiosity and new questions develop. Frequently, students will diverge from the slated activity to explore their own questions, continually building on their knowledge base. Through this process of questioning and exploration, students begin to formulate their understanding of the basic concepts. In this stage, instructors observe and listen to students as they interact with each other and the data sets. Probing questions help students clarify their understanding of major concepts and redirect their investigations when necessary. It is critical to allow adequate time at this point for students to thoroughly investigate the guiding questions in the module, as well as the questions they have generated themselves.

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Explanation, students are introduced more formally to the lesson's science concepts. Through readings and discussions, students gain understanding of the major concepts and can verify answers to questions or problems posed earlier. In addition, more abstract concepts not easily explored in earlier activities are introduced and explained. As students formulate new ideas to interpret observations made in the Explore stage, appropriate vocabulary can be introduced. If students have unresolved questions, they may continue to look for solutions in the elaborate stage.

Elaboration, students expand on what they have learned and apply their newfound knowledge to a different situation. They test ideas more thoroughly and explore additional relationships. Providing closure to the lesson and verifying student understanding is critical at this point.

Evaluation, the learning cycle provides opportunities for the instructor to continually observe students' learning and to monitor their progress using questioning techniques and discussions. More formal evaluation can be conducted at this stage. The assessment should be aligned with the styles and content of the learning experience. We have provided traditional assessments in the form of quizzes and ideas for alternative assessments such as using concept maps or having students create summary projects and reports. The multiple choice quizzes were designed and used primarily for assessing changes in student understanding as part of the evaluation of the materials.

Diseko & Van (2006) applied constructivist perspectives on learning and multimedia design principles which integrated into the design and development of a multimedia learning environment (MMLE) guided by the design framework. The design experiment was conducted in five phases: the establishment of the design framework after an extensive literature review, the development of the MMLE, a pilot study, the final implementation and data analysis. Quantitative and qualitative data were collected. The preliminary results of the study showed that the students had an overwhelming positive experience of the MMLE. The study made a contribution to the field of Nursing Science education on neonatology as it designed and developed multimedia learning materials and assessed the value of those learning materials for learners in similar contexts.

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Additional, Bransford and Donovan (2005) identified three principles which are keys to successful teaching as follows:

1. Students come to the classroom with preconceptions about how the world works. For example, nursing students come to study with some knowledge about nursing, health and illness, health care and other related aspects. If their initial understanding is not engaged, they may fail to grasp the new concepts and information, or they may learn them for purposes of a test but revert to their preconceptions outside of the academic environment.

2. To develop competence in an area of inquiry, students must possess a deep foundation of factual knowledge, understand facts and ideas in the context of a conceptual framework develop practical knowledge from experience with similar or contrasting clinical situation, and organize knowledge in ways that facilitate retrieval and application.

3. A metacognitive approach to instruction can help students learn to take control of their own learning by defining goals and monitoring their progress in achieving them.

2.6.3 Motivational Theory: Keller's ARCS model

Keller (1979) presented the theoretical framework for the inclusion of motivation in the theory and practice of instructional systems design. Keller (1987) has claimed that if motivation is to be applied effectively to instructional design, it should be based on solid motivation theory and systematic process of instructional design. One of the key ingredients in the successful implementation of the newly established was to apply ARCS Model to the design of multimedia web-based learning into nursing courses.

Lack of motivation can be a problem for learners. (Soloway et al., 1998). Constructivism and sociocultural learning theories place significant importance on what each learner brings to the learning experience because they believe that prior experiences and motivation are factors in how knowledge is built. Constructivists and proponents of the sociocultural theories of learning attempt to remedy the learners' lack of motivation by giving them more ownership and control over their learning. The learners are involved in goal setting, choosing their learning activities and evaluating

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their progress. Learners are encouraged to be curious and explorative. Based on their interests, learners are encouraged to formulate and evaluate hypotheses.

The motivational theorists believe that the degree of learner motivation closely correlates with the achievement of learning objectives (Dreber & Caputi, 1992; Wongwiwatthananukit & Popovich, 2000; Song & Keller, 2001). Motivation is one component of the set of principles that excellent educators apply to their instruction to help students understand the importance of the content area, so they will want to continue to learn, use and apply what they have learned. This tends to make learning more meaningful for learners and potentially more motivating. Students who are motivated to learn tend to engage in activities. In contrast, students who are not motivated to learn do not put forth their best effort to learn. They may be in attentive during the instruction and may not organize or rehearse the material to be learned. They may not monitor their level of understanding or even ask for assistance when they do not understand what is being taught. These habits limit students' potential for learning and skill development and result in low levels of productivity (Wongwiwatthananukit & Popovich, 2000).

Keller (1983) noted that arriving at the acronym ARCS (Attention, Relevance, Confidence, & Satisfaction) was from a purposeful attempt to make the model meaningful, consistent and easy to communicate. Because of its focus on matching motives to the unique affective characteristics of learners and its clear suggestions for strategies, the ARCS Model is practical indeed influence a student's motivation as follows:

Attention

Attention, as Keller point out, is the first step of motivation and prerequisites for learning. He argues that it is not enough to gain the learner attention, the "real challenge is to sustain it, to produce a satisfactory level of attention throughout a period of instruction. Keller (1987) motivation definition is "capturing the interest of learner, stimulating the curiosity to learn".

Keller attention can be gained in two ways: (1) Perceptual arousal – uses surprise or uncertainly to gain interest. Uses novel, surprising, incongruous, and uncertain events; or (2) Inquiry arousal, stimulates curiosity by posing challenging questions or problems to be solved. Methods for grabbing the

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learners' attention include the use of: Active participation, by adopt strategies such as games, role play or other hands-on methods to get learners involved with the material or subject matter. Variability, to better reinforce materials and account for individual differences in learning styles, use a variety of methods in presenting material (e.g. use of multimedia). Humor, maintain interest by use a small amount of humor (but not too much to be distracting) Incongruity and Conflict, a devil's advocate approach in which statements are posed that go against a learner's past experiences. Specific examples use a visual stimuli, story, or biography. Inquiry, pose questions or problems for the learners to solve, e.g. brainstorming activities.

Relevance

Relevance has to be established in order to increase a learner's motivation, by using concrete examples which the learners are familiar. Six major strategies has been described by Keller include. Experience; tell the learners how the new learning will use their existing skills. We best learn by building upon our preset knowledge or skills. Present Worth, what will the subject matter does for me today? Future Usefulness, what will the subject matter does for me tomorrow? Needs Matching, take advantage of the dynamics of achievement, risk taking, power, and affiliation. Modeling, first of all, "be what you want them to do!" Other strategies include guest speakers, videos, and having the learners who finish their work first to serve as tutors. Choice, allow the learners to use different methods to pursue their work or allowing choice in how they organize it (Pantel, 1997)

Confidence

To help students understand their likelihood for success. If they feel they cannot meet the objectives or that the cost (time or effort) is too high, their motivation will decrease. Provide objectives and prerequisites, help students estimate the probability of success by presenting performance requirements and evaluation criteria. Ensure the learners are aware of performance requirements and evaluative criteria. Allow for success that is meaningful. Grow the Learners, allow for small steps of growth during the learning process. Feedback, provide feedback and support internal attributions for success. Learner Control, learners should feel some degree of control over their learning and assessment. They should believe that their success is a direct result of the amount of effort they have put forth.

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Providing learners the opportunity to practice and acquire new skill under low-risk condition. To build the learners' confidents, the research concentrated an appropriate interactions, consistent, and explored learner understanding by using periodic question, and exercise. This tends to make learning more meaningful for learners and potentially more motivating. As pointed out by Anderson et al. (1996) in a critique of situated learning, it seems important both to motivation and to learning to practice one's skills from time to time in full context.

Satisfaction

Learning must be rewarding or satisfying in some way, whether it is from a sense of achievement, praise from a higher-up, or mere entertainment. Make the learner feel as though the skill is useful or beneficial by providing opportunities to use newly acquired knowledge in a real setting. Provide feedback and reinforcement. When learners appreciate the results, they will be motivated to learn. Satisfaction is based upon motivation, which can be intrinsic or extrinsic (Bonnie et al., 1998).

2.7 Midwifery practice in Thailand

Historically, birth attendants called hmor tam yae dominated the care of Thai pregnant women. Most of them were women who had seen or experienced childbirth at least once before and thus they provided care from a basis of experiential knowledge. The delivery usually took place in or around the woman's home, and often involved the attendant physically supporting and encouraging the labouring woman, as well as providing immediate postnatal care to mother and baby. (Satrirat, 2005)

The World Health Organization (WHO) promotes the midwife as the lead care for normal pregnancy and birth. Clinical experience has been always an integral part of nursing education. It prepares student nurses to be able of "doing" as well as "knowing" the clinical principles in practice. According to the International Confederation of Midwives (a definition that has also been adopted by the World Health Organization and the International Federation of Gynecology and Obstetrics): A midwife is a person who, having been regularly admitted to a midwifery educational program that is duly recognized in the country in which it is located, has successfully completed the prescribed course of studies in midwifery and has acquired the requisite

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qualifications to be registered and/or legally licensed to practice midwifery. The educational program may be an apprenticeship, a formal university program, or a combination.

The midwife is recognized as a responsible and accountable professional who works in partnership with women to give the necessary support, care and advice during pregnancy, labour and the postpartum period, to conduct births on the midwife's own responsibility and to provide care for the infant. This care includes preventive measures, the promotion of normal birth, the detection of complications in mother and child, accessing of medical or other appropriate assistance and the carrying out of emergency measures.Midwives are autonomous practitioners who are specialists in a low-risk pregnancy, childbirth, and the postpartum stage. They generally strive to help women have a healthy pregnancy and natural birth experience. Midwives are trained to recognize and deal with deviations from the norm. Obstetricians, in contrast, are specialists in illness related to childbearing and in surgery. The two professions can be complementary, but often are at odds because obstetricians are taught to "actively manage" labor, while midwives are taught not to intervene unless necessary.

Intrapartum nursing care

The midwifery profession demands both scientific knowledge and practical skills (Silverton, 1993). Midwifery education is based on an understanding of health sciences theory and clinical preparation that shapes knowledge, judgment, and skills deemed necessary to provide primary health care management to women and newborns. Major roles of the nurse caring for labouring women include a thorough admission assessment and ongoing maternal and fetal assessment. Focus of this assessment is on prior obstetric history, current pregnancy, labour symptoms, and a history and physical examination emphasizing the respiration, cardiovascular, etc. Leopold maneuvers provide a systemic assessment of fetal position and presentation and thus should be performed fetal assessment. Nurse should develop proficiency in perfoming vaginal examination to assess labour progress. The vaginal examination should be systematic, beginning with assessment of cervical dilatation and effacement, fetal presentation, and position. Nursing care during second stage of labour:

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conducting childbirth, placenta is important of midwife. These roles extend to postpartum care.

The midwife has an important task in health counseling and education, not only for the woman, but also within the family and community. This work should involve antenatal education and preparation for parenthood and may extend to women's health, sexual or reproductive health and childcare. A midwife may practice in any setting including in the home, the community, hospitals, clinics or health units.

Each education program is encouraged to develop its own method of teaching issues beyond the scope of the current core competencies. This study developed intrapartum nursing care web-based learning unit to describe these contents in form of multimedia to facilitate more attractive and understanding of nursing students.

Mechanism of labour

Beazley (1986) defined labour simply as the process occurring naturally about term during which the mother expels the products of conception. Every midwife is expected to understand the mechanism of labour, so this has to be included in the midwifery curriculum. Today the measurable elements of labour are used to define both the physiology and progress of 'normal labour' and are mentioned in most texts. Cervical dilation, descent of presenting part, uterine contractions, and recording of maternal and fetal observations are now recorded on a chart devised and used to plot progress of labour, known as the partogram. The World Health Organization produced a modified version of the partogram adopting a consensus view of progress in labour as suggested by other earlier pioneers of the partogram chart (Friedman, 1965). The partogram is now recognized and used world wide as a tool to monitor the progress of labour and to alert careers to labour that is not progressing normally.

Silverton (1993) stated that progress of labour to be considered 'normal' should be within limit. The start of labour is supposedly calculated from the onset of regular painful contractions and although pain is present in most labours, pain is not a decisive phenomenon of the onset of labour. The majority of women report childbirth as being very painful, whilst some women describe labour pains as intolerable. Thus,

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intrapartum nursing care is not only conducting normal labour, but pregnant holistic care also demand.

The series of manoeuvres undertaken by the fetus when travelling through the birth canal are collectively known as the mechanism of labour. Principles common to all mechanisms are: “descent takes place” the leading part rotating forward when it meets the pelvic floor to come under the symphysis pubis whatever emerges from the pelvis will pivot around the pubic bone. The pelvis is wider in the transverse diameter at the pelvic inlet, round at the mid-cavity and wider in the anteroposterior diameter at the outlet. Thus, at the start of labour with the vertex presenting, the fetal head will usually engage in the transverse position (Figure. 2-1A). The head is engaged when the widest diameter of the presenting part (biparietal diameter) has passed the pelvic brim. As labour progresses the fetal head is forced onto the dilating cervix and flexion such that the vertex (the area of the fetal head bounded by biparietal diameter and sub-occipitobregmatic diameter) leads. This represents the smallest diameter of the fetal head approximately 9.5 cm. Descent through the pelvis follows on reaching the levator ani muscles by internal rotation, usually to the occipito–anterior position. (Figure. 2-1B). The occiput comes to lie under the pubic arch and the head distends the soft tissues of the perineum and crowns when the biparietal diameter distends the vulva and the head no longer slips back in the absence of maternal effort ((Figure. 2-1C). Delivery of the head involves extension pivoting the suboccipital region around the pubic bone. Restitution occurs with the head rotating to come into line with the fetal shoulders ((Figure. 2-1D). At the time of restitution the shoulders have engaged in the transverse position at the pelvic inlet and undergone internal rotation to lie in the anterioposterior position. The shoulders are delivered by gentle downward traction to deliver the anterior shoulder under the symphysis pubis, followed by lateral flexion of the baby to deliver the posterior shoulder (Martin & Hutchon, 2004)

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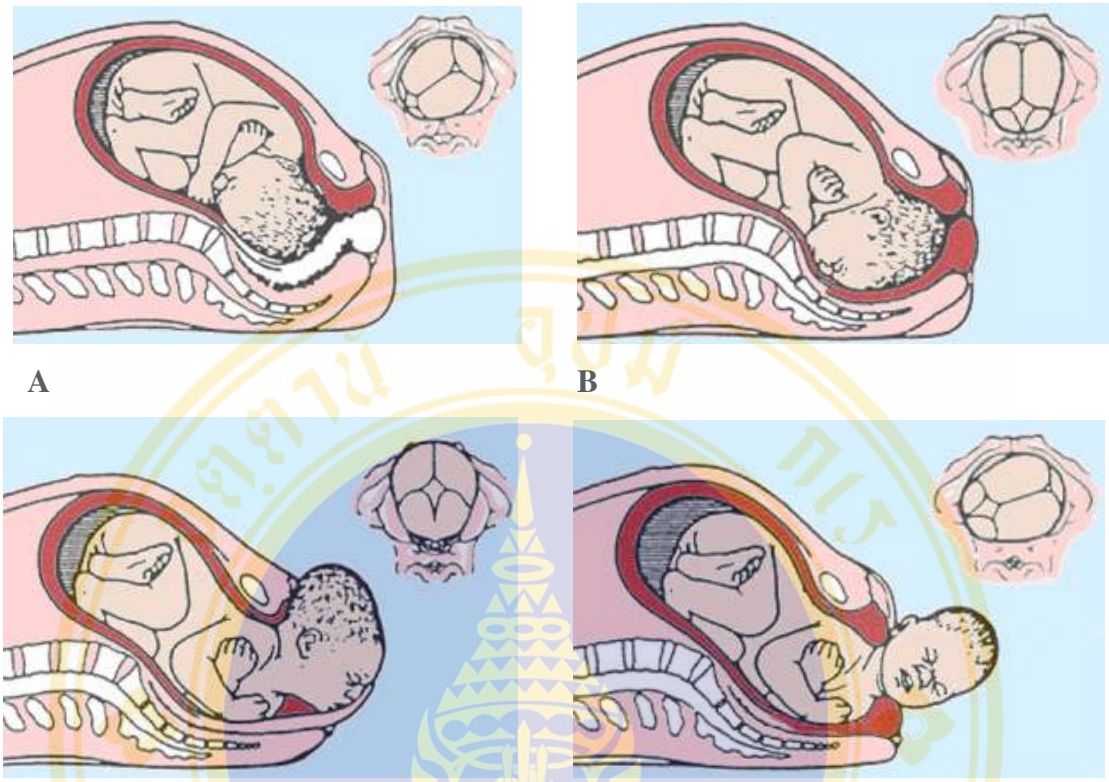

Figure 2-1 The mechanism of labour: (A) Engagement, (B) Internal rotation, (C) extension, and (D) Restitution

The picture from www. sautuqalbi.blogspot.com/2009_01_01_archive.html

It seems to be generally understood that the mechanism of labour describes the movements of the fetus in response to the bony structures and soft tissues of the birth canal during labour, but as the fetus is largely hidden from view how do the student know how the fetus moves during labour? The process and mechanism of labour web-based learning was designed to instruct the concept of the presenting part as it descends through the pelvic, which was especially important when teaching the process and mechanism of labour.

