THE DEVELOPMENT OF A WEB-BASED INSTRUCTIONAL MODEL TO ENHANCE VOCABULARY LEARNING ABILITY THROUGH CONTEXT-CLUES BASED MEANING GUESSING TECHNIQUE FOR THAI ENGLISH AS A FOREIGN LANGUAGE UNIVERSITY STUDENTS

Acting Sub Lt. Kiattichai Saitakham

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in English Language Studies

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การพัฒนารูปแบบการสอนบนเครือข่ายอินเตอร์เน็ตเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์โดยวิธีการเดาความหมายจากบริบทสำหรับนักศึกษามหาวิทยาลัยไทยที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ

ว่าที่ร้อยตรีเกียรติชัย สายตาคำ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรดุษฎีบัณฑิต
สาขาวิชาภาษาอังกฤษศึกษา
มหาวิทยาลัยเทคโนโลยีสุรนารี
ปีการศึกษา 2553

DEVELOPMENT OF A WEB-BASED INSTRUCTIONAL MODEL TO ENHANCE VOCABULARY LEARNING ABILITY THROUGH CONTEXT-CLUES BASED MEANING GUESSING TECHNIQUE FOR THAI ENGLISH AS A FOREIGN LANGUAGE UNIVERSITY STUDENTS

Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

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ว่าที่ร้อยตรีเกียรติชัย สายตาคำ : การพัฒนารูปแบบการสอนบนเครือข่ายอินเทอร์เน็ตเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์โดยวิธีการเดาความหมายจากบริบทสำหรับนักศึกษามหาวิทยาลัยไทยที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ (DEVELOPMENT OF A WEB-BASED INSTRUCTIONAL MODEL TO ENHANCE VOCABULARY LEARNING ABILITY THROUGH CONTEXT-CLUES BASED MEANING GUESSING TECHNIQUE FOR THAI ENGLISH AS A FOREIGN LANGUAGE UNIVERSITY STUDENTS) อาจารย์ที่ปรึกษา : อาจารย์ ดร. สุขสรรพ์ ศุภเศรษฐเสรี, 259 หน้า.

วิจัยครั้งนี้มีวัตถุประสงค์ คือ (1) เพื่อพัฒนารูปแบบการสอนบนเครือข่ายอินเทอร์เน็ตเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์ภาษาอังกฤษ โดยวิธีการเดาความหมายจากบริบทสำหรับนักศึกษามหาวิทยาลัยเทคโนโลยีสุรนารีที่เรียนรายวิชาภาษาอังกฤษ 3 ภาคการศึกษาที่ 1 ปีการศึกษา 2553 (2) เพื่อหาประสิทธิภาพของบทเรียนเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์ภาษาอังกฤษโดยวิธีการเดาความหมายจากบริบทที่พัฒนาขึ้นตามเกณฑ์มาตรฐาน 85/85 (3) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักศึกษาที่เรียนเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์ภาษาอังกฤษโดยวิธีการเดาความหมายจากบริบทบนเครือข่ายอินเทอร์เน็ตและนักศึกษาที่ได้รับการสอนโดยวิธีเผชิญหน้าและ (4) เพื่อศึกษาเจตคติของนักศึกษาที่มีต่อการเรียนบนเครือข่ายอินเทอร์เน็ต

กลุ่มตัวอย่างที่ใช้ในการวิจัยในครั้งนี้คือนักศึกษามหาวิทยาลัยเทคโนโลยีสุรนารีที่เรียนรายวิชาภาษาอังกฤษ 3 ภาคการศึกษาที่ 1 ปีการศึกษา 2553 มหาวิทยาลัยเทคโนโลยีสุรนารี จำนวน 80 คน โดยแบ่งเป็นกลุ่มทดลองและกลุ่มควบคุม กลุ่มละ 40 คน กลุ่มทดลองได้เรียนบนเครือข่ายอินเทอร์เน็ตและกลุ่มควบคุมที่ได้รับการสอนโดยวิธีเผชิญหน้า หลังจากที่ทั้งสองกลุ่มได้ทำการทดสอบก่อนเรียน กลุ่มทดลองได้เรียนบทเรียนบนเครือข่ายอินเทอร์เน็ตโดยผ่านเว็ปไซต์ www.welmc.net และกลุ่มควบคุมได้เรียนโดยวิธีเผชิญหน้า จากนั้นนักศึกษาทั้งสองกลุ่มได้ทำแบบทดสอบหลังเรียน กลุ่มทดลองจะตอบแบบสอบถามและได้รับการสัมภาษณ์

เกณฑ์มาตรฐาน 85/85 นำมาใช้เพื่อทดสอบประสิทธิภาพของบทเรียนบนเครือข่ายอินเทอร์เน็ตโดยใช้สูตรการหาประสิทธิภาพของกระบวนการและค่าประสิทธิภาพของผลลัพท์ (E1/E2) ในการเปรียบเทียบผลสัมฤทธ์การเรียนคำศัพท์ภาษาอังกฤษของกลุ่มทดลองและกลุ่มควบคุมวิเคราะห์ข้อมูลโดยใช้การวิเคราะห์ความแปรปรวน (ANCOVA) เพื่อขจัดตัวแปรร่วม ค่าเฉลี่ยเลขคณิต ($\bar{X}$) และค่าร้อยละใช้เพื่อวิเคราะห์ข้อมูลความคิดเห็นของนักศึกษาจากแบบสอบถามและการสัมภาษณ์นักศึกษาที่มีต่อการเรียนบนเครือข่ายอินเทอร์เน็ต

ผลการวิจัยพบว่า

1. รูปแบบการสอนบนเครือข่ายอินเทอร์เน็ตเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์โดยวิธีการเดาความหมายจากบริบทหรือ The Saitakham Model ที่พัฒนาขึ้น ได้รับการประเมินจากผู้ทรงคุณวุฒิทางการออกแบบระบบการสอนและการสอนภาษาอังกฤษว่าอยู่ในเกณฑ์ “เหมาะสมมาก” ($\overline{X}$ = 4.67)

2. บทเรียนการสอนบนเครือข่ายอินเทอร์เน็ตเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์ โดยวิธีการเดาความหมายจากบริบทที่พัฒนาขึ้นมีค่าประสิทธิภาพ 83.50/84.25 ซึ่งเป็นไปตามเกณฑ์มาตรฐาน 85/85 ที่ตั้งไว้

3. กลุ่มทดลองมีผลสัมฤทธิ์ทางการเรียนสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

4. นักศึกษามีความคิดเห็นที่ดีมากต่อการเรียนเพื่อส่งเสริมความสามารถในการเรียนรู้คำศัพท์ภาษาอังกฤษโดยวิธีการเดาความหมายจากบริบทบนเครือข่ายอินเทอร์เน็ต ($\overline{X}$ = 4.06)

สาขาวิชาภาษาอังกฤษ ลายมือชื่อนักศึกษา_____

ปีการศึกษา 2553 ลายมือชื่ออาจารย์ที่ปรึกษา_____

ACTING SUB LT. KIATTICHAI SAITAKHAM : DEVELOPMENT OF A WEB-BASED INSTRUCTIONAL MODEL TO ENHANCE VOCABULARY LEARNING ABILITY THROUGH CONTEXT-CLUES BASED MEANING GUESSING TECHNIQUE FOR THAI ENGLISH AS A FOREIGN LANGUAGE UNIVERSITY STUDENTS. THESIS ADVISOR : SUKSAN SUPPASETSEREE, Ph.D., 259 PP.

WEB-BASED INSTRUCTION/ INSTRUCTIONAL SYSTEM MODEL/ VOCABULARY LEARNING STRATEGIES

The purposes of this study were (1) to develop a web-based instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique of the students who enrolled on English III course in the trimester 1, academic year 2010 at Suranaree University of Technology, (2) to determine the efficiency of English vocabulary learning lessons via web-based instruction based on the 85/85 standard, (3) to compare achievement of English vocabulary learning ability of both experimental group and control group, and (4) to explore the students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

The samples were 80 students who enrolled in the English III course in the trimester 1, academic year 2010 at Suranaree University of Technology. They were divided into two groups: the experimental group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via the web-based instruction (www.welmc.net) while the control group received tutoring

from face to face method. After taking a pretest, the experimental group was taught via the web-based instruction and the control group was taught by face to face method. When finished learning, both groups were asked to do a posttest. After that, the questionnaire and interview were administered to the experimental group.

The 85/85 standard criterion was used to determine the efficiency of English vocabulary learning lessons via web-based instruction by using the efficiency of the process and the efficiency of the product formula (E1/E2 formula). To compare the English vocabulary learning achievement both of the control and experimental groups, the Analysis of Covariance or ANCOVA model was used to remove extraneous variability that derives from pre-existing individual differences. The arithmetic means and percentage were used to analyze data of the students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

The findings were as follows:

1. The web-based instructional model (The Saitakham Model) for enhancing English vocabulary learning ability by context-clues based meaning guessing technique was rated by the experts in Instructional System Design and English Language Teaching field as "Very Appropriate" ($\bar{X}$ = 4.67**)**.

2. The efficiency value of the development of a web-based instruction lessons to enhance English vocabulary learning ability by context-clues based meaning guessing technique were 83.50/84.25 that met the standard level at 85/85.

3. The achievement of English vocabulary learning ability of the students in the experimental group was higher than that of the students in the control group with statistically significant differences at 0.05

4. The students had very good opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction ($\bar{X}$ = 4.06**)**.

School of English Student's Signature _____

Academic Year 2010 Advisor's Signature _____

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Acting Sub Lt. Kiattichai Saitakham

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

Table **Page**

LIST OF FIGURES

Figure **Page**

LIST OF ABBREVIATIONS

WBI	=	Web-based instruction
SUT	=	Suranaree University of Technology
WWW	=	World Wide Web
CAI	=	Computer-Assisted Instruction
CaI	=	Computer-aided Instruction
CMI	=	Computer-Managed Instruction
IBI	=	Internet-Based Instruction
CBE	=	Computer-Based Education
ID	=	Instructional design
GUI	=	Graphical User Interface
HTML	=	Hyper Text Markup Language
VRML	=	Virtual Reality Modeling Language
URL	=	Uniform Resource Locator
CGI	=	Common Gateway
XML	=	eXtensible Markup Language
KS Model	=	Kiattichai Saitakham's Model
O-NET	=	Ordinary National Educational Test
IRT	=	Item Response Theory
SS Plan	=	Saitakham's Study Plan

CHAPTER 1

INTRODUCTION

The present study attempts to develop a web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique. This section presents the background of the study, purposes of the study, significance of the study, research questions, research hypothesis, scope and limitations of the study, definitions of key terms, and finally the implications of the study.

1.1 Background of the Study

It is a common fact that over the years, the development of information technology has spread widely all over the world. The expansion of technology has no boundaries. Most aspects of human life and whatever fields associated with human have been touched and affected by its development. Technology is the greatest key to change social, cultural, political values or education. It can be said that technological developments cause continuous changes to every sector of modern society.

As to the education system, technology is the main facilitator that contributes essential knowledge required by the system. It has impacted education today. In the age of educational reform in Thailand, educational technologies become more and more important. According to the Thailand National Educational Act of 1999, there is support and promotion given to the production and refinement of textbooks,

reference books, academic books, publications, materials, and other media for education through acceleration of production capacity and the development of educational technologies. Furthermore, there is an awareness of the aspect of personal development for both producers and users of technologies for education.

As we go into the information and communication technology age, English is emerging as the most important world communication language. It is crucial in international communication and is used widely as an international language. Moreover, it has been accepted as the tool and symbol of the modern technologically advanced society. In Thailand English is not only regarded as an international language but it also plays an important role in Thai education. It is regarded as the most important foreign language. English has been taught systematically since the Thailand National Educational Act in 1999 (Ministry of Education, 1996). It is now commonly taught from the primary through secondary level for all 12 years. This is done in order to help Thai learners to develop their English proficiency. Therefore it is clear that Thailand appreciates the value of learning English.

In learning English, reading is one of the most important skills. Saengpakdeejit (2001) said that reading seems to be the most necessary skill for learners because it is the only skill that they themselves can practice anytime, anywhere. In the same way, Dobson (2006) stated that reading is the skill that learners will in all likelihood have the most opportunities to use and that they can use most conveniently. Besides that, Wongsothorn (2002, quoted in Issarapakdee, 2006) stated that the most used skill in the work place was English reading and this skill enables learners to do research effectively and learn independently through various sources of printed information. Moreover, Wongla's study (1999) revealed that English

vocabulary knowledge and reading ability are the factors for helping the students to comprehend the text. Therefore, reading skill is one of the most important skills that learners need to master in order to succeed in the classroom.

However, the achievement of most Thai undergraduate university students is limited in their academic studies because they have low proficiency in English reading. Wongsothon (1993, quoted in Praphruekij, 2005) investigated the levels of English language skills of Thai university students and found that their reading skills were fairly poor and need improvement. Similarly, Thammongkol (1970, quoted in Praphruekij, 2005) found that Thai undergraduate students have reading difficulties. Chaibunruang and Karnphanit (1993) investigated Thai students' attitudes towards studying English and found that a large number of students had negative attitudes towards studying English and the result of the study showed that students had problems with reading English texts.

With regard to English reading problems of Thai university students, vocabulary knowledge is one of the causes for students' low proficiency in reading. Punya (1994) examined the effect of in-school factors on students' English achievement and found that the factor which affected the students' English achievement is vocabulary. Saengchai (1990) concluded that students cannot understand vocabulary because they do not know the meaning of some words in context. Vocabulary knowledge is very important because it helps the learner to succeed in reading. Krashen and Terrell (1983) stated that vocabulary is of prime concern in the L2 setting because it plays a dominant role in classroom success. Dale (1969) stated that vocabulary is a key to concept development. Moreover, Harris (1961, quoted in Promrat, 1998) indicates that words which children can use and

understand indicate the development of their concepts and ideas. Therefore, the learners should have good strategies or the best way to learn vocabulary for success in reading. Vocabulary learning strategies are very important for language learners, empowering them by having them to cope with the demands of classroom and indeed, may help them to continue to learn on their own apart from the class (Freeman and Long, 1991, quoted in Nuchsong, 1997).

Many studies have attempted to find out good strategies or methods for enhancing students' English vocabulary learning ability such as Chamot and Kupper (1989), Coady (1979), Liu and Nation (1985), Nunan (1991), Rubin (1975), and they found that the characteristic of a good language learner is guessing. Wen and Johnson (1997) also found that while all learners consistently used guessing as a strategy, it was the high achievers who tend to guess according to the reading context. Nation and Coady (1988) studied the relationship of vocabulary to reading with an emphasis on reviewing the relevant research relating to guessing as well as learning vocabulary in context. The general conclusion to be drawn from the research is that learning vocabulary through context must be the major way of increasing vocabulary knowledge. But it would seem that two complementary approaches are necessary to get this increase: the encouragement of a substantial quantity of reading and the development of the skill of guessing from context. Saitakham (2000) investigated English vocabulary learning strategies employed by high and low proficiency English major students at Naresuan University, Thailand. The result of the study showed that good students most frequently use the strategy of guessing the meaning from context clues while poor students most frequently use dictionary strategies for learning English vocabulary. Suppasetseree and Saitakham (2008) studied English vocabulary learning strategies of

non-English major students with different levels of English proficiency at Suranaree University of Technology, Thailand and found that good students guessed the meaning of unknown words from the context clues and poor students relied on dictionary use for learning English vocabulary. Krutkaeo (1980) examined the effect of context clues on students' speed reading ability and the results showed that the students who used context clues read faster than those who did not use them.

In conclusion, many findings of the studies reviewed above showed that good language learners often use a guessing strategy to find the vocabulary meanings. Therefore, it can be said that one way to enhance students' vocabulary learning ability would be to teach them to derive meaning from the context clues.

In the age of technological education, media and technology have influenced education, especially the Internet. The Internet has invaded instructional settings. It is a tool that offers powerful possibilities for improving learning. The Internet is a worldwide computer network that enables communication among millions of users from around the world (Klssen and Vogel, 2003). As the Internet is increasingly integrated in education, the World Wide Web is becoming a powerful and dynamic medium for delivering instruction. The World Wide Web has emerged rapidly to become the premier electronic medium. Many institutions have adopted the World Wide Web as one of the feasible delivery methods for learning activities. Alexander (1995) stated that the web provides opportunities to develop new learning experiences for students not possible previously. The Web is a medium of learning and instruction. It has a potential to support the creation of well-designed resources, such as Web-based instruction.

Web-based instruction (WBI) can be defined as an innovative approach for delivering instruction to remote audiences, using the web as a medium (Khan, 1997). Relan and Giilani (1997) stated that WBI as the application of a repertoire of cognitively oriented instructional strategies implemented within a constructivist and collaborative learning environment, utilizing the resources of the World Wide Web. Web-based instruction is available to anyone, anytime, and anyplace - irrespective of time and distance. Because of the advantages of WBI, a number of institutions are offering it as a teaching and learning tool. Furthermore, many studies have been carried out to document the profitability of teaching and learning via WBI.

Lammintakanen and Rissanen (2003) evaluated WBI experiences from both the students' and teachers' perspectives at universities in Finland. The results indicated that the students' and teachers' experiences were largely positive, and correlated with other international research results in this field. Benrud (2003) studied students' performance in web-based courses at the University of Baltimore in USA. and the findings suggested that a class with a generally higher level of experience, comfort, and appreciation for the web-based learning have a higher level of success. Selim (2003) investigated the acceptance of course websites as a teaching and learning tool in higher education institutions as perceived by students at United Arab Emirates University. A survey instrument was distributed to 450 undergraduate students and a total of 403 usable responses were obtained and the results indicated a good fit from the data. Course website usefulness and ease of use proved to be key determinants in the acceptance and usage of course websites as an effective and efficient learning technology. Drennan and Kennedy (2005) explored the factors that affect student satisfaction with flexible online learning in management education at

the University of Queensland. 248 participants answered the questionnaire. The results suggest that positive perceptions toward technology and an autonomous learning mode have the greatest influence student on satisfaction with courses presented in a flexible learning mode.

Many Thai researchers have designed web-based instruction for teaching and learning and they have also explored the students' attitudes towards their web courses. The results of their studies showed that the students were successful and got higher learning achievement via Web course learning. Besides, the findings revealed that the students had high positive attitudes towards learning through WBI (Hinnon, 2007; Duangjai , 2006; Napapong, 2006; Suppasetseree , 2005; Pateepsut, 2004; Bunnag, 2003; Somjai and Supaka, 2003; Dejthongpong, 2002; Suwanbenjakul, 2002; Vate-U-lan, 2001). As evidenced from the studies reviewed above, it can be concluded that teaching and learning via WBI is a very important way to enhance the students' learning ability and their willingness to participate in the classroom. Moreover, web-based learning also encourages the students to be autonomous learners.

As most Thai university students have problems with low proficiency in English, especially in English vocabulary knowledge and reading ability, students of Suranaree University of Technology (SUT) also face this problem. Suppasetseree (2005) stated that many of the first year SUT students got low scores on the Ministry of Education English Entrance Exam. Moreover, most of SUT students have problems in English reading. Chongapirattanakul (1999) studied English proficiency of the first year SUT students and found that most of the students have low proficiency in English. Wongla (1999) investigated the factors affecting reading achievement of 250 first year students at SUT and found that most of the students are poor English

reading skills. This study also revealed that English vocabulary knowledge and reading ability are the factors for helping the students to comprehend the text. Ward (2000) studied SUT engineering students' ability in reading their subject-specific textbooks in English. A yes-no checklist test of engineering vocabulary knowledge was administered to 250 students about to embark on their engineering studies. The students were tested on their knowledge of the 2,000 most common foundation engineering words. The scores indicated that student knew only slightly less than half of the 2,000 necessary words.

Based on the problems of SUT students in English reading, it is necessary to help them improve their reading ability and expand their vocabulary knowledge. Therefore, it is anticipated that the results of this study may help and support them succeed in the classroom.

1.2 Significance of the Study

As the importance of English reading skills mentioned by many research studies, vocabulary knowledge is a factor for helping the students to comprehend the text. However, most Thai university students have low proficiency in English reading. Guessing vocabulary meanings from the context clues was found by many studies that it can enhance students' vocabulary learning ability. Moreover, web-based instruction is discussed as one of the feasible delivery methods for learning activities. Most of institutions are offering it as a teaching and learning tool and many studies have been carried out to document the profitability of teaching and learning via WBI.

To respond to the problems in English vocabulary knowledge and English reading ability of SUT students and to investigate good vocabulary learning strategies

to support students' reading ability as well as the usefulness of WBI, this present study attempts to develop a web-based instructional model for enhancing English vocabulary learning ability of the students who enrolled on English III course at Suranaree University of Technology in the trimester 1, academic year 2010. This can be regarded as a way to expand students' vocabulary and improve the student's knowledge of vocabulary in order to succeed in their classroom learning.

1.3 Purposes of the Study

There are four main purposes of the study.

1. To develop a web-based instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique of the students who enrolled on English III course at Suranaree University of Technology in the trimester 1, academic year 2010.
2. To determine the efficiency of English vocabulary learning lessons via web-based instruction to students who enrolled on English III course at Suranaree University of Technology in the trimester 1, academic year 2010 based on the 85/85 standard.
3. To compare achievement of English vocabulary learning ability of students who received tutoring via web-based instruction and those who received tutoring via face-to-face method.
4. To explore the students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

1.4 Research Questions

In order to achieve the purposes stated above, the study focuses on the following questions:

What are the elements in developing web-based instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique?

1. Is there the efficiency on the 85/85 Standard of English vocabulary learning lessons via web-based instruction?
2. Are there any significant differences in English vocabulary learning ability between the experimental and control groups?
3. What are the students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?

1.5 Research Hypotheses

Four research hypotheses of the present study are as follows:

1. A web-based instructional model for enhancing English vocabulary learning ability by using context clues developed by the researcher is rated as "Appropriate" by the experts in Instructional Systems Design and English Language Teaching field.
2. The efficiency of English vocabulary learning lessons via web-based instruction meets the 85/85 standard.

3. The achievement of English vocabulary learning ability of the students who received tutoring via web-based instruction is higher than those who received tutoring via face-to-face method at the .05 level.
4. The students have positive opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

1.6 Scope and Limitations of the Study

The present study aims to develop a web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique for the students at Suranaree University of Technology**,** and compare the achievement of English vocabulary learning ability between the students who received tutoring via web-based instruction and those who received tutoring via the face-to-face method. Therefore, the subjects of this study may not be representative of the students who enrolled in other English courses at Suranaree University of Technology or other universities because they may have different backgrounds, learning environments and needs.

1.7 Definitions of Key Terms

1. Web-based instruction means a website designed to teach or to provide supplementary instruction. A website is developed for this project to provide web-based instruction in English vocabulary learning by context-clues based meaning guessing technique for enhancing English vocabulary learning ability of the students who enroll on English III course at Suranaree University of Technology in the

trimester 1, academic year 2010. It is designed and constructed by the researcher. It is delivered through public or private computers, and displayed by web browsers.

2. **Context clues** refer to the words and phrases in a sentence which help the readers understand the meaning of an unfamiliar word.

3. **Vocabulary learning ability** is the gain in scores on the post-test compared to the pre-test.

4. **University students** are the students who enroll in English III course in the trimester 1, academic year 2010 at Suranaree University of Technology, Nakhon Ratchasima, Thailand.

5. **Opinions:** Satisfaction, dissatisfaction or feedback about learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

6. **85/85 Criteria:** The standard criterion used to determine the efficiency of English vocabulary learning lessons via web-based instruction by using the efficiency of the process and the efficiency of the product formula (E1/E2 formula)

To conclude, this chapter provides a general introduction to the study. It begins with the background of the study, the significance of the study, the purposes of the study and the research questions. Then, the research hypotheses, scope and limitations of the study and the definitions of key terms are presented.

CHAPTER 2

LITERATURE REVIEW

The present study attempts to develop a web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique. This chapter presents a review of literature covered by the study. The discussion is divided into six main parts:

1. English Vocabulary Learning
    - Definitions of Vocabulary and the Importance of Vocabulary Learning
    - Vocabulary Learning Strategies
2. Learning Vocabulary through Reading: Guessing Meaning from Context Clues
3. Educational Technology
    - Definitions of Educational Technology
    - Importance of Educational Technology
    - Related Theories in Educational Technology
4. Web-based Instruction
    - Definitions of Web-based Instruction
    - Components and Features of Web-based Instruction
    - Advantages of Web-based Instruction
    - Limitations of Web-based Instruction

5. Designing the Effective Web-based Instruction and Instructional Design
   - Definitions of Instructional Design
   - Characteristics and Principles of Instructional Design
   - Instructional Design Models
   - Advantages of Instructional Design
   - Limitations of Instructional Design
6. Related Research on Teaching and Learning via Web-Based Instruction for Enhancing Students' Vocabulary Learning Ability

2.1 English Vocabulary Learning

English vocabulary learning is one of the most important aspects in teaching and learning English. It is central to language and is of great significance to language learners. Vocabulary is a key component to develop the ideas and concepts of the students to succeed in the classroom. Many aspects of English vocabulary learning are discussed in this section.