Nursing competency

Higher education institutions today face great challenges. They are expected to equip students with analytic, critical, reflective and transformative skills so as to meet the needs of the current workplace (Clarkeburn et al., 2000). Nursing scholars have investigated the basic skills of nurses. The definition of `competency' is

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not clearly stated in the literature, which impedes the investigation of this issue. Yura and Walsh (1967) identified three types of essential skill needed in the nursing process: intellectual, interpersonal and technical skills. Competence is viewed as a person's ability to perform tasks, and competencies as total capability – what a person can do, not necessarily what that person does (Manley & Garbett, 2000). Norman (1985) outlined a categorization of clinical competence that consists of five competencies: clinical skills, knowledge and understanding, interpersonal attributes, problem-solving and clinical judgments, and technical skills. Maatsch (1990) presented a model of general clinical competence which consists of three overlapping constructs: medical knowledge, clinical problem-solving and general competence. The general competence includes intelligence, motivation, learning skills, general knowledge base and personality. Competency assessment is generally outcome-oriented, aiming at assessing an individual's performance in terms of applying professional knowledge and skills in a clinical setting. Competence assessment techniques cover psychomotor, cognitive and affective aspects (Redman et al., 1999). Most healthcare students begin their professional education expecting to acquire the knowledge and skills needed to provide high-quality care (Hall et al., 2008). Nursing competence development and assessment are issues crucial to safe and efficient nursing services. Factors determining nursing competence development have been explored in nursing education (Baramee & Blegen 2003; Dolan, 2003).

In this study, nursing competencies then are regarded as sets of knowledge, skills, traits, motives and attitudes that are required for effective performance in a wide range of nursing jobs and various clinical settings. Competencies are assumed to be present when a nurse accomplishes a given task and thus they can be derived from an analysis of actual practice.

2.8 Stress in nursing student

Clinical practice is a stressful situation for nursing students, especially those who lack of knowledge. One of the important stress situation of nursing students is had no experience before practice that cause them unlikely to success in their study (Cooper et al., 1988). The factor students reported feeling most stressful about is lack

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of competence. This factor loses its stressor power progressively during training, but nevertheless remains the most stressful up to the end. Lack of competence has been reported to continue to be an important stressor for professionals with little experience, but to disappear with experience (McVicar, 2003). In order to work well as a professional, it is thus necessary to acquire competences which facilitate the performing of the job in a correct and healthy way (Zupiria et al., 2007). The suffering responses vary for different individuals. Thus, differences in the ways in which individuals perceive stressful situations and cope with them, account for why some individuals suffer more than others and are negatively affected in terms of their health, well being and their way of working (Lazarus & Folkman, 1984).

Awareness of the existence of stress in nursing students by nurse educators and responding to it will help to diminish student nurses experience of stress (Lindop, 1987). Clinical experience is one of the most anxiety producing components of the nursing program which has been identified by nursing students. In a descriptive correlation study by Beck and Srivastava (1991), 94 second, third and fourth year nursing students reported that clinical experience was the most stressful part of the nursing program. Lack of clinical experience, unfamiliar areas, difficult patients, fear of making mistakes and being evaluated by faculty members were expressed by the students as anxiety-producing situations in their initial clinical experience. In study done by Hart and Rotem (1994) stressful events for nursing students during clinical practice have been studied. They found that the initial clinical experience was the most anxiety producing part of their clinical experience. The sources of stress during clinical practice have been studied by many researchers (Admi, 1997). The inadequacy of clinical experience may also lead to students' difficulty with their integration into the workplace. If students are continually dissatisfied with the quality and scope of their clinical experiences, then the nursing program may suffer.

In order to identify what is considered by students to be the most stressful aspects of clinical training; Zupiria et al. (2003a as cite in Zupiria et al., 2007) developed a questionnaire which measured the degree of stress perceived in 41 potentially stressful situations. Factorial analysis revealed nine principal factors. Some of these have to do with the task itself: ''lack of competence'', ''contact with suffering'', ''uncertainty'' whereas others are more related to relationships developed

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during the course of the tasks: ‘‘lack of control in the relationship with patients’’, ‘‘emotional involvement’’, ‘‘being harmed in the relationship with patients’’, ‘‘patients seeking a closer relationship’’ and ‘relationships with tutors and companions’’. One of the least important stressing factors was found to be ‘‘overload’’, which for students represents clinical situations which produce a feeling of being overwhelmed, rather than a high work-load in itself. These findings corroborate those of other authors which identified similar sources of stress and degrees of importance assigned to them (Admi, 1997). On the other hand, the factor ‘‘lack of competence’’ has been identified as the main source of stress for nursing students in clinical setting (Pagana, 1988; Sheu et al., 2002) and was also found by other authors to be associated with nurses with little experience whereas it was not considered to be important by experienced nurses (McVicar, 2003). Thus, some stressors are related to a lack of experience, while others are independent of experience.

Anxiety is considered to be a normal reaction to stress. It may help a person to deal with a difficult situation, for example at work or at school, by prompting one to cope with it. When anxiety becomes excessive, it may fall under the classification of an anxiety disorder (McLaughlin et al., 2005) Anxiety can be accompanied by physical effects such as heart palpitations, fatigue, nausea, chest pain, shortness of breath, stomach aches, or headaches. Physically, the body prepares the organism to deal with a threat. Blood pressure and heart rate are increased, sweating is increased, blood flow to the major muscle groups is increased, and immune and digestive system functions are inhibited (the *fight or flight* response). External signs of anxiety may include pale skin, sweating, trembling, and pupillary dilation. Someone suffering from anxiety might also experience it as a sense of dread or panic. Anxiety does not only consist of physical symptoms. There are many emotional symptoms involved as well. Some of them include: "Feelings of apprehension or dread, trouble concentrating, feeling tense or jumpy, anticipating the worst, irritability, restlessness, watching (and waiting) for signs (and occurrences) or danger, and, feeling like your mind's gone blank." There's also, "nightmares/bad dreams, obsessions about sensations, a trapped in your mind feeling, and feeling like everything is scary." One of the most common symptoms of anxiety is fear.

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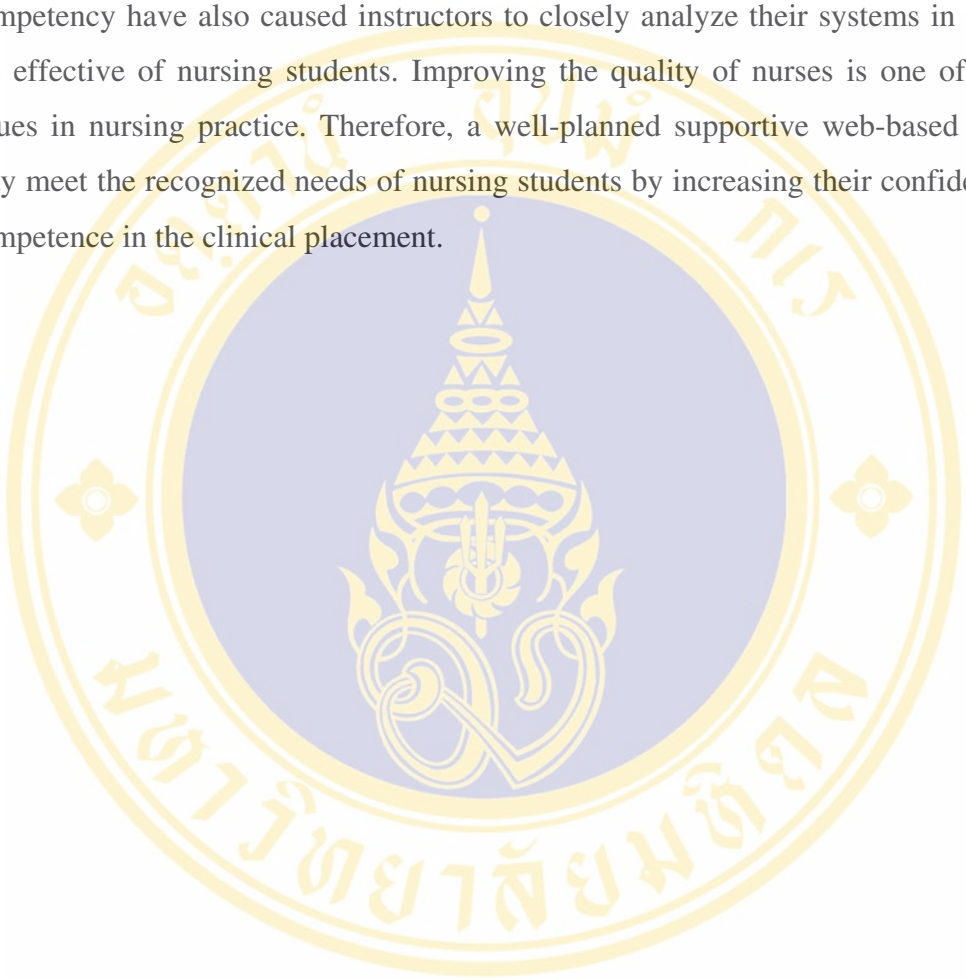
Instructors should be made aware of this particularly important stressor and consider the students' clinical training as a ''time to learn''. Attempts should be made to encourage the development of a positive attitude to the present moment which the student is living by assuming from the beginning his/her role as a student. Lacks of competency have also caused instructors to closely analyze their systems in ensuring the effective of nursing students. Improving the quality of nurses is one of the key issues in nursing practice. Therefore, a well-planned supportive web-based learning may meet the recognized needs of nursing students by increasing their confidence and competence in the clinical placement.



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CHAPTER III
METHODOLOGY

3.1 Overview of the Chapter

This chapter illustrates the development of the web-based learning on process and mechanism of labour, and intrapartum nursing care which used the 5Es model and Motivational Theory: Keller's ARCS model as educational framework. This chapter also described implementation of the web-based learning units as a supplementary to the traditional teaching. The methods used for data collection and analysis were described.

3.2 Study setting

This study was conducted at Ramathibodi hospital school of nursing. The students were divided by curriculum committees into 4 groups. The students in this study were the first and second groups of the third year of nursing students. Midwifery' subjects in this nursing school are divided into three lectures (maternal-newborn nursing and midwifery 1, 2, and 3) and two practicums (maternal-newborn nursing and midwifery practicum 1, and 2). The maternal-newborn and midwifery subject 1 was taught in the second year. The maternal-newborn nursing and midwifery practicum 2 was taught in the third year. During this period, the students undergoing to maternal-newborn and midwifery practice 1. Students were undergoing to maternal-newborn nursing and midwifery 2 in the fourth year. The factors effecting process and mechanism of labour contents were party in maternal-newborn and midwifery 2 subject. The intrapartum nursing care practicing in labour ward on this web-based learning unit contents are partly on maternal-newborn nursing and midwifery practicum 2 that the lecture contents were taught in maternal-newborn nursing and midwifery 2 subject in the third year.

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3.3 Unit 1: Web-based learning unit on process and mechanism of labour

3.3.1 Development of web-based learning unit

The web-based learning unit on the process and mechanism of labour was developed for midwifery students by integrating the principle of 5E inquiry cycle to those of the reproductive anatomy and physiology. The content covered fetal skull, uterine muscle, and relationship between fetus and maternal pelvis (Figures. 3-1, 3-2). They were displayed by using several interactive features including graphics, animation, and video, interactive quiz, and case scenario in order to draw students' attention and maintain continuous learning.

Figure 3-1 The main menu entering the web-based learning unit

3.3.1.1 Contents of the web-based learning unit 1

This interactive web-based learning multimedia with the above features allowed the students to see, hear and interact during the learning process. This web-based learning multimedia unit was composed of three chapters: (Figure 3-2) the first chapter was introduction. The second chapter was on the factors affecting

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processes of labour. The third chapter was the stages of labor and mechanism of labor. The content in each chapter was briefly described as follows:

Figure 3-2 Lists of content topics

Chapter 1: Introduction

This chapter was a review the content on fundamental knowledge of normal delivery. It composes of woman reproductive anatomy, fertilization, fetal development and placenta formation. The materials in this chapter were not only texts but also animation of placenta formation, fetal development, and sound of fetal heart. Some of the contents are demonstrated in figure 3-3.

Figure 3-3 Interactive animation described placenta formation.

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Chapter 2: Factors Affecting Processes of Labour

The features in this chapter (Figure. 3-4) were animation of the pelvic cavity's composition: bony part and soft part, cervical effacement and dilatation (passage). The animations described cervical effacement and dilatation of the cervix. It also elaborated uterine composition and how the uterine muscle works (power). The fetus, passenger, was describe how it effect the labour process. The content in this chapter emphasize the psyche that also affected the labouring woman.

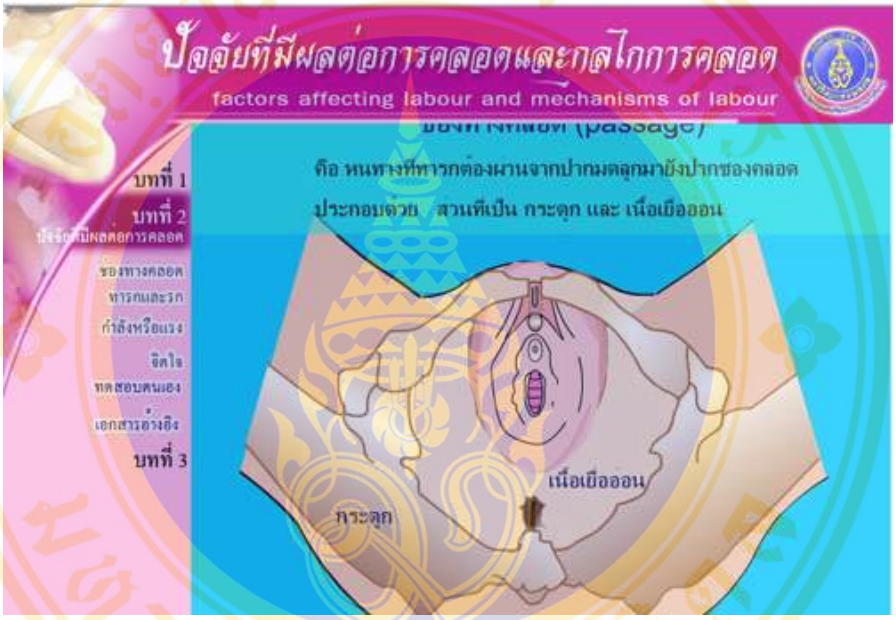

Figure 3-4 An interactive menu about the passage affecting the process of labour.

Figure 3-5 An interactive menu about the passager affecting the process of labour

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Chapter3: Process and Mechanism of Labour

The third chapter contained graphic stages of labour, animation of mechanism of labour, placenta separation and delivery that happen in the uterus, the circumstance that occurred in the process of labour such as molding, engagement, decent of fetal head (Figures. 3-6, 3-7). Video on early breast feeding, interactive quiz and exercise, and case scenario with multiple choice questions were also described (Figures. 3-8, 3-9).

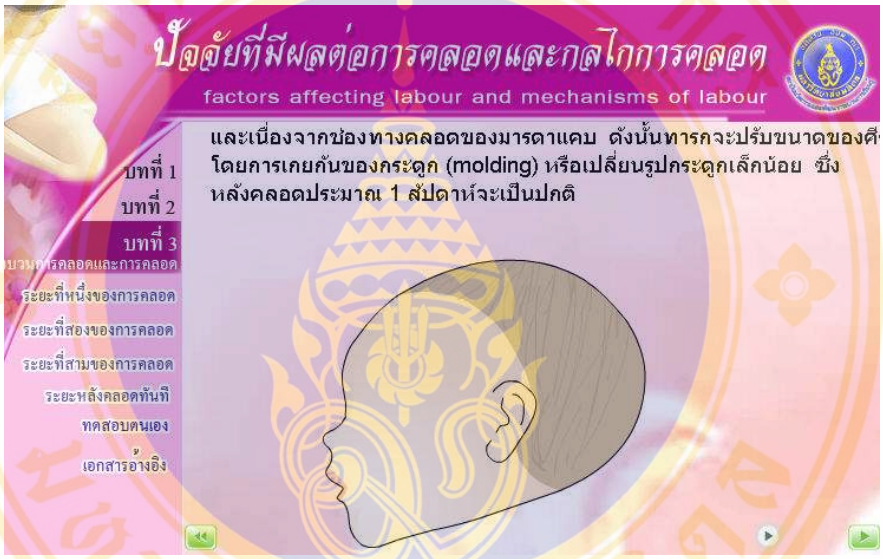

Figure 3-6 Illustration of animation showing molding of fetal head

Figure 3-7 Illustration of animation on progression molding of fetal head

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Figure 3-8 An interactive postpartum care window allowing students to choose contents.

Figure 3-9 Video displayed early breast feeding

The web-based learning also contained web-boards for posting the questions and discussing among students–students and students-teacher. The instructor could contact individual student for confidential feedbacks. The contents

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were validated by three experienced educators which suggested valuable comments on content as well as the illustrations. The web-based learning was modified according to the comments and suggestions and uploaded on www.thaicyberu.go.th (Figure.3-10). The frequency and amount of time spent by each student would be automatically recorded (Figure. 3- 11).