2.1.1 Definitions of Vocabulary and the Importance of Vocabulary Learning

Vocabulary is the total number of words which make up a language (Longman, 1991). Jackson and Amvela (2000) defined vocabulary as a collection of words or a package of sub-sets of words that are used in particular contexts. Hornby, Cowie, and Gimson (1984) stated that vocabulary is the total number of words which make up a language; and a range of words known to, or used by a person. In addition, Richards, J. Platt, and H. Platt (1992) stated that vocabulary is a set of lexemes which includes single words, compound words and idioms.

Fries (1960) defined vocabulary as the combination of sounds, which is dependent on the past experience of people. These sounds may be different in meaning, but there is one that is more dominant than the others. Therefore, a word can have more than one meaning. Moreover, the study of words can be focused on three aspects, which are sound, form, and meaning. The study of word sound is the study of stress and pitch, which can carry different meanings in language. The study of word form is the study of suffix, affix and infix. As for the study of word meaning, it can be divided into three aspects, which are lexical meaning, morphological meaning and syntactical meaning.

Vocabulary knowledge is very important and plays an essential role in learning English. Nation (1990) noted that vocabulary is the most important language learning element. Learners feel that many of their difficulties in both receptive and productive language use are from the lack of vocabulary knowledge. Vocabulary is a prime concern in second language settings because it plays a dominant role in classroom success (Krashen and Terrell, 1983). Avila and Sadoski (1996) stated that the mastery of vocabulary is an essential component of second language acquisition.

Kufaishi (1988) stated that English vocabulary is a fundamental language unit that students must learn at the beginning of their learning because it is one of the most important learning skills. All four communication skills, speaking, listening, reading, and writing, will not be sufficient if learners lack vocabulary knowledge (Jordan, 1997). Ghazal (2008) stated that vocabulary is the building blocks of a language since they label objects, actions, and ideas without which people cannot convey the intended meaning.

Lewis (1993) explained that vocabulary is the center of language teaching and learning because language consists of grammatical lexis, not lexical grammar. His most important contribution was to highlight the importance of vocabulary as being basic to communication. He also indicated that if language learners do not recognize the meanings of the key words used by those who address them, they will be unable to participate in the conversation. Vocabulary is the basic knowledge to communicate effectively using all four skills: listening, speaking, reading, and writing. Davies and Pearse (2000) stated that vocabulary is important because it is frustrating for language learners trying to communicate. They can't communicate effectively if they don't know many of words they need.

Krashen and Terrell (1983) noted that vocabulary is also important for the ESL acquisition process. The popular belief is that one uses form and grammar to understand meaning. The truth is probably closer to the opposite; we acquire morphology and syntax because we understand the meaning of utterances. They also stated that acquisition depends crucially on the input being comprehensible. And comprehensibility is dependent directly on the ability to recognize the meaning of key elements in the utterance. Thus, acquisition will not take place without comprehension of vocabulary.

As to the importance of vocabulary as reviewed above, it can be concluded that vocabulary knowledge is one of the key elements to support the learners' success in the classroom. It is a crucial and major part of a student's learning. Therefore, the learner should acquire enough vocabulary knowledge in learning. A native English-speaking university freshman has acquired vocabulary at the rate of at least 1,000 words per year from childhood and knows 20,000 to 25,000

words upon college entrance (Nagy and Anderson, 1984; Nation, 1990). For second language learners entering university, Laufer (1992) found that knowing a minimum of about 3,000 words was required for effective reading at the university level, whereas knowing 5,000 words indicated likely academic success. Therefore, good vocabulary learning strategies should be supported in the classroom in order to expand students' vocabulary size and improve their knowledge of vocabulary for success in their classroom learning.

2.1.2 Vocabulary Learning Strategies

Language learning strategies encourage greater overall self-direction for learners. Self-directed learners are independent learners who are capable of assuming responsibility for their own learning and gradually gaining confidence, involvement and proficiency (Oxford, 1990). Ellis (1997) noted that learning strategies are particular approaches or techniques that learners employ to try to learn. Wenden and Rubin (1987) defined learning strategies as the behaviors and thought processes that learners use in the process of learning, including any sets of operations, steps, plans, routines used by the learners to facilitate the obtaining, storage, retrieval, and use of information.

Vocabulary learning strategies are one part of language learning strategies which in turn are part of general learning strategies (Nation, 2001). Vocabulary learning strategies are very important for language learners, empowering them by having them to cope with the demand of class and indeed, may help them to continue to learn on their own apart from the class (Freeman and Long, 1991, quoted in Nuchsong, 1997). Cameron (2001) defined vocabulary learning strategies as the actions that learners take to help themselves understand and remember vocabulary

items. Intaraprasert (2004) stated that it is any set of techniques or learning behaviors, which students reported using in order to discover the meaning of a new word, to retain the knowledge of newly-learned words, or to expand their knowledge of English vocabulary. Vocabulary learning strategies were proposed and classified by many researchers.

Gu and Johnson (1996) explained the second language vocabulary learning strategies as metacognitive, cognitive, memory and activation strategies. Metacognitive strategies consist of selective attention and self-initiation strategies. Learners who employ selective attention strategies know which words are important for them to learn and are essential for adequate comprehension of a passage. Learners employing self-initiation strategies use a variety of means to make the meaning of vocabulary items clear. Cognitive strategies involve guessing strategies, dictionaries and note-taking strategies. Learners using guessing strategies draw upon their background knowledge and use linguistic clues like grammatical structures of a sentence to guess the meaning of a word. Memory strategies are divided to rehearsal and encoding categories. Word lists and repetition are instances of rehearsal strategies. Encoding strategies include such strategies as association, imagery, visual, auditory, semantic, and contextual encoding as well as word. Activation strategies include those strategies through which the learners actually use new words in different contexts. For example, learners may make sentences by using the words they have just learned.

According to Nation (2001), vocabulary learning strategies were classified and grouped with three general classes of strategies that are planning vocabulary learning, sources of vocabulary knowledge, and learning processes. First,

planning vocabulary learning involves deciding on where to focus attention, how to focus the attention, and how often to give attention to the item. These strategies are choosing words, choosing the aspects of word knowledge, choosing strategies, and planning repetition. Secondly, sources of vocabulary knowledge concerns finding information about words. The information may include all of the aspects involved in knowing a word. The sub-categories of this class are the strategies of analyzing the words, using context, consulting a reference source in the first or second language, and using parallels in the first or second language. Last, learning processes involve ways of remembering vocabulary and making it available for use. Noticing, retrieving, and generating were the sub-categories in the class.

Schmitt (1977) developed classified vocabulary learning into two categories: strategies for discovery of a new word's meaning and strategies for consolidating a word once it has been encountered. Category one, the strategies for discovery of a new word's meaning, include (1) determination strategies that are analyzing part of speech / affixes / root / any available picture or gestures, checking for L1 cognate, guessing meaning from textual context, and using a dictionary. And (2) social strategies involve asking a teacher for a synonym, paraphrase, or L1 translation of new words, and asking a classmate for meaning. Category two, the strategies for consolidating a word once it has been encountered, consist of social strategies, memory strategies, cognitive strategies, and metacognitive strategies. Social strategies are studying and practicing meanings in a group and interacting with native speaker. Memory strategies are connecting a word to a previous personal experience, associating the word with its coordinates, connecting the word to its synonyms and antonyms, using semantic maps, imaging word form and word's

meaning, using key- words methods, grouping words together to study them, studying the spelling of a word, saying new word aloud when studying, and using physical action when learning a word. Cognitive strategies are verbal repetition, written repetition, word lists, putting English labels on physical objects, and keeping a vocabulary notebook. Metacognitive strategies include using English language media such as songs, movies, newscasts, etc., testing oneself with word tests, skipping or passing new words, and continuing to study words over time.

Cohen (1987) grouped the strategies into four main categories as rote-repetition, structure, semantic strategies, and the use of mnemonic devices. Rote-repetition includes repeating the word and its meaning until it seems to have stuck. Structure includes analyzing the word according to its root, affixes, and inflections as a way to understand its meaning. Semantic strategies involve thinking of synonyms so as to build a network of interlinking concepts, clustering words by topic group or type of word, or linking the word to the sentence in which it was found or to another sentence. The use of mnemonic device helps students to create a cognitive link between an unfamiliar foreign language word or its translation by means of a cognitive mediator.

Lawson and Hogben (1996) classified vocabulary learning under four different categories. These include repetition, word feature analysis, simple elaboration, and complex elaboration. Repetition strategies comprise reading of related words, simple rehearsal, writing of word and meaning, cumulative rehearsal, and testing. Word feature analysis consists of spelling, word classification, and suffix. Simple elaboration involves sentence translation, simple use of context, appearance similarity, and sound link. The last category is complex elaboration: complex use of context, paraphrase, and mnemonic devices.

Stoffer (1995) proposed nine categories of vocabulary learning strategies. These include strategies involving authentic language use, strategies involving creative activities, strategies for self-motivation, strategies used to create mental linkages, memory strategies, visual/auditory strategies, strategies involving physical action, strategies used to overcome anxiety, and strategies used to organize words.

According to Intaraprasert's study (2004), vocabulary learning strategies were proposed and classified into three main categories: strategies to discover the meaning of new vocabulary items, strategies to retain the knowledge of newly-learned vocabulary items, and strategies to expand one's knowledge of vocabulary items. Strategies to discover the meaning of new vocabulary items consist of using Thai-English / English-Thai / English-English dictionary, guessing the meaning from the context, asking classmate / teacher / or others, looking the word roots / prefixes / or suffixes, and using online dictionary / electronic dictionary. Strategies to retain the knowledge of newly-learned vocabulary items include memorizing with or without the word list, keeping a vocabulary notebook, grouping words based on synonyms and antonyms, associating new words with the already-learned ones, using new words in writing, using new words with peers, speaking Thai with English loan-words, keeping words as the computer background, keeping word cards or word chart in the bed room, keeping words as rhymes or songs, and using pictures. The last category, strategies to expand one's knowledge of vocabulary items, consists of listening to radio programmes in English especially ones for language learning, watching TV, programmes in English especially ones for language learning, surfing the Internet especially website for language learning, reading different types of English printed material, playing games in English, practicing translating from

Thai into English and vice versa, watching English- speaking film with Thai-narrated script, attending classes of every module regularly, listening to English songs, and doing extra vocabulary exercises from different sources.

In summary, there are many different vocabulary learning strategies classified and proposed in different ways by many researchers. Most of them can be applied to a wide range of vocabulary learning and they are very useful and valuable in all levels of vocabulary learning.

2.2 Learning Vocabulary through Reading: Guessing Meaning from Context Clues

Reading is the one of the most important skills. It is a crucial skill for students because they themselves acquire more knowledge by reading. Saengpakdeejit (2001) said that reading seems to be the most necessary skill for learners because it is the only skill that they themselves can practice anytime, anywhere. In the same way, Dobson (2006) stated that reading is the skill that learners will in all likelihood have the most opportunities to use and that they can use most conveniently. Besides that, Wongsothorn (2002, quoted in Issarapakdee, 2006) stated that the most used skill in the work place was English reading and this skill enables learners to do research effectively and learn independently through various sources of printed information. Hood, Solomon, and Bums (1995) stated that reading is the way we use language in daily life in order to communicate with each other. It is a basic communication skill and a primary means of learning in our society. Marksheffel (1963) noted that reading is the process of language perception from which the readers get new ideas and use

them to solve problems and entertain themselves. Reading skill is one of the most important skills that learners need to master in order to succeed in the classroom.

Many researchers (Wongla, 1999; Harris, 1961, quoted in Promrat, 1998; Punya, 1994; Saengchai, 1990; Krashen and Terrell, 1983; Dale, 1969) stated that vocabulary knowledge is one of the most important factors to help the learners succeed in reading. Low vocabulary knowledge has a bad effect on comprehension of a text. Students or readers may not interpret appropriately if they have inadequate vocabulary. Williams (1984) stated that the real problem for foreign learners is that they may not know many of the words in the text they read and therefore cannot recognize them. Laufer (1997) explained that reading comprehension in both first and second language is also affected by textually relevant background knowledge and the application of general reading strategies, such as predicting the content of the text, guessing unknown words in context, making inferences, recognizing the type of text and text structure, and grasping the main idea of the paragraph. And it has been consistently demonstrated that reading comprehension is strongly related to vocabulary knowledge, more strongly than to the other components of reading. Beck, Perfetti, and McKeown (1982), Kameenui, Carnine and Freschi (1982), and Stahl (1983) also indicated that an improvement in reading comprehension can be attributed to an increase in vocabulary knowledge. Many previous studies (Omanson, Beck, Mckeown, and Perfetti, 1984; Freebody and Anderson 1983; Beck, Perfeni, and McKeown, 1982; Kameenui, Carnine and Freschi 1982; Pany, Jenkins and Schreck, 1982; Marks, Doctorow and Wittrock, 1974) showed that low frequency vocabulary in a text has a negative effect on comprehension.

Thus, vocabulary knowledge would seem to be the most important element and a tool to support the reading ability of the students to comprehend the text. It is the one of many factors that allows readers it get information from the text. To increase students' vocabulary knowledge, good vocabulary learning strategies should be promoted and supported in the classroom.

Many studies attempted to find out the good strategies or methods for enhancing students' English vocabulary learning ability such as studies by Chamot and Kupper (1989), Coady (1979), Liu and Nation (1985), Nunan (1991), and Rubin (1975). They concluded that the most useful characteristic of a good language learner is guessing. Good students used guessing strategies for learning vocabulary. Wen and Johnson (1997) also found that while all learners consistently used guessing as a strategy, it was the high achievers who tend to guess according to the reading context. Nation and Coady (1988) studied the relationship of vocabulary to reading with an emphasis on reviewing the relevant research relating to guessing as well as learning vocabulary in context. The general conclusion to be drawn from research is that learning vocabulary through context must be the major way of increasing vocabulary knowledge. But it would seem that two complementary approaches are necessary to get this increase: the encouragement of a substantial quantity of reading and the development of the skill of guessing from context. Saitakham (2000) investigated English vocabulary learning strategies employed by high and low proficiency English major students at Naresuan University, Thailand. The result of the study showed that good students most frequently use the strategy of guessing meaning from context clues while poor students most frequently use dictionary strategies for learning English vocabulary. Suppasetseree and Saitakham (2008) studied English vocabulary

learning strategies of non-English major students with different levels of English proficiency at Suranaree University of Technology, Thailand and found that good students guessed unknown words meaning from the context clues and poor student relied on dictionary use for learning English vocabulary. Krutkaeo (1980) examined the effect of context clues on students' speed reading ability and the results showed that the students who used context clues read faster than those who did not use them.

The use of context clues is an effective way to develop students' vocabulary and increase their reading comprehension by which the reader uses the clues to infer or deduce the meaning of unfamiliar words from the context (Fengning, 1994). Context clues are other words and sentences that are around the new word. Nation and Coady (1988) noted that context clues can be viewed as morphological, syntactic, and discourse information in a given text which can be classified and described in terms of general features. In addition, Aebersold and Field (1997) noted that using the context surrounding the words to guess its meaning is one of the most useful and overarching strategies for dealing with unknown words encountered while reading. The following advantages of this strategy are noted by Fengning (1994):

1. To make the students aware of one important feature of vocabulary, namely, that context determines the meaning of words.
2. To help students develop a holistic approach toward reading a text. While they are looking for context clues, they learn to direct their attention to language units larger than the sentence because the context of a new word may be drawn from a group of sentences, a paragraph, or even the entire text.

3. To encourage students to develop the willingness to take risks so they are more confident and independent in their approach to reading.

Lansdowne (1985) also stated that guessing from the context clues can help the students to read and understand more quickly, and help readers to develop the thinking process. Guessing word meaning from the context is one of the effective ways to learn vocabulary. The students have learned to look for a number of clues. To look for the clues, Nattinger (1988) suggested that at first, the guesses are guided by the topic of the text. Secondly, we are guided by the other words in the discourse to help us guess. Discourse is full of redundancy, anaphora and parallelism, and each offers clues for understanding new vocabulary. Finally, grammatical structures also contain further clues.

There is a variety of context clues that can be used to infer the meaning of a word. **According to How-To-Study.com (2008)** divided types of context clues into definition, synonym, antonym, description, summary, and visual context clues.

1. Definition context clues: the texts include a definition to help the students understand the meaning of a word.

2. Synonym context clues: a synonym is a word that means the same as or nearly the same as another word.

3. Antonym context clues: an antonym is a word that means the opposite of another word.

4. Description context clues: the texts provided one or more descriptions to help the students understand the meaning of a word.

5. Summary context clues: the texts provided a number of statements for helping the students to comprehend and understand the meaning of a word.

6. Visual context clues refers to a picture, drawing, chart, graph, or other type of visual aids to help the students understand the meaning of a word.

According to Schools.manatee.k12.fl.us.com (www, 2008), there are five types of context clues.

1. Definition/explanation clues: sometimes a word's or phrase's meaning is explained immediately after its use.

2. Restatement/synonym clues: sometimes a hard word or phrase is said in a simple way.

3. Contrast/antonym clues: sometimes a word or phrase is clarified by the presentation of the opposite meaning and somewhere close to its use.

4. Inference/general context clues: sometimes a word or phrase is not immediately clarified within the same sentence. Relationships, which are not directly apparent, are inferred or implied.

5. Punctuation clues: students or readers can also use clues of punctuation and type style to infer meaning, such as quotation marks (showing the word has a special meaning), dashes , parentheses or brackets (enclosing a definition), and italics (showing the word will be defined).

Fengning (1994) also classified six types of context clues that can be used to infer the meaning of a word. These are definition clues, example clues, comparison and contrast clues, summary clues, synonym clues, and antonym clues. To be successful in guessing from the context clues, Laufer (1997) indicated that in order to consistently make good guesses, students should know about 98% of vocabulary in the texts. In addition, Liu and Nation (1984) conducted research on advanced second

language learners and found that the high proficiency learners guessed between 85 % and 100 % of the unknown words.

Nation (2001) discussed five conditions to consider what proportion of unknown words can be guessed from the context. First, it is necessary to look at guessing where learners already know a large proportion of the word in the texts. Liu and Nation (1985) noted that at least 95% of the running words need to be familiar to the students in order to use the clues for guessing the unknown words. Therefore, 95% means that there is one unknown word in every 20 running words, or one in every two lines (Nation, 2001). Second, the estimates of guessing need to be based on the actual words not known by each learner. Third, learner skill is a critical factor in guessing. Next, learners must be given credit for guesses that are not 100% correct but which make a small but positive contribution to knowledge of the meaning of the word. Lastly, it is important to distinguish between guessing from natural contexts and deliberate learning with specially constructed or chosen contexts.

Laufer (1997) also discussed four factors affecting guessing word meanings. These are nonexistence of clues, lack of familiarity with the words in which the clues are located, presence of misleading or partial clue, and incompatibility between the reader's schemata and the text content. Firstly, nonexistence of clues. It cannot be taken for granted that clues are present in the text and need only to be discovered by the students. Secondly, lack of familiarity with the words in which the clues are located. A high density of unknown words will reduce the usability of clues as there will be a higher probability that words that explain each other will be unfamiliar. Thirdly, presence of misleading or partial clue. The learner who has been taught that there is no need to understand the precise meaning of words may remain satisfied with

whatever makes sense in the context, whether it is right or wrong. Lastly, incompatibility between the reader's schemata and the text content. If the two are different, the students may impose their interpretation on the text and try to understand individual words in a way that will fit the global meaning, suppressing the clues that suggest a different interpretation.

With regard to providing help and support the students to become fluent and skillful at guessing from the contexts, Clarke and Nation (1980, quoted in Nation, 2001) explained following five-step procedures for guessing meaning from context:

1. Look at the unknown word and decide its part of speech.
2. Look at the clause or sentence containing the unknown word.
3. Look at the relationship between the clause or sentence containing the unknown word and other sentences or paragraphs.
4. Guess the meaning of the word by using the knowledge gaining from step one to three.
5. Check that the guesses are correct or not.

At the first step, the students have to decide what part of speech the unknown word is. The students were encouraged to focus on the unknown word and besure that the right word is focused on. The second step, students have to look at the immediate context of the unknown word and simplify this context if necessary. Aebersold and Field (1997) suggested that (1) if the unknown word is a noun, what adjectives describe it? What verb is it near? That is, what does this noun do and what is done to it? (2) If the unknown word is a verb, what noun does it go with? Is it modified by an adverb? (3) If the unknown word is an adjective, what noun does it modify? And (4) If the unknown word is an adverb, what verb does it modify? The third step, students

have to see what joining word can be put between the clause containing the unknown word and the adjoining clauses. Aebersold and Field (1997) noted that sometimes this relationship will be signaled by a conjunction like *but, because, if* or *when,* or by an adverb like *however* or *as a result.* Punctuation can serve as a clue, such as semicolons which often signal a list of inclusion relationships, and dashes may signal restatement. Moreover, reference words like *this, that,* and *such* also provide useful information. At the fourth step, the students have to use the knowledge gained from the steps one to three to guess the meaning of the word. The last step, the students have to check that their guess is correct or not. There are three steps involved in this checking, namely, guess the meaning of the word, justify the guess using a variety of clues, and readjust the guess if necessary.

Aebersold and Field (1997) suggested the following three ways to check the guesses.

1. See that the part of speech of your guess is the same as the part of speech of the unknown word. If it is not the same, then something is wrong with your guess.
2. Replace the unknown word with your guess. If the sentence makes sense, your guess is probably correct.
3. Break the unknown word into its prefix, root, and suffix, if possible. If the meanings of the prefix and root correspond to your guess, good. If not, look at your guess again, but do not change anything, if you feel reasonably certain about your guess using the context.

In conclusion of this part, regarding learning vocabulary through reading: guessing from context clues, guessing vocabulary from context clues is one of the

most frequent way to discover the meaning of new words. According to the literature reviews and the studies have shown above, this approach is the one of the effective ways to learn vocabulary. Therefore, it can be said that one way to enhance students' vocabulary learning ability has been through deriving meaning from context clues.

2.3 Educational Technology

2.3.1 Definitions of Educational Technology

With the coming of the twenty-first century, it can be said that this is the age of media and technology. Technology is an inescapable component of the way of life in modern society. It is a great factor in the changes that have come in social, cultural, political values and education have been changed. Technological developments cause continuous changes to every sector of modern society. Technology in education can have many interpretations. Primarily, it is technology of the process of education itself which gives it its conventional term, "educational technology" (Cook, Seng and Halim, 1981).

Educational technology involves the application of systems, techniques, and aids to improve the process of human learning. It is characterized by four features in particular: the definition of objectives to be achieved by the learner; the application of principles of learning to the analysis and structuring of the subject matter to be learned; the selection and use of appropriate media for presenting material; and the use of the appropriate methods of assessing student performance to evaluate the effectiveness of courses and materials (Collier, 1971). Cleary (1976) stated that educational technology is concerned with the overall methodology and set of techniques employed in the application of instructional principles.

Educational technology is the body of knowledge resulting from the application of the science of teaching and learning to the real world of the classroom, together with the tools and methodologies developed to assist in these applications (Dieuzeide, 1971). Carnegie (1972) noted that educational technology is a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction. Educational technology is a complex, integrated process involving people, procedures, ideas, devices and organization, for analyzing problems, and devising, implementing, evaluating and managing solutions to those problems, involved in all aspects of human learning (AECT Task Force, 1977).

In conclusion, there are many definitions of educational technology. The term educational technology may be broadly taken to study the technology of teaching and learning, or how to project knowledge from teacher to student, which includes the use of equipment as the vehicle of teaching and learning as in language laboratories and computer-aided instruction, and the use of hardware as an aid in teaching and learning.

2.3.2 Importance of Educational Technology

In education systems, technological inventions have had an important role in teaching and learning. Many researchers discussed technological inventions that affect and benefit instruction.

Engler (1972) viewed technology as being inextricably related to education. Heinich (1970) predicted that learning and teaching are going to be more

deeply affected by the new availability of information than any other area of human life. There is a great need for a new approach, new methods, and new tools in teaching, man's oldest and most reactionary craft. There is a great need for a rapid increase in learning and a great need for methods that will make the teacher effective, and multiply his or her efforts and competence. Teaching is in fact, the only traditional craft in which we have not yet fashioned the tools that make an ordinary person capable of superior performance. Saad, Ismail and Khine (1981) concluded the educational technology have many effects in teaching and learning that:

1. Educational technology can make education more effective. Educational technology can speed up the role of learning and can help the teacher make better use of his time.
2. Educational technology can make education more individualized. By using various kinds of media, students can learn individually at their own pace and rate. The use of technology permits students to find their own directions.
3. Educational technology can make teaching more powerful. New forms of media and communication give man added capability. Mediated instructions improve retention since for some students seeing makes the difference in learning.
4. Educational technology can make learning more immediate. It can help to bridge the gap between the outside world and the world inside the school.
5. Educational technology can make access to education more equal. Equal access to rich learning environment is not possible without some recourse

to technology. Information is more easily accessible regardless of geographical differences.

Rogers (2003) explained two benefits of educational technology. First, use of technology provides added value to teaching and second, learning and technology assists in the assessment of the learning outcomes.

First, educational technology use provides added value to teaching and learning. The use of technology brings added value to the teaching or learning processes when it makes possible something that otherwise would be impossible or less viable to do. For teaching, adding value might mean individualizing instruction or making it more responsive to student's questions and interests, or providing additional resources of information so instruction is more real-world, authentic, and current. Teachers can also use educational technology to support additional opportunities for learners to practice, get feedback, or allow for revision or reflection. Thus, it supports knowledge acquisition and practice, so learners become more fluent in their knowledge.

Added value for learning might mean educational technology that supports the accessing of data, processing of information, or communicating of knowledge by making these processes more feasible. Educational technology can aid students' accessing information or representing it in new ways. It can increase access to people, perspectives, or resources and to more current information. In terms of processing information, added value might mean that the educational technology supports students learning-by-doing or aids them in constructing mental models, or making meaning, by scaffolding their thinking. In addition, educational technology can also

add value to students' ability to show and articulate to others what they have learned. For example, the World Wide Web is a medium through which it is relatively easy for students to communicate with others around the world. Whether to their peers or outside experts, with educational technology students are able to create more authentic and professional communication and in the style and format appropriate for the topic.

Second, learning and educational technology assists in the assessment of the learning outcomes. Planning for the assessment of students' learning outcomes is a key component of designing instruction. Technology can assist teachers in collecting both formative and summative data that will help them understand how students are meeting or have met the learning outcomes for that lesson or unit. Some software or hardware actually collects formative data during its use, and some technologies also provide help in the analysis of the information. Generally, these are software programs designed to assess student leaning, such as tutorial or drill and practice software. Some of these programs, through screens or printouts of information, or other feedback mechanisms, support student's self-assessment of their learning. In addition, educational technology is an aid to summative assessment, especially performance assessments where students are to produce products that allow them to show what they know and can do. Moreover, when teachers use educational technology to assist them in the assessment of students' progress toward or obtainment of learning outcomes it makes technology an even more effective instructional tool. It will help students to prepare for their future to be asked to create computer-produced products, to become accustomed to showing their progress

through such products, and to describe how these products demonstrate what they know.

According to Barron and Orwig (1997), there are ten benefits of educational technology:

1. Instructional effectiveness: Multimedia instruction from educational technology can increase in students' achievement.
2. Active learning: Interactive technologies provide stimulating environments that encourage student involvement in the learning process.
3. Critical thinking: The structure and the use of technology can promote higher-level thinking skills. The use of technology such as hypermedia and telecommunications also affects thinking skills.
4. Individualization: Students are different, and they learn and develop in different ways at varying rates.
5. Motivation: Motivating students is a constant challenge in education. Technology can inspire students and teachers by making learning exciting and relevant.
6. Flexibility for students with special needs: Technology offers many advantages for students with special needs.
7. Cooperative learning: Technology can be used to enhance and encourage cooperative learning in our schools through small groups using a single computer, network-based instructional programs

8. Communication skill: Communication skill can be enhanced by using technology in small groups and by integrating telecommunication into the curriculum.
9. Multisensory delivery: One benefit of multimedia instruction is that it provides information through multiple sensory channels, allowing students with various learning styles to assimilate and apply the knowledge.
10. Multicultural education: Telecommunications make it possible to expand classroom walls and to link students and teachers in national and international exchanges. These interactions enable students from vastly different backgrounds to build cultural bridges by investigating common problems from different perspectives.

As present above, these are many advantages of educational technology. Educational technology is very essential if used effectively. Teachers should be aware of the value of using educational technology.

2.3.3 Related Theories in Educational Technology

Autonomous Learning

Over the last three decades or in the early of 1980s, the concepts of learner autonomy and independence have gained momentum, the former becoming a 'buzzword' within the context of language learning (Little, 1991). Most of the definitions of autonomy respond to ideals and expectations, which arise in the field of language learning. Learner autonomy is defined in many different ways by many different researchers.

Holec (1988), one of the earliest advocates of autonomy in language teaching, has defined learner autonomy as "to take charge of one's learning is to have, and to hold, the responsibility for all the decisions concerning all aspects of learning, i.e. determining objectives, defining the contents and progressions, selecting method and techniques to be used, monitoring the procedure of acquisition properly speaking (rhythm, time, place etc,) and evaluating what has been acquired."

Garner and Miller (1999) explained that autonomy is a situation in which the teacher is still an important part of the learning process, but the teacher isn't the main focus in the learning process. The teacher transfers all control to the learners, so that learners are totally responsible for all the decisions concerned with their learning and the implication of these decisions without the direct control of the teacher.

Dickinson (1993) also defined autonomy as the situation in which the learner is completely responsible for all decisions concerned with his or her learning and completion of those decisions. Within complete autonomy, there is no direct involvement of teacher and leaner, and the learner is also independent of particularly prepared materials.

Littlewood (1996) explained the concept of autonomy as the learners' ability and willingness to make choices independently. In addition, he suggested that the ability depends on possessing both knowledge about the alternatives from which choices have to be made and necessary skills for carrying out whatever choices seem most appropriate. Willingness depends on having both the motivation and confidence to take responsibility for the choices required. Little (1991) listed the concept of autonomy as follows:

1. Autonomy is not a synonym for self-instruction; in other words, autonomy is not limited to learning without a teacher.
2. In the classroom context, autonomy does not entail an abdication of responsibility on the part of the teacher; it is not a matter of letting the learners get on with things as best they can.
3. On the other hand, autonomy is not something that teachers do to learners; that is, it is not another teaching method.
4. Autonomy is not a single, easily described behavior.
5. Autonomy is not a steady state achieved by learners.

Benson and Voller (1997) stated that the term autonomy has come to be used in at least five ways:

1. For situations in which learners study entirely on their own.
2. For a set of skills which can be learned and applied in self-directed learning.
3. For an inborn capacity which is suppressed by institutional education.
4. For the exercise of learners' responsibility for their own learning.
5. For the right of learners to determine the direction of their own learning.

Littlewood (1996) defined an autonomous learner as one who has an independent capacity to make and carry out the choices which govern his or her actions. Wenden (1998) indicated that there seem to be seven main attributes characterizing autonomous learners:

1. Autonomous learners have insights into their learning styles and strategies.
2. Take an active approach to the learning task at hand.
3. Are willing to take risks, i.e., to communicate in the target language at all costs.
4. Are good guessers.
5. Attend to form as well as to content, that is, place importance on accuracy as well as appropriacy.
6. Develop the target language into a separate reference system and are willing to revise and reject hypotheses and rules that do not apply.
7. Have a tolerant and outgoing approach to the target language.

To increase and develop the learners' autonomy, Littlewood (1996) focused on the independent capacity that increases students' autonomy. This capacity depends on two main components: ability and willingness. He explained that ability and willingness can themselves each be divided into two components. Ability depends on possessing both knowledge about the alternatives from which choices have to be made and the necessary skills for carrying out whatever choices seem most appropriate. Willingness depends on having both the motivation and the confidence to take responsibility for the choices required. If a person is to be successful in acting autonomously, all of these four components need to be present together. Littlewood also stated that to increase autonomy in using and learning language could involve a progression such as the following:

1. Learners are able to make their own choices in grammar and vocabulary such as in controlled role-plays and simple tasks involving information exchange. This is the initial step towards autonomous communication.
2. Learners choose the meanings they want to express and the communication strategies they will use in order to achieve their communicative goals.
3. Learners are able to make more far-reaching decisions about goals, meanings and strategies such as in creative role-playing, problem-solving and discussion.
4. Learners begin to choose and shape their own learning contexts, such as in self-directed learning and project work.
5. Learners become able to make decisions in domains which have traditionally belonged to the teacher such as materials and learning tasks;
6. Learners participate in determining the nature and progression or their own syllabus.
7. Learners are able to use language (for communication and learning) independently in situations of their choice outside the classroom.

Lee (1998) indicated main five factors which are crucial to the development of learner autonomy. First, voluntariness: It is a pre-requisite for independent language learning. Students who are coerced into joining a self-directed

learning programme may not benefit as much as those who volunteer. Second, learner choice: Learner choice is essential to autonomous learning. Learner choice implies that students can work at their own pace, deciding on questions of what, when, how, and how often. Next, flexibility: Learners need a supportive environment in order to learn to be more independent. Flexibility in a self-directed learning programme means that students can change options such as objectives, contents, process of learning according to their needs and interests. Fourth, teacher support: It is crucial for the teacher to establish a good relationship with students, supporting and guiding them in their learning such as by helping them formulate their goals more clearly, and providing feedback, encouragement, and reinforcement. Lastly, peer support: Learner autonomy is not only individual but also social. Therefore, interaction, negotiation, and collaboration are important factors in promoting learner autonomy.

According to a framework for developing autonomy explained by Littlewood (1996), there are three main domains of autonomy: autonomy as a communicator, autonomy as a learner, and autonomy as a person. First, autonomy as a communicator depends on the ability to use the language creatively; the ability to use appropriate strategies for communicating meanings in specific situations. Second, autonomy as a learner depends on the ability to engage in independent work and the ability to use appropriate learning strategies, both inside and outside the classroom. Third, autonomy as a person depends on the ability to express personal meanings and ability to create personal learning contexts, e.g. through interacting outside the classroom. The relations among three main domains of autonomy framework are shown in Figure 2.1.

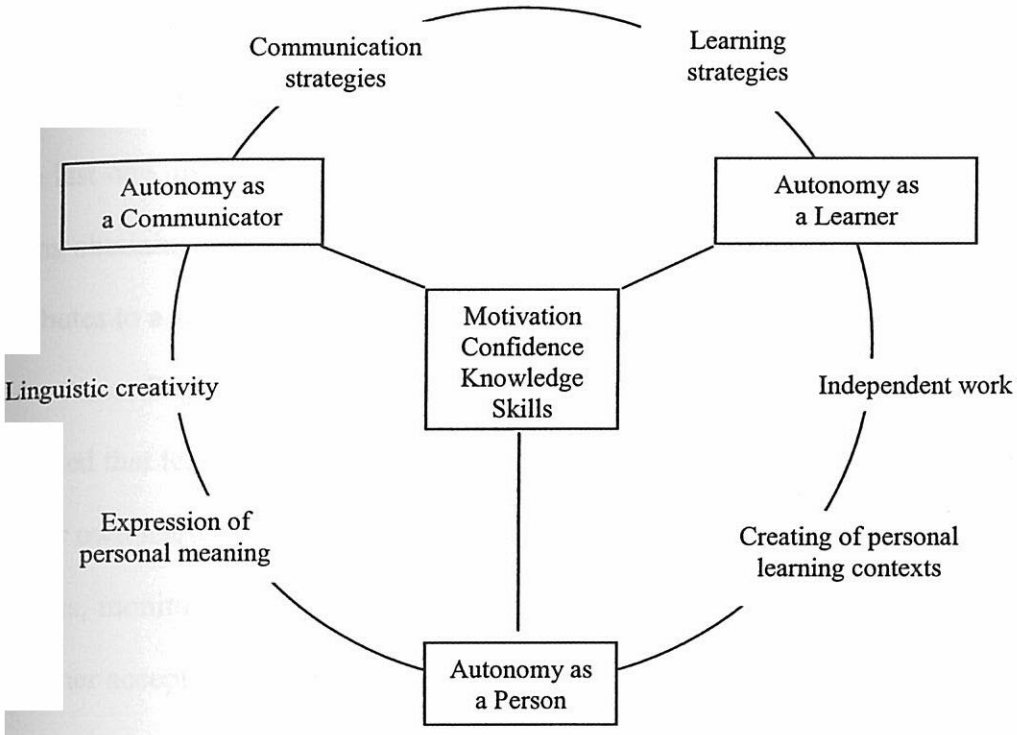


Figure 2.1 Framework for Developing Autonomy in Foreign Language Learning (Littlewood, 1996)

The figure 2.1 shows the three main domains of autonomy as linked areas around a circle. At the centre of the circle, there are the four main components of autonomy: motivation, confidence, knowledge and skills. In addition, it illustrates how the domains and area of autonomy overlap. Littlewood (1996) explained that in the domain relations of his framework, linguistic creativity is most obviously associated with a person's autonomy as a communicator. However, since it facilitates the expression of personal meanings, it also contributes directly to his or her autonomy as a person. Communication strategies are most obviously associated with a person's autonomy as a communicator. However, since they enable a student to deal more independently with texts and social situations, they also contribute to his or her

autonomy as a learner. Next, learning strategies are most obviously associated with a person's autonomy as a learner. However, since they enable learners to extend their communicative repertoire, they also contribute to their autonomy as communicators. In the last one, independent work includes the creation of personal learning contexts such as obtaining foreign newspapers or joining groups of native-speakers, and thus contributes to a student's autonomy as a person.

According to these various descriptions of leaner autonomy, it can be concluded that learner autonomy is a strategy in which the learners take responsibility for their own learning, and do such things as set learning objectives and goals, change materials, monitor and evaluate their learning. The basis of learner autonomy is that the learner accepts responsibility for their own learning. Because autonomous learners are encouraged to take responsibility for their own work, so they are able to learn how to learn from their own successes and failures in the ways which help them to be more efficient learners in the future. Learner autonomy should be promoted in order to help the learners to develop and improve their learning ability more effectively.

Constructivism Theory

Constructivism is the theory of learning that regards learning not so much as the product of passive transmission but as a process of active construction (Hadjerrouit, 2005). The theory views learning as a process of knowledge construction, with concept development and comprehensive understanding as the goals (Fosnot, 1996). Constructivism is child-centered; it proposes that learning environments should support multiple perspectives or interpretations of reality, knowledge construction, context-rich, experience-based activities (Jonassen, 1991). Constructivism uses construction kits to assist learners to construct knowledge and emphasizes presenting learning activity in a meaningful context, provides an

alternative theoretical foundation for rethinking and redesigning teaching practices (Chen, 2003). An important component of the theory is to focus a child's education on authentic tasks. These are tasks which have real-world relevance and utility, that integrate those tasks across the curriculum, that provide appropriate levels of difficulty or involvement (Jonassen, 1991).

According to VonGlasersfeld (1996), there are two main aspects of constructivism. First, learning is a process of knowledge construction instead of absorption. Learners construct knowledge based on their own perceptions and conceptions of their world and learning occurs only when the learners are actively involved in the construction and reorganization of concepts. Second, knowledge is highly related to the environment in which the learner experiences and constructs the knowledge.

The constructivists believe that knowledge is a constructed element resulting from the learning process and knowledge is a unique to individual who construct it (Duffy, McDonald and Mizell, 2005). According to Gagnon and Collay (2008), constructivists assume that learners construct their own knowledge on the basis of interaction with their environment. Four epistemological assumptions are at the heart of constructivist learning. First, knowledge is physically constructed by learners who are involved in active learning. Second, knowledge is symbolically constructed by learners who are making their own representations of action. Next, knowledge is socially constructed by learners who convey their meaning making to others. Last, knowledge is theoretically constructed by learners who try to explain things they don't completely understand.

Constructivism is child centered. It is assumed that learners learn better if they construct knowledge for themselves, rather than having it dictated by the teacher. The constructivist paradigm suggested a set of instructional principles that guide the design

of learning environments. According to Hadjerrouit (2005), the basic instructional design principles are as follows: 1) knowledge must be actively constructed by learners, not passively transmitted by teachers. 2) Students' prior knowledge must be taken into account by the construction of new knowledge. 3) In order to be useful for problem solving, knowledge components must be related to each other. The process of constructing interrelated knowledge requires higher order thinking skills, such as analysis and design skills. 4) To get students actively involved in knowledge construction, learning activities should focus around a set of intrinsically motivating problems that are situated in real-world tasks. 5) Learning should take place in a collaborative environment that involves social interaction and negotiation. 6) Assessment procedures should be embedded in the learning process, focus on authentic tasks, and consider learners' individual orientations, and 8) teachers serve primarily as guides and facilitators of learning, not as transmitters of knowledge.

Jonassen (1994) summarized the implications of constructivism for instructional design. The following principles describe how knowledge construction can be facilitated. These are provide multiple representations of reality, represent the natural complexity of the real world, focus on knowledge construction, not reproduction, present authentic tasks (contextualizing rather than abstracting instruction), provide real-world, case-based learning environments, rather than pre-determined instructional sequences, foster reflective practice, enable context-and content dependent knowledge construction, and support collaborative construction of knowledge through social negotiation.

Honebein (1996) explained the seven goals for the design of constructivist learning environments: provide experience with the knowledge construction process,

provide experience in and appreciation for multiple perspectives, embed learning in realistic and relevant contexts, encourage ownership and voice in the learning process, embed learning in social experience, encourage the use of multiple modes of representation, and encourage self-awareness in the knowledge construction process.

Fosnot (1996) defined four main principles about learning which are derived from the theory of constructivism. First, learning is not the result of development but learning is development itself. This means that invention and self-organization on the part of the learner is needed. Second, disequilibrium facilitates learning. Learners should be offered challenging, open-ended investigations in realistic and meaningful contexts. Third, reflective abstraction is the driving force of learning. Allowing reflection time through journal writing, representation in multi-symbolic form, and discussion of connection across experiences may facilitate abstraction. Last, Dialogue within a community engenders further thinking. The classroom needs to be seen as a community so that learners can engage in activity, reflection, and conversation.

Murphy (1997a) summarized and synthesized the eighteen characteristics of constructivist learning and teaching. These are: 1) Multiple perspectives and representations of concepts and content are presented and encouraged. 2) Goals and objectives are derived by the student or in negotiation with the teacher or system. 3) Teachers serve in the role of guides, monitors, coaches, tutors and facilitators. 4) Activities, opportunities, tools and environments are provided to encourage metacognition, self-analysis self-regulation, self-reflection, and self-awareness. 5) The student plays a central role in mediating and controlling learning. 6) Learning situations, environments, skills, content and tasks are relevant, realistic, authentic and represent the natural complexities of the 'real world. 7) Primary sources of data are

used in order to ensure authenticity and real-world complexity. 8) Knowledge construction and not reproduction is emphasized. 9) This construction takes place in individual contexts and through social negotiation, collaboration and experience. 10) The learner's previous knowledge constructions, beliefs and attitudes are considered in the knowledge construction process. 11) Problem-solving, higher-order thinking skills and deep understanding are emphasized. 12) Errors provide the opportunity for insight into students' previous knowledge constructions. 13) Exploration is a favored approach in order to encourage students to seek knowledge independently and to manage the pursuit of their goals. 14) Learners are provided with the opportunity for apprenticeship learning in which there is an increasing complexity of tasks, skills and knowledge acquisition. 15) Knowledge complexity is reflected in an emphasis on conceptual interrelatedness and interdisciplinary learning. 16) Collaborative and cooperative learning are favored in order to expose the learner to alternative viewpoints. 17) Scaffolding is facilitated to help students perform just beyond the limits of their ability. 18) Assessment is authentic and interwoven with teaching.

With the coming of the twenty-first century, the information age is based on rapidly increasing and changing information, and the goal of education is no longer to train students to store and retrieve mastered information. Education is being partially transformed by new technologies. The roles of technology in a constructivist classroom are being discussed.

Murphy (1997b) pointed out that technology is increasingly being touted as an optimal medium for the application of constructivist principles to learning. LeBaron and Bragg (1994) stated that the role of technology in education is so important, that it will force the issue of didactic versus constructivist teaching. Teachers will no longer

have a choice but will be compelled to use a constructivist approach in a technology-rich environment. Collins (1991) stated that technology seems to be coming down on the side of constructivists, who have been trying unsuccessfully to date to change the prevailing societal view of education because computers undermine the didactic, lecture methodology, and, instead promote the student as a self-directed learner. Mann (1994) stated that the use of new technologies in an educational setting has caused the theory of learning, constructivism, to receive new attention. Students in these settings become empowered by gaining access to real data and work on authentic problems.

Based on the review of the constructivism shown above, it can be concluded that this theory founded on the premise that learners all construct their own perspective of the world, based on individual experiences and schema focuses on preparing the learner to solve problems in ambiguous situations and focuses on knowledge construction, not knowledge reproduction.

2.4 Web-based Instruction

The World Wide Web (WWW) is increasingly identified as a creative way of using computer technology to provide learning and teaching. Many institutions across all disciplines are considering web-based instruction and the best ways to use the rich resources of the web to promote student learning. Web-based instruction is becoming more and more important in higher education. It is the emergence and development of a new form of technology-supported instruction. It is a variable medium of facilitate a learning environment (Khan, 1997).

Web-based instruction has developed and changed from any number of computer-based instructional methods, often referred to as Computer-Assisted Instruction (CAI),Computer-aided Instruction (CaI), Computer-Managed Instruction (CMI), Internet-Based Instruction (IBI), or Web-Based Instruction (WBI), but collectively called Computer-Based Education (CBE) (Mathew and Dohery-Poirier, 2000).

2.4.1 Definition of Web-based Instruction

The concepts of web-based instruction in teaching and learning have received increasing attention over the recent years. The definitions of web-based instruction are defined by many scholars as shown in the Table 2.1 on next page.

Table 2.1 Definitions of Web-based Instruction

Authors	Definitions
Kumrow, Vogt and Kazlauskas (2002)	A non-linear hypermedia and/or hypertext learning technology, offers educators a method to deliver instruction that may enhance the learning process.
Case, Bauder and Simmons (2001)	A form of distance education which uses electronic illustrations of print or video to teach.
Na-Songkhla (1999)	The integration of hypermedia attribute with the WWW network for creating the learning environment in the dimension of unlimited time and distance of the learners or learning without boundary.
McCormack and Jones (1998)	The Web used as a repository student can access to retrieve any information that would be useful to them. The web is not only to help distribute information but also to place the information in a form that goes beyond text and takes advantage of the media that will help students understand better and to which they can relate more easily.
Khan (1997)	A hypermedia based instructional program which utilizes the attributes and resources of the www to create a meaningful learning environment where learning is fostered and supported.
Relan and Gillani (1997)	The application of a repertoire of cognitively oriented instructional strategies within a collaborative learning environment, utilizing the attributes and resources of the World Wide Web.

Table 2.1 Definitions of Web-based Instruction (Continued)

Authors	Definitions
Fuchs and Szabo (1997)	Instruction delivered either whole or in part on the World Wide Web. Materials created for this mode of instruction take advantage of the hypertext capabilities of the Web and/or communications features of the Internet.
Sherry and Wilson (1997)	A hypermedia-based instructional program, which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported.
Clark (1996)	Individualized instruction delivered over public or private computer networks and displayed by a Web browser.
Smith and Ragan (1993)	Instruction is the delivery of information and activities that facilitate learners' attainment of intended, specific learning goals, and the medium is the physical means by which the instructional message is communicated.

In brief, web-based instruction (WBI) can be defined as using the World Wide Web as the medium to deliver course material, administer tutorials and quizzes or to communicate with students. This also encompasses using the web for communication in the process of teaching a class. Moreover, WBI called a tool to provide information or knowledge in order to contribute to the most effective instruction and learning via the World Wide Web. It is anytime-instruction delivered through the Internet or a corporate intranet to browser-equipped learners. Moreover, instruction can be delivered by a combination of static methods, learning portals, hyperlinked pages, screen cam

tutorials, streaming audio/video, and live web broadcasts, and interactive methods, threaded discussions, chats, and desk-top video conferencing (Hinnon, 2007).