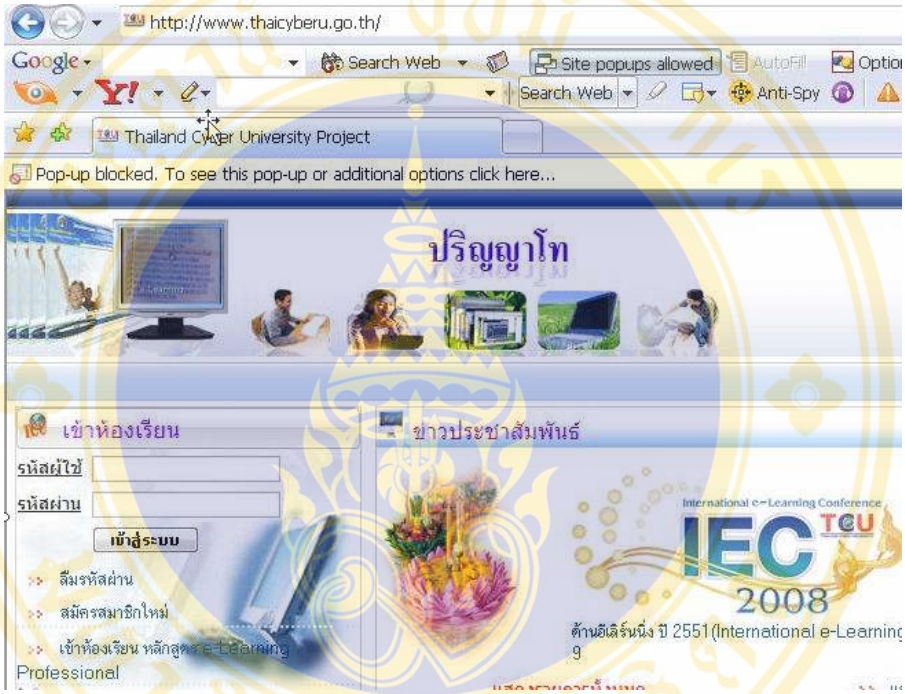

Figure 3-10 The homepage of www.thaicyberu.go.th

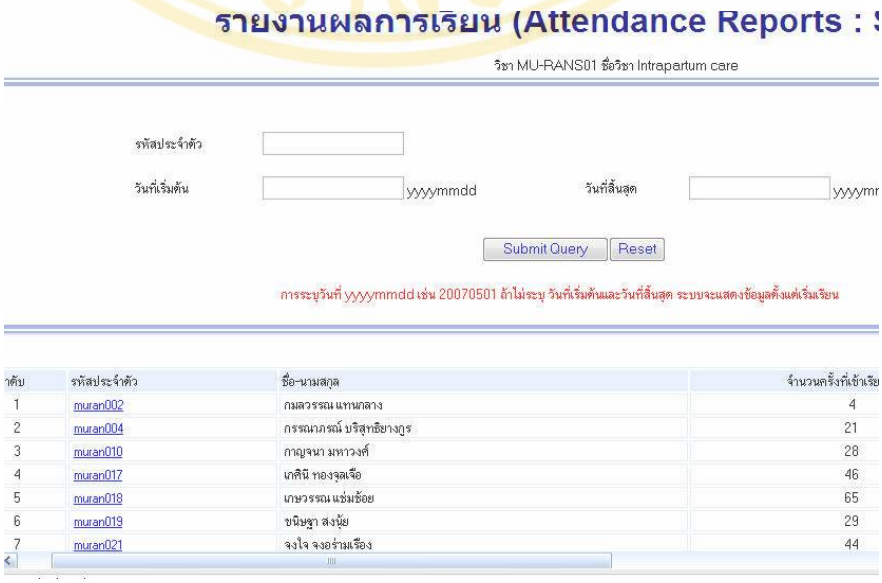

Figure 3-11 the number of visit web-based learning

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3.3.1.2 Applying 5Es model to the design of web-based learning unit

The 5Es model, derived from constructivist consideration (Bybee, 1997), was used to design this web-based learning. The first step was engagement, by stimulating questions in each chapter to create interest and enable students to explore their existing believe and idea (Figure. 3-12). In the second step on exploration, the students explored and verified their own knowledge through the content of web-based learning. The misconception of knowledge could be corrected. The following step on explanation provided them with opportunities to integrate knowledge to answer formative questions and exercises (Figure. 3-13). The elaboration step is the closure for retention of information and concept as well as to move the student toward application of what they have learned. In the final step is on evaluation that occurs in all four parts of the learning cycle, the students were encouraged to assess their understandings by doing exercises at the end of each chapter (Figure. 3-14). The reflection of learning is the abilities of the learners to construct their own new concepts and answering the given questions.

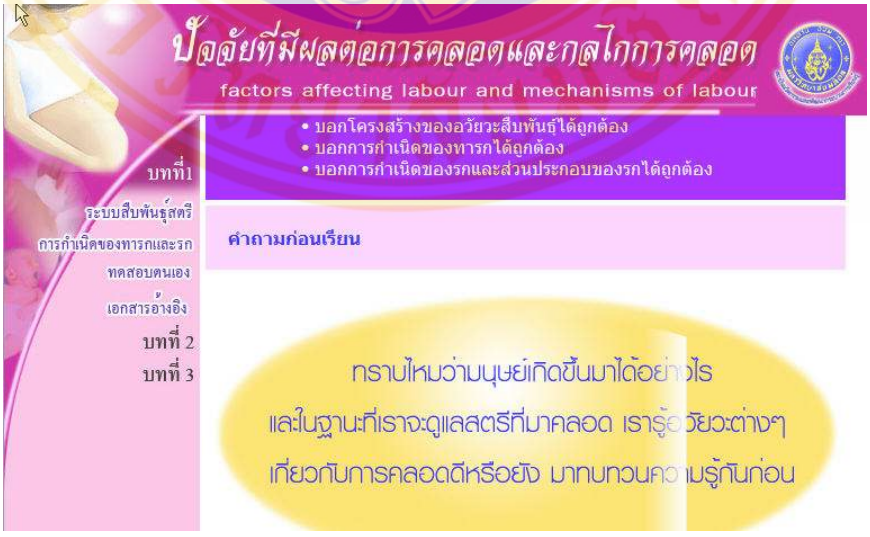

Figure 3-12 Example of learning tasks stimulating questions

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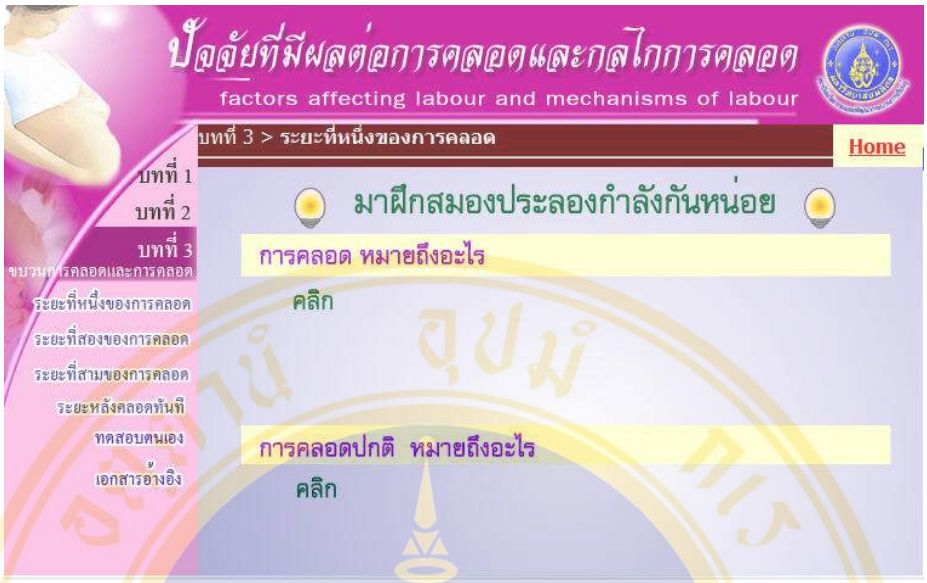

Figure 3-13 Question to stimulate the student to think during studying the content

Figure 3-14 Self–tests with feedback

3.3.2 Implementation of the web-based learning unit1 on process and mechanism of labour

3.3.2.1 Ethic consideration

The conduct of this study was approved by Mahidol University Human Research Ethics Committee. The students were told the purpose of the study and explanations given for the tasks to be performed. All 85 students have signed the

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consent to participate in this study. The criteria for inclusion in this study were: (1) they understood and agreed with the aims of this study; (2) they had experience in internet use and (3) they expressed a strong commitment to the completion of this study.

3.3.2.2 Participants

The participants of this study were third year nursing students undergoing midwifery practice. Most participants (97.6%, n =85) were female; with mean age of 21.50 ± 0.59 years and grade point average (GPA) of 2.87 ± 0.33. The students' experience in using internet was 3 ± 0.46 years. The average time of internet spent per week was 4.75 ± 2.27 hours.

3.3.2.3 Study design

A randomized experimental design was used so that each student had an equal probability of selection and minimizes bias (Socken et al., 2005). Eighty five third year nursing students were randomly assigned by computer into two groups: control (43 students) and experimental (42 students). There was no significant difference in age, GPA, and computer experience between the two groups ($p>.05$). The control group received only lecture and tutorial while the experimental group was supplemented with the web-based unit for 2 weeks.

Lectures and tutorial on factors affecting labour (2 hours) and the process and mechanism of labour (2 hours) were delivered to both groups by the same instructors. Then an orientation was given to both groups to explain the study design as well as the pretest and posttest which would be held at the same time for both groups.

After the pretest, the experimental group received an orientation on overview of the web-based learning, as well as a direction for using a web browser, e-mail and web board. They were given username and a password and allowed two weeks to study the content of the web based course. Then a posttest on factual knowledge and attitude test were conducted. In addition, a 60-minute semi-constructed interview on 10 randomly selected students was performed.

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3.3.3 Student assessment

3.3.3.1 Data collection

Factual knowledge test on web-based learning (Appendix A)

The factual knowledge test was composed of 20 multiple choices, 10 true/false, and 28 interactive questions. Some of the multiple choice questions were case scenarios. The levels of questions, from Bloom's taxonomy, were apprehension and application domains (Bastable, 2003). True/false questions were knowledge domain. The internal consistency of the items in the questionnaire was found be 0.67 by using Kuder Richardson 20 (Waltz, Strickland & Lenz, 2005). The difficulty and discrimination indices were 0.27-0.71 and 0.21-0.97 respectively. The possible total scores of the factual knowledge ranged from 0 to 58, one point for each correct answer.

The factual knowledge test was reviewed by 3 experienced educators to support content validity by using an item objective congruence (IOC) technique. Average scores from the three experts were ≥ 0.5 for all items.

Students' perception (Appendix F)

This questionnaire was developed from the knowledge of web-based construction and online learning to obtain information on students' perception of their learning environment. This questionnaire comprised of 20 items using a 5-point Likert-scale ranking from 1(strongly disagree) to 5 (strongly agree). It was divided into 3 categories: usefulness of web-based learning (10 items), web design (6 items), and online strategy (4 items). A higher score indicated a higher level of satisfaction. This questionnaire was validated by three experienced educators to ensure that each statement was clear and center research focused. The reliability of the instrument measured by using Cronbach's alpha formula was 0.91. At the end of the assessment form, a blank area was provided for additional comments.

Interviews (Appendix G)

Ten students in the experimental group were randomly selected for a 60- minute interview on experience and attitude of web-based learning (Figure. 3-15) Some sample questions were: "How does supplementation of the web-based learning enhance your learning?", "What do you like or dislike about the web-based learning?" and "What feature in the web-based learning would you like to change if

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you could?" The students gave consent for audio taping interview which was transcribed and analyzed.

Figure 3-15 Interviewing the students using audio-taped recorder for qualitative data.

3.3.3.2 Data analysis

Data were analyzed using the Statistical Package for the Social Science (SPSS) version 11.5 for windows. The level of significance was set at .05 for all tests. Pair t test was used to compare the increase in knowledge of both control and experimental groups. Independent t test was used to compare the demographic data and factual knowledge score in both groups. The Pearson product-moment correlation coefficient was used to measure correlation between the posttest and satisfaction score, and the access time of web-based learning.

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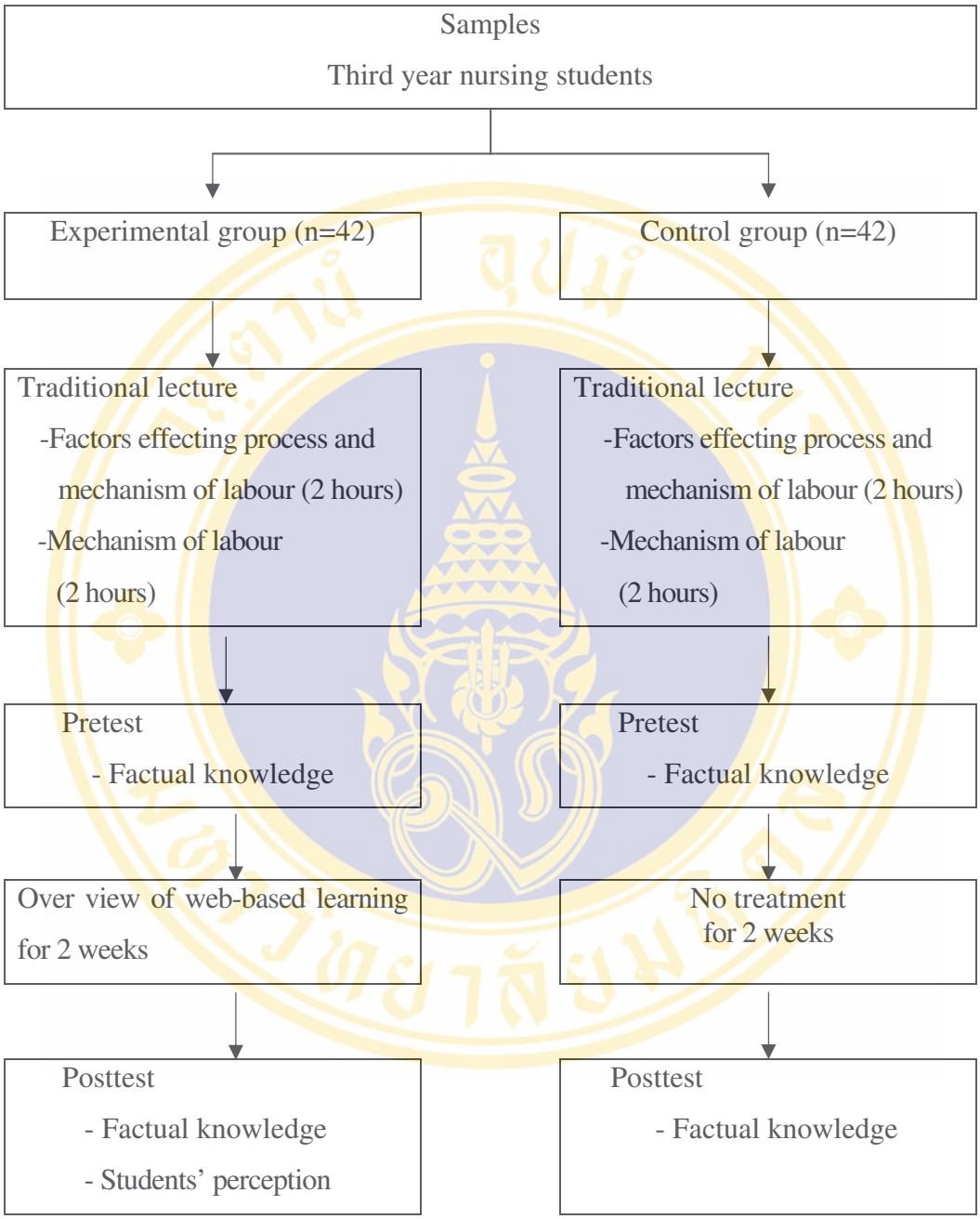

Figure 3-16 The schematic representation of research design and the flow of process design

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3.4 Unit 2: Web-based learning unit on intrapartum nursing care

3.4.1 Development of the web-based learning unit

The first step in designing intrapartum web-based learning is to define the learning outcomes or expected performance. The main objective of this web-based learning is to help students acquire factual knowledge and skills during intrapartum care. It should also reduce stress among nursing students.

3.4.1.1 Contents of the web-based learning unit 2

This web-based learning unit was developed based on the lecture contents required for nursing and midwifery care. It consists of 4 chapters: (Figure. 3-16)

Figure 3-17 Contents of intrapartum nursing care

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Chapter1: Admission to Labour Unit

This chapter shows a video clip on interviewing techniques, reviewing laboratory findings and diagnostics of true labour pain. It also includes an animation and a video of abdominal assessment, videos of present and past history interviewing and vaginal examination (Figure 3- 17). The interactive nursing care plans for enema and pubic hair perineum shaving are also described.

Figure 3-18 An animation and a video of abdominal assessment

Chapter 2: Nursing Care during the First Stage of Labour

It includes an assessment of uterine contraction, a video clip of discomfort and pain management during labour, animation and video clips of intrapartum fetal surveillance, progression of labour assessment, interactive nursing diagnostics during the first stage of labour, and fetal assessment by using appearances, pulse, grimaces, activity, and respiration: APGAR score(Figure 3-18, 3-19).