2.4.2 Components and Features of Web-based Instruction

Sherry and Wilson (1997) stated that a web-based instruction environment should include many resources, support collaboration, implement web-based activities as part of the learning framework, and support both novices and expert. Khan (1997) discussed the web-based instruction program in terms of various components and features that can be conductive to learning environment. Banathy (1992) insisted that the 'components' are integral parts of a web-based instruction system but 'features' are characteristics of a web-based instruction program contributed by those components. Khan (1997) explained that components can contribute to one or more features such as e-mail (component) in a Web-based instruction program can provide asynchronous communication (features) to students and teachers. In addition, e-mail and conference tools (components) can jointly contribute to the creation of a virtual community (features) on the web.

Components of Web-based Instruction

Khan (1997) categorized the components of web-based instruction to content developments, multimedia components, Internet tools, computers and storage devices, connection and service providers, authoring programs, servers, and browsers and other applications. According to Khan (1997), these web-based instruction components are listed below.

1. Content Development
    - Learning and instructional theories
    - Instructional design (ID)

2. Multimedia Components

- Text and graphics
- Audio Streaming
- Video Streaming
- Graphical User Interface (GUI)
- Compression technology

3. Internet Tools

- Communications Tools: asynchronous and synchronous
- Remote Access Tools: logging in to and transferring files from remote computers such as Telnet, File Transfer Protocol (ftp), etc.
- Internet Navigation Tools: access to databases and Web documents such as Gopher, Lynx, etc.

4. Search and Other Tools

- Search Engines
- Counter Tool

5. Connections and Service Providers

- Modems
- Dial-in such as standard telephone line, ISDN, etc. and dedicated services such as 56kbps, T1, El, lines, etc.
- Gateway Service Provider, Internet Service Provender

6. Authoring Programs

- Programming languages such as Hyper Text Markup Language (HTML), Virtual Reality Modeling Language (VRML), Java, Java scripting, etc.

- Authoring Tools
- HTML Converters and Editors, etc.

7. Servers
   - HTTP servers, HTTPD software, Web site, Uniform Resource Locator (URL), etc.
   - Common Gateway Interface (CGI); a way of interacting with the http or Web servers. CGI enables such things as image maps and fill out forms to be run.

8. Browsers and Other Applications
   - Text-based browser, graphical browser, VRML browser, etc.
   - Links such as hypertext links, hypermedia links, 3-D links, image-maps, etc.
   - Applications that can be added to web browsers such as plug-ins.

Features of Web-based Instruction

Khan (1997) divided the features of web-based instruction into two categories: key features and additional features. Key features are an integral part of the WBI design, such as interactive and multimedia systems. On the other hand, additional features are secondary tools assisting WBI designs, such as ease of coursework development. Some keys examples of key features and additional features are as follows:

1. Key Features*:* Interactive, multimedia, open system, online search, device-distance-time independent, globally accessible, electronic publishing,

uniformity world-wide, online resources, distributed, cross-cultural interaction, multiple expertise, industry supported, learner-controlled, etc.

2. Additional Features: Convenient, self contained, ease of use, online support, authentic, course security, environmentally friendly, non-discriminatory, cost effective, ease of coursework development and maintenance, collaborative learning, formal and informal environments, online evaluation, virtual cultures, etc.

2.4.3 Advantages of Web-based Instruction

As the use of the web-based instruction has become a powerful tool for learning and teaching, the number of institutions is increasing which are offering it as a teaching and learning tool. Web-based Instruction is obviously seen as a tool to offer a rich and stimulating educational environment. It is a powerful way to support a learning environment. Many researchers support the values of web-based instruction. Table 2.2 is a presentation of the several advantages of web-based instruction as proposed by various authors.

Table 2.2 Advantages of Web-based Instruction

Authors	Advantages of WBI
Aber (2008)	Educational Advantages 1. Flexible delivery of instruction; asynchronous, universal access. 2. Image-rich curriculum; photographs, maps, diagrams and charts. 3. Extensive text, tabular and digital data. 4. Bringing the world to students. 5. Links to related web sites; governmental agencies, other universities, and the private sector. 6. Student web-pages; creation of online student portfolios, career advancement. 7. Highly motivated students-teachers, professionals, non-traditional and mature individuals. 8. Lack of personal bias; age, race, ethnicity, etc. 9. Worldwide student potential; United States, Canada, Europe, Asia, etc. Institutional Advantages 1. Increased student enrollment; individual courses, degree; seeking students. 2. Delivery of unique programs; specialty programs not widely available. 3. Ability to attract non-traditional students; rural and distant localities. 4. Greater university visibility; good recruiting tool. 5. No geographic limits for offering courses and programs. 6. Capability for instructor to teach from any location to any location. 7. Leadership position for innovative teaching; recognition and funding.

Table 2.2 Advantages of Web-based Instruction (Continued)

Authors	Advantages of WBI
Erricolo and Matthes (2008)	1. WBI is beneficial for those students who cannot attend classrooms because of their personal or professional commitments, or their limited financial resources, or physical limitations. 2. WBI is accessibility because instructional material is available 24 hours a day, eliminating conflicts with one's schedule. 3. For instructors, once the class material is in electronic format, WBI is easy to modify and keep up to date. 4. The organization of the material will be enhanced because there will be only one repository for everything. 5. Visual images are very important for some courses and so using Web-based instruction provides enhanced clarity in the explanation of things to students. 6. WBI meets the needs of students using web sites at any place and time, whether at home, in their dorms, or even when traveling. 7. Students can register for online courses during their vacation because they do not have to be in the university to take the courses and they can plan for their graduation because they can register for more than one course since online courses do not have time conflicts.
Mwaura (2003)	1. WBI makes it easy for teachers to adopt the advanced instructional technologies yet to come in future. 2. Web-based instruction able to send announcements, assignments, or any other communication to the whole class through email attachments or listserv in their course web sites as saving their time and effort.

Table 2.2 Advantages of Web-based Instruction (Continued)

Authors	Advantages of WBI
	3. Teacher are able to keep in touch with their students on the days that the classes do not meet and to clarify things that students might not have understood because students can send in questions through the course web sites at any time whether the class is in session or not. 4. Web-based instruction makes all the students pay attention to the information posted on the course web site because there is no physical contact between the teacher and the students.
Kruse (2005)	1. Access is available anytime, anywhere, around the globe. 2. Per-student equipment costs are affordable. 3. Student tracking is made easy. 4. Possible 'learning object' architecture supports on demand, personalized learning. 5. Content is easily updated.
Web-based instruction (nd., quoted in Suppasetseree, 2005)	1. WBI can be used for information resources. There are millions of potential WWW sites so these sites can be used to support student research, discovery, and exploration. 2. WBI can be used for supporting materials, assignments, lessons or course information. Students can access materials that teachers put in a central place or on the web site such as teachers create a workbook for a lesson, including text, graphics, links to other sites, teachers can convert this workbook so that it is part of the World Wide Web and students can access it. Also teachers can make all kinds of course and lesson information available.

Table 2.2 Advantages of Web-based Instruction (Continued)

Authors	Advantages of WBI
	3. Complete lessons can be given on the web. Students can take lessons individually or in small groups. In this instruction, teachers can include lesson content, practice, feedback, and assessment. 4. Complete courses can be offered through this kind of teaching. That means an entire class online or entire program can be taken by students
Alessi and Trollip (2001)	1. Learners' activities can be easily coordinated such as it is easier to post an assignment in the Web-base instruction. 2. Learners can easily access learning materials at their convenience while at all educational institutions, at home or at work. Worldwide access is also possible. 3. It is easy for instructors to supplement their learning materials with the web resources. 4. Opportunities for learning are created, for example foreign language learning can be accomplished for a worldwide audience via the web. 5. It facilitates communication among learners and educators because learners can communicate with the educator or among themselves.
Mathew and Dohery (2000)	1. Enhancing student learning. 2. Spending more time with students working in small groups or one-on-one. 3. Reducing repetitive teaching tasks. 4. Reducing paper flow and management, and providing improved instructional materials.

Table 2.2 Advantages of Web-based Instruction (Continued)

Authors	Advantages of WBI
Aoki, Fasse and Stowe (1998)	1. The nature of its platform independence and easy sharing of data enable collaboration among distance learners. Students can attend virtual classroom disparate in place and time, and they can change ideas and comments. 2. Hypertext links allow integration of disparate sources and formats of educational materials into one place so the students have easier access to wealth of information. 3. The next generation of Hyper Text Markup Language (HTML) called eXtensible Markup Language (XML) will provide the potential to dynamically customize the content of the course materials according to the skill and knowledge of the students' level. 4. Updating of information on the web is easy
Laurillard (1993)	Students can control the pace and sequence of instruction and make personally meaningful choices which in theory should assist in developing their cognitive structure.

Regarding the advantages of web-based instruction from many ideas of the researches, it can be concluded that web-based Instruction is obviously seen as a tool to offer a rich and stimulating educational environment. It can provide both teachers and students abundant learning opportunities. Web-based instruction provides anytime and anywhere access to instruction; for example, a student can sit at the computer in their home or at a local library and take courses at a university in another province or country. In addition, it provides a student-centered learning environment and can promote learner autonomy.

2.4.4 Limitations of Web-based Instruction

Although a lot of advantages can be provided when using the web-based instruction, it still contains some limitations. Singhal (1997, quoted in Hinnon, 2000) pointed out the disadvantages related to the use of technology including web-based instruction. First, when lines are busy due to many users, it may take time to access information and this can lead to students' frustration. Second, lack of training of the teachers can make it difficult to implement the Internet in the language classroom. Next, costs in training, as well as on-line costs of using a provider may interfere with implementing such a technology in schools, especially in schools that have limited funding. Last, but not least, some of the issues and topics accessed by the Internet are unsuitable for children.

McManus (2000) noted that web-based instruction material is time consuming for teachers to develop and the web is not a preference if the learners cannot gain access to an internet connected to their computers. In addition, one of the problems of web-based instruction is the lack of social interactions. Barnard (1997) agreed that the limitations attributed to web based instruction include the potential for lack of non-verbal feedback and because of loss of connectivity, students might feel that the educational process is quite removed or fragmented to the degree that they feel they are not learning what they should be learning.

Another list of limitations to web based instruction included such things as the fragmentation of educational systems, disconnection between students and faculty, and misinterpretation or misreading of asynchronous textual communications (Starr, 1997). In addition, discriminate access to unauthentic, unreliable, and incorrect information is also an educational problem (Brooks, 1997). Kruse (2008) pointed out

two real disadvantages to web-base instruction. The first drawback, when compared to live instruction, is the lack of human contact, which greatly impacts learning. The second major drawback is the lack of multimedia in many WBI programs.

In conclusion, it can be said that although a lot of advantages can be provided through using the web-based instruction. There are also limitation. The major limitations of web-based instruction is that it is time-consuming to construct the website; there are can be a problem to access through the Internet; the lack of social interaction when using the web-based instruction between the teachers and students; the lack of technological skill on the part of teachers and students; and the students' of lack time-management skills and ability to undertake self-directed learning.

2.5 Designing the Effective Web-based Instruction and Instructional Design

A good web course design will take advantage of technology to make learning more responsive, relevant, and meaningful to students, allowing spontaneous experiences without physical distance constraints (Lan, 1999, quoted in Pachec, 2005). In addition, a good web course should be constructed to reflect the shift from an instructor-centered approach to a student-centered approach (Grunet, 1997). From the studies that are being done on effective web-based instruction and good pedagogy to the development of web-based instruction, good and effective web-based instruction has the following characteristics (Simmons, 2008):

1. Good WBI states clear objectives and prerequisites in learner terms.
2. Good WBI has consistent layout and design with a well-planed navigation scheme.

3. Good WBI employs a learner-directed, non-linear approach.
4. Good WBI is interactive.
5. Good WBI has a source of motivation for learners.
6. Good WBI provides frequent practice and immediate feedback.
7. Good WBI is concise and presents information is small chunks.
8. Good WBI uses a variety of media styles and presentation techniques to maintain interest and appeal to different learning styles.

According to Pacheco (2005), there are eight major components in the construction of an effective web-based learning course:

1. General information: The online syllabus should include course descriptions and prerequisites, time, technical help and the teacher's contact information (phone, fax, and email). Information about required technology tools, such as the Internet browser, plug-in programs, and how to use the course website should be included.

2. Course information: A web-based course should contain complete course descriptions, including course and unit objectives (general and specific), credit hours, activities, etc.

3. Schedule: It can also be referred to as a calendar. This component provides a timeline for the sequence of topics and activities in each session. It may include class requirements, content to be covered in each session, activities, assignments, exams, and surveys to be completed by students. This part probably includes the most important information for students.

4. Resources: This component provides all supportive and related course material. It includes the suggested text references and hyperlinks that the facilitator

may choose to use to scan the documents directly into the course website. Web materials allow for easy updating and always provide up-to-date information for students.

5. Multimedia presentation of content: Perhaps the most difficult part of developing a web-based course is creating online content. The teacher can begin by transferring basic lecture materials, including lecture notes and summaries to the web and integrating media such as sound, images, and video. This can make online learning more attractive and accommodate different learning styles of students.

6. The virtual classroom: Adding discussion forums, chat rooms, and e-mail to the online course is a common way to enhance interaction among students and the teacher. Class members can access and participate in asynchronized discussion as well as engaging in collaborative or private interactions as if they were in a real classroom. The teacher should use these functions, and communicate requirements to students. Discussion topics may be assigned to focus on course materials. Participation points may be assigned as part of a course grade in order to encourage students' participation.

7. Assessments: This component should include the criteria that will be used to determine course grades. It may include a performance progress tracking system accessible to students via online. Students can check the individual progress for each session. The database of tracking student progress and grades is useful to the teacher for course management.

8. Testing: Online drill or practice tests can be used to reinforce learning. For example, short essay or multiple choice test formats can be used by students to provide a self-assessment of their level of understanding of the text.

Ritchie and Hoffman (1997, quoted in Ruksasuk, 2000) stated that effective web-based instruction requires seven principles:

First, motivating the learners. The teachers should use graphics, color, animation, and sound to motivate learners. In addition, to increase motivation include establishing the value of what user are to learn such as linking the information to other website that related the topics.

Second, identifying what is to be learned: It is important and necessary to let the students know at the beginning stage what their responsibility will be because it helps them to achieve the goals set.

Third, reminding learners of past knowledge: To facilitate retention of information in long term memory, learners must be link the new information with related information already stored in long-term memory.

Fourth, requiring active involvement: For learning to take place, the learners must actively process and make sense of the information presented. Therefore, to do this, the learners must develop an artifact of their learning. To ensure that the learners produce an artifact of their knowledge, eight strategies were proposed: compare, classify, induce, deduce, analyze errors, construct supports, make abstractions, and analyzed idea that they encounter in the web-based instruction they learned.

Fifth, providing guidance and feedback. Guidance and feedback can be provided to learners or users either when they explore the web-based instruction or afterward. The provision of guidance and feedback can come when learners are required to make choices among alternatives after instruction. If these choices are designed to determine appropriate or inappropriate responses by the learners, pages linked to their answer and can guide the learners to a more appropriate answer.

Sixth, testing. In order to ensure that students have obtained the desired knowledge, learning needs to be assessed.

Finally, effective web-based instruction requires providing enrichment and recommendation: This provides learners with either recommendation in areas where comprehension is lacking, or to extend students' knowledge.

Frizell and Hübscher (2002) stated that designing effective web-based instruction is a difficult task for instructors who lack experience in interaction and web-based instructional design. They also pointed out that instructional system design can provide course designers with principles and design guidelines associated with effective instruction that can be utilized in the design of web-based instruction.

As web-based instruction has become one of the fastest-growing mediums in education, the instructors from a variety of academic areas are developing instructional materials for distance learning programs. These instructors are novice web designers and have received no training in interaction and web-based instructional design (Braxton, 2000 and Tennyson 1995). The need for design support is a major issue in the design of web-based instruction as the poor design of courses is one of the key problems with learning from the web (Bork and Britton, 1998 and Kessler, 1999).

Clark (1994) and Jonassen (1988) stated that instructional design of course materials directly affects learning effectiveness. In addition, Khan (1997) and Hannum (1998, quoted in Frizell and Hübscher, 2002) noted that to promote effective instruction, web-based courses must be designed with a focus on the opportunities and capabilities afforded by the web in relation to instructional design. Moreover, Moallem (2001) stated that employing instructional design principles and models in

creating web-based instruction can help ensure that what is produced is of high quality and is able to present significant challenges to students.

As the instructional design is an important component to design web-based instruction, the instructional design was focused and various instructional models have been developed by the researches. The literature regarding instructional design was reviewed in this section.

2.5.1 Definitions of Instructional Design

There are several definitions of instructional design (ID). Some of those more commonly referred to are presented in the table below.

Table 2.3 Definitions of Instructional Design

Authors	Definitions of Instructional Design
McNeil (2008)	The systematic process of translating general principles of learning and instruction into plans for instructional materials and learning.
Gustafson and Branch (2002)	The system of procedure for developing education and training programs in consistent and reliable fashion.
Coldevin and Mead (2001).	The entire process of analyzing learning needs and goals and The development of a delivery system to meet those needs. It includes development of instructional materials and activities; and tryout and evaluation of all instruction and learner activities.
Dick, L. Carey, and J. Carey. (2001)	The systematic approach for the design, development, implementation and evaluation of instruction.

Table 2.3 Definitions of Instructional Design (Continued)

Authors	Definitions of Instructional Design
Moallem (2001)	The systematic development of instructional specification using learning and instructional theory to ensure the quality of instruction.
Zook (2001)	A systematic thinking process to help learners learn.
Ruffini (2000)	The systematic planning and development of instruction.
Smith and Ragan (1999)	The systematic and reflective process of translating principles of learning and instruction into plans for instructional materials and activities, information resources, and evaluation.
Shambaugh and Magliaro (1997)	An intellectual process to help teachers systematically analyze learner needs and construct possibilities to responsively address those needs.
Berger and Kam (1996)	The systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs. It includes development of instructional materials and activities; and tryout and evaluation of all instruction and learner activities.
Lowe and Schwen (1975, quoted in Andrews and Goodson, 1995)	The systematic process focused on improving the effectiveness and efficiency of learning and instruction in various educational environments.

Table 2.3 Definitions of Instructional Design (Continued)

Authors	Definitions of Instructional Design
Shrock (1995)	The system approach that seeks to apply scientifically derived principles to the planning, design, creation, implementation, and evaluation of effective and efficient instruction.
Smith and Ragan (1993)	The system process of translating principle of learning and instruction into plans for instruction materials and activities.
Winn (1990)	It involves a set of decision making procedures by means of which the most effective instructional strategies are developed or chosen, given the outcomes learners are to achieve and the conditions under which they are to achieve them.

According to the definitions above, it can be said that instructional design is a system or process of solving problem and examining the instruction, identifying the ways to teach and evaluation of effective and efficient instruction.

2.5.2 Characteristics and Principles of Instructional Design

Smith and Ragan (1993) discussed the characteristics and assumptions that underlie instructional design. These are as follows:

1. Instructional design is a systematic process (as opposed to fortuitous, haphazard activity).
2. Instructional design has a problem-solving orientation (need assessment leads to activities directed as improvement of instruction, which in turn lead to evaluation).

3. Instructional design is learning and learner-centered (as opposed to teaching or medium-centered).
4. Instructional design has as a goal: efficient, effective, and appealing instruction.
5. Instructional design insists on congruence between objectives, instruction, and evaluation.
6. Instructional design is both theoretic and empirical (as opposed to intuitive).

Reier and Dempsey (2002) also explained the several characteristics that should be present in all instructional design efforts.

1. Instructional design is learner-centered.
2. Instructional design is gole-oriented.
3. Instructional design focuses on real-world performance.
4. Instructional design focuses on outcomes that can be measured in a reliable and valid way.
5. Instructional design is empirical.
6. Instructional design typically is a team effort.

Following are the major principles of instructional design addressed by Smith and Ragan (1993):

1. The design of instruction must be directed by needs and shaped to fit the learning environment.
2. Instructional design must include consideration of the following learner characteristics:
    - Likenesses and differences.

- Changing and stable characteristics.
- Specific prime learning.

3. The more precisely learning goal(s) are identified and analyzed to determine necessary components of learning tasks and their prerequisite skills and knowledge, the more effectively and efficiently these goals will be attained.
4. Assessment of learning is guided by goals of the instructional system and should employ particular techniques to ensure adequacy of the assessment. Frequently, assessment design involves trade-offs in validity, reliability, and practicality.
5. Instructional strategies can do the following:
    - Provide the framework for learning at both micro and macro levels.
    - Be more generative or more supplantive depending on the task, context, and learners.
    - Be organized around the expanded instructional events, and framework for instructional strategies.
6. A fundamental element in the design of instruction is the character of the learning task. Effectiveness of instruction can be improved when instructional strategies are based upon supporting the cognitive demands of different types of learning (using the framework provided by the expanded instructional events).
7. The characteristics of different media, the environments offered by different learner groupings, and the potentials offered by different instructional management strategies interact with task characteristics, learners' characteristics, and the learning context.

8. At the macro level, such as in units, courses, and programs of study, attention must be given to articulation and a form of curriculum organization should be designed that takes into account setting, learners, and learning goals.
9. The translation of specifications into instructional materials is accomplished through production processes, which vary according to the medium/media that will be used to deliver instruction.
10. Evaluation of instruction should be conducted as part of the design/development process (formative) and to estimate the value of completed instruction (summative).
11. Design should reflect appropriate technology.

2.5.3 Instructional Design Models

A model is usually considered to be an abstraction and implication of a defined referent system, presumably having some noticeable fidelity to the referent system (Hayman, 1974 and Logan, 1976). Models of instructional design have descriptive, prescriptive, and explanatory elements in varying degrees. That is, some models describe the components or activities of instructional design, but they are used as if they prescribe the necessary activities, and sometimes are presented as prescriptions. Some models have a strong basis in learning theory so that they tend to explain instructional design in term of the events of learning (Andrew and Goodson, 1995).

According to Andrew and Goodson (1995) instructional design models serve four purposes:

1. Improving learning and instruction by means of the problem-solving and feedback characteristics of the systematic approach.
2. Improving management of instructional design and development by means of the monitoring and control functions of the systematic approach.
3. Improving evaluation processes by means of the designated components and sequence of events, including the feedback and revision events, inherent in models of systematic instructional design.
4. Testing or building learning or instructional theory by means of theory-based design within a model of systematic instructional design.

The value of a specific model is determined within the context of use. A model assumes a specific intention of its user and a model should be judged by how it mediates the designer's intention, how well it can share a work load, and how effectively it shifts focus away from itself toward the object of the design activity (Ryder, 2008). Many models are very useful and suitable for creating instructional materials. Some common used models include the ADDIE Model, the Dick and Carey Model, the Kemp Model, the ARCS Model, the ASSURE Model, and the SREO Plan, which are presented below.

ADDIE Model

The ADDIE model is a systematic instructional design model consisting of five phases: analysis, design, development, implementation, and evaluation. The ADDIE Model is an iterative instructional design process, where the results of the formative evaluation of each phase may lead the instructional designer back to any previous phase. The end product of one phase is the starting product of the next phase. The process of the model can be illustrated by the diagram shown in Figure 2.2.

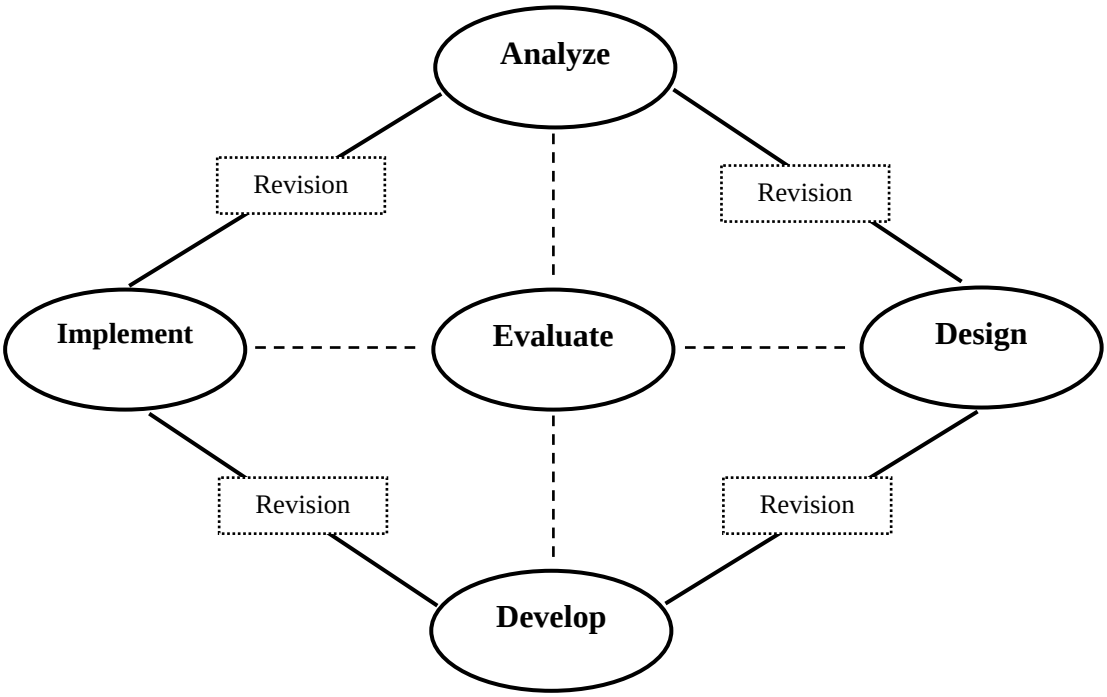


Figure 2.2 The Elements of ADDIE Model (Reier and Dempsey, 2002)

Analyze phase is the foundation for all other phases of instructional design. The designers identify the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. The outputs of this phase often include the instructional goals, and a list of tasks to be taught. These outputs will be the inputs for the Design phase.

Design phase involves using the outputs from the Analyze phase to plan a strategy for developing the instruction. In this phase, the designers must outline how to reach the instructional goals determined during the Analyze phase and expand the instructional foundation.

Develop phase is the actual creation of the content and learning materials based on the Design phase. The purpose of this phase is to generate the lesson plans

and lesson materials. This phase the designers will develop the instruction, all media that will be used in the instruction, and any supporting documentation.

The Implementation phase refers to the actual delivery of the instruction. This phrase, the plan is put into action and a procedure for training the learner and teacher is developed. Materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated.

Evaluation should actually occur throughout the entire instructional design process. This phase consists of formative and summative evaluation. Formative evaluation involves collecting data to identify needed revision to the instruction and summative evaluation involves collecting data to assess the overall worth of the instruction. Revision refers making needed changes based on the formative evaluation data.

Dick and Carey Model

One of the most popular and influential instructional design models was created by Dick and Carey (1996). The model describes all the phases of an iterative process that starts by identifying instructional goals and ends with summative evaluation. This model is shown in Figure 2.3.

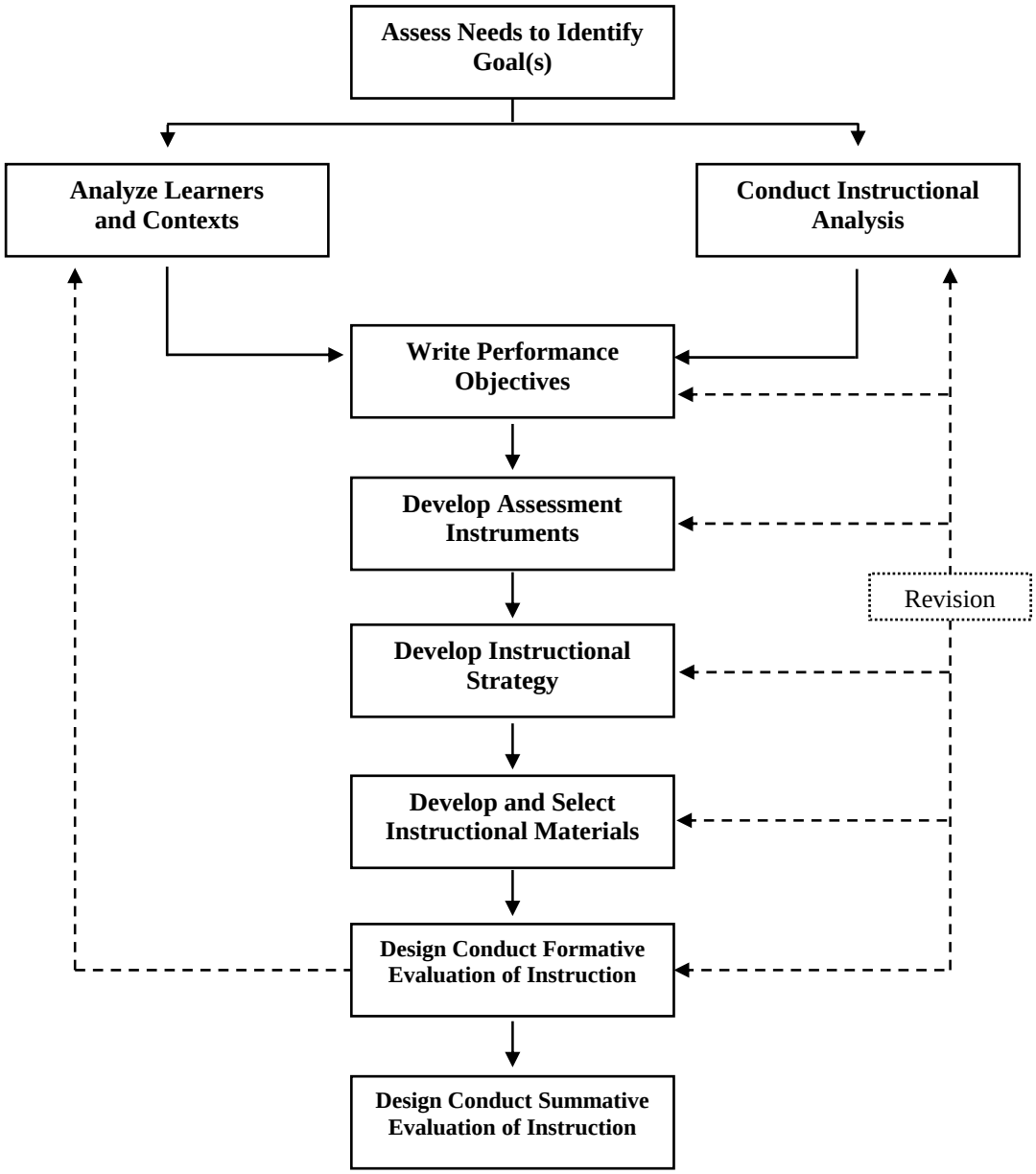


Figure 2.3 Dick and Carey Systems Approach Model (Dick and Carey, 1996)

According to Figure 2.3, the first step is assess needs to identify goals. In this step, the designer will write about what they expect the learner to be able to do at the end of their instruction The instructional goal may be derived from a list of goals, from a needs assessment, from practical experience with learning difficulties of

students, from the analysis of people who are doing a job, or from some other requirement for new instruction.

The second step is to conduct instructional analysis. The designers will determine step-by-step what people are doing when they perform that goal after they have identified the instructional goal. The final step in the instructional analysis process is to determine what skills, knowledge, and attitudes, known as entry behaviors, are required of learners to be able to begin the instruction. A diagram will be produced that depicts the relationships among all of the skills that have been identified.

The next step is analyzing learners and contexts. The designers need to analyze and identify the learners' behaviors and context. That is, what is it that the learners are already capable of doing? Analyze the instructional goal is a parallel analysis of the learners, the context in which they will learn the skills, and the context in which they will use them. Learners' current skills, preferences, and attitudes are determined along with the characteristics of the instructional setting and the setting in which the skills will eventually be used.

Then, writing performance objectives. In this step, designers will go through each sub skill box of their instructional analysis diagram and write a clear and precise statement about what behavior the learner will exhibit, under what conditions, and on what criteria it will be judged successful.

The fifth step is developing assessment instruments. Based on the objectives that the designers have written, develop assessments that are parallel to and measure the learners' ability to perform what the designers described in the objectives. Major emphasis is placed on relating the kind of behavior described in the objectives to what the assessment requires.

The sixth step is developing the instructional strategy. This step forces the designer to answer important questions about how they will implement their learning plan. The five major components of an instructional strategy are pre-instructional activities, information presentation, student participation, testing, and follow-through. Using the products of the previous design phases, the designers will sequence and cluster objectives, plan pre-instructional, testing, and follow-up activities, write out the information presentation and student participation strategies, and then finally, allocate activities for each learning session. While doing this, the designer will take into account audience characteristics and include elements to motivate them and hold their attention.

The seventh step is developing instructional materials. The designers should use their instructional strategy to construct the instruction. The development should include a student manual, the instruction, tests, and an instructor's manual. Choices of multimedia should be made upon the congruence between the skill and the media type. Practice and feedback should be as close to the real world situation as possible.

The eighth step is design and conducting the formative evaluation of instruction. Formative evaluation is the beta testing that takes place to help the designers smooth out their instruction. Even with all of their tedious and careful analysis, planning, and reviewing, they have only created instruction that will theoretically work. Ideally the designers will conduct three rounds of evaluation that are one-to-one evaluation, small-group evaluation, and field evaluation. Each type of evaluation provides the designer with a different type of information that can be used to improve evaluation of existing materials or classroom instruction.

The ninth step is revising the instruction. In this step, the designers will revise the instruction itself or the procedures of how the instruction is used. The data from

the formative evaluation are summarized and interpreted to attempt to identify difficulties experienced by learners in achieving the objectives and to relate these difficulties to specific deficiencies in the instruction.

As you seen the Figure 2.3 above, the “Revise Instruction” indicates that the data from a formative evaluation are not simply used to revise the instruction itself, but are used to reexamine the validity of the instructional analysis and the assumptions about the entry behaviors and characteristic of learners. It is necessary to reexamine statements of performance objectives and test items in light of collected data. The instructional strategy is reviewed and finally all this is incorporated into revisions of the instruction to make it a more effective instructional tool.

The last step is designing and conducting the summative evaluation. The summative evaluation is the culminating evaluation of the effectiveness of instruction but it is not a part of the design process. It is an evaluation of the absolute and relative value or worth of the instruction and occurs only after the instruction has been formatively evaluated and sufficiently revised to meet the standards of the designers. Because the summative evaluation usually does not involve the designers of the instruction but instead involves an independent evaluator, so this component is not considered an integral part of the instructional design process. It is being listed separately.

Kemp Model

The Kemp design model takes a holistic approach to instructional design. This model focus on content analysis, as there would be in any educational design and a focus on support and service, which is not present in other ID models (Qureshi, 2007). The Figure 2.4 is depicted the elements of the Kemp model.

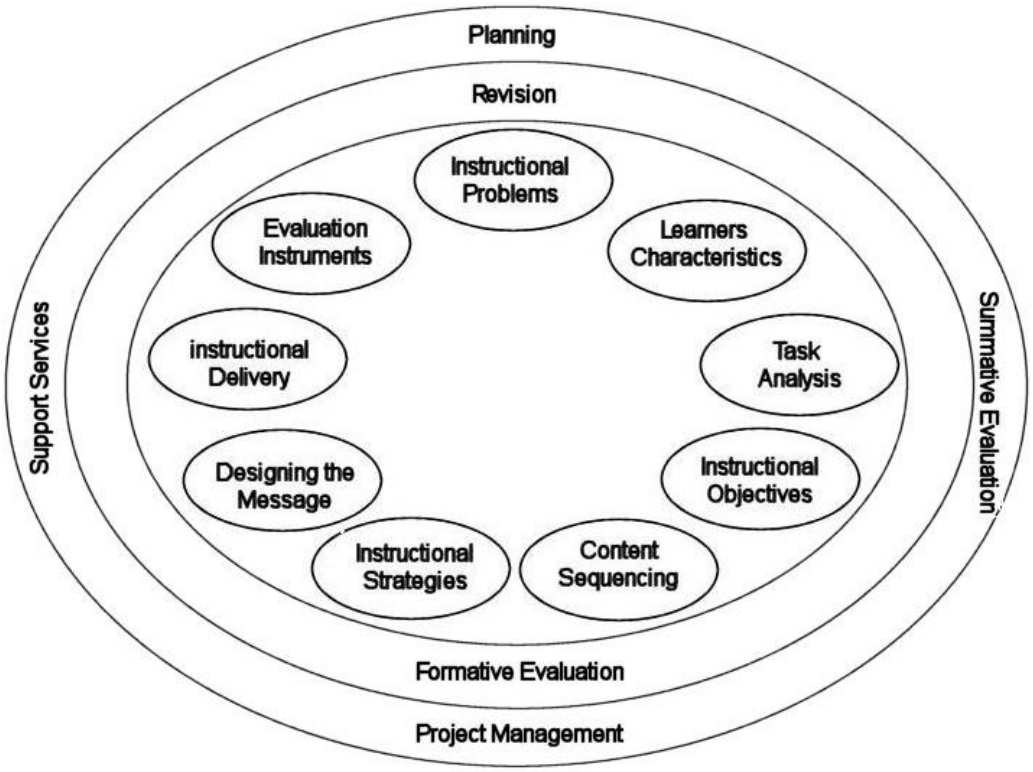


Figure 2.4 The Elements of Kemp Model (Kemp, Morrison and Ross, 1996).

The oval shape of the model gives the designer the sense that the design and development process is a continuous cycle that requires constant planning, design, development and assessment to insure effective instruction. The model is systemic and nonlinear and seems to encourage designers to work in all areas as appropriate. The Kemp model has nine key elements:

1. Identify instructional problems, and specify goals for designing an instructional program.
2. Examine learner characteristics that should receive attention during planning.
3. Identify subject content, and analyze task components related to stated goals and purposes.

4. State instructional objectives for the learner.
5. Sequence content within each instructional unit for logical learning.
6. Design instructional strategies so that each learner can master the objectives.
7. Plan the instructional message and delivery.
8. Develop evaluation instruments to assess objectives.
9. Select resources to support instruction and learning activities.

Revision encircles all nine elements of model. The two outer ovals illustrate the feedback feature, which allows the designer to make changes in the content or treatment of elements at any time during the development cycle. The idea is to improve any weak parts of the program as they are discovered to better insure learners will be able to accomplish the instructional objectives at a satisfactory level. The nine elements as shown in the diagram, however, the starting point and order in which the designer addresses the individual elements is not predetermined. The use of the oval as a visual organizer underscores this purpose. Designers may use the model flexibly to suit their own needs. The elements are not connected with lines or arrows, which would indicate a linear, sequential order. All programs or projects may not require all nine elements. The word element is used as a label to describe each of the nine parts. In keeping with the non-linear concept of the model, terms such as step, stage, level, or sequential item were deliberately not used.

ARCS Model

The ARCS model is a problem solving approach to designing the motivational aspects of learning environments to stimulate and sustain students' motivation to learn (Keller, 2006). According to John Keller's ARCS model of motivational design, there

are four steps for promoting and sustaining motivation in the learning process: 1) attention, 2) relevance, 3) confidence, and 4) satisfaction.

1. Attention

- Attention can be gained in two ways:
  - Perceptual arousal: uses surprise or uncertainty to gain interest. Uses novel, surprising, incongruous, and uncertain events; or
  - Inquiry arousal: stimulates curiosity by posing challenging questions or problems to be solved.
- Methods for grabbing the learners' attention include the use of:
  - Active participation: 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 videos, short lectures, mini-discussion groups).
  - 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.

2. Relevance

- Establish relevance in order to increase a learner's motivation. To do this, use concrete language and examples with which the learners are familiar. Six major strategies described by Keller include:

  - Experience: tell the learners how the new learning will use their existing skills.
  - Present worth: what will the subject matter do for me today?
  - Future usefulness: what will the subject matter do 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 a choice in how they organize it.

3. Confidence

- 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.

4. 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.
- Do not patronize the learner by over-rewarding easy tasks.

ASSURE Model

The ASSUR Model was constructed by Robert Heinich and Michael Molenda of Indiana University and James D. Russell of Perdue University, the model is an acronym for the description of a set of tasks central to the informed selection and use of educational technology. (Heinich, Molenda, Russell, and Smaldino, 1999). This model assumes that instruction will not be delivered using lecture/text book only. It

allows for the possibility of incorporating out-of-class resources and technology into the course materials.

The steps in the process of this model are analyze learners, state objectives, select instructional methods, utilize media and materials, require learner participation , and evaluate and revise.

1. Analyze Learners

To begin designing a course, the designers or teacher must know whom they are teaching. The teachers need to write down the following information:

- General characteristics: grade, age, ethnic group, sex, mental, emotional, physical, or social problems, socioeconomic level, etc.
- Specific entry competencies: prior knowledge, skills, and attitudes.
- Learning styles: verbal, logical, visual, musical, structured, etc.

2. State Objectives

If the teachers know their students, teachers can begin writing the objectives of their lesson. Objectives are the learning outcomes, that is, what will the student learn and get out of the lesson? It will be helpful to state the objectives using the ABCD format. The ABCD's of writing objectives are:

- Audience
- Behavior to be demonstrated.
- Conditions under which the behavior will be observed.
- Degree to which the learned skills are to be mastered.

3. Select Instructional Methods

Once the teachers know their students and have a clear idea of what they should get out of the lessons. The following questions will help the designers or teachers to decide what media will be useful.

- Look at my objectives, what method is appropriate for delivery of the information needed for the learning task? Can it be done independently or is some type of guided instruction required? Does it have to be completed in the classroom?
- What types of media provide the information needed to complete the task? What media do my students have available to them? What types of media do they have prior experience with? What types of media are common or required for the subject matter?
- Can I select media that is already created? Will something work with a little modification? Do I need to design something myself?

4. Utilize Media and Materials

In this step, it's time to do teachers' lesson and use the media and materials that their have selected. The teachers should always preview the materials before using them in a class and should also use the equipment in advance to be sure it works and how to use it. Make sure that your instructional materials are suitable and work well in the classroom.

5. Require Learner Participation

The basis of the Constructivist theory of learning is that students learn through active engagement with their learning environment, not passive engagement. Participation includes discussion, small group learning and testing or assessment. It is important to allow for frequent feedback on the students' performance and many opportunities to practice what they have learned.

6. Evaluate and Revise

At this point in the process teachers need to evaluate the student's performance, the materials and the assessment methods. Good teachers must reflect upon the lesson, the stated objectives, the instructional strategy, the instructional materials, and the assessment and determine if these elements of the lesson were effective or if one or more of them need to be changed the next time the lesson is done. Sometimes a lesson may seem like it would be great, at least on paper. But then when the teachers actually teach the lesson with a specific set of students, a teacher might discover there were several things that did not seem to work. The materials used might not have been appropriate for the grade level or the material might not be very motivating. The instructional strategy might not have got students interested in participation or the strategy might have been difficult for teachers to manage. The assessment teachers used might have shown that students didn't learn what teachers tested for. This might mean that teachers did not accurately test for the stated objectives, the method of assessment needs to be revised, or the lesson did not permit enough time for the students to master the objectives. According to the process of the ASSURE model, the model specifies evaluation in terms of learner achievement, and evaluation of the entire instructional process before, during, and after instruction.

The SREO Plan

The SREO Plan or Suppasetseree's Remedial English Online (SREO) Plan was designed by Dr. Suksan Suppasetseree. It is Internet-based instructional system for teaching Remedial English to first-year students at Suranaree University of Technology. According to Suppasetseree (2005), the SREO Plan was derived from many instructional designers such as Dick and Carey (2001), Kemp (1971), Klausmeier and Ripple (1971), Gerlach and Ely **(**1971). The SREO Plan is shown in figure 2.5.

As you seen the Figure 2.5, SREO Plan comprises six major steps: analyze setting, construct prototype, produce instructional packages, test prototype, conduct teaching and learning activities, and conduct evaluation.

The first step is to analyze the setting. To begin designing any program of study, a survey is conducted to identify problems, needs, and expectations of learners. The obtained data is used as a frame work for developing the curriculum of the program of study. At this stage**,** problem identification, needs assessment, and curriculum analysis are focused.

The second step is to construct the prototype. It consists of eight sub steps. These are conducting prototype including writing objectives, identifying learners, selecting content, developing instructional module, specifying teaching method and instructional media, identifying instructional environment, specifying instructional management plan and identify evaluation.

The next step is to produce instructional packages. The purpose of this step is to create learning activities based on the content associated with the learning objectives.

The fourth step is test prototype. This is an iterative process that enables each step to be tested and evaluated until the ISD model has been followed for all objectives.

The fifth step is conduct teaching and learning activities. The learning packages are delivered in the web-based form via the Internet and other on-line components such as e-mail and web board.

The last step is conduct evaluation and revision. Observe students using the materials, collect data from student surveys. At this step, the instructors analyze

grades to determine what components of the class worked best. Did students achieve the desired outcomes? What revisions are necessary to improve the learning process? Revision is a constant process. Instructors may have found an objective that was consistently hard for students to grasp. Maybe the objective was unclear? Maybe the materials to learn the objective were inadequate? Revisions act as a screwdriver that is constantly tweaking the loose areas.

The web-based instructional model or the Saitakham Model was designed with the analysis and synthesis of the characteristics, the principles, and the approaches of many models mentioned above. It is anticipated that the Saitakham Model will be one of the best approaches to provide effective learning. The Saitakham Model will be discussed intensively in Chapter 5.

2.5.4 Advantages of Instructional Design

There are a number of advantages to using instructional design. Following is a list of some of the advantages of systematic instructional design (Smith and Ragan, 1999):

1. Instruction design encourages advocacy of the learners.
2. Instruction design supports effective, efficient, and appealing instruction.
3. Instruction design supports coordination among teachers, designers, or developers, and those who will implement the instruction.
4. Instruction design facilitates diffusion, dissemination, and adoption.
5. Instruction design supports development for alternate delivery systems.

6. Instruction design facilitates congruence among objectives, activities, and assessment.
7. Instruction design provides a systematic framework for dealing with learning problems.

Shambaugh and Magliaro (1997) discussed four benefits and advantages of instructional design.

1. Instructional design is a pragmatic tool to systematically help teacher develop and reflect on lesson and unit development.
2. Instructional design is a responsive tool to help the teachers to address issues of learning outcomes, learners, content, teaching options, and learning context and to overall keep learning in the forefront of your thinking and actions.
3. Instructional design is a research tool to help the teachers learn about students, teaching, and assessment options.
4. Instructional design is an accountability tool for teacher reflectivity and self study of teaching.

In conclusion, instructional design provides a tool to help the teachers make responsive teaching decisions, ones that keep learning as the primary focus.

2.5.5 Limitations of Instructional Design

According to Smith and Ragan (1999), instructional design has limited applicability to educational experiences in which are learning goals cannot be identified in advance and no particular goals are ever identified. In such cases, because there is no lead time to the education and since reflection and planning are central to instructional design, there is limited opportunity to apply many of its

principles and procedures. In a situation without prespecified learning goals, if a teacher is not available, then the responsibility for structuring the learning experience rests totally on the learners, and their success depends on their own cognitive strategies, prior knowledge, and motivation, the educational process rests on an almost completely generative strategy. In addition to goal-free learning environments, there are many other problems and situations that are not amenable to instructional design. Finally, instructional design is not intended to take the place of expertise in particular teaching methods for individual subject areas although instructional design can be a helpful understanding for such methods.

2.6 Related Research on Teaching and Learning via Web-Based Instruction for Enhancing Students' Vocabulary Learning Ability

Many studies have been conducted to develop and prove the effectiveness of web-based instruction for teaching and learning on general courses in the university. However, there are only a few studies that have been done in the area of teaching and learning via web-based instruction for enhancing students' vocabulary learning ability.

Kim and Gilman (2008) investigated the use of multimedia components such as visual text, spoken text, and graphics in web-based instruction to increase learners' English vocabulary learning at Myungin Middle School in Seoul, South Korea. A total of 172 middle school students in five classes participated in the study. Each individual was required to complete several testing instruments such as a pretest, posttest, retention test, and attitude inventory. Participants learned better when they

received “visual text and added graphics” or “visual text, added spoken text, and added graphics” instruction. The results lead one to conclude that an effective way to improve learning of English vocabulary is to offer graphics that illustrate what the vocabulary means.

Hui, Hu, Clark, Tam, and Milton (2008) compared the effectiveness and satisfaction associated with technology-assisted learning with that of face-to-face learning. The empirical evidence suggests that technology-assisted learning effectiveness depends on the target knowledge category. The findings show that technology-assisted learning better supports vocabulary learning than face-to-face learning. In addition, technology-assisted learning improves students’ acquisition of knowledge that demands abstract conceptualization and reflective observation but adversely affects their ability to obtain knowledge that requires concrete experience.