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Figure 3-19 An animation of fetal assessment by using APGAR score

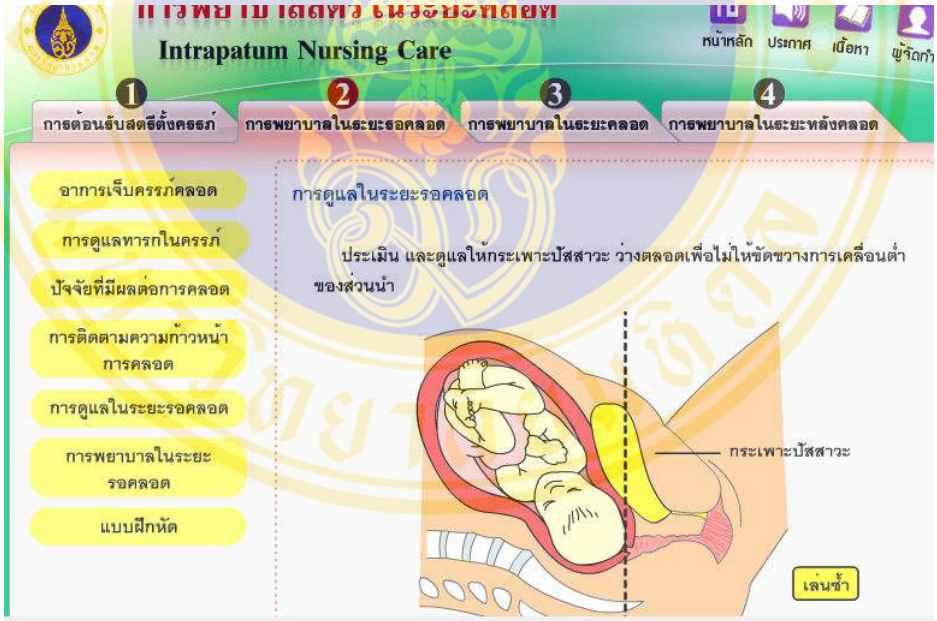

Figure 3-20 An animation of full bladder obstructing process of labour

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Figure 3-21 The window of the interactive nursing diagnostic. Students can click at the bottom (after thinking for a while) to see a nursing care plan in the next window

Chapter 3: Nursing Care in the Second Stage of Labour

This chapter includes a video clip of parturient woman and students preparation, conduct of normal labour (fetal head, shoulder, trunk, cord cutting), animation of placental separation and placental delivery (Figures 3-21, 3-22). The videos of placenta checking and episiotomy wound repaired are also described.

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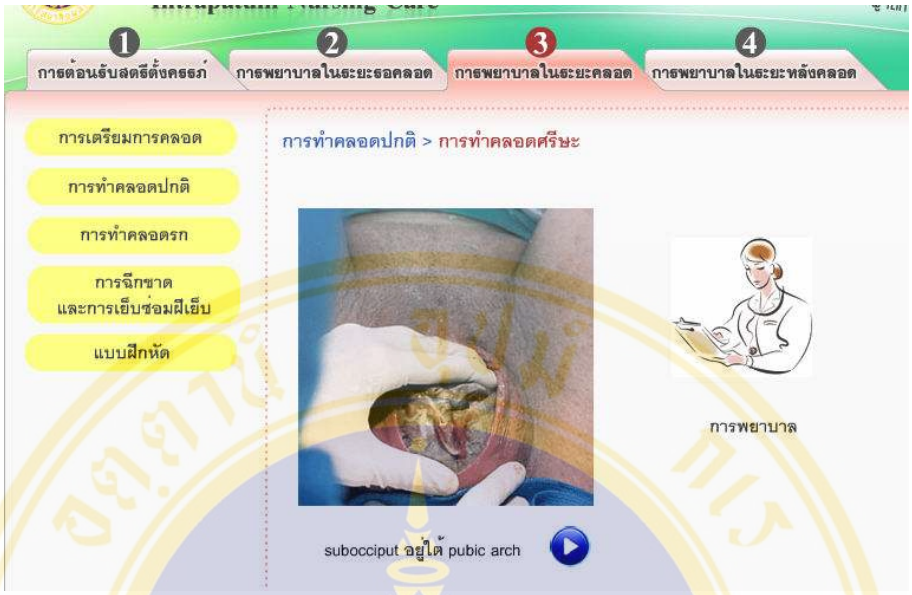

Figure 3-22 The window showing the nursing care and video of conducting fetal head

Figure 3-23 The window showing the video of conducting fetal shoulder

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Chapter 4: Nursing Care for Immediate Postpartum Care:

This chapter illustrated a picture of vital sign assessment, vulva hygiene, and video clips of postpartum uterine massage, episiotomy wound and perineum care and care of the bladder (Figure 3-23). In addition, a video clip on encouragement of bonding and early breast feeding of the newborn was also included.

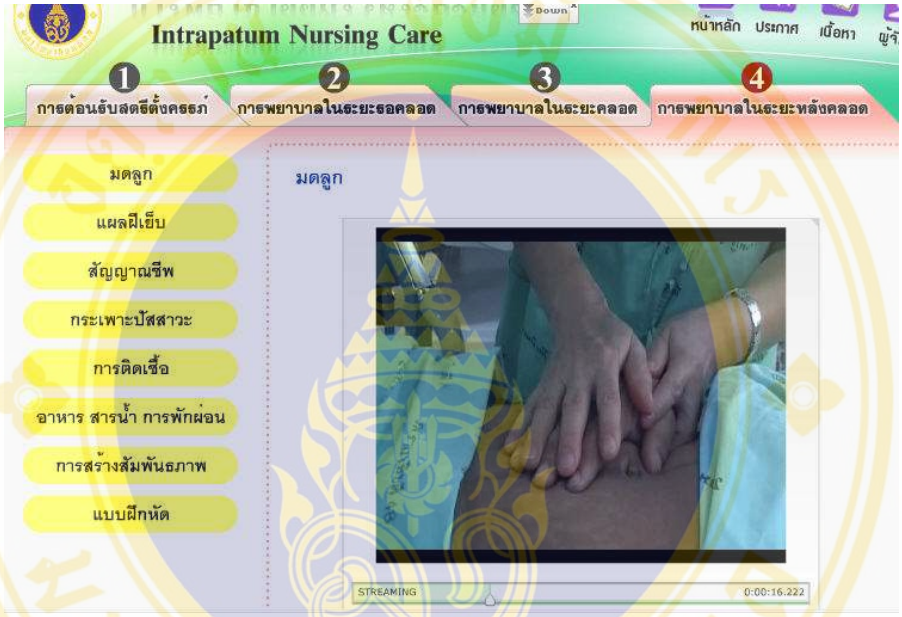

Figure 3-24 Video showing how to teach the postpartum women massage the uterus

3.4.1.2 Applying 5Es model to the design of web-based learning unit 2

The learning cycle used in this web-based learning unit follows the 5Es model of Bybee's (1997): Engagement, Exploration, Explanation, Elaboration, and Evaluation. The learning cycle based on constructivism as its theoretical foundation. A constructivist perspective assumes that students must be actively involved in their learning. Concepts are not directly transferred from teacher to students but rather constructed by the students. As an instructional model, the learning cycle provides the active learning experiences recommended by the National Science Education Standards (National Research Council, 1996).

The engagement step focuses students' attention on the topic. The questions posed at the beginning of each chapter for pre-assessment of the students help them make connections of what they know, and inform them of where

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they are heading. In the Exploration step, the contents in web-based learning give students new information that extends what they have learned in the earlier parts of the learning cycle. New vocabularies and procedures were introduced. The periodic questions and immediate feedback answers also interactively assessed the correction of explored information. The Explanation step, students were asked periodically to explain what they knew. The students' comprehension of the new vocabularies and new concepts were assessed. The students were tested on how well they collected information, together with what they have already knew. In the Elaboration step, the students were assessed by using questions that need more information that extend what they had been learning. At this stage the students solved the problem by applying knowledge they had learned. In the Evaluation step, the students were encouraged to assess their understandings by doing exercises at the end of each chapter.

3.4.1.3 Applying Motivational Theory: Keller's ARCS model to the design of web-based learning unit

Motivation theory provides a framework for how the knowledge of human accumulates, how it relates to learning, and how it supports strategies for making instruction appealing for the learner. The motivation theory believes that the degree of learner motivation closely correlates with the achievement of learning objectives. The major work in this field has been conducted by John Keller (Dreber, 1992). Keller attempted to synthesize what was known about motivation and make this knowledge relevant and useful for the field of instructional technology.

Keller (1983) described four major dimensions of motivation, which composed of attention, relevance, confidence, and satisfaction as follows:

Attention is the first condition of motivation and prerequisite for learning. Keller's definition for attention is "capturing the interest of learners, stimulating the curiosity to learn". To gain and sustain the learner's attention, the researcher of this study accumulates the engagement of 5Es model and multimedia introduction: provide relevant cartoon animations and questions that relevant to the contents such as to stimulated curiosity of the nursing students. This element is evident in the introduction part of chapter 1 (Figure. 3-24).

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Figure 3-25 Cartoon multimedia introductions for stimulating curiosity of nursing students

Relevance, this step supports the explore step of 5Es model. Keller has emphasized, “relevant is a powerful factoring in determining what learners are motivated to learn, or what the learner are willing to continue after the attention has been aroused. To increase relevance of the content to develop the module, the contents in two web-based learning units were based on traditional lecture. The contents were designed in the form of multimedia e.g. of videos, animations that illustrate the abstract contents and applications for the nursing students.

Confidence involves the learner’s “positive expectancy for success”. The learner is expected to learn a new skill and opportunity to acquire and practice skill under conditions where the psychological risks are reasonably low”. All steps of procedures in intrapartum care are very important and students cannot make a mistake. If they do incorrect procedure, the immediate feedbacks have to be given for patient safety; this is considered to be a high pressure for the students. Providing the students the opportunity to practice and acquire new skills under low risk conditions, many procedures in web-based learning were carefully designed. The students could log in as frequency as they needed until they have confident in their skills. This

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learning style is under low stress. Moreover, the case scenario and periodic questions were presented throughout the web-based learning unit to confirm their understanding.

Satisfaction, referring to students' interval motivations and reactions to make the learners feel that the skill is useful or beneficial by providing opportunities to use newly acquired knowledge in a real setting. Satisfaction is a category that concentrates on helping learners to feel positive on their achievement.

The conclusion of these motivational objective in the study reminds the researcher not only make the instructional sound, but also make the program interesting and enjoyable.

3.4.2 Implementation of the web-based learning unit 2

3.4.2.1 Ethic consideration

The conduct of this study was approved by Mahidol University Human Research Ethics Committee. The participants of this study were the fourth year nursing students undergoing midwifery practice. They were all told the procedure of this study in which they could withdraw at any time they wanted. All students signed the consent form to participate in this study. The criteria for inclusion in this study were: (1) they understood and agreed with the aims of this study; (2) they had experience in internet use and (3) they expressed a strong commitment to the completion of this study. A randomized experimental design was used in this study. Each student had an equal probability of being selected to minimize bias Socken et al.2005).

3.4.2.2 Participants

The mean of age of 84 fourth year nuring students was 21.82 (SD =.44), ranging from 21- 23 years and grade point average (GPA) was 2.92 ± 3.88. Most participants (96.51%, n = 84) were female; with mean age of 21.50 ± 0.59 years Average time of internet spent per week was 5.10 ± 2.76 hours. The students' experiences in using computer were 7 ± 0.46 years. There was no significant difference in age, grade in maternal-newborn nursing care and midwifery 2, and computer experience between the two groups of students (p>.05).

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3.4.2.3 Study design

The 84 fourth year nursing students in the maternal-new born nursing and midwifery practicum 2 were divided randomly into 2 groups by using students' identity numbers for reducing bias and cross-contamination, the control (A1, n = 42) and the experimental group (A2, n = 42). Midwifery in the nursing school in this study is divided into five subjects: three lectures (maternal-newborn nursing and midwifery 1, 2, and 3) and two practicum (maternal-newborn nursing and midwifery practicum 1, and 2). Intrapartum nursing care in web-based learning unit is partly about maternal-newborn nursing and midwifery practicum 2 that the lecture contents are taught in maternal-newborn nursing and midwifery 2.

After finishing maternal-newborn nursing and midwifery 2 subject for 6 months, the students went on to midwifery practicum 2. This subject provides practices about intrapartum nursing care from admission of pregnant women through postpartum care and risk assessment. Before practicing on the ward, the students were given demonstration on how to conduct normal labour and returned demonstrations of both groups were carried out (Figures 3-25, 3- 26). They practice on the labour ward the following day. The research design was shown in the figure 3-27.

Figure 3-26 Plastic models for demonstration how to conduct normal labour

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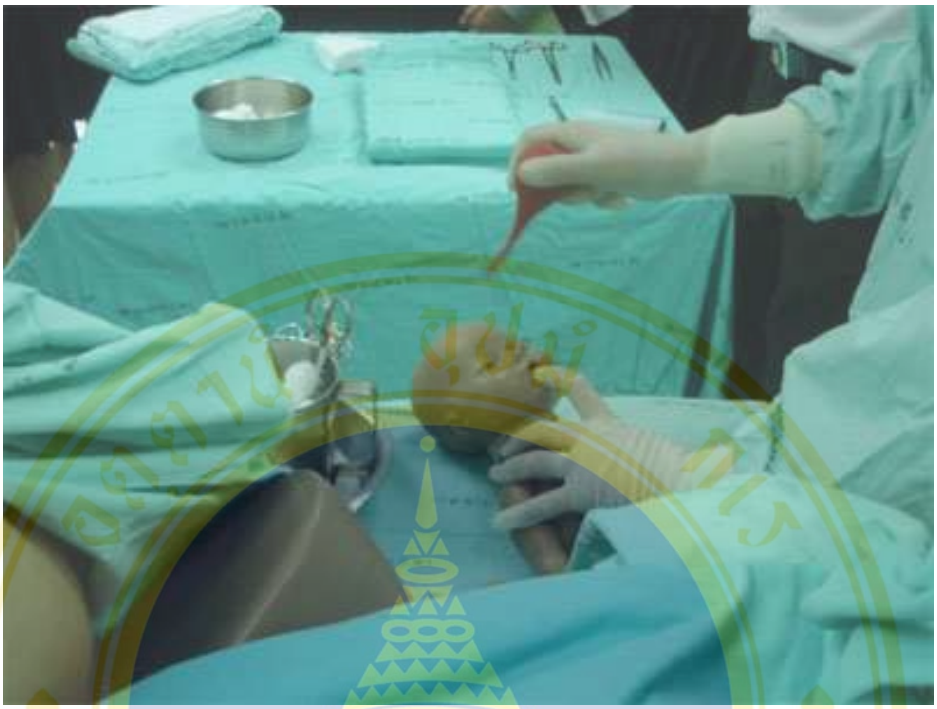

Figure 3-27 Instructor demonstrated how to conduct normal labour for 2 days before practicing on the labour ward

Schedule	Experimental group	Control group
Six weeks before practice	Traditional lecture	Traditional lecture
One week before practice	Learning with web-based learning unit 1week	no treatment
Two days before practice	Received demonstration with plastic model	Received demonstration with plastic model
The first day of practicing	Test on conceptual knowledge	Test on conceptual knowledge
	Test on stress	Test on stress
Practicing (4 weeks)	Learning through web-based learning unit at the end of clinical practice everyday	no treatment
	Observed performance skill during clinical practice	Observed performance skill during clinical practice
Finishing practice	Test on competency	Test on competency
	Assess on students perception on web-based learning	

Figure 3-28 The schematic representation of research design and the flow of process design

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Experimental group

At one week before practice on the labour ward, the authors met with the experimental group. The students were given explanations about the research objectives and all the procedures they have to follow. The experimental group was asked to visit the website for the developed learning unit on intrapartum care for one week. They were taught by the demonstration all the steps needed for the interactive study using websites, and log-in information. After one week, just before practicing on the ward, the students were given the conceptual knowledge test and stress questionnaire. And at the end of the practice, six weeks later (4 weeks on the labour ward and 2 weeks on the high risk ward), the students received the competency test on maternal and newborn care. Perception of the web-based learning questionnaires and opinions from interviews were also assessed.

Control group

The students in the control group did not receive the web-based learning. The students were given an orientation for practicing on the labour ward. Then, the purpose and procedure of this study were explained to them. Similar to experimental group, they were given the test on the conceptual knowledge of nursing care in intrapartum care before practicing on the ward. Then, a questionnaire on stress was given. Six weeks later, the competency test on caring of parturition and newborn was given at the end of the practicing.

3.4.3 Students assessment

3.4.3.1 Data collection

The six instruments for assessment consisted of demographic assessment, knowledge test on web-based learning, performance skills checklist, students' perception of web-based learning, clinical stress, and competency assessment. Demographic assessments describe age, gender, cumulative grade point average, experience of internet usage, and experience of web-based learning.

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Conceptual knowledge test (Appendix B)

The knowledge test consisted of fifteen questions on scenarios about the pregnant woman from the moment she came in to the delivery room with true labour pain through to postpartum care. The conceptual knowledge test was reviewed by three experienced educators to support contents validity by using the item objective congruence (IOC) technique. Average scores from the three experts were ≥ 0.5 for all items. The possible scores ranged from 0 to 15. The test was tried out on 30 fourth-year nursing students. The reliability estimated by using Kuder-Richardson 20 was 0.85, the difficulty and discrimination indices were 0.30-0.89 and 0.25-0.85, respectively.

Performance skill observation checklist (Appendix C)

The performance skill checklist was developed by a maternal newborn nursing and midwifery committee and validated by faculty members from obstetric nursing department. The checklist of fifteen items had been used for more than 10 years and revised every year. Each item was worth four points, ranging from1 to 4. The possible scores ranged from 15 to 60. The average scores from the five instructors supported contents validity by using the item objective congruence (IOC) was 1.00 for all items. These concerned abdominal assessment, diagnosis of true labour pain, progress of labour assessment, delivery of baby and placenta, and fetal apgar score assessment. The performance skills checklist scores in both groups were assessed during students' practice on the labour ward by three faculty members of this nursing school with more than four years of experience.

Students' perception (Appendix F)

The attitudes of nursing students toward intrapartum care on web-based learning method were assessed by a 20 item questionnaire, using a 5 point Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree). The possible scores ranged from 20 to 100. The questionnaire was divided into 3 categories: usefulness of web-based learning (10 items), web design (6 items), and online strategy (4 items). The questionnaire was validated by three experienced instructors. The reliability of this questionnaire showed Cronbach alpha coefficient of 0.86.