Chan and Liou (2005) studied the influence of using five web-based practice units on English verb-noun collocations with the design of a web-based Chinese-English bilingual concordancer on collocation learning. Thirty-two university students participated by taking a pre-test, two post-tests, and responding to a background questionnaire and an evaluation questionnaire. The findings indicated that learners made significant collocation improvement immediately after the online practice but regressed later. Moreover, the final performance was still better than students’ entry level. Different verb-noun collocation types and learners with different prior collocation knowledge were found to be not equally receptive to the practice effects.

Song and Fox (2005) explored the role of mobile technology in English as second language (ESL) vocabulary learning for working adult learners. In this study, through the use of short message service (SMS), m-technology was integrated into

web-based vocabulary learning for working adult learners. The study examined learner experiences of m-technology used in the workplace in Hong Kong. Ten learners were involved in the study. Both quantitative and qualitative methods were adopted through assessments using an online test system and an open-ended questionnaire sent by email to collect data. The research findings show significant improvements in their vocabulary learning and in their attitudes towards using m-technology in their learning.

Nelson (1999) developed web-based vocabulary activities and quizzes to help improve students' vocabulary skills at the University of Aizu, Japan. The initial results of this application were twofold. First, many students began doing each activity repeatedly, almost like a game. In a given week, some students would complete an activity 10-15 times, until they were able to recognize every word instantly. The activity acts much like an electronic version of vocabulary flash cards. Though hardly innovative in its pedagogy, this basic drill activity led to an immediate and remarkable expansion of students' vocabulary as demonstrated by improved quiz scores.

Regarding the study on learning via web-based instruction for enhancing students' vocabulary learning ability, no previous research had been conducted with Thai students. In addition, the evidence from both the previous studies and the literature review show the usefulness of learning vocabulary by guessing from the context clues as well as the importance of learning via web-based instruction. Therefore, the present study attempts to develop a web-based instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique. This can be regarded as a way to expand students' vocabulary and

improve the student's knowledge of vocabulary in order to succeed in their classroom learning.

In summary, this chapter provides the literature review of the study. It begins with English vocabulary learning, learning vocabulary through reading: guessing from context clues. Next, educational technology, web-based instruction, and designing effective web-based instruction and instructional design. Finally, the related research on teaching and learning via web-based instruction for enhancing students' vocabulary learning ability is concluded.

CHAPTER 3

METHODOLOGY

The present study aims to develop web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique. This chapter describes the research methodology, the samples, research procedure, research instruments and construction and efficiency of the instruments, data analysis, and Saitakham's Study Plan (SS Plan). A web-based instructional model for English vocabulary learning based on guessing meanings from context clues: the Saitakham Model is also discussed in the final section.

3.1 Research Methodology

The study was an experiment research design with both quantitative and qualitative data. The sample included two groups: the control, and the experimental group. The control group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via the face to face method while the experimental group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via web-based instruction. Prior to the experiment, both groups took a pretest to measure their vocabulary learning ability. After the experiment was conducted, a post-test was given to all the subjects. For the experimental group, the questionnaire and a semi-

interview were administered. Then, the data obtained was analyzed to find out whether the control and the experimental groups are significantly different.

3.1.1 Samples

The samples of the study were 80 purposively selected students who enrolled in the English III course in trimester 1, academic year 2010 at Suranaree University of Technology, Nakhon Ratchasima, Thailand**.** The samples included two groups: the control and the experimental group. The control group also consisted of 40 students who received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via the face to face method. The experimental group consisted of 40 students who received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via web-based instruction. Both control group and experimental group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique based on the content of English III course.

3.1.2 Research Procedure

Both the control group and experimental group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique based on the content of English III course by the researcher. The control group was taught in the traditional way following a teacher's lesson plan while the experimental group was taught by using web-based instruction. The experimental group was trained in using the computer and web-based instruction for two hours before the experiment to equalize their computer skills. Before the experiment, both groups were measured in their vocabulary learning ability by a pre-test. After the experiment was conducted, a post-test was given to all subjects. For the experimental

group, the questionnaires and semi-interview were administered. The research procedure is illustrated as follows:

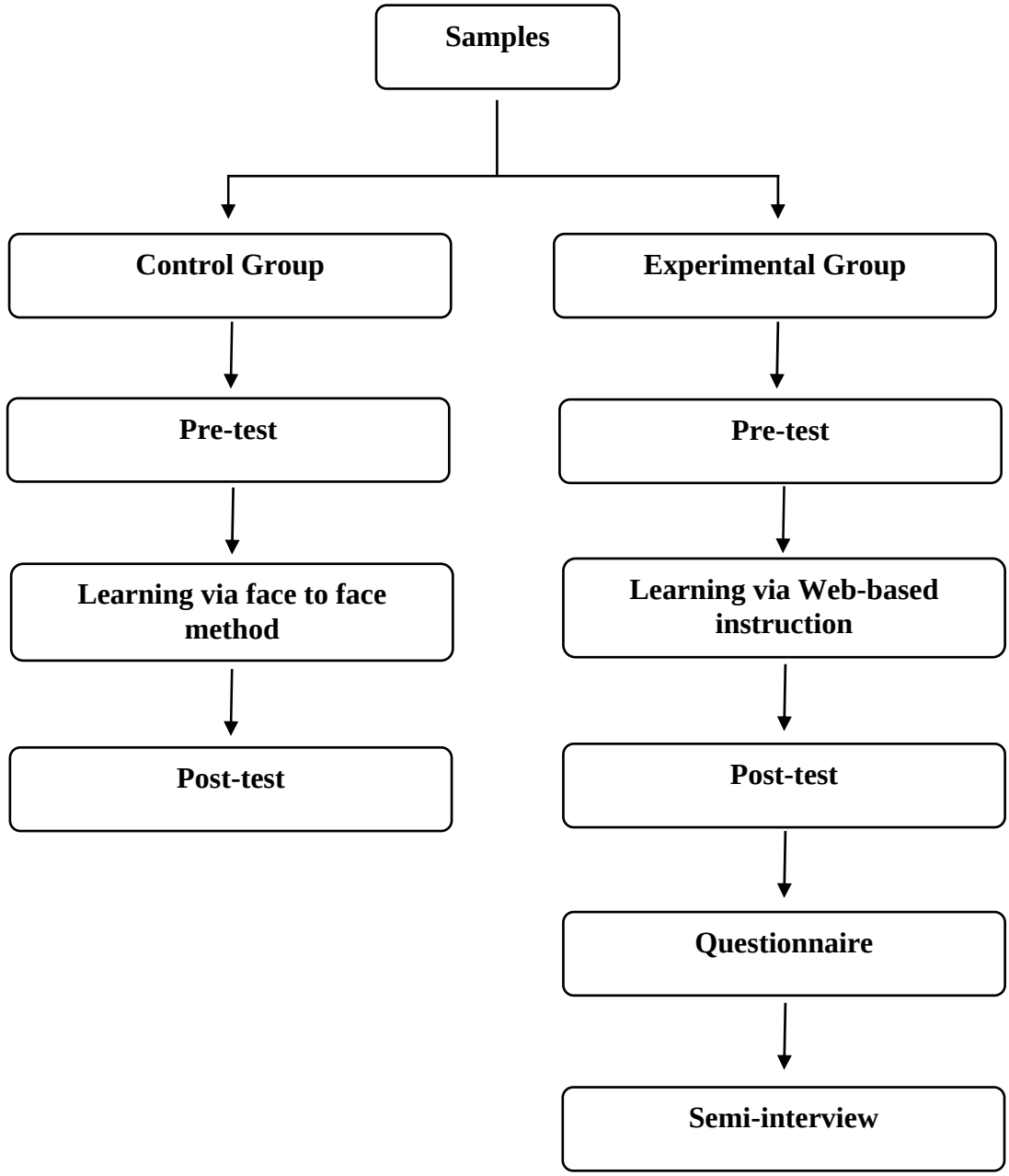


Figure 3.1 Research Procedure

3.1.3 Variables

There are two main types of variables, independent and dependent variables.

1. Independent variable. The independent variables included the two types of methods of instruction; an instruction based on face-to-face method, and Web-based instruction method.

2. Dependent variable. The dependent variables which could be affected by the independent variables are students' English vocabulary learning ability and opinions toward learning through web-based instruction.

3.2 Research Instruments and Construction and Efficiency of Instruments

The instruments and the procedures of instrument construction and the determination of the instruments' efficiency of the study are as follows:

3.2.1 A Web-based instructional model for English vocabulary learning based on guessing meanings from context clues (The Saitakham Model)

"The Saitakham Model" is a web-based instructional model for English vocabulary learning based on context-clues based meaning guessing technique. The Saitakham Model was created by the researcher. It was designed to enhance student's English vocabulary learning ability by context-clues based meaning guessing technique. The followings are the steps of the construction of the Saitakham Model.

1. Review related literature on instructional design.

2. Study the instructional design process from many models such as the ADDIE, the Dick and the Carey, the Kemp, the ARCS, the ASSURE the Model, and the SREO Plan to determine which of them would be feasible to use.
3. Determine the components of the model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique via web-based instruction.
4. Construct the instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique via web-based instruction.

3.2.2 Evaluation Form of the Saitakham Model

An evaluation form of instructional model plan was originally created by the researcher as there has been no previous study related. This form together with the Saitakham Model was sent to the experts in Instructional Systems Technology and English Language Teaching field to evaluate the plan designed by the researcher before the plan implementation. The information gathered from the evaluation was used to revise the plan. The followings are the steps of the construction and the determination of the efficiency of an evaluation form of the Saitakham Model.

1. Construct an evaluation form of the Saitakham Model.
2. Evaluate the Saitakham Model by the experts in the field of Instructional Systems Design and English Language Teaching.
3. Revise the Saitakham Model according to the suggestions from the experts.

3.2.3 English Vocabulary Learning Lessons via Web-based Instruction

English vocabulary learning lessons via web-based Instruction were constructed by the researcher. They were designed based on the content of the English III course to enhance student's English vocabulary learning ability by context-clues based meaning guessing technique. They were used by the participants in the experimental group after the pre-test. The 85/85 standard (Brahmawong, 1978) was used to determine the efficiency of the lessons. The steps of the construction and the determination of the efficiency of English vocabulary learning lessons via web-based instruction are as follows:

1. A study of the course description of the English III course focused on English vocabulary used in the course.
2. A review of related literature regarding English vocabulary learning by context-clues based meaning guessing technique.
3. A study of how to create the website by using the Modular Object-Oriented Dynamic Learning Environment (Moodle). It is a free and open-source e-learning software platform.
4. Design of the web pages for "Web-based Instruction to Enhance English Vocabulary by Context-clues based meaning guessing technique". The main menu of the web-based instruction consisted of "Learning Objectives", "Lessons", "Self Test", "Announcement", "Webboard", "Send E-mail to Teacher", and "Web Links."
5. Creation of the web pages for the on-line web-based instruction by using Moodle Software.

6. An examination by the experts of "Web-based Instruction to enhance English Vocabulary by Context-clues based meaning guessing technique".
7. A revision of the website before using it in the try-out stages.

To evaluate the effectiveness of English vocabulary learning lessons via web-based instruction, three steps of try-out in the developmental testing process were done to evaluate the lessons. The students for the try-out studied the lessons, did the exercises and took the tests. The students' achievement scores from both exercises and tests were calculated to measure the efficiency of the lessons.

1. Individual Testing

The first step was an individual test. This step was done in the trimester 3, academic year 2009. Three students with different English proficiency levels, high, moderate, and low, participated in this step. The criteria for dividing the samples into different levels of English proficiency were as follows: high achievers were the students who have English Ordinary National Educational Test (O-NET) scores above 50, moderate student got between 31-49 scores, and less able students got below 30. Three students were asked to take the pre-test on English vocabulary ability test. They studied English vocabulary by context-clues based meaning guessing technique via web-based instruction for 10 fifty-minute periods. After that, they took the post-test and were asked for feedback and opinions about the lessons in order to improve the quality of the lessons.

2. Small Group Testing

The second step in the try-out was the small group testing. Six students participated in this try-out. There were two high achievers, two moderate

achievers, and two low achievers. The same procedure was followed with these students as with the individual testing. The data obtained from the students on the feedback and opinions about the lessons were analyzed. Then, the researcher adjusted the instrument by adding and modifying the exercises, content and structure, pictures, and program functions. In addition, font sizes, colors, and formats of some activities were changed. This step was done in the trimester 3, academic year 2009.

3. Field Study Testing

The last step of the try-out was the field study testing. 30 students with high, moderate, and low English proficiency levels participated in this step. In the trimester 3, academic year 2009, 10 students of each proficiency group were asked to do the pre-test. After learning English vocabulary learning by context-clues based meaning guessing technique, web-based instruction for 10 fifty-minute periods via web-based instruction, they took the post-test.

The students' scores obtained from the exercises and the post-test from the individual testing, small group testing, and field study testing were determined for efficiency of English vocabulary learning lessons based on the criteria of the 85/85 standard level (Brahmawong, 1978). The following formula was used to determine the efficiency.

$$E_1 = \frac{\overline{X}}{A} \times 100$$

E_1 = Efficiency of the process – the percentage of average scores

$\sum x$ = Average scores all students obtained from the exercises

A = Total score of the exercises in the lessons

$$E_2 = \frac{\overline{F}}{B} \times 100$$

E_2 = Efficiency of the product – the percentage of average scores

$\sum F$ = Average scores all students obtained from the test

B = Total score of the test in the lessons

Three steps of try-out in the developmental testing process (individual testing, small group testing, and field study testing) were done to evaluate the lessons. The efficiency of three steps of try-out in the developmental testing process is presented in the table 3.1.

Table 3.1 The Efficiency of Three Steps of the Developmental Testing Process

Developmental Testing Process	**E_1 (Efficiency of Process)**	**E_2 (Efficiency of Product)**
Individual Testing	71.10	78.35
Small group Testing	80.00	80.85
Field study Testing	82.90	83.00

As can be seen from the table above, the efficiency index of individual testing, small group testing and field study testing is 71.10/78.35, 80.00/80.85, 82.90/83.00 respectively. According to the value of E_1 and E_2 of the process of the field study testing (82.90/83.00) showed that the efficiency of English vocabulary learning lessons of the developmental testing process meets the 85/85 standard level. Therefore, these lessons could be used by the sample in the experimental group.

The steps of the construction and determination of the efficiency of English vocabulary learning lessons try-out are illustrated in the Figure 3.2.

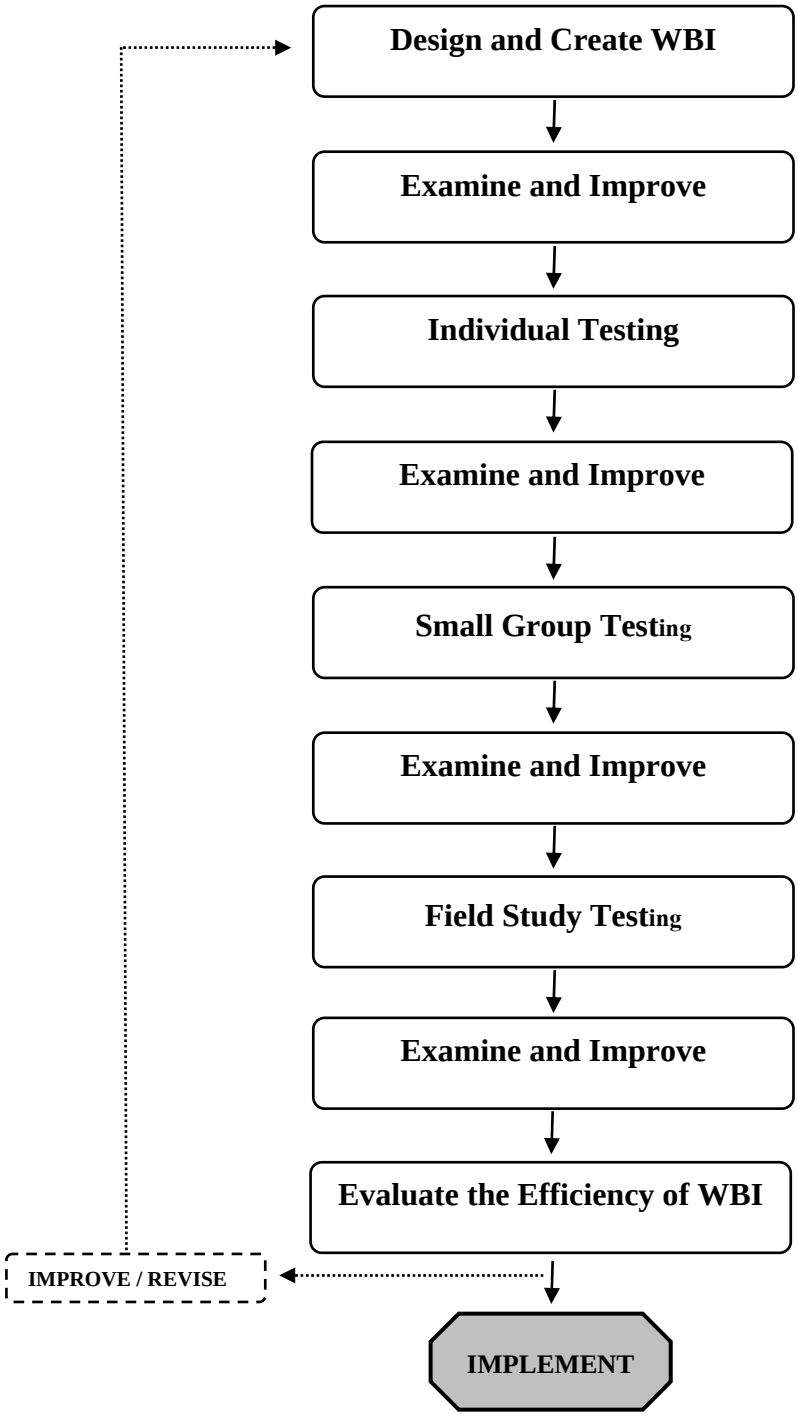


Figure 3.2 Steps of English Vocabulary Learning Lessons Try-outs

3.2.4 Lesson Plans

The lesson plans for enhancing students' vocabulary learning ability by using context-clues based meaning guessing technique were designed and constructed based on the content of the English III course. There were two lesson plans of the study; for the control group and the experimental group.

The procedures for construction of the lesson plans for the control group were as follows:

1. Study the course description of English III course focusing on vocabulary used for the course.
2. Construct the lesson plans for enhancing English vocabulary learning ability by context-clues based meaning guessing technique based on the content of English III course.
3. Examine the lessons plans by the experts.
4. Improve and revise the lesson plans before using with the control group.

The procedures for construction the lesson plans of the experimental group were as follows:

1. Study the course description of English III course focusing on vocabulary used for the course.
2. Construct the lesson plans based on web-based instruction for enhancing English vocabulary learning ability by context-clues based meaning guessing technique based on the content of the English III course.
3. Examine the lesson plans by the experts.

4. Improve and revise the lesson plan before using it with the experimental group.

The steps of the lesson plans construction for the control and experimental groups are illustrated in the Figure 3.3 below.

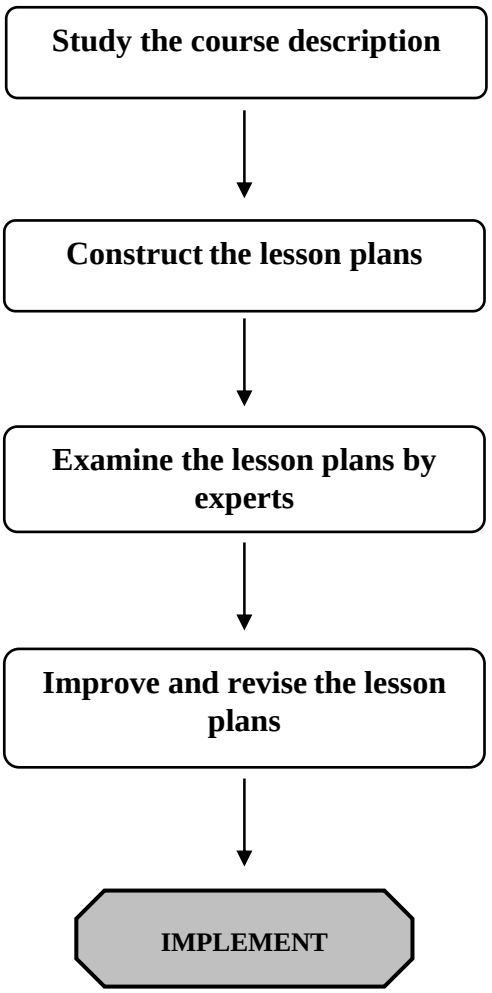


Figure 3.3 Steps of Lesson Plan Construction for Control and Experimental Groups

3.2.5 English Vocabulary Learning Test on Guessing Meanings from the

Context Clues

Tests were used to assess students' English vocabulary learning ability and to compare students' English vocabulary learning ability before and after the experiment. The tests were constructed by the researcher and employed as a parallel pre-test and post-test for the control and experimental groups. The construction of English vocabulary tests on context-clues based meaning guessing technique was constructed as follow:

1. Study on the course description of English III course focusing on vocabulary used for the course.
2. Study the literature review of English vocabulary learning by context-clues based meaning guessing technique.
3. Consult the experts about the test principles and the processes of the test construction.
4. Develop the test consisting of 100 multiple choice questions with four alternatives.
5. Examine and check the content validity of the test by the experts.
6. Modify and revise the test with suggestions from the experts.
7. Conduct the pilot study with 40 students who enrolled on English III course in the trimester 3, academic year 2009 at Suranaree University of Technology. The students were not the same as those in the "sample" of the study.
8. Carry out an item analysis based on the data obtained from the pilot study. Each question was analyzed for the level of difficulty (p) and discrimination power (r) by using the Item Response Theory (IRT) software programme developed by Assoc. Prof. Dr. Sirichai

Kanjanavasi, Assoc. Prof. Dr. Kanit Khaimook, and Assoc. Prof. Dr. Suwimol Wongwanit. The criteria used to select the test items was 0.20-0.80 and $r \geq 0.2$. The formulas used to analyzed for the level of difficulty (p) and discrimination power (r) were as follows:

Test Difficulty Formula

$$p = \frac{RH + RL}{N_H + N_L}$$

p = Difficulty of the test

R_H = Number of students who answer a test item correctly in the high group

R_L = Number of students who answer a test item correctly in the low group

N_H = Number of students in the high group

N_L = Number of students in the low group

Discrimination Formula

$$r = \frac{R_H - R_L}{N_H + N_L}$$

r = Discrimination index

R_H = Number of students who correctly answered in the high group

R_L = Number of students who correctly answered in the low group

N_H = Number of students in the high group

N_L = Number of students in the low group

9. Select eighty items as a pre-test and post-test with forty items in each.
10. Determine the reliability of the test by using Kuder-Richardson's formula (KR-20). The IRT software programme will be used to calculate the reliability of the test. It was accepted at KR.-20 $\geq$ 0.7. The formula of KR.-20 is presented below.

$$KR.\text{-}20\ (r_t) = \frac{n}{n-1}\left(1 - \frac{\Sigma pq}{\sigma^2_t}\right)$$

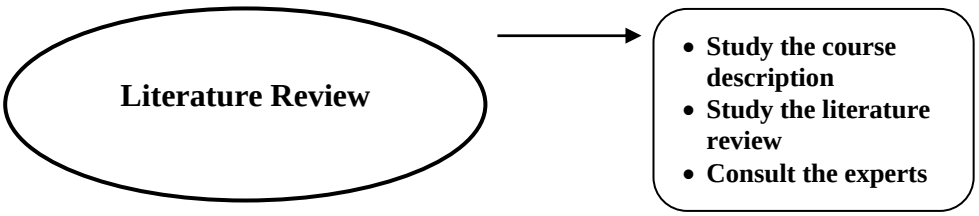
n = Numbers of question

p = The portion of students who correctly answered each question

q = The portion of students who incorrectly answered each question (1 – p)

σ^2_t = Variance of the total score

The following figure showed the steps in construction of English vocabulary learning ability tests.