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Semi-structured interview (Appendix G)

To identify subtle factors that the quantitative method could not approach, the semi-structured interview was adopted at the end of the course. Ten students were recruited on a volunteer basis after announcement via e-mail. The students were informed that information provided by them would be used to evaluate the web-based learning unit; no students would be individually identified. Each student was interviewed for one hour on her web-based learning experience. At the beginning, they express their own opinion, and then they were asked questions regarding the content, web design, and online strategy. Some excerpt questions were "What are the features in the web-based course that facilitate your learning?" "What do your like or dislike about this web-based learning unit?" "What do you want to change if you could?" etc. All ten students gave consent for audiotaping of the interviews which were transcribed and put into two categories: web-based materials and online strategy.

Competency test (Appendix D)

At the end of the practice, all of the students were assessed by using the competency test. The 10 open-ended questions were developed and revised by 5-members of the nursing obstetrics committee. The test composed of three parts: conducting the normal labour, delivery of the placenta, and immediate newborn nursing care. The possible scores were 0- 30.

Stress test (Appendix E)

According to Spielberger (1970), stress is a psychological and physical response to a threat to self-concept characterized by subjective, consciously perceived feelings of tension. The stress due to deficient of knowledge questionnaire in this study developed from clinical stress questionnaire modified by Tunkoon (1998) that was developed from part of Occupational Stress Indicator: OSI (Cooper et al., 1998). The questionnaire consisted of 27 items on psychological that divide into 2 sections; 12 clinical stress and 15 ignorance stress items and 13 items described physical healths that are stressful on the labour clinical ward of nursing students. A 6-point Likert scale was used for each item to measure the intensity of nursing students' stress ranging from 1 (not stressed) to 6 (very stressed). The possible score was 40 - 240. The total score was divided by using percentile; lower than 25 percentile is

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minimal stress (range 40-103 scores), range 25 to 75 percentile is moderate stress (range 104-123 scores) and higher than 75 percentile is defined as high stress (more than 123 scores). This questionnaire was revised by three instructors to support content validity. It was tried out on 30 students. The reliability of this questionnaire showed a Cronbach alpha coefficient of 0.86.

3.4.3.2 Data analysis

Data were analyzed using the Statistical Package for the Social Science (SPSS) version 11.5 for windows. The level of significance was set at .05 for all tests. The descriptive statistic was used to describe students' demographic data. The independent t-test was used to compare the demographic data, conceptual knowledge score, ignorance stress scores, performance skill scores and competency scores between both groups. The Pearson product-moment correlation coefficient was used to measure the relationships among the performance skill scores and conceptual knowledge score, and ignorance stress scores, and competency scores and satisfaction score, and the access time of web-based learning unit score.

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CHAPTER IV
RESULTS

4.1 Overview of the Chapter

The randomized research was conducted to determine the effect of two units of web-based learning: process and mechanism of labour and intrapartum nursing. The findings from unit1 were presented in tables and descriptive data as follows: factual knowledge test scores and perceptions' of nursing students on web-based learning test scores. The result in unit 2 were also present in the same manner of previous unit as follow: conceptual knowledge test score, performance skill observation scores, competency scores, perceptions' of nursing students on web-based learning test scores, and stress scores. The results on attitude of students toward web-based learning were also described.

4.2 Unit 1: Web-based learning unit on process and mechanism of labour

4.2.1 Factual knowledge test on process and mechanism of labour

The results in table 4.1 show no significant difference in the pretest score on the factual knowledge between the control (41.44±5.00) and experimental groups (42.95±4.88). However, the posttest scores in the experimental group (51.00 ± 3.34) were significantly higher than those in the control group (41.70 ± 5.56)

The pretest and posttest scores in each chapter between control and experimental groups are shown in Table 4-1. In chapter 1 (introductory part) there was no significant difference in posttest scores between the experimental and control groups. However, the means of posttest score of chapter 2 (factors affecting process of

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labour) was significantly higher in the experimental group when compared to the control group. Similar results were found in chapter 3 (mechanism of labour).

Table 4-1 Comparison of the mean of factual knowledge test on mechanism of labour web- based learning between Pretest and Posttest by t-test

	Control (n = 43)		Experiment (n=42)		t value
	$\bar{x}$	SD	$\bar{x}$	SD	
Pretest	41.44	5.00	42.95	4.88	-0.267[ns]
Chapter 1	3.00	.96	2.86	.87	-1.016[ns]
Chapter 2	15.77	2.20	16.67	2.87	-.101[ns]
Chapter 3	21.9	13.48	22.67	2.83	1.804[ns]
Posttest	41.70	5.56	51.00	3.34	-0.937**
Chapter 1	3.18	.79	3.17	1.06	-1.619[ns]
Chapter 2	15.81	2.63	19.93	1.70	-8.699**
Chapter 3	23.12	4.18	27.62	1.99	-14.185**

[ns] no significant difference, ** $p < .001$

4.2.2 Students' perception of web-based learning unit on process and mechanism of labour

The web-based learning unit was evaluated for three attributes, i.e., usefulness, web design, and online strategy (Table 4-2). The results from 42 students showed a mean score of 88.53±7.01, indicating high satisfaction of the students and good quality of the web-based learning medium.

The students found the web-based learning unit useful and cover all objective (4.40±.63). It enabled them to grasp the main concepts of the processes and mechanisms of labour (4.62±.54). Animated and colored pictures could effectively and briefly demonstrate the processes and mechanism of labour by transforming the abstract content into concrete images (4.62±.66) and appropriate to the level of students (4.48±.55). Additionally, quizzes and exercises assisted them to review the content and to assess themselves for knowledge development (4.45±.55). The results suggested that the students perceived the web-based learning unit as a useful tool.

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Table 4-2 Minimum scores, maximum scores mean, and standard deviation, of students' perception of the web-based learning unit

Attributes	min	max	mean	SD
Usefulness (10 questions)	**35.00**	**50.00**	**44.93**	**3.82**
1. interesting contents	3	5	4.33	.53
2. covering all objectives	2	5	4.40	.63
3. well-matched with the course	4	5	4.60	.50
4. sufficient information	4	5	4.45	.50
5. clear and accurate explanation	3	5	4.62	.54
6. appropriate pictures and animations	3	5	4.48	.55
7. contents support learning	2	5	4.62	.66
8. contents appropriate to students	3	5	4.48	.55
9. sufficient periodic quizzes and exercises	3	5	4.45	.55
10. relevant feedbacks to assist students' understanding.	4	5	4.50	.51
Web-based design (6 questions)	**22.00**	**30.00**	**26.71**	**2.49**
11 appropriate length of each presentation	3	5	4.33	.61
12 easy navigation and following	3	5	4.50	.60
13 eye-catching screen	3	5	4.55	.55
14 well visual clarity	4	5	4.60	.50
15 appropriate font size and easy to read	3	5	4.43	.55
16 attractive colorful pictures, animations, graphics, and precise content.	3	5	4.31	.52
Online strategy (4 questions)	**11.00**	**20.00**	**16.89**	**2.16**
17. preference for learning via web-base learning	3	5	4.31	.56
18. preference for learning via web-base learning more than reading textbooks	3	5	4.12	.71
19 preference on learning from internet	3	5	4.12	.63
20 replacement traditional lecture with web-based learning method.	2	5	4.33	.69
Total	**68.00**	**100**	**88.53**	**7.1**

Regarding web-based design, most students indicated that the developed unit was appropriately designed, and the content in each chapter was not excessive (4.33±.61). It was easy to navigate and follow (4.50±.60). Each screen designed to orient the learner's attention (4.60±.50). The features in terms of voice, font, color, animation, and graphics were of high quality (4.31±.52). It was perceived as an appropriate tool for students' learning process.

Most students agreed that the web-based learning unit was appropriate for online learning (4.31±.56). The students preferred the web-based course when compared to textbooks (4.12±.71). Some students suggested it should replace the traditional teaching in the near future (4.33± .69).

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As for accessibility to data, four students sent e-mail to inquire about inaccessibility. Ten students used the provided web-board to discuss the given question. The average access time of each student was 3.62±1.69 hours (range 0.33 - 8.17 hours).

4.2.3 Correlation between posttest scores, students' perception and website access time

The Pearson product-moment correlation coefficient was used to measure the relationship between posttest score with website access time, and satisfaction scores. The results on correlation between web site access time, satisfaction score and posttest score are shown in table 4-3. The posttest scores was statistically correlated with those of the web site access time (r =.777, p <.001) and the satisfaction scores (r=.828, p <.001). In addition, the web site access time was statistically correlated with those of the satisfaction scores (r =.726, p <.001).

Table 4-3 Correlation between posttest scores and perception scores, and the web-based learning access time

	Access time	Posttest scores	perception scores
access time	1.000		
Posttest scores	.777**	1.000	
Perception scores	.756**	.828**	1.000

** *P< .01*

4.2.4 Students' interviews on web-based learning unit on process and mechanism of labour

Most of the students felt that the content of web-based materials was appropriate:

"*The website has sufficient content and gives additional information on web sites that I may further explore. It is a reliable support for my learning process. I will use it again for national council licensing examination for registered nurses.*"

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However, there was a negative comment on the amount of content that *"It contains too much content*."

Pictures and animations part of the web-based medium attracted attention and increase understanding as shown in the following excerpt:

"*I like the colored pictures and the animations because they help my understanding more than just reading from the textbooks*."

Most of the students enjoyed doing the quizzes and exercises due to the interactive feature as well as freedom to repeat as many as wished:

"*I enjoy doing the interactive quizzes and exercises and I like the idea of being able to do them again and again*

Concerning the online strategy, the students preferred the flexibility in time and space. The positive attitudes include:

"*It is a very useful learning method and I would like to see it in other subjects. I like this online learning unit because I can study at home, at any time*."

However, there were a few complaints on of lack of knowhow for using the web-board.

"*I don't like to discuss and ask questions on the web because I may not get the feedbacks. I may not get the exact answers*."

There was also a comment on inadequate instruction, i.e.,

"*A detailed instruction on how to use the web-board should be included*."

4.3 Unit 2: web-based learning on intrapartum nursing care

4.3.1 Conceptual knowledge test

The experimental group received supplementation with web-based learning one week before taking up this test on the first day of practice on the labour ward. As shown in table 4-4, the conceptual knowledge mean in the control group and experimental group were 8.88±1.35 and 11.14±2.1 respectively. There was a significant difference in the conceptual knowledge score between the two groups (t=-6.11, df=82). The item for which the experimental group have higher score than control group were in the order of the cardinal mechanism of labour, sign of placenta

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separation, things to be done in case the nuchal cord is around the neck of the fetus, oxytocin toxicity, timing of episiotomy, conducting the baby's head, and newborn nursing care.

Table 4-4 Comparison of the mean of conceptual knowledge scores on web- based learning between control and experimental groups by t-test

Group	Control (n = 42)		Experiment (n=42)		t value
	$\bar{x}$	SD	$\bar{x}$	SD	
Conceptual Knowledge	8.88	1.35	11.14	2.1	-6.11***

*** $p < 0.001$

4.3.2 Performance skills test scores

The total observation checklist composed of 15 items that were observed when the students conducted normal labour from parturient woman assessment through two hours postpartum care. The possible scores were from 15-60. Because all students did not do all the assessment items observed by each instructor, thus, the scores were pooled and convert later into grades: The highest score was 4. The means scores of the experimental group (3.33 ± .28) were significantly higher than those of control group (3.17 ± .29) (Table 4-5).

Table 4-5 Comparison of the mean of performance skill of nursing students' scores by t-test

Group	Control (n = 42)		Experiment (n=42)		t value
	$\bar{x}$	SD	$\bar{x}$	SD	
Performance skill score	3.17	.29	3.33	.28	-2.41**

** $p < 0.01$

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4.3.3 Competency test score

The competency scores ranged from 0-30. The mean scores in the control and experimental group were 24.83 ±=.36 and 23.90±=.44 respectively (Table 4-6).

Table 4-6 Comparison of the mean of three attributes of competency score (n = 84)

Activity	Control (n = 42)		experiment (n=42)		t value
	$\bar{x}$	SD	$\bar{x}$	SD	
Competency score	**24.83**	**.36**	**23.90**	**.44**	**1.63** ^{ns}
Normal labour	8.01	1.54	8.09	1.78	.608 ^{ns}
Placenta delivery	8.20	1.53	8.94	1.38	.000**
Newborn nursing care	7.98	1.09	7.55	1.55	.147 ^{ns}

^{ns} P > 0.5, ** *p <.001*

There was no significant difference in total mean scores between the two groups (t= 1.63, df = 2, p= .106). For competency in conducting normal labour, the mean scores of control group and experimental group were 8.01±1.54 and 8.09±1.78 respectively. The mean score of control group was not significantly lower than that of the experimental group (t=3.02. df=82, p=.608). In the competency on placenta delivery, the mean score in the experimental group (8.94±1.38) was significantly higher than that of control group (8.20±1.53), (t= -2.08, df=82, p= .000). In the item on newborn nursing care, there was no significant difference in the scores of control (7.98 ±.09) and experimental group (7.55 ±1.55), (t= -.15, df=82, p= .147).

4.3.4 Students' perception

The students' perception of intrapartum care web-based learning unit was evaluated by using the questionnaire which was categorized into three attributes, i.e., usefulness, web design, and online strategy (Table 4-7).

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Table 4-7 Minimum scores, maximum score, mean, and standard deviation of students' perception of the web-based learning unit 2

Attributes	min	max	mean	SD
Usefulness (10 questions)	**39.00**	**50.00**	**46.48**	**2.69**
1. interesting contents	3	5	4.33	.53
2. covering all objectives	2	5	4.40	.63
3. well-matched with the course	4	5	4.60	.50
4. sufficient information	4	5	4.45	.50
5. clear and accurate explanation	3	5	4.62	.54
6. appropriate pictures and animations	3	5	4.48	.55
7. contents support learning	2	5	4.62	.66
8. contents appropriate to students	3	5	4.48	.55
9. sufficient periodic quizzes and exercises	3	5	4.45	.55
10. relevant feedbacks to assist students' understanding.	4	5	4.50	.51
Web-based design (6 questions)	**22.00**	**30.00**	**27.67**	**2.24**
11 appropriate length of each presentation	3	5	4.33	.61
12 easy navigation and following	3	5	4.50	.61
13 eye-catching screen	3	5	4.55	.55
14 well visual clarity	4	5	4.60	.50
15 appropriate font size and easy to read	3	5	4.43	.55
16 attractive colorful pictures, animations, graphics, and precise content.	3	5	4.31	.52
Online strategy (4 questions)	**12.00**	**20.00**	**17.00**	**1.95**
17. preference for learning via web-base learning	3	5	4.31	.56
18. preference for learning via web-base learning more than reading textbooks	3	5	4.12	.71
19 preference on learning from internet	3	5	4.12	.63
20 replacement traditional lecture with web-based learning method.	2	5	4.33	.69
Total	**73.00**	**100.00**	**91.15**	**2.35**

In terms of usefulness; when consider each item, the students could simply gain knowledge from the web-media provided (4.45±.50). The web-based course enabled them to understand the main concept of the intrapartum care (4.62 ± .66) and appropriate to the level of students(4.48±.55). Animation and colorful pictures could effectively demonstrate the intrapartum care in brief by converting abstract contents into something more concrete (4.48±.55). Additionally, quizzes and exercises assisted them to review the contents and to assess themselves in terms of knowledge development (4.45±.55). The results suggested that the students perceived web-based learning as a useful method. The perception of being useful was important for students' confidence. At the end of the study, students report more confidence in their knowledge and their sense of confidence grew stronger.

In terms of web-based design, most students pointed out that the developed media tool was appropriately designed, and the content in each chapter did not exceed

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the learning limit (4.33±.61). It was easy to navigate and follow (4.50± .61). Each screen designed to orient the learner's attention (4.55±.55). The features in terms of voice, font, color, animation, and graphics were of high quality (4.31± .52). The developed web-based media was perceived as an appropriate tool for students' learning process.

In terms of on-line strategy, most students agreed that the web-based learning was appropriate for online learning as high scores were rated (4.31± .56). The students preferred web-based learning when compared to textbooks (4.12 ± .71). Some students suggested that traditional teaching should be replaced by web-based learning in the near future (4.33± .69).

4.3.5 Semi-structured interview

From interviews, the students emphasized the benefit of interactive features that it could explain what happens in the uterus. Learning from the web-based unit was easier and more understandable than learning from a textbook.

"I like the colored pictures, animations and videos because they help my understanding more than just reading from the textbooks."

All students indicated that the pictures and animations could explain from the physiological point of view about what happens in the uterus. The video clips could demonstrate the real situation that they would face on the ward. They could see blood, sequence of head, shoulder and trunk appearance, and baby crying as if they were real.

"I think I know the steps of conduct normal labour when I practiced with plastic model, but when I leave the class I forgot everything, the web help me very much."

The web-based unit could help them recognize several steps of the procedure, for example, physical assessment, abdominal assessment, vaginal assessment, the pregnant and deliver preparing and postpartum uterus massage and etc. The students expressed that it was better than learning based on only lecture and plastic model demonstration because the web-based unit showed real situations, and they could use repeatedly.

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"I do not like the plastic model because in the web-based unit I can see the real situation including blood, learning with plastic model does not provide real environment."

"Plastic model help me to recognize step of procedure, but not the real situation, in addition, the web help me to prepare the mood of exciting before practice"

Some students did like the interactive content in this web-based unit because it explained from the admission care through the postpartum care.

The web-base covered all content I have to learn before practicing on ward, I like animation and video such as APGAR score assessment it is very enjoy and useful. .

This web-based learning unit could also reduce the stress from practice because it helped students prepare themselves before real practice on the ward.

"It help me to review the contents and many procedures, it makes me more confidence than reading only textbook."

"I have more confidence with the web-based course, because I think I had prepared myself both in knowledge and procedure."

It enabled me to learn a lot.

Nevertheless, a few students said that they did not like e-learning because they did not know which part of the content the instructors would like to focus.

"There are many contents; I don't know which parts I should learn, so I just only learn from video, animation, and exercise, which are the parts that I like very much".

Moreover, some students did not like to ask questions via the web-board; they preferred the face-to-face situation to obtain immediate feedback.

"The teacher is an expert; I think I like to learn with them"

Most importantly, some students need supports on computer skills. The students also need support from the faculty for internet connection.

"It is very disappointed that the internet connection and download are very slow. The faculty should more provide internet sets and time at resource center.

Even though some students prefer to learn from the web-based unit, but they do not like to communicate via web-board due to limitations in typing skills.

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"I am not good at typing and I don't like to type, it takes a lot of time"

However, some students seem to like discussion on web broad

"I felt the discussion board could have been more useful, I think I use it to answer the questions instead of discussing"

4.3.6 Stress

The questionnaire on stress test consisted of two parts: psychological stress due to knowledge deficiency and physical stress before practice (Table 4-8). The mean stress score of the students in these groups were at a moderate level (114.46±14.10) (see methodology: stress test). As shown in table 4-8. The mean score for the control (119.67 ±14.90) was significant higher than those in the experimental group (109.26±12.78) (t = 3.62, df = 82, p = .001). for the all items on the stress test. When consider the psychological stress which composed of clinical stress and ignorance stress, the psychological stress score (the possible score was 27-162) in the control group (84.64±4.71) was significantly different from those of the experimental group (82.31±5.38) (t = 2.11, df = 82, p = .04). In the item on clinical stress, there was no significant difference in the scores of control (37.17±3.13) and experimental group (36.29±3.50), (t= 1.22, df=82, p= .80). However, the ignorance stress score (the possible score was 15-90) in the control group (47.48±3.06) was significantly different from those in the experimental group (46.02±2.85), (t = .25, df = 82, p = .03). For physical stress, the score in the control and experimental groups were 28.67 ±8.79 and 27.89 ±8.22 (the possible score was 13-78). There was no significant difference between the two groups (t = .42, dF = 82, P = 0.67).

Table 4-8 Comparison of the mean test scores of stress before practice between the control and experimental groups by t-test

Group	Control (n = 42)		Experiment (n=42)		t value
	$\bar{x}$	SD	$\bar{x}$	SD	
Stress score	**119.67**	**14.90)**	**109.26**	**12.78**	**3.62 ****
Psychological stress (27 items)	84.64	4.71	82.31	5.38	2.11*
Clinical stress (12 items)	37.17	3.13	36.29	3.50	1.22 ns
Ignorance stress (15 items)	47.48	3.06	46.02	2.85	.25*
Physical stress (13 items)	28.67	8.79	27.89	8.22	.42 ns

ns no significant difference, ***p <.01*, **p <.05*

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The following are examples from some items that students chose in the stress test

"I know how to conduct normal labour, so I am not stressed"

"*I have enough knowledge that I could pass this course, so I am not stressed*" and "*I am not stressed when I practice at this ward"*

"I know how to take care the pregnant women in each stage of labour, thus I feel more confidence in my work"

"I can nicely adapt myself when I practice at labour room"

"I know how to prepare tools and instruments, so I am not stressed"

4.3.7 Correlation between conceptual knowledge score, performance skill score, competency score, stress test scores, students' perception, and website access time

The Pearson product-moment correlation coefficient was used to measure the relationship between performance skill scores, conceptual knowledge scores, stress scores, website access time, competency scores, and satisfaction scores. The results on correlation are shown in table 4-9. The performance skill scores was statistically correlated with those of the web site access time (r =.88, p <.001), satisfaction scores (r=.324, p <.001), conceptual knowledge(r =.45, p <.01), and competency scores (r =.36, p <.05) In addition, the web site access time was statistically correlated with those of the satisfaction scores (r =.324, p <.05), but not with the stress score (r =.-.048, p=.76).

Table 4-9 Correlation between conceptual knowledge score, performance skill score, competency score, stress scores, students' perception, and website access time (n=42)

	1	2	3	4	5	6
1conceptual score	1					
2 Performance	.415**	1				
3 Competency score	.032	.357*	1.			
4 Stress	-.314*	-.048	.204	1		
5 Perception score	-.066	.324*	.050	.044	1	
6 Website access time	.439**	.877**	.240	-.017	.328*	1

* p < 0.05

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CHAPTER V
DISCUSSION

5.1 Overview of the Chapter

This chapter aimed to discuss the effects of two web-based learning units, i. e., process and mechanism of labour, and intrapartum nursing care on knowledge, skills, and competencies of the nursing students. The attitude of nursing students on the two web-based learning units was also described.

5.2 Unit 1:Effects of the web-based learning unit on the process and mechanism of labour on knowledge of nursing students

Results from this study revealed that supplementation of a web-based learning to the traditional lecture improved of nursing students' factual knowledge on factors affecting the process and mechanism of labour. The posttest scores of the students who received web-based learning in combination with the lectures were significantly higher than those who received only lectures. This finding suggested that supplementation of a web-based learning can be utilized as a tool to ensure understanding of the nursing students. This might be due to both the interactive feature and the integration of 5Es model into the multimedia which attracted and engaged students to maintain their interests in continuous learning. The graphics and animations in this study help clarifying the content and promote understanding of the complexity on the process and mechanism of labour. This finding is in consistent with that of Rouse (2000) who supplemented the computer assistant instruction in congenital heart disease to traditional lecture.

The finding of no significant difference in the posttest scores in chapter 1, but not chapter 2 and 3, between the control and experimental groups may be due to the fact that some contents of chapter 1 had already been taught in physiology and

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maternity subject. Additionally, the questions in the factual knowledge test were on cognitive domain level. Thus studying from textbooks either with or without supplementing with web-based learning gave the same outcomes. This finding was similar to those of Buckley (2003) which showed no significant difference in knowledge retention between web-based learning group and lecture-based learning.

On the contrary, the contents in chapters 2 and 3 were specifically on midwifery knowledge which were new and rather abstracts for the nursing students. Studying only from textbooks might not be enough, since the students have to use imagination on what happen inside the uterus. Moreover, each student came out with different interpretations depending on her prior knowledge as well as misconception. This is in accordance with the principle of cognitive learning theory, that each person perceives, interprets, and respond to any situation in her/his ways (Braungart & Braungart, 2003) However, animation on certain topic such as mechanism of labour and separation of placenta from the uterus can display continuously frame-by-frame like the real situation. Moreover, video clip on some topic as early breast feeding, allow students to see an expression of eyes contact between mother and her baby. This was similar to the finding of Ribbon (1998) that the use of clinical picture, animation, and video on the multimedia was the popular part of the materials that textbooks and lecture notes could not facilitate. The concise understanding of the principles and concepts have led the students to construct their own concept and enhanced retaining of more substantial knowledge retention.

In addition, the tests in chapters 2 and 3 in this web-based learning unit 1 were mostly on comprehensive and application domain levels. The questions involved the scenarios in which the students had to think, understand, and analyze before making decision and thus resulting in a better understanding. This was similar to the finding of Sandstrom (2006) that the integrated case study, liked scenario, in a part of classroom time, could promote critical thinking. The correlation between the knowledge application ability and problem-solving ability was found to be high when the questions required high-ordered thinking.

However, the significantly higher posttest result of factual knowledge in the experimental group may not be attributable to solely the content of the web-based learning unit but also from other sources. Results from the interview indicated that

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there were some students also dug deeper into other websites from links given in our web- based learning unit. In addition, learning from our unit may facilitate their reading of textbooks making for higher scores.

Most students in the experimental group were satisfied with their web-based learning experiences. The correlation between the posttest scores and time spent on the web-based learning and the satisfaction scores suggested that the web-based learning help increasing students' conceptual understanding especially for those who liked the web and accessed it more often than others. The positive results on attitude test which were supported by the interviews in this study were congruent with the studies of Kenny (2002) and Jang (2005) that the well designed web-based learning could facilitate students learning. However, the challenge in this study seemed to be the lack of computer experience of nursing students, compared to students in other fields who have more privileged than. Only 10 out of 42 students discussed on provided web-board, due to unfamiliarity with the use of web board as complained by some students. This is not surprising, since Creedy et al. (2007) suggested that increased the proportion of IT skill in nursing students was important, and such skill should be obtained early in a program of study. Some students reported the draw back of online learning that it is unable to give immediate feedback compared to that of the traditional method. This is in contrast to the result of Buckley's (2005) that students reported the effectiveness and joyfulness of discussion by using web-board. This may be partly explained by the difference in culture and style of learning as well as lack of computer skills of the Thai nursing students. Thus, students' preparation for e-learning is very important as supported by the study of O'Neil and Fisher (2008) that a lack of technology and computer experience is a barrier to success in an online course. The nursing students in this study preferred the web-based learning as a supplementary to the existing course rather than replacing the traditional course.

Whilst there is limited empirical evidence to support clinical practice, despite the increasing number nursing students and limited number of instructors, web based learning is seen as a potential method to promote understanding and retaining of conceptual knowledge. The web based learning that engaged the learner in activity, is an approach method for teaching and learning and reducing risk of accidence on clinical practice.

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5.3 Unit 2: Effects of the web-based learning unit on intrapartum nursing care on knowledge, skills, competencies and stress reduction of nursing students

This intrapartum care web-based learning unit was employed for nursing students to retrieve the content given in the traditional lecture on intrapartum care for six months before practicing on the labour ward. This study was to determine the effect of intrapartum web–based learning method on conceptual knowledge, performance skills, and competency scores. It also evaluated how it could reduce the ignorance stress of nursing students. Finally, the attitude toward web-based learning was examined and interviewed. The results from the conceptual knowledge test, and performance skills showed that the experimental group, supplemented with the web-based learning unit, had significantly higher scores. This may be due to the fact that the contents in the web-based learning, related to the content taught in lecture, were so condensed with important subject matters that students could learn in a short time and students could utilize to apply with the patients. Integrated of 5Es and Keller's ARCS motivation theory could engage and capture the interested of nursing students to review their prior knowledge and construct their related new contents of a subject domain as they arise naturally in problem situations by using Explore, Explain, Extend, and Evaluate on their progress. Therefore, the students in experimental group could answer the scenario questions form diagnostic true labour pain through postpartum care than those in the control group. The results in this study support the finding of Reims et al (2008) that an e-learning unit with good design, academic content, and integrated tests motivates learning and yields outcomes compared to a traditional lecture method.

The result from the stress test on the first day of clinical practice showed that the experimental group had a moderate level of stress and had significant lower scores than those of control group. This was in accordance with the study of Tunkoon (2002) and Namakanham (2004) who found that Thai students had moderate score level of stress. However this finding was not consistent with Sulman and Halbai (2007) that the state anxiety of Jordanian nursing students was at the high level. Nevertheless, stress does not only have negative effects but also positive ones. The

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effects of stress depend on the adequacy coping behaviours. (Jalowice, 1988) In this study, the students may be appraised for moderate stress of clinical practice as a challenge that they could control clinical practice by seeking information. This is supported by the number access to the web-based learning in the experimental group from 1-12 (mean = 7.76±24) and duration of 10 minutes to 1.54 hours (mean = 42.37±1.45 minutes). This finding showed that the students used the confrontive coping behaviour that generally regarded as effective and necessary when dealing with the problems by more learning the intrapartum care content in web-based learning. The ignorance stress score of the control group was significant higher than that of the experimental group. This result may be explained by anticipation of stress in students experience cognitive deficits that lead to misinterpretation of information or blocking of memory and recall. Additional, the stress score in the experimental group has negative correlation with conceptual knowledge. The students empowered with web-based learning unit could retrieve and clarify the prior knowledge before practice on the ward. Therefore they had adequate intrapartum care knowledge and resulting in less stress before practice on real patients.

The principle and concepts of midwifery practice are knowledge application and skill development. The clinical practice included case assignment for attending and conducting normal labour, clinical conference on cases, and nursing round on parturient women. These strategies provide meaningful learning experience and excellent opportunity for students to bridge the gap between theory and practice (Carlott et al., 2003). Thus, the students must be proficient in both conceptual knowledge and steps of procedure. When the performance skill is considered, the results showed that supplementing with web-based learning unit for 1 week before and during clinical practice on ward resulted in increasing performance skill scores compared to the control group. Web-based learning unit accumulated contents of obstetric nursing and synthesized in the form of multimedia such as the animation of abdominal palpation, the full bladder obstructing progress of labour and the graphic display of the stages of labour. Video clips also demonstrated physical assessment, vaginal examination, breathing relaxation and step to conduct normal labour. In addition, the video clips show steps of conducting normal labour from preparing parturient women to go through episiotomy repair. Some forms of animation were

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used to explain the physiology that the students should deeply understand such as placental separation, each type of placenta delivery and cause of postpartum haemorrhage. Lee et al. (2007) reported that students taught using e-learning clinical skills package performed better than the control group taught by using traditional methods. When interviewed students stated that the web not only helped them gain the knowledge rapidly but also helped them remember steps of various procedures. Furthermore they could study the procedure as many times as they wanted. This is consistent with the study of Gerdprasert et al. (available on line). The conduct normal labour is naturalization of psychomotor level (Billing & Halstead, 2005). The skill performance demonstrated professional competency in that it is automatic with good coordination. Thus, the students should utilize knowledge and steps of conduct normal labour immediately. The feature in web-based learning unit could facilitate the process that they needed. Thus, when determining correlation between conceptual knowledge and performance skills, there was a positive correlation.

The faculty had oriented students to the mechanism of labour and steps of normal labour by using plastic model in the resource centre of the university. However, when interviewed about the students' learning with plastic model with web-based learning, they stated that plastic model helped them rehearsed two times only. This included the steps of scrub perineum through placenta delivery, but they were not realistic enough. The models were made of hard plastic, not slippery, as what they saw in the web which was the real situation. Furthermore, the students could not rehearse on them again because of time constraint. Sit et al. (2005) explored the view of post registration students on online learning that the students reported positive attitude for convenience, its allowing them to study at their own pace and time. Web–based learning helps them greatly, especially in the steps of many procedures when they had to conduct for the first time and they made mistake. If they wanted to correct them they would assess the web again, the web-based unit helped them greatly. This was supported by the positive correlation between performance scores and the number of time the web-based unit was accessed.

In this web-based learning, the use of periodic formative assessments helped students in their thinking and explaining. For example, the "stop and think!" section was designed to help learners think back to what they had learned in previous

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contents and how their prior knowledge was related to current topics. Additionally, the immediate feedback could provide students with modification and refinement of thinking, thus, when they faced the same situation on the ward, they could solve those problems, such as how to do when head of baby born entangled with the nuchal cord. This is consistent with the study of Tait et al. (2008), which developed a critical care e-learning scenario for nursing student and found that students had a strong and positive attitude to the case scenarios.

When considering the correlation between performance skill, access time, conceptual knowledge, competency, and satisfaction score, performance skill had positive correlation with others except stress score. The stress in the clinical practice was not only due to the lack of knowledge but also environment on the ward, the urgent situation, and close observation of instructors, and other staff (Pryjmachuk et al., 2008). As reflected from students' interview, they indicated that although they had prepared knowledge, they were still nervous because it was their first time to conduct normal labour. Although they knew the general steps of the normal labour, what happens in each case is not predictable. They reported that, "*I am very nervous because the lives of the mother and the baby are in my hands. I am happy when I hear the baby cry*". This is consistent with the study of Burnard et al. (2007), which found that the students had various kinds of stress, for example, stress on their status as students, stress in the clinical setting, interaction with other nurses, doctors and even with patients. Namakunkhum et al. (2004) studied factors inducing stress during nursing practice in fourth year nursing students in Chaingmai hospital nursing school of Thailand, they found that stress was related to supervisors' characteristics, the type of practice and patient care, personals and staffs' characteristics practicing place, and students' personality. In contrast, some students reported their nervousness before they practice, but once they could conduct normally; the stress is reduced to a half.

The result of the test after finishing clinical practice or competency test was evaluated by essay questions knowledge. Questions were entirely related to clinical practice. They consisted of three parts: conduct normal labour, delivery of the placenta, and immediate care for the newborn. Mean test scores between the experimental and control group were not significantly different in this study. This may be explained in two ways. Firstly, the clinical practice is the best place where the

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students synthesize the knowledge gained in the classroom and apply it to practical situations (Schim & Scher, 2002). Secondly, the knowledge and performance skill acquired from clinical conference, clinical round, and clinical practice in six weeks might be enough to establish the same psychomotor skills in two groups. Therefore, these competency scores were not only gained from the additional web-based learning but also the clinical practice may also play an important role in obtaining competency scores. This was supported by positive correlation between competency scores and performance skills. Additional, the result showed that only placenta delivery competency of the experimental group was significantly higher than those of control group. This is because normal labour and newborn nursing care competencies could acquire during clinical practice but the contents related placenta delivery, students have to answer many questions during did this procedure such as sign of placenta separation. Thus, the web-based learning supplementation group could answer questions more than those in traditional group.

Students' perceptions of quality of the web-based learning unit were rated high. In a similar finding of other studies, students most frequently reported satisfaction with web-based learning was its flexibility in learning, where students were able to study at their own pace and at the time convenient to them (Gerdprasert et al., available on line). They agreed that web-based learning was useful, academic design, relevant to the course, easy, and friendly to use. An addition it provided an opportunity for students to acquire knowledge, and skill to take care of pregnant women before and during practice on the labour ward. This was supported by the time that they accessed the web in 6 weeks about 1-12 times (mean = 8) and there was a positive correlation between satisfaction and the web access time.