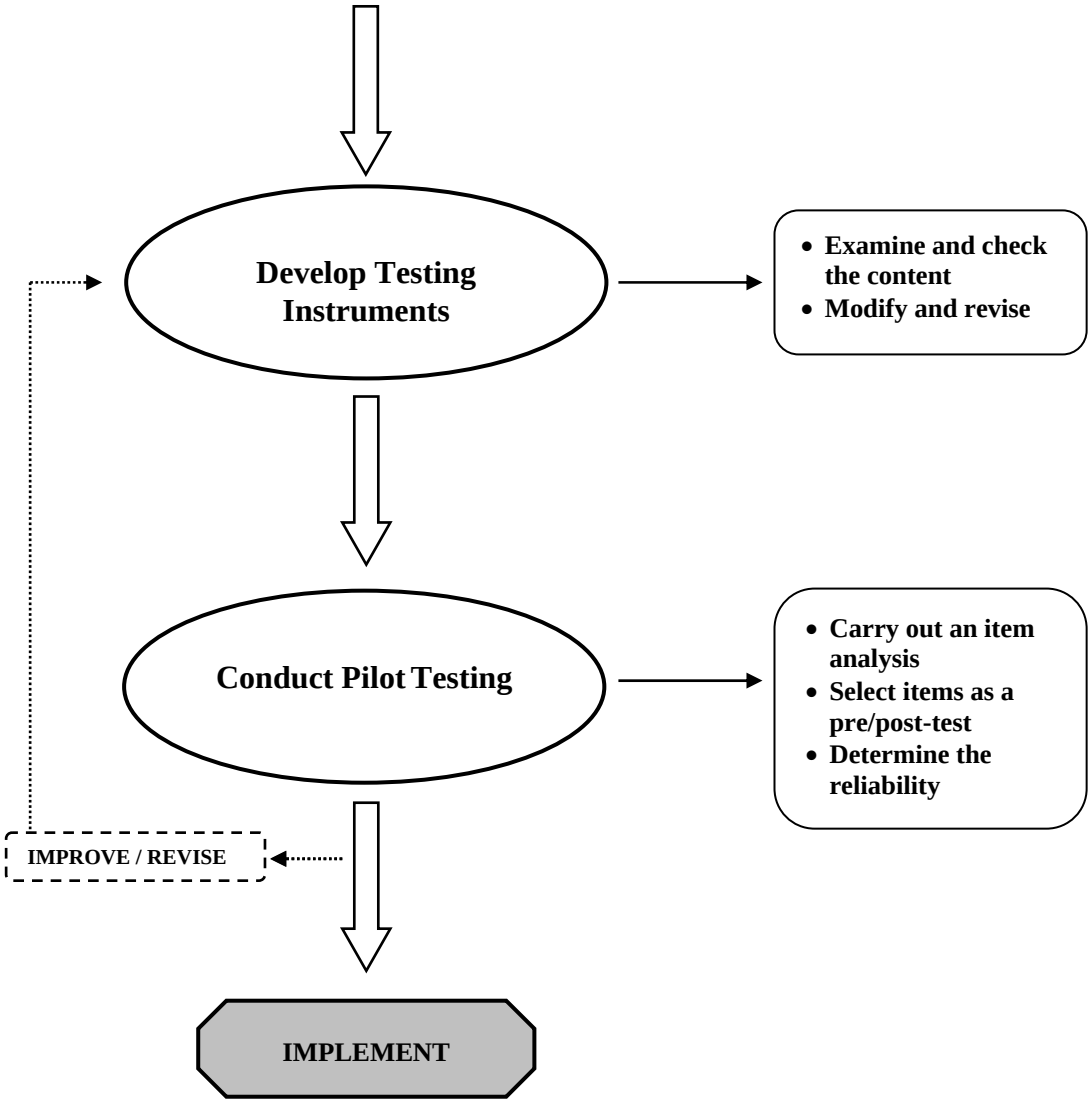


Figure 3.4 Steps of Construction of English Vocabulary Learning Ability Tests

3.2.6 The Questionnaire

The questionnaire for this study was constructed by the researcher. It was constructed to collect the students' feelings, opinions, comments, strengths, weaknesses, and suggestions about learning via web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique.

The questionnaire consisted of two sections. In part one, the students were asked about their about their skills in computer and internet using. In part two, students were asked to rate their feelings and opinions about learning via web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique.

There were many items in this part. The Likert's scale was used to measure their opinions. The students were asked to rate their opinions about learning via web-based instruction by using context clues on the scale of 1-5 as follows:

5 = strongly agree

4 = agree

3 = uncertain

2 = disagree

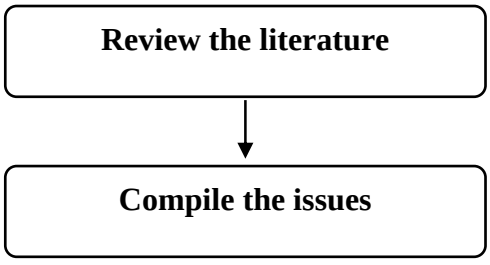
1 = strongly disagree

Part two consisted of an open-ended section for obtaining more suggestions and opinions from the students. The procedures of construction are as follow:

1. Study the literature about how to construct the questionnaire.
2. Compile the issues concerning about learning via web-based instruction which enhance English vocabulary learning ability by context-clues based meaning guessing technique.
3. Construct statements based on the issues compiled from learning via learning via Web-based instruction which enhance English vocabulary learning ability by using context clues.

4. Examine all of the statements and recommendations by the experts concerning the validity of the questionnaire.
5. Try out all of the statements with 40 students who enrolled on English III course at Suranaree University of Technology. The students are different from those who were the sample of the study.
6. Calculate all of the statements by using the t-test.
7. Select the statements which had the most significant differences at the level 0.05 to be the part of the questionnaire.
8. Try out the statements again to find out the reliability.
9. Check the reliability of the questionnaire by using the method of the Coefficient Alpha of Cronbach.

The steps in the construction of questionnaire are presented in the Figure 3.5.



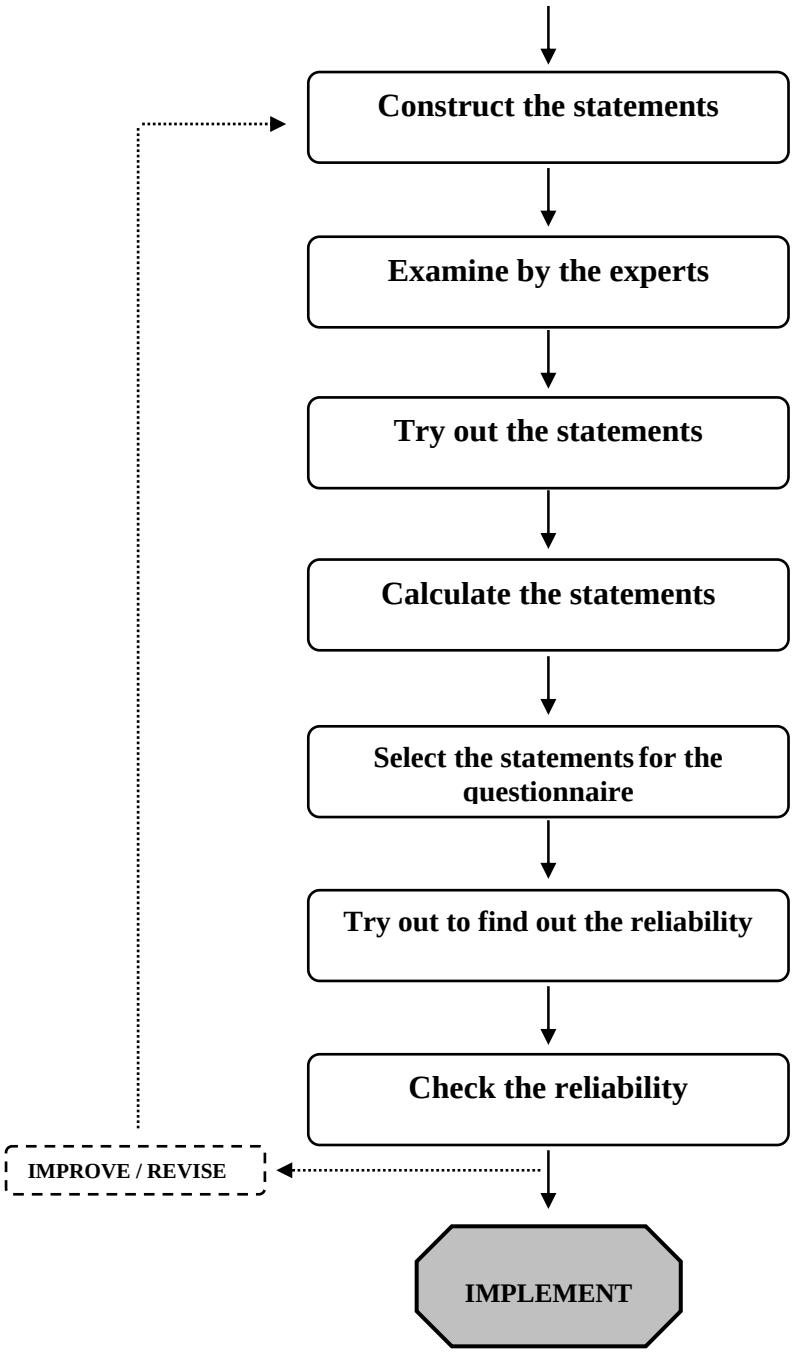


Figure 3.5 Steps of Construction of the Questionnaire

3.2.7 The Interview

A semi - structured interview was used to elicit the students' feelings, opinions, comments, strengths, weaknesses, and suggestions about learning via web-

based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique. The semi - structured interview provided the opportunities for the researcher and the samples to discuss the topics in more details. The interview topics were formed into questions to elicit the information. The questions were examined by the experts. After that, these questions were used with the samples. Ten students were interviewed for 15-20 minutes after answering the questions. To minimize problems of ambiguity, misinterpretation and for gaining more data the samples were interviewed in Thai. Digital recording of the conversations for accuracy and future reference was used with the students' knowledge and permission while the interview was taking place.

3.3 Data Collection

The procedures of data collection were as follows:

1. Conduct the pre-test with the control group and experimental group.
2. Provision was made for the control group to receive tutoring by the face to face method for enhancing their English vocabulary learning ability by context-clues based meaning guessing technique while the students of the experimental group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via web-based instruction.
3. Conduct the post-test with the control group and experimental group and then the experimental group was asked to answer the questionnaire about learning via web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique.

4. Interview the experimental group about their feelings, opinions, comments, strengths, weaknesses, and suggestions about learning via Web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique.

3.4 Data Analysis

The data obtained from different methods of the study was analyzed and interpreted in two main ways, by quantitative and qualitative data analysis.

3.4.1 Quantitative Data Analysis

Quantitative data includes the data obtained from the pre-test, post-test and questionnaire.

The data obtained from the pre-test and post-test

To compare the English vocabulary learning achievement both of the control and experimental groups, the Analysis of Covariance or ANCOVA model by Scheffe was used to remove extraneous variability that derives from pre-existing individual differences, such as students' English background knowledge or English vocabulary learning ability. The computer software program, SPSS, was used to analyze the data.

The data obtained from the questionnaire

The data from the Likert's scale was calculated for the arithmetic means ($\bar{X}$). These means indicated the students' opinions towards learning via web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique. The criteria of means is from a range divided by number of level created. This is (5-1)/3 = 1.33 for each level the means was added up

with 1.33. Mean scores derived from this scale were calculated and interpreted based on the criteria:

3.68 – 5.00	=	very good opinions
2.34 – 3.67	=	good opinions
1.00 – 2.33	=	bad opinions

3.4.2 Qualitative Data Analysis

Quantitative data includes the data obtained from the open-ended section of the questionnaire and the semi - structured interview**.**

The data obtained from the open-ended section of the questionnaire

The data obtained from the questionnaire in the open-ended section was labeled and coded so that the differences and similarities between all the answers were seen.

The data obtained from the interview

Transcribing the conversation is the first step for producing a written version of the interview. After that, the data were labeled and coded. In the last step, the data were categorized to summarize the students' attitudes towards learning via web-based instruction.

This chapter describes the research methodology, populations and samples, research procedure, research instruments and construction and efficiency of the instruments, and data analysis. In the next chapter, the research findings and discussion will be presented.

CHAPTER 4

FINDINGS AND DISCUSSIONS

The present study attempts to develop a web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique. This chapter presents the research findings and discussion. The research findings are organized according to the four purposes of the study, these are:

1. To develop a web-based instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique of the students who enrolled on English III course at Suranaree University of Technology in the trimester 1, academic year 2010**.**
2. To determine the efficiency of English vocabulary learning lessons via Web-based instruction to students who enrolled on English III course at Suranaree University of Technology in the trimester 1, academic year 2010 based on the 85/85 standard
3. To compare achievement of English vocabulary learning ability who received tutoring via web-based instruction and those who received tutoring via face-to-face method.
4. To explore the students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction**.**

The research findings are presented in six main parts. These are as follows:

1. The findings of the development of web-based instructional model (the Saitakham Model) to enhance English vocabulary learning ability by context-clues based meaning guessing technique
2. The findings of the development of web-based instruction lessons to enhance English vocabulary learning ability by context-clues based meaning guessing technique via web-based instruction
3. The findings of students' English vocabulary learning achievement by context-clues based meaning guessing technique for experimental and control groups
4. The findings of comparison of English vocabulary learning achievement by context-clues based meaning guessing technique for experimental and control groups
5. The findings of students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction
6. The findings of semi-interview about learning English vocabulary by context-clues based meaning guessing technique via web-based instruction

4.1 Findings

4.1.1 The Findings of the Development of a Web-based Instructional Model (the Saitakham Model) to Enhance English Vocabulary Learning Ability by Context-Clues Based Meaning Guessing Technique

"The Saitakham Model" is a web-based instructional model for English vocabulary learning based on context-clues based meaning guessing

technique. The Saitakham Model was created by the researcher. It was designed to enhance student's English vocabulary learning ability by context-clues based meaning guessing technique. The evaluation form of Saitakham Model was sent to three experts in Instructional Systems Design and English Language Teaching field. The experts are Prof. Dr. Chaiyong Brahmawong, Dr. Sarit Srikhao, and Dr. Peerasak Siriyothin. The collected data from the five-point rating scale questionnaire (5 = very strongly agree, 4 = strongly agree, 3 = agree, 2 = slightly agree, and 1 = least agree**)** was calculated for the arithmetic means.

The criteria of means is from a range divided by number of level created. This is (5-1)/3 = 1.33, for each level the means was added up with 1.33. Mean scores derived from this scale were calculated and interpreted based on the criteria: 3.68 – 5.00 = very strongly agree, 2.34 – 3.67 = agree, and 1.00 – 2.33 = least agree. The results of the analysis are presented in table 4.1 below

Table 4.1 The Findings of the Expert's Opinions on the Development of a Web-based Instructional Model (the Saitakham Model) to Enhance English Vocabulary Learning Ability by Context-Clues Based Meaning Guessing Technique

Items	**Statements**	$\bar{X}$	**SD**
1	Each component of the model has appropriate connection.	4.33	1.155
2	The steps of the model are clear and easy to understand.	4.67	0.577
3	The steps of the model are easy to implement.	4.67	0.577
4	Overall, the model is appropriate to be used in teaching English Vocabulary by context-clues based meaning guessing technique	4.67	0.577
5	In conclusion, the model is satisfied.	4.67	0.577
	Total	**4.60**	**0.693**

According to the table 4.1, the data obtained shows that the experts very strongly agree that the steps of the Saitakham Model are clear and easy to understand, easy to implement, and the model is appropriate to be used in teaching English Vocabulary by guessing meaning from the context clues with the mean scores 4.67. In addition, the experts also very strongly agree that each component of the model has appropriate connection, with the mean scores 4.33. Overall, the experts very strongly agree that the model is satisfied ($\bar{X}$ = 4.67**)**.

In conclusion, the Saitakham Model was rated by the experts in Instructional Systems Design and English Language Teaching field as “Very Strongly Agree” ($\bar{X}$ = 4.60). According to the rate of expert’s opinions on the development of the Saitakham Model, this corresponded well with the first hypothesis of this study.

4.1.2 The Findings of the Development of a Web-based Instruction Lessons to Enhance English Vocabulary Learning Ability by Context-Clues Based Meaning Guessing Technique

To evaluate the effectiveness of English vocabulary learning lessons via web-based instruction, three steps of try-out in the developmental testing process (individual testing, small group testing, and field study testing) were done to evaluate the lessons. In each step of try-out in the developmental testing process (individual testing, small group testing, and field study testing), the lessons were modified and the mistakes were collected in order to improve the lessons and make them more suitable and effective.

At the step of individual testing, many details of web-based instruction lessons were modified. First, the learning menus were improved by add-on and remove items on the webpages in order to enhance convenience and help with

understanding how to use the WBI lessons. Second, the size and color of fonts were changed and designed to make the lessons more interesting. Third, the cartoon pictures or movement pictures were added on the website to make the learning more attractive. Next, more examples, exercises and tests were provided to help students gain more understanding of the lessons. Last, some typing mistakes were corrected. The efficiency index of individual testing was 71.10/78.35 which didn't meet the 85/85 standard level (see Appendix A for further information).

The second step of try-out in the developmental testing process was small group testing. The animated pictures and useful website links were provided to help students enjoy searching for information, playing games, and gaining more knowledge. In addition, the list of learning menus was rearranged again. Grammatical errors were also checked and corrected in this step. The efficiency index of this step was 80.00/80.85 which didn't meet the 85/85 standard level (see Appendix A for further information).

Field study testing was the last try-out step in the developmental testing process. At this step, the learning menus of sub-topics were grouped into "Lessons." Moreover, the contents of all webpages were checked. The efficiency index of this step was 82.90/83.00. With this value, it showed that the efficiency of English vocabulary learning lessons via web-based instruction of the developmental testing process meets the 85/85 standard level (Brahmawong, 1978) and was higher than the small group testing (see Appendix A for further information).

After the three steps of the developmental testing process were done, the lessons were used by the sample in the experimental group to determine the efficiency of English vocabulary learning lessons. It was found that the efficiency

value of the development of a web-based instruction lessons to enhance English vocabulary learning ability by context-clues based meaning guessing technique are **83.50/84.25**. Therefore, the efficiency of English vocabulary learning lessons of the study meets the 85/85 standard. This corresponded well to the second hypothesis of the study (see Appendix B for further information).

4.1.3 The Findings of Students' English Vocabulary Learning Achievement by Context-Clues Based Meaning Guessing Technique for Experimental and Control Groups

Tests were used to assess students' English vocabulary learning ability and compare students' English vocabulary learning ability before and after the experiment. The table 4.3 shows that the results of the students' English vocabulary learning achievement by context-clues based meaning guessing technique of both groups increased (see Appendix F for further information).

Table 4.2 English Vocabulary Learning Achievement by Context-Clues Based Meaning Guessing Technique for Experimental and Control groups

Group	Test	$\bar{X}$	SD
Experimental	Pre-test	16.50	4.27
	Post-test	25.58	3.85
Control group	Pre-test	15.38	4.81
	Post-test	21.40	5.86

N = 40

According to the table 4.3, the data obtained shows that the students of the experimental group who received tutoring via web-based instruction got the pre-test average score of 16.50 and the post-test average score of 25.58 while the control

group who received tutoring via the face-to-face method got the pre-test average score of 15.38 and the post-test average score of 21.40. These results revealed that both the experimental and control groups got higher mean scores after learning English vocabulary by context-clues based meaning guessing technique. To examine whether their English vocabulary learning ability increased significantly, pre-test and post-test scores of each group were compared and calculated for statistical differences by using Paired Sample T-Test. The findings are shown in Table 4.3 and 4.4.

Table 4.3 The Statistical Difference of Pre-tests and Post-tests for the Experimental Group *(Analyzed by using Paired Sample T-Test)*

Paired Differences								
Experimental Group	**Mean**	**Std. Deviation**	**Std. Error mean**	**95% Confidence Interval of the Difference**		**t**	**df**	**Sig. (2-Tailed)**
				Lower	Upper			
Pre-test Post-test	-9.075	3.008	.476	-10.037	-8.113	-19.084	39	.000

Table 4.4 The Statistical Difference of Pre-tests and Post-tests for the Control Group *(Analyzed by using Paired Sample T-Test)*

Paired Differences								
Control Group	**Mean**	**Std. Deviation**	**Std. Error mean**	**95% Confidence Interval of the Difference**		**t**	**df**	**Sig. (2-Tailed)**
				Lower	Upper			
Pre-test Post-test	-6.025	3.285	.519	-7.076	-4.974	-11.598	39	.000

The tables above present statistics concerning the distribution of differences between the pair scores (Paired Differences) of experimental and control groups, the 95% Confidence Interval of the Difference, the t value, their df and their 2-tailed p-value.

As can be seen from the table 4.3 (the statistical difference of pre-tests and post-tests for the experimental group), the value of the test statistic t (on 39 degrees of freedom) is -19.084, and the 2-tail p-value is .000. The table 4.4 (the statistical difference of pre-tests and post-tests for the control group) presents the value of the test statistic t (on 39 degrees of freedom) is -6.025, and the 2-tail p-value is .000.

Both experimental and control groups have the 2-tail p-value of .000. This value expresses that there were significant differences at the level of .05. Therefore, both groups of students who received tutoring via web-based instruction (pretest $\bar{X}$ = 16.50, post-test $\bar{X}$ = 25.58**)** and those who received tutoring via face-to-face method (pretest $\bar{X}$ = 15.38, post-test $\bar{X}$ = 21.40**)** had better English vocabulary learning ability after studying the English vocabulary by context-clues based meaning guessing technique.

4.1.4 The Findings of Comparison of English Vocabulary Learning Achievement by Context-Clues Based Meaning Guessing Technique for Experimental and Control Groups

To compare the English vocabulary learning achievement both of the control and experimental groups, the Analysis of Covariance or ANCOVA model by Scheffe was used to remove extraneous variability (students' English vocabulary learning ability) that derives from pre-existing individual differences. The data obtained from the pre-test and post-test were analyzed in order to see if there were

significant differences between the control and experimental groups. The results are presented in the table 4.5 below.

Table 4.5 The Findings of Students' English Vocabulary Learning Achievement for Experimental and Control Groups (*Analyzed by using ANCONVA)*

Dependent Variable: posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1419.876[a]	2	709.938	64.976	.000
Intercept	521.169	1	521.169	47.699	.000
method * pretest	1419.876	2	709.938	64.976	.000
Error	841.312	77	10.926		
Total	45739.000	80			
Corrected Total	2261.188	79			

a R Squared = .628 (Adjusted R Squared = .618)

According to the table 4.5, the p-value (Sig.) of each F ratio is given as .000, which means that it is not beyond the 0.05 level. These results show that the students in the experimental group who received tutoring English vocabulary by using context clues via web-based instruction had a higher average post-test score ($\overline{X}$ = 25.58) than the control group who received tutoring through face-to-face method ($\overline{X}$ = 21.40) with a statistically significant difference at the level of 0.05. This corresponded to the third hypothesis of the study.

4.1.5 The Findings of Students' Opinions toward Learning English Vocabulary by Context-Clues Based Meaning Guessing Technique via Web-based Instruction

The questionnaire for this study was constructed by the researcher. It was constructed to collect the students' feelings, opinions, comments, and suggestions

about the strengths and weaknesses of learning via web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique. 40 students were asked to answer this questionnaire. 70% of the respondents (28 students) were male and 30% (12 students) were female. The questionnaire consisted of two parts.

Part I of the questionnaire asked about their computer and internet using skills. The data obtained shows that 55% of students were good at using computers and 45% were fair. About typing skills, 40% had good skills, 57.5% were fair, and 2.5% rated themselves as poor. On the skills of Internet usage, 67.5% were good and 32.5 % were fair. In the frequency of Internet surfing, it was found that 62% of the students often access the Internet, while there were 35% and 2.5% who “sometimes” and “rarely” surf the Internet, respectively.

In part II, the Likert’s scale was used to measure their opinions. The data obtained from the five-point rating scale was calculated for the arithmetic means ($\bar{X}$). These means indicated the students’ opinions towards learning via web-based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique. Mean scores derived from this scale were calculated and interpreted based on the criteria: 3.68 – 5.00 = very good opinions**,** 2.34 – 3.67 = good opinions and 1.00 – 2.33 = bad opinions. The findings of the analysis are presented in the Table 4.6 below.