However, some students disliked this learning method. They cited lack of computer support and typing skill. They preferred face-to-face learning method because they could ask question and received feed back immediately. Some students indicated that they did not know which parts of the content in the web were stated. This finding is similar to the study of Horiuchi et al. (2009), also found that students in the web-based groups' comments on discomfort with the lack of direct faculty contact during learning. Students reported feeling anxious and worried whether or not their knowledge was correct. Students in the face-to-face group appreciated the actual

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presence of the faculty which provided an atmosphere in which they could acquire the key points from an expert.

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CHAPTER VI
CONCLUSION

6.1 Overview of the Chapter

This chapter summarizes a process for developing, implementing and evaluating of two web-based learning units on process and mechanism of labour, and intrapartum nursing care. The findings on knowledge, conceptual knowledge, performance skills, competency scores, and stress scores were reported. The limitations of the study were also described.

6.2 Conclusion of the study

This study aimed at development of web-based learning units in process and mechanism of labour and intrapartum nursing care for nursing students. The 5Es model and the Keller's ARCS Model of Motivational Design (Keller, 1987) are employed to frame the development of this present study. This study was a randomized research to determine the effects of two newly developed web-based learning units on nursing students' achievement: factual knowledge, on conceptual knowledge, performance skills, competency and stress. Nursing students have positive attitude toward the two web-based learning modules. The conduct of this study was approved by Mahidol University Human Research Ethics Committee. All students have signed the consent to participate in this study.

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6.3 Unit 1: Process and mechanism of labour web-based learning unit

The main objective of this web-based learning is to help students acquire factual knowledge of factors that effected mechanism of labour. The mechanism of labour web-based learning unit was developed based on the constructivism learning theory and 5 Es learning cycle. It was composed of three chapters: 1 introductory, 2. factors affecting process of labour, and 3. mechanism of labour. The study was summarized as follows:

1. The participants of this study were 85 third year nursing students undergoing midwifery practice. They were divided into control group (43) which received traditional lecture and tutorial and an experimental group (42) in which the traditional lecture and tutorial was supplemented with the web-based learning unit.

2. Most participants (97.6%, n = 85) were female; with mean age of 21.50 ± 0.59 years and grade point average (GPA) of 2.87 ± 0.33. The students' experience in using internet was 3 ± 0.46 years. The average time of internet spent per week was 4.75 ± 2.27 hours. There was no significant difference in age, GPA, and computer experience between the two groups ($p>.05$).

3. Lectures and tutorial on factors affecting labour (2 hours) and the process and mechanism of labour (2 hours) were delivered to both groups by the same instructors. After finishing the course, the control and experimental group received pretest of mechanism of labour (58 items) for 1 hour. Then, the experimental group was supplemented with the web-based learning unit for two weeks. At the end of web-based learning, the posttest was used to evaluate the two groups of the students. Additional, an attitude test and a 60-minute semi-structured interview on 10 randomly selected students was conducted.

4. The results showed that the posttest scores in the experimental group were significantly higher than those in the control group. Upon considering each chapter, there was no significant difference in posttest scores between the experimental and control groups in chapter one. However, the means of posttest score of chapters two and three were significantly higher in the experimental group when compared to the control group.

5. The web-based learning unit was evaluated for three attributes, i.e., usefulness, web design, and online strategy. The results from 42 students showed a

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mean score of 88.53 ± 7.01, indicating high satisfaction of the students and good quality of the web-based learning medium.

6. The results on correlation between web site access time, satisfaction score and posttest score showed that posttest score was statistically correlated with those of the web site access time (r =.777, p <.001) and the satisfaction scores (r=.828, p <.001). In addition, the web site access time was statistically correlated with those of the satisfaction scores (r =.726, p <.001).

7 From the interviews the nursing students had a strong positive attitude toward the web-based learning method.

6.4 Unit 2: Intrapartum nursing care web-based learning unit

The main objective of this web-based learning is to help students acquire conceptual knowledge and competencies during intrapartum care. It is expected to reduce stress among nursing students. This unit was develop based on the constructivism learning theory and ARCS Keller model and composed of 4 sections: 1) admission to labour unit 2) nursing care during the first stage of labour 3) nursing care in the second stage of labour 4) nursing care for immediate postpartum care**.** The study was summarized as follows:

1. The participants were the 84 fourth year nursing students in the maternal-new born nursing and midwifery practicum 2 the students were randomly divided into 2 groups by using students' identity numbers, the control (n = 42) and the experimental group (n = 42). There was no significant difference in age, grade in maternal-newborn nursing care and midwifery 2 subject, and computer experience between the two groups of students (p>.05).

2. At one week before practice on the labour ward, the experimental group was asked to visit the website of intrapartum care for one week as well as during practicing maternal newborn nursing care and midwifery practicum. After one week, just before practicing on the ward, the students were given the conceptual knowledge test and ignorance stress questionnaire. Six weeks later, at the end of the practice, the students received the competency test on maternal and newborn care. Perception of the web-based learning questionnaires and opinions by interviewing were also assessed.

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The control group, which did not receive the web-based learning, was given the test on the conceptual knowledge before practicing on the ward. Then, a questionnaire on ignorance stress was given. Six weeks later, the competency test on caring of parturition and newborn was given at the end of the practicing.

3. The conceptual knowledge mean scores in experimental group were (11.70±2.1) was significantly higher than those of the control group (8.65±1.35).

4. The means scores of performance skills in the experimental group (3.33 ± .28) were significantly higher than those of control group (3.17 ± .29) $p < 0.05$.
The total mean competency scores in the control (24.83±.36) and experimental group (23.90±.44) were not significantly different. However, when considered the item on the placenta, the mean score in the experimental group was significantly higher than that of control group

5. The stress mean scores of the nursing students in these nursing students in experimental group (109.26±12.78) were significantly lesser than those of the control group (119.67±14.90) suggesting a reduction in stress of the nursing students.

6. The performance skill scores was statistically correlated with those of the web site access time (r =.88, p <.001), satisfaction scores (r=.324, p <.001), conceptual knowledge(r =.45, p <.01), and competency scores(r =.36, p <.05). In addition, the web site access time was statistically correlated with those of the satisfaction scores (r =.324, p <.05), but not with the stress score (r =.-.048, p=.76)

7. Interviewing results indicated positive attitudes of the nursing students toward the intrapartum nursing care web-based learning unit. The students also found it as a useful learning tool which was easy to operate.

The results in this study showed an enhancement of nursing students' conceptual understanding on the process and mechanism of labour and intrapartum nursing care as well as improve clinical skill of conducting normal labour upon supplementing the traditional lecture with web-based learning units. This may be due to the interactive features of the unit with animations, colorful pictures, interactive quizzes, exercises and case scenarios. The results from attitude test and interviews revealed that the students perceived the web-based learning unit to be fun, flexible, and convenient. Results of the study suggest that the well designed web-based

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learning unit with good content and relevance to the curriculum facilitates learning of the nursing students.

6.5 Limitations

1. Although most of the nursing students in this study favoured the idea of supplementation the traditional lecture with a web-based learning unit. However, some students had difficulties in using the web-board for discussing and/or expressing ideas. This was partly due to the lack of computer skills as well as attitude in academic discussion through the web. Normally Thai nursing students work in groups and often meet each other and thus favour face-to-face discussion.

2. The high score of the experimental group could not be attributed to only the exposure to our learning unit. Students' own pursuit knowledge in the textbooks and other web- based source might also contribute to better achievements.

3. This web-based learning unit has been tried only on one group of 42 students in nursing department of Ramathibodi hospital. Thus, the finding may not be generated to other groups of nursing students who have different demographic characteristics from those of the nursing students in this study.

4. The interview results came from only ten volunteer students. The students in this group may prefer web-based learning style that contributes the positive results of the interview.

6.6 Recommendations

For nursing education

Base on the result of this research study, the authors recommended a wider use of the web-based learning for nursing education in order to develop knowledge and awareness of real word care setting and to develop their decision-making skills in the areas when real practicing is limited. Moreover, increasing number of nursing while there is a shortage of faculty, may lead to replacement traditional learning method with web-based learning strategy.

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For nursing researcher

For further research, similar experiments should be performed on students from other nursing schools with similar problems as this study. Higher numbers of students should give rise to more conclusive results. Furthermore, randomized the students for interviewed may be find additional results.

For further web-based learning developments, the positive attitudes of nursing students to the web-based learning units' supports the use of a well design e-learning for nurse education. It provides an opportunity for students to acquire knowledge, and skills, the care of parturition women when placements are not available. It also gives the students a chance to rehearse their skills before experiencing a real life placement to ensure that nursing student have clear implications for practice. Thus, the methodology and results of this study should be applied in other subjects.

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APPENDICES

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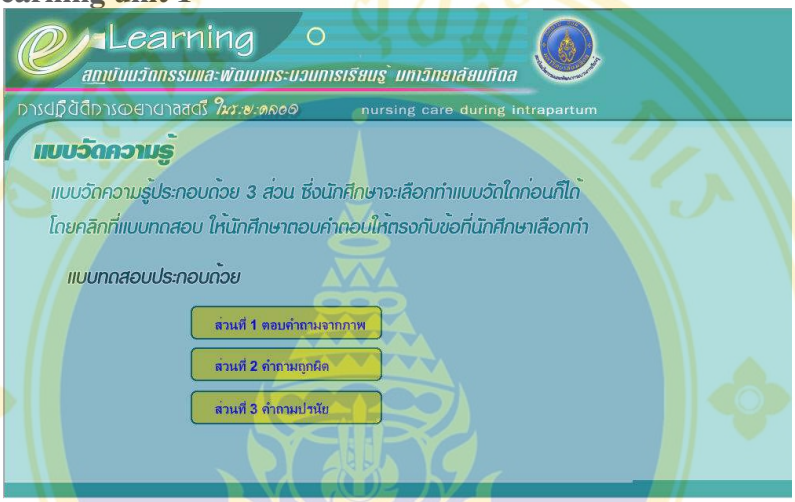
APPENDIX A

The factual knowledge test: A test on process and mechanism of labour web-based learning unit 1



The main menu of the factual knowledge on process and mechanism of laour pretest, students could choose any topic that they want to practice.

Estimated the cervical dilatations by clicking the yellow arrow in bottom

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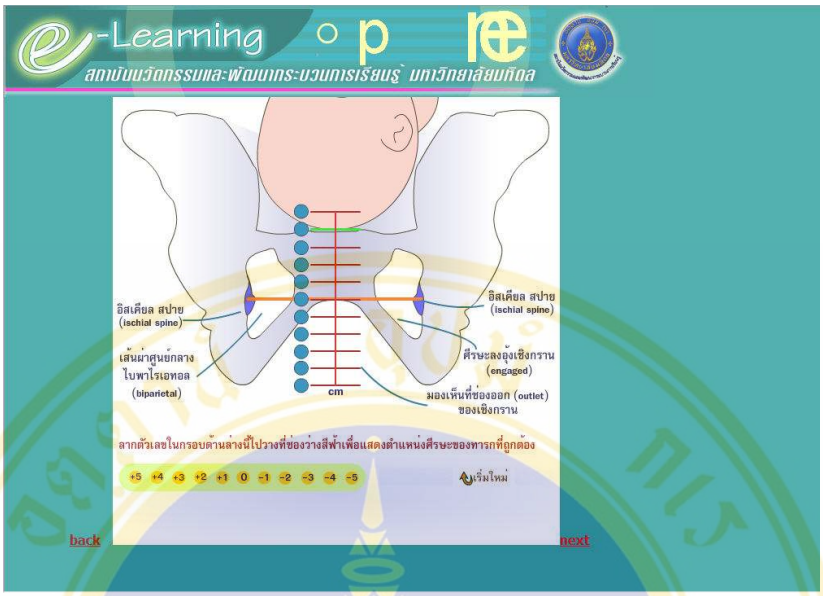

Drag numbers from the bottom to related circular blue area for estimating the station of presentation

Drag the word from the bottom for the fetal head

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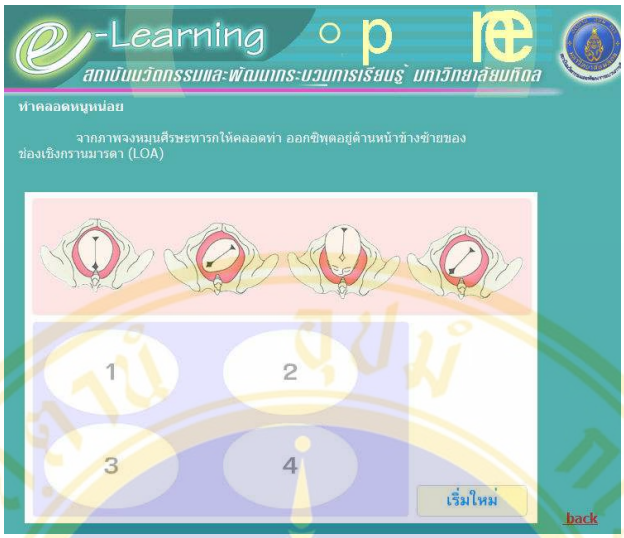

From the picture, please indicate the correct rotatation of the left occipital anterior position for normal delivery

These following statements are false or true

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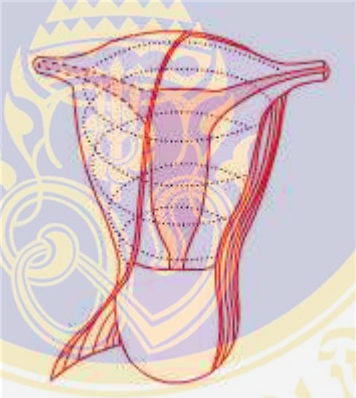
Choose the best answer

1. The vaginal normal delivery is impossible, if
    a. It is not vertex presentation.
    b. It is not flexion attitude.
    c. It is not good uterine contraction.
    d. It is not good bearing down force.
2. Which statement does describe “Engagement” of fetal head?
    a. Fetal head is just in true pelvic cavity.
    b. Presentation is at ischial spine level.
    c. Biparietal diameter is at ishial spine level.
    d. Biparietal passes the true pelvic.
3. How these muscle arrangements do affect the deliver?



    a. The fetal was expeled from the uterus.
    b. The cervix was shorted.
    c. The cervix was dilated.
    d. The postpartum hemorrhage was prevented.
4. Narin is 6 weeks pregnant. She goes to see you at antenatal clinic. She is expected normal delivery because you have found…….
    a. Pelvic angle is more than 70 degree.
    b. Diagonal conjugate diameter is 11.5 cm.
    c. Intertuberous diameter is 11.5 cm.
    d. The angle between the thumbs while place at ischio pelvic rami is more than 70 degree.

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5. Narin is 38 weeks pregnant , the nurse findings are according to the picture:

The nurse should conclude that the fetal is…..

   a. Vertex presentation, longitudinal line, Flexion, not engagement.
   b. Sacrum presentation, longitudinal line, Flexion, not engagement.
   c. Vertex presentation, longitudinal line, Flexion, engagement.
   d. Sacrum presentation, longitudinal line, Flexion, engagement

6. Narin had severe bottom accident. How does this circumstance affect the labour process?

   a. Immobile of coccyx
   b. Ischial spine will be prominence
   c. The separated of symphysis of pelvis
   d. Immobile of ilium

7. From the above circumstance, what is the plane that may be obstructed the progress of labour

   a. Inlet of pelvis
   b. Mid plane
   c. Outlet of pelvis
   d. Ishial spine

8. When Narin is full term, she goes to delivery room; she tells that there is some water from vagina. How do you handle this situation?

   a. Notify the doctor
   b. FHS assessment
   c. Vaginal examination
   d. Uterine contraction assessment

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9. Narin's contraction are every 3 minutes, are of moderate intensity, and last 40 seconds, from vaginal examination, the dilatation is on the picture, what was phase of labour Narin in?

   a. Latent phase
   b. Active phase
   c. Transition phase
   d. Second stage of labour

10. From the above circumstance, if normal process of labour, how long does Narin give birth?
   a. 2-4 hours
   b. 4-6 hours
   c. 6-8 hours
   d. It can not be estimated.

11 Please select the best answer for describing the graph of uterine contraction below

animation

   e. The frequency of uterine
   f. The pain period
   g. The duration of uterine contraction
   h. The resting period of uterine contraction

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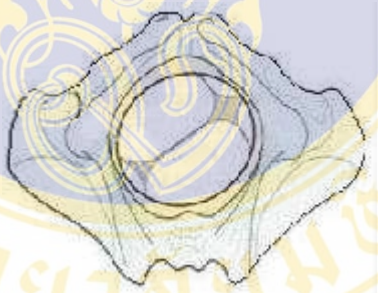
12. Narin had gradually labour pain; there was a ring at umbilical level even though she had passed urine. What does this circumstantiate interpreted?

a. Good uterine contract
b. Progressed cervical dilation and effacement
c. Station of fetal head progress
d. Pathological ring

13. The finding from vaginal examination as in picture, the finding is above ischial spine approximate 2 cms with slightly green amniotic fluid.



What should the nurse record?

a. Flexion, ROA, longitudinal lie, occipital presentation, station-2, clear amniotic fluid
b. Deflexion , ROA, longitudinal lie, occipital presentation, station-2, clear amniotic fluid
c. flexion, ROP, longitudinal lie, occipital presentation, station-2, mind meconium
d. deflexion, ROP, longitudinal lie, occipital presentation, station+2, mild meconium

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14. During the 1st stage of labour, the record shows that within 1 hour intensity duration as text below

	Freguency	intensity	duration
10.00	3 minute	moderate	45 second
10.15	2.30 minute	moderate	50 second
10.30	2.20 minute	moderate	60 second
10.45	2.30 minute	moderate	60 second

How do you interpret the data?

a. Hyperstimulation
b. Normal uterine contraction
c. Moderate contraction
d. Hypotonic contraction

15. In the situation above, Narin has bearing down force, when do you recommend her to push down?

a. Rupture of membrane
b. Station+2 level
c. Transitional phase
d. 2 nd stage of labour

16. From picture, what is the step of mechanism of labour?

a. Flexion
b. Extension
c. Internal rotation
d. External rotation

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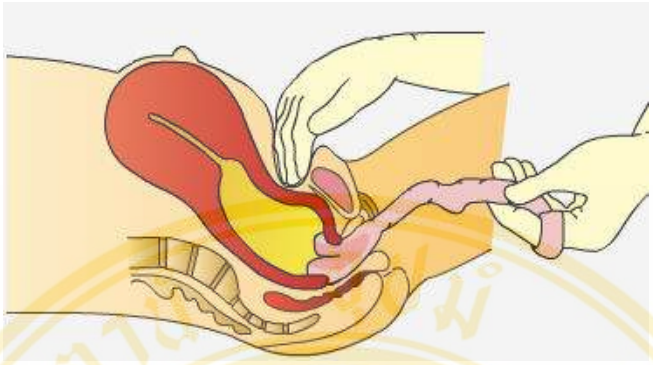
17. What do we call this mechanism of placenta delivery?



animation

a. Brandt-Andrews Maneuver
b. Controlled cord traction
c. Modified Crede' Maneuver
d. Crede Maneuver

18. From mechanism of placenta separation, what do we call this sign? What is the name of this placenta delivery method? And what is the most type of fetal membrane that may be retained in uterus?

a valva sign, ducan method, chorion
b retroplacenta bleeding, Schultz method, amnion
c valva sign, ducan method, amnion
d retroplacenta bleeding, Schultz method, chorion

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19. After vaginal birth, you took the baby to her mother. The mother told you that baby heading was not conture. What do you inform her?
    a. The fetal fontanels are still opened, will notify the doctor.
    b. There is some fluid under fetal head, it will be normal within 2-3 days
    c. Cause by molding of baby head during birth, it will be normal within 2-3 days
    d. There is some hemorrhage under the fetal head skin; the baby will be alright soon.
20. What is the most immediate post partum awareness?
    a. Infection
    b. Perineum wound
    c. Post partum haemorrhage
    d. Electrolyte imbalance

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APPENDIX B

The conceptual knowledge test

Choose the best answer or answer the questions

1. Narin, 24 years old and pregnant for 39 weeks, came to delivery room. How do you know that she is going to delivery a baby?

   ……..

   (Key word: true labour pain, regular uterine contraction, cervical dilatation and effacement, bloody show, rupture of membrane)

2. After vaginal examination, it is found that the cervix opened at 3 cms, 80% effacement, station-2, and vertex presentation. What is the stage of labour of Narin?
   a. latent Phase
   b. Active phase
   c. Transitional phase
   d. Maximum phase
3. If you were an attender of Narin, how often would you evaluate the uters contraction and fetal heart sound?
   a. At least every 15 minute
   b. At least every 30 minute
   c. At least every 45 minute
   d. At least every 60 minute
4. In order to make Narin comfortable and promote intra uterine fetal health during first stage of labour, what position do you not suggest her during waiting for delivery?
   a. Lean on right side
   b. Lean on left side
   c. Fowler‘s position
   d. Supine position

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5. Narin has mild uterine contraction every 5-6 minuets; doctor ordered to administrate oxytocin. As a nurse, what must you be careful with oxytocin?
    a. Fetal hyperglycemia
    b. Fetal hyperbilirubin
    c. Hyperstimulation of uterus
    d. Hypotonic of uterus
6. During the process of abdominal palpation to find presentation of fetus, what step of Leopold do you use?
    a. First maneuver
    b. Second maneuver
    c. Third maneuver
    d. Fourth maneuver
7. What do you do if the EKG result from Narin's monitor for the fetus shows Type II deceleration?
    a. Report to doctor immediately
    b. Prepare the mother's abdominal for an emergency c/s
    c. Give O2 mask to Narin
    d. All above
8. Narin urges to push down, when do you suppose to move her to labour room?

……

……

9. What is the most appropriated procedure to conduct fetal head?

……

……

10. During conduct fetal head, it is found slightly loose nuchal cord 1 round, what is the appropriated procedure for midwifery nurse to help the baby?

a. continues with conduct normal labour

b. use a finger to pick up the cord over the baby head

c. ask the parturition woman to push out and urgent conduct normal labour

d. use a sponge to clamp the umbilical cord and cut between clamped cord

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11. What is the sign of schultz's mechanism of placenta separation method?

a. cotelydon separate from the same time

b. the separation started at the middle of placenta

c. the separation started at the rim of placenta

d. the separation started occurred all at the same time

12. What is the name of the procedure to delivery placenta by utilizing pressure from fundal of uterus along pelvic axis?

a. fundal pressure

b. cord traction

c. modifier Crede'

d. Brant- Andrew

13. When is the right time to episiotomy to least the blood loss?

a. during presentation fully flexion

b. during presentation fully extension

c. during presentation slightly extension

d fetal crown

14. What is immediate postpartum care for Narin?

a. lochia observation

b. cauterized urine

c. change the wet clothes

d. massage the uterus

15. First minute newborn baby cries in low voice, irregular respiration, and blue appearances. What are nursing care?

a suction secretion from nose and stimulate the baby.

b. suction secretion from mouth and then oxygen spray.

c. suction secretion by using catheter and then oxygen spray.

d. suction secretion and then cutting umbilical cord.

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APPENDIX C

The performance checklist for intrapartum nursing care

Name ..... Student ID.....

Date ..... Score .....

Nursing care and midwifery competency	score			
	4	3	2	1
1. formulate, analyze, and interpret the health assessment data				
2. nursing diagnosis				
3. nursing care for pain relief and discomforts during labour				
4. Leopold maneuver abdominal assessment				
5. the relationship between uterus, gestational age, and risk assessment				
6 intrauterine fetal health assessment				
7. true labour pain and staging of labour diagnosis				
8. progress of labour assessment				
9. delivery assisting				
10. delivery preparation				
11. normal labour conducting				
12. placenta delivery				
13. new born assessment by using APGAR score and physical appearances				
14. breast feeding Promotion				
15. Immediate postpartum women health promotion				

Evaluator.....

Evaluation score of performance skills on nursing care and midwifery practice, are identified by these criteria:

4 means practice correctly all steps by student

3 means practice correctly under some recommendations

2 means practice correctly under mostly recommendations

1 means practice correctly under every recommendations

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APPENDIX D

The competency test

Please answer the following questions

1 Mrs. Narin was 27 years old, and primigravida. She urged to push the baby. The nurse does vaginal examination which found the cervix dilated 10 cms. 100 % effacement station +3

Prepare the normal labour..(3 points)....

……

……

Explain the procedure for conduct normal (7points)

……

……

……

2 After 10 minutes the baby birth, it is found that the uterus is anterior-cephalad movement of the uterine fundus, which becomes firmer and globular, lengthening of the umbilical

Indicated sign of placenta separation (2 points)

……

……

Explain the procedure of delivery of placenta (4 points)

……

……

……

Provide Mrs. Narin nursing care after placenta delivery (4 points)

……

……

……

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3 The boy was born for 1 minute. He did not cry, has blue all over appearance, arms and Legs slightly flexed,

From above data, what addition assess and data will be evaluated? (4 points)

……...

……

Nursing diagnosis and supportive data of the baby (3 points)

……..

……..

What are nursing cares for the baby (3 points?)

……

……

……

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APPENDIX E

Stress test

Objective: This questionnaire is to evaluate your feeling on undergoing midwifery practice. This questionnaire is purely a simple indicator of the amount of stress that you are currently experiencing within 2 weeks. To determine your level of stress, just select one answer for each question. Please answer all the questions as honestly as possible.

Evaluation Checklist	6	5	4	3	2	1
1. I feel anxiety when I practice in the delivery room						
2 The first experience in the delivery room makes me scare						
3. I feel frustrate with the clinical practice that I cannot control.						
4. I can nicely adapt myself when I practice at labour room.						
5. When I feel anxiety or under pressure, I can solve problem by myself.						
6. When someone is watching me attentively for a mistake, my heart beats fast and then I would make a mistake sometime.						
7. I have increase resistant or aggressive behaviour when the time past.						
8. I am satisfied with present nurse student life.						
9. I am an over anxiety personality.						
10. The past practice, I feel sorrow with what I have done.						
11. In the pass six months, I were under depression without a proper reason.						
12. During my practice, I have a short tempered emotion with a small disturbance.						
13. I am confident with my competency under the efficient, and enough hand on practice.						
14. I think that my nurse practice error increased to a level of loosing self confidence.						
15. In my opinion, I feel safe and secure during my work in the delivery room because I have enough knowledge.						
16. I am satisfied with my current level of my knowledge and ability to handle the pregnant woman.						
17. Whenever I need help, I always get help, thus, I feel warm.						
18. Atmosphere in the delivery room makes me get anxiety.						
19. During my first time conduct normal labour, without experience, I get nervous due to lack of knowledge.						
20. The first experience with the pregnant woman, I feel that I could not manage anything with her.						
21. I know how to take care the pregnant women in each stage of labour, so I am not stressed.						
22. I know how tools and instruments to be prepared, so I am not stressed.						
23. I know how to conduct a baby, so I am not stressed.						
24. I know how to conduct placenta, so I am not stressed						

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Evaluation Checklist	6	5	4	3	2	1
25. I know how to nursing care the new born baby so I am not stressed						
26. No matter what happen, I am able to handle with any problem.						
27. I believe that if I were well preparing, I would take a better care of a pregnant woman.						
Physical health						
1. Sleepless or sleep disturbance						
2. Headache and feel dizzy						
3. Sweat out and feel hearth beat excited.						
4. Difficulty in breathing						
5. Eat or drink disorder						
6. Physical pain without reason						
7. Abnormal weight loss or gain						
8. Bored with food						
9. Tried and fell weak						
10. Sexual interested decreased.						
11. Tremor						
12. Pain in stomach without reason						
13. diarrhea						

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APPENDIX F

Students' perception of web-based learning questionnaire

It was used to assess students' attitude toward both units.

Evaluation of web-based learning

Objective: This document is for evaluation of quality of web-based learning from users' views.

The evaluation form consists of three parts which are;

1. General information
2. Evaluation checklists follow these principals
    a. Usefulness
    b. Web-based design
    c. Online strategy

Evaluation scale: Please make / into each evaluation scale that represents your views. Each of five scales indicates quality of the multimedia as follows;

5 = quality of the web-based learning is excellent

4 = quality of the web-based learning is good

3 = quality of the web-based learning neither good nor should be improved

2 = the web-based learning should be improved

1 = the web-based learning is inappropriate

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Demographic data

You are ……years old.

You are on the year of nursing student grad average.....

Do you have notebook? oYes oNo

Have you ever used internet oYes oNo

Where do you used internet o home o university o dormitory

oother.....

You used internet.....time per week

Have you ever learn with web-based or e-learning before?

oYes oNo

Have you ever used web board before?

oYes oNo

The problem in using internet are…….

What do you want the faculty support for internet learning……

In the future, if the lessons were offered via internet, you will.....

o like o dislike

I like because.....

I dislike because.....

Please select the appropriate score from you opinion on usefulness, design of web-based learning and online strategy.

Evaluation checklists	Levels of students' perception				
	strongly agree	agree	Neither good nor should be improved	Should strong be improved	strongly disagree
	5	4	3	2	1
Usefulness (10 questions)					
1. interesting contents					
2. covering all objectives					
3. well-matched with the course					
4. sufficient information					
5. clear and accurate xplanation					
6. appropriate pictures and animations					
7. contents support learning					
8. contents appropriate to students					

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Evaluation checklists	Levels of students' perception				
	strongly agree	agree	Neither good nor should be improved	Should strong be improved	strongly disagree
	5	4	3	2	1
9. sufficient periodic quizzes and exercises					
10. relevant feedbacks to assist students'understanding.					
Web-based design (6 questions)					
11 appropriate length of each presentation					
12 easy navigation and following					
13 eye-catching screen					
14 well visual clarity					
15 appropriate font size and easy to read					
16 attractive colorful pictures, animations, graphics, and precise content.					
Online strategy (4 questions)					
17. preference for learning via web-base learning					
18. preference for learning via web-base learning more than reading textbooks					
19 preference on learning from internet					
20 replacement traditional lecture with web-based learning method.					
total					

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APPENDIX G

A semi-structured interview questions that was used on process and mechanism of labourlearning before students express later opinion.

This is semi constructed interviewed for student opinions on the web-based learning units. Some sample questions were: “How does supplementation of the web-based learning enhance your learning?”, “What do you like or dislike about the web-based learning?” and “What feature in the web-based learning would you like to change if you could?”

A semi-structured interview questions that was used in intrapartum nursing care web-based learning

1. What do you think about web-based learning unit using to supplement your learning?
2. How do you feel in using the web-based learning units to supplement your learning?
3. What do you like or dislike about the web-based learning units?
4. What features in web-based learning units would you like to change if you could?

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APPENDIX H

Evaluation of Computer-Assisted Learning Multimedia

Objective: This document is for evaluation of quality of multimedia web-based learning units from users' views.

The evaluation form consists of three parts which are;

1. General information
2. Evaluation checklists follow these principals
   - Introduction
   - Contents
   - Language used
   - Teaching and learning design
   - Multimedia components
   - Interaction design

3 Summary of evaluation

Evaluation scale: Please make / into each evaluation scale that represents your views. Each of five scales indicates quality of the multimedia as follows;

5 = quality of the multimedia is excellent

4 = quality of the multimedia is good

3 = quality of the multimedia is neither good nor should be improved

2 = the multimedia should be improved

1 = the multimedia is inappropriate

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Evaluation checklists	Levels of learners' views				
	Excellent	Good	Neither good nor should be improved	Should be improved	Inappropriate
	5	4	3	2	1
1.Appropriation of objective					
2.Contents cover objective					
3. Contents match objective					

Part 1 General information

1.1 Process and mechanism of labour web-based learning

Intrapartum nursing care web-based learning

1.2 Course

Levels/Year : Bachelor of Nursing / Year 3 (mechanism of labour)

Levels/Year : Bachelor of Nursing / Year 4 (intrapartum nursing care)

1.3 Lesson storage is upload on www.thaicyberu.go.th

1.4 Contents of the multimedia : follow curriculum

1.5 Computer requirement

- Personal Computer (PC) or Computer Notebook
- CPU Pentium 166 MHz (MMX) or higher, RAM 64 MB or higher, SVGA monitor
- OS Window 95 (Thai Edition) or higher
- Plug-in such as Macromedia Flash Player

……..internet access network

2 Using method

- open homepage of thaicyber university: URL: www. thaicyberu.go.th, key user name and password, go to the subject that you want to evaluate and the contents will be appeared.

3 Type of lesson: web-based learning

4 Content summary

This web-based learning presents the mechanism of labour and intraaprtum nursing care contents in the form of multimedia for the third and fourth year of nursing students. The 5Es inquiry model and Keller, ARCS motivation model was used to guild the development of these web-based learning units. The contents are

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relevant to the traditional course. Learners can learn by themselves with enjoyment because the multimedia consists of animation, sound, and feedbacks which allow learners to participate with lesson. Learners can assess their achievement immediately after complete the lesson.

5 Advantages: Enhance learning, easy to understand, and good for long-term memory for using in clinical practices.

Evaluation Part 1 General information

1. Program download

□ difficult □ easy and convenient □ inappropriate □ others……..

2. Appropriate for recent Hardware

□ appropriate □ inappropriate □ others……..

3. Appropriation of essential information (lesson structures, objective for using lesson, program installation, etc.,)

□ appropriate □ inappropriate □ others……..

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Evaluation checklists	Levels of learners' views				
	Excellent	Good	Neither good nor should be improved	Should be improved	Inappropriate
	5	4	3	2	1
1.Introduction - arousing introduction					
2.Contents of lesson 2.1 lesson structure is clear, wide, deep, and integrated prior knowledge with new knowledge 2.2 relevant to curriculum 2.3 relevant to objective 2.4 relevant to application in teaching and learning, continuing interrelation 2.5 appropriate in level of difficulty 2.6 not against with nation secure, ethic and moral principles					
3. Use of language -correct language, clear in communication, appropriate to learners' levels					
4. Teaching and learning design 4.1 relevant content 4.2 enhance creativity 4.3 flexible, respond to personal differences, control of contents and practices' orders 4.4 length of each unit is appropriate 4.5 interesting contents presentation 4.6 variety of interesting self evaluation					
5. Multimedia component 5.1 appropriate screen, easy to use, beautiful 5.2 font size and color is clear and beautiful and easy to read 5.3 appropriate use of pictures, relevant to contents, beautiful and creativity in designing 5.4 sound quality in lesson is appropriate, good, interesting, etc.					
6. Interactive navigation 6.1 interactive program is easy to use, convenient, navigation is clear and correct 6.2 feedbacks enhance reinforcement or appropriately help learners					

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Part 3 Summary of evaluation

Summary of quality evaluation by providing reasons according to your views, identify advantages, disadvantages for improvement as follows

1. Introduction……
   ……
   ……
2. Contents……
   ……
   ……
3. Language……
   ……
   ……
4. Teaching and learning
   design ……
   ……
   ……
5. Multimedia Component …….
   ……
6. Interaction Design ……
   ……

Summary ……
……

Evaluated by…….

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