Table 4.6 The Findings of Students' Opinions toward Learning English Vocabulary by Context-Clues Based Meaning Guessing Technique via Web-based Instruction

Items	Statements	$\overline{X}$	SD
1	Learning English vocabulary by guessing meaning from the context clues via WBI is a modern way of learning.	4.42	0.501
2	Learning English vocabulary by guessing meaning from the context clues via WBI is convenient to learn, you can review the lessons anywhere and anytime.	4.25	0.670
3	Learning English vocabulary by guessing meaning from the context clues via WBI is the way to enhance your self-directed learning.	4.18	0.747
4	Learning English vocabulary by guessing meaning from the context clues via WBI is enjoyable.	3.98	0.698
5	Learning English vocabulary by guessing meaning from the context clues via WBI doesn't make you feel isolated or alone.	3.55	0.677
6	Learning English vocabulary by guessing meaning from the context clues via WBI is useful in learning.	4.30	0.564
7	Learning English vocabulary by guessing meaning from the context clues via WBI helps you remember more new vocabulary.	4.05	0.504
8	Learning English vocabulary by guessing meaning from the context clues via WBI has clear explanation of contents and exercises.	3.72	0.599
9	Learning English vocabulary by guessing meaning from the context clues via WBI has the appropriate contents with learning objectives.	4.05	0.677
10	Learning English vocabulary by guessing meaning from the context clues via WBI is easy to understand the lessons.	3.85	0.770
11	Overall, learning English vocabulary by guessing meaning from the context clues via WBI is satisfied.	4.30	0.687
	TOTAL	**4.06**	**0.645**

N = 40

As can be seen from the table 4.6, the data obtained reveals that the total means score of the questionnaire is 4.06. This value indicates that the students had very good opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

Considering each item, the students agreed that learning English vocabulary by guessing meaning from the context clues via web-based instruction is modern, with the highest means average 4.42. They agreed that learning via web-based instruction is useful, with the means average 4.30. They also agreed that learning via web-based instruction is convenient to learn since a person can review the lessons anywhere and anytime ($\bar{X}$ = 4.25), learning via web-based instruction is a way to enhance their self-directed learning ($\bar{X}$ = 4.18), and this way of learning can help them remember more new vocabulary ($\bar{X}$ = 4.05). The students agreed that learning via web-based instruction is enjoyable with the means average 3.98 and easy to understand the lessons with the means average 3.85. They agreed that learning English vocabulary by guessing meaning from the context clues via web-based instruction has clear explanations of contents and exercises with the means average 3.72. The students expressed that learning English vocabulary by guessing meaning from the context clues via web-based instruction doesn't make them feel isolated or alone with the lowest means average 3.55.

In conclusion, according to the total means score of the questionnaire ($\bar{X}$ = 4.06). It shows that the students had very good attitudes toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction. The finding corresponded to the fourth hypothesis of the study.

4.1.6 The Findings of Semi-interview about Learning English Vocabulary by Context-Clues Based Meaning Guessing Technique via Web-based Instruction

The semi - structured interview was used to elicit the students' feelings, opinions, comments, strengths, weaknesses, and suggestions about learning via web-

based instruction which enhance their English vocabulary learning ability by context-clues based meaning guessing technique. Ten students were interviewed for 15 – 20 minutes after answering the questionnaire. Each student was asked six questions to get the data. To minimize problems of ambiguity and misinterpretation, and for gaining more data, the samples were interviewed in Thai, which is their first language. Digital recording of the conversations for accuracy and future reference was used with the students' knowledge and permission while the interview was taking place. The findings of the interview from six questions are as follows:

Question 1: Do you like learning English vocabulary by context-clues based meaning guessing technique via web-based instruction? Why or why not?

When students were asked if they liked learning English vocabulary by context-clues based meaning guessing technique via web-based instruction, it was found that ten students (100%) liked to learn via this method. There are three main reasons from their opinions.

First, five students (50%) said that they liked it because learning via web-based instruction was convenient. They could study, review, and practice the lessons anywhere and anytime they wanted.

Second, three students (30%) expressed that web-based instruction was the way to promote autonomous learning. They can learn continuously on their own without the teacher.

Third, two students (20%) said that learning English vocabulary by context-clues based meaning guessing technique via web-based instruction was really fun.

Question 2: What do you like and dislike most when learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?

When they were asked about the things that they like most when learning English vocabulary by context-clues based meaning guessing technique via web-based instruction, they expressed different ideas. There were four reasons that they like.

The first is the animated pictures and the colorful webpages. Eight students (80%) said that this web-based instruction was designed with beautiful animated pictures. Each webpage was colorful and this motivated them to learn.

The second is the content of the lesson. Six students (60%) liked the contents of the lesson. The content was clear enough to understand. They also said that the level of difficulty of the content was suitable for their learning ability.

The third thing they liked is the exercises and tests of the lesson. Four students (40%) agreed that the exercises and tests helped them to understand the lesson. When they did the exercises and tests completely, they could immediately check the answers by themselves and realize the level of their vocabulary knowledge. In addition, they felt the exercises and tests were suitable for their learning ability.

The last thing they like is a well organized webpage. Three students (30%) stated that each page of the website and learning menus were well organized so it was easy to use and learn via web-based instruction.

For what the students dislike when learning English vocabulary by context-clues based meaning guessing technique via web-based instruction, three students (30%) answered that they felt good and liked all part of this web-based instruction so there were nothing they disliked. However, three students (30%) said that they disliked the system of the password set-up because they felt that the passwords were difficult to remember. If they forget their passwords, they cannot gain access to web-based instruction. Two students (20%) said they disliked the low-speed

Internet connection and two other students (20%) expressed that there were too few examples for some of the topics, and they need more explanations of the exercise answers in order to help them understand why the answers were wrong.

Question 3: How do you feel while you are learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?

When they were asked about their feelings while they were learning English vocabulary by context-clues based meaning guessing technique via web-based instruction, they expressed the ideas as follows:

First, seven students (70%) felt that they had fun, were happy and enjoyed learning. They said they can listen to music or play a computer game, that's why they spent learning time without any anxieties. Second, four students (40%) felt relaxed and had freedom in learning, because normally they studied with teachers in a classroom, they had to follow everything from their teacher. And the other four students (40%) said that they thought learning via web-based instruction was very useful. They could gain more knowledge about new vocabulary.

Question 4: Are you convenient in learning English vocabulary by context-clues based meaning guessing technique via web-based instruction? If not, what are the problems? Would you give any suggestions or comments?

When the students were asked about the convenience or problems that they faced when learning English vocabulary by context-clues based meaning guessing technique via web-based instruction, five students (50%) did not have the problem however, two problems were found by the other students.

First, five students (50%) found the speed of the computer and the Internet connection was slow. Therefore, they felt bored while waiting for the network connection.

Second, learning without a teacher also was a problem. Five students (50%) said that although the webboard was provided to discuss learning problems or posting questions, they still felt inconvenient when they had the problems. Sometimes, they would like to solve problem immediately but they can't do that, because they have to wait for the teacher's suggestions or comments on the webboard.

Question 5: How should web-based instruction on English vocabulary by context-clues based meaning guessing technique be adjusted to meet your needs?

When students were asked about what should be revised in learning English vocabulary by guessing, three suggestions were given.

Firstly, six students (60%) suggested that this web-based instruction should have a variety of contents, not only learning vocabulary by context-clues based meaning guessing technique but also other contents or skills, such as English grammar learning and speaking skills.

Secondly, three students (30%) said that web-based instruction should be well- organize with learning menus and animated picture design.

Lastly, two students (20%) suggested that each exercise and test should provide the answers with explanations to facilitate more understanding.

Question 6: Would you like to learn English or English vocabulary through the web-based instruction like "web-based instruction on English vocabulary by guessing

meanings from the context clues" next time? If you would, what content or subjects would you like to learn?

For the last question, students were asked if they want to learn English or English vocabulary through the web-based instruction like "web-based instruction on English vocabulary by context-clues based meaning guessing technique" again.

The information obtained reveals that all of them (100%) want to learn English vocabulary through web-based instruction like "web-based instruction on English vocabulary by context-clues based meaning guessing technique". In addition, five students (50%) wanted to practice their speaking skills, three students (30%) were interested in learning grammar, three students (30%) wanted to practice their reading skills, and two students (20%) wanted to practice their listening skills. In addition, two students (20%) said they would be interested in practicing writing skills.

The findings of the interview also corresponded to the fourth hypothesis of the study.

4.2. Discussion

According to the findings of the study presented above, five separate discussions can be summarized as follows:

4.2.1 The Discussion on the Findings of the Development of Web-based Instructional Model (the Saitakham Model) to Enhance English Vocabulary Learning Ability by Context-Clues Based Meaning Guessing Technique

Based on the findings regarding the development of the Saitakham Model to enhance English vocabulary learning ability by context-clues based meaning

guessing technique, three experts in the field of instructional systems design and English language teaching: Prof. Dr. Chaiyong Brahmawong, Dr. Sarit Srikhao, and Dr. Peerasak Siriyothin very strongly agreed that the Saitakham Model is suitable to teach English vocabulary by context-clues based meaning guessing technique via web-based instruction because this model was designed using a systematic process, and each component and step were clear and easy to understand. Thus, the model was suitable for implementation.

To design effective instructional approaches and models, the steps in the construction of the model are very important. In the process of development, the teachers need a step-by-step guide to design the model (The Michigan Department of Education, 2010). The Saitakham Model was created using a systematic process. The researcher studied and reviewed related literature on instructional system design in order to get a design concept. An analysis and synthesis was made of the characteristics, principles, and approaches of many instructional systems models such as those of ADDIE, Dick and the Carey, Kemp, ARCS, the ASSURE Model, and the SREO Plan, in order to create the Saitakham Model.

Five stages of the model (analyze, specify and identify, construct and test, conduct, and evaluate) were designed to teach English vocabulary by context-clues based meaning guessing technique via web-based instruction. Each stage of the model has appropriate connections and it is clear and easy to understand. Moreover, all steps of the model are easy to implement. Therefore, the experts “very strongly” agreed that the Saitakham Model was appropriate to use in teaching English vocabulary by context-clues based meaning guessing technique.

4.2.2 The Discussion on the Findings of the Development of Web-based Instruction Lessons to Enhance English Vocabulary Learning Ability by Context-Clues Based Meaning Guessing Technique via Web-based Instruction

The efficiency of English vocabulary learning lessons via web-based instruction was at the level 83.50/84.25. This meets the standard level of 85/85.

As can be seen, the level of efficiency has met the standard criterion. This was because the lessons were completely developed in three trial steps in the developmental testing process: individual testing, small group testing, and a field study testing. The data obtained from each stage of the try-out process helped the researcher to find the weak and strong points so that the researcher could develop and revise the lessons for the web-based instruction. This point supports the idea of Brahmawong (1989) that the developmental testing processes can enhance the teachers' confidence to create suitable lessons. Moreover, the developmental testing processes can nurture the teachers to be professional in designing lessons.

According to the efficiency of vocabulary learning lessons via web-based instruction at the level 83.50/84.25 (E1/E2), it can be seen that the efficiency of the outcomes (E2) was higher than for the process (E1). The reason might be that students became familiar with doing the exercises. They could practice doing the exercises again and again if they were not satisfied with their scores. Moreover, the format of the exercises was in the same format as the test so students were familiar with the format. This might have been a motive for them to pay more attention while taking the test in order to get higher scores. Thus, the efficiency of the outcomes (E2 = 84.25) was higher than the efficiency of the process (E1 = 83.50).

This finding agreed with many studies. Suppasetseree (2005) developed Remedial English lessons via the Internet and the finding revealed that the efficiency of the outcome was 86.27 while the efficiency of the process for the field study test was 85.03. Puttinate and Phiancharean (2005) developed content-based computer assisted lessons and the efficiency of the content-based computer assisted instruction program was at the level: E1 = 84.40 and E2 = 85.67. Moreover, Sukpredee (2005) designed a multimedia computer instruction program and also found that the program had the efficiency rate of 84.06/86.14. In addition, Suppasetseree (2000) developed courseware lessons for English 1 and the tests of the efficiency of the lessons showed that the efficiency of the outcomes (E2 = 87.93) was higher than the efficiency of the process (E1 = 85.63).

4.3.3 The Discussion on the Findings of Comparison of English Vocabulary Learning Achievement by Context-Clues Based Meaning Guessing Technique who Receive tutoring via Web-based Instruction and those who Received tutoring via Face-to-face Method

The finding reveals that the students in the experimental group who received tutoring of English vocabulary by context-clues based meaning guessing technique via web-based instruction had a higher average post-test score ($\bar{X}$ = 25.58) than the control group ($\bar{X}$ = 21.40) who received tutoring through the face-to-face method, which is a statistically significant difference of 0.05.

This finding agreed with Suppasetseree (2005) who developed Remedial English lessons via the Internet and Srikalsin (2001) who developed an internet-based computer instruction on working principles and components of

computers. Both of them found that the achievement of students who received tutoring via the Internet and those who received tutoring via the face-to-face method were “highly significantly” different. Moreover, Sa-ard (2004) developed web-based instruction on present simple tense and present continuous tense, and also found that the students who received tutoring via web-based instruction had a higher average score than students who received tutoring through the face-to-face method.

Accordingly, the achievement of the experimental group was “significantly higher” than the control group. This may be due to the fact that web-based instruction contains many animated pictures on colorful webpages. These moving pictures enhanced students’ comprehension and motivation so students enjoyed learning, and it helped them have greater understanding. Erricolo and Matthes (2008) stated that visual images are very important on learning via web-based instruction because they can provide enhanced clarity in the explanation of things to students. Aber (2008) also agreed that learning through web-based instruction motivated students highly.

Shu and Kuei-Feng Yang (2006) investigated the attitudes toward web-based distance learning among public health nurses in Taiwan. They found that students are very much in agreement that web-based instruction is convenient and allows them to learn freely on their own time. Mwaura (2003) stated that learning via web-based instruction is convenient for students. They could study, review, and practice the lessons anywhere and anytime. This can make them pay more attention to the information or lessons posted on the web. Ru-si and Chin (2007) studied the gender differences in Taiwan university students’ attitudes toward web-based

learning. They found that students expressed that web-based learning is open and very convenient to everyone regardless of gender.

Based on these reasons, it can be said that learning vocabulary by context-clues based meaning guessing technique via web-based instruction can help students have better understanding of the lessons, and that, therefore, will enhance their learning achievement so it will be higher than that of the students in the control group.

4.3.4 The Discussion on the Findings of Students' Opinions toward Learning English Vocabulary by Context-Clues Based Meaning Guessing Technique via Web-based Instruction

The findings of this study showed that the students had positive opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction. Many studies corroborate that students have a positive attitude toward learning via WBI (Hinnon, 2007; Duangjai, 2006; Napapong, 2006; Pateepsut, 2004; Bunnag, 2003; Somjai and Supaka, 2003; Dejthongpong, 2002; Suwanbenjakul, 2002; Vate-U-lan, 2001). This is because the students feel that web-based instruction is very interesting. All the graphic images and website links entertain and help the students relax while learning. Besides, the students can control their own learning. They can learn and review the lessons as they wish, so they can spend their learning time without stress. Moreover, it is convenient to learn via web-based instruction because they can access the lessons anywhere and anytime. This agrees with many researchers. Erricolo and Matthes (2008) stated that web-based instruction meets the needs of students using web sites at any place

and time, whether at home, in their dorms, or even when traveling. Students can easily access learning materials at their own convenience (Alessi and Trollip, 2001).

According to the data from the questionnaire, it was found that the students agreed that learning via web-based instruction is modern; it was at the highest means average score ($\bar{X}$ = 4.42). This bears out what Suppasetseree (2005) found, that students "very strongly" agreed that learning Remedial English via the Internet is "modern." Suwanbenjakul (2002) explored the students' opinions towards learning via web-based instruction and found that the students "very strongly" agreed that learning via web-based is "new." Moreover, Srikalsin (2001) investigated opinions about learning via internet-based computer instruction on working principles and components of computers. Those students "very strongly" agreed that this is the modern way in learning.

Although the students agreed that learning via web-based instruction is modern (with the highest means average score), they felt quite isolated when studying via WBI (with the lowest means average score ($\bar{X}$ = 3.55). This is because they had to learn by themselves. They didn't have any interaction with friends or teachers. Kruse (2008) discovered that learning via web-based instruction was impacted by the lack of human contact. McManus (2000) also said that one of the problems of web-based instruction is the lack of social interactions which contributed to them feeling bored. Barnard (1997) stated that one of the disadvantages attributed to web-based instruction is the potential for lack of non-verbal feedback so students might feel lonely and isolated.

4.3.5 The Discussion on the Findings of Semi-interview about Learning English Vocabulary by Context-Clues Based Meaning Guessing Technique via Web-based Instruction

The findings from the semi - structured interviews indicated that the students were satisfied and enjoyed studying English vocabulary by context-clues based meaning guessing technique via web-based instruction. Most of the students expressed that web-based instruction was an easy and convenient way to learn. They agreed that learning via web-based instruction was very useful and it could increase their learning achievement. Moreover, learning via web-based instruction can enhance self-directed learning.

Many studies from different countries come to the same conclusion. Drennan and Kennedy (2005) investigated the factors that affect student satisfaction with web-based instruction at the University of Queensland, Australia. The results showed that positive perceptions toward technology and an autonomous learning mode have the greatest influence on student satisfaction with courses presented in a flexible learning mode. Selim (2003) studied the acceptance of web-based instruction as a teaching and learning tool in higher education institutions as perceived by students at United Arab Emirates University. The data showed that web-based instruction was a useful, effective and efficient learning technology. Benrud (2003) also investigated students' performance in web-based courses at the University of Baltimore in the USA. The findings suggested that a class with a generally higher level of experience, comfort, and appreciation for the web-based learning have a higher level of success. Moreover, Lammintakanen and Rissanen (2003) studied

web-based instruction experiences from the students' and teachers' perspectives at universities in Finland. The results indicated that the students' and teachers' experiences were largely positive.

As the basic findings of the study, it can be seen that the web-based instructional model and the Saitakham Model were satisfactory to the experts. They "very strongly" agreed that the model was suitable to teach English vocabulary by context-clues based meaning guessing technique via web-based instruction. Moreover, the efficiency of learning lessons was higher than the standard level. The learning achievement of the students who learned via web-based instruction was higher than that the students who learned via the traditional face-to-face method. In addition, the students also had positive opinions toward learning via web-based instruction.

For these reasons, it can be concluded that learning English vocabulary by context-clues based meaning guessing technique via web-based instruction is an effective and suitable learning tool for enhancing and increasing the students' vocabulary knowledge. Web-based instruction can support and motivate students to learn without the restrictions of time and place. This is one of the best ways of learning, through the use of modern educational technology.

The findings presented in this chapter and the discussions which accompanied the study confirm the initial hypotheses. The part of introduction, The Saitakham's Study Plan (SS Plan), the Saitakham Model, and the pedagogical implications of the Saitakham Model will be presented in the next chapter.

CHAPTER 5

A WEB-BASED INSTRUCTIONAL MODEL FOR ENGLISH VOCABULARY LEARNING BASED ON MEANING GUESSING TECHNIQUE: THE SAITAKHAM MODEL

The present study attempts to develop web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique. This chapter contains three main sections. These are the part of introduction, The Saitakham's Study Plan (SS Plan), the Saitakham Model, and the pedagogical implications of the Saitakham Model.

5.1 Introduction

As to the advantages of instructional design and many instructional design models as reviewed in Chapter 2, there is no doubt that instructional design can provide the guidance toward good pedagogy to design and develop the best instruction. Instructional design directly affects learning effectiveness. Many researchers from many academic areas are developing the processes or the steps for instructional design. There are many effective instructional approaches and models such as ADDIE Model, Dick and Carey Model, Kemp Model, ARCS Model, ASSURE Model and the SREO Plan. All of the models are created using the system

process and focused on examining and solving the instructional problems, identifying the ways to teach, and assessing the effectiveness of the instruction. To provide effective learning, therefore, the Saitakham Model was designed with the analysis and synthesis of the characteristics, the principles, and the approaches of many models.

5.2 The Saitakham's Study Plan (SS Plan)

To develop the Saitakham Model, the whole process of this present study was studied and reviewed. The Saitakham's Study Plan (SS Plan) was designed to explain all of the process of the study. The SS Plan is presented in the Figure 5.1.

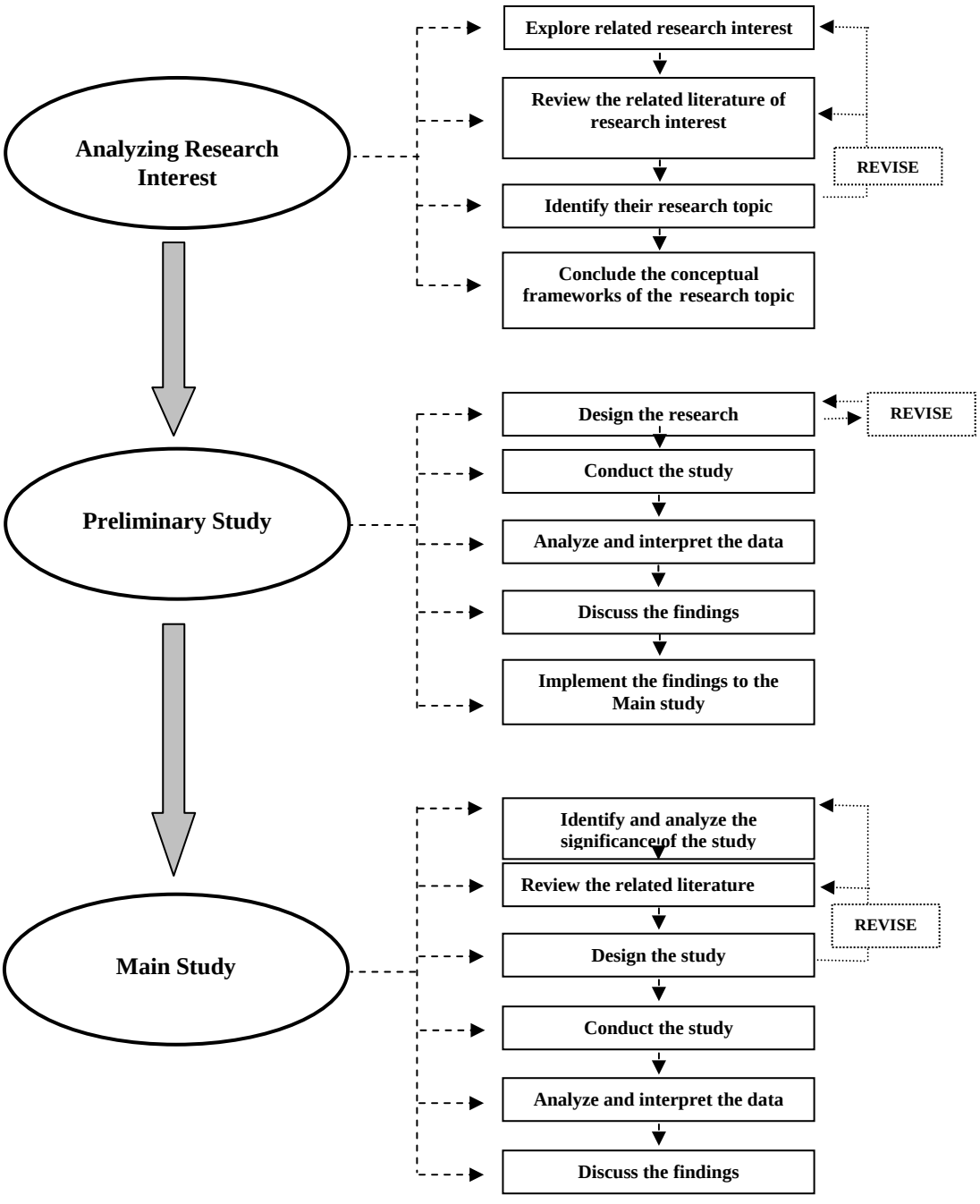


Figure 5.1 The Saitakham's Study Plan (SS Plan)

According to the figure 5.1, there are three main parts of the model: analyzing research interest, preliminary study, and present study. The first main part involves analyzing the research interest. In this part, the researchers explored their relate

research interest, review the related literature of their research interest, identify their research topic, and the researchers have to conclude the conceptual frameworks of their research topic. The second main part of the SS Plan is concerned with the preliminary study. This part presents the stages of the research design, identifying the sample, developing instruments, conducting the study, analyzing and interpreting the data, discussing the findings, and implementing the findings to the present study. The last main part of the SS Plan is the process of the present study. It is comprised of identifying and analyzing the rationale and the significance of the study, reviewing the related literature**,** designing the study, conducting the study, analyzing and interpreting the data, discussing the findings, and proposing further study based on the findings.

5.3 The Saitakham Model

This section is presented a web-based instructional model for English vocabulary learning based on guessing meanings from context clues or “The Saitakham Model”. The discussions of five main stages are presented.

The Saitakham Model is a web-based instructional model for English vocabulary learning based on context-clues based meaning guessing technique. The Saitakham Model was designed by the researcher using an analysis and synthesis of the characteristics, principles, and approaches of many other instructional models. The Saitakham Model is shown in Figure 5.2.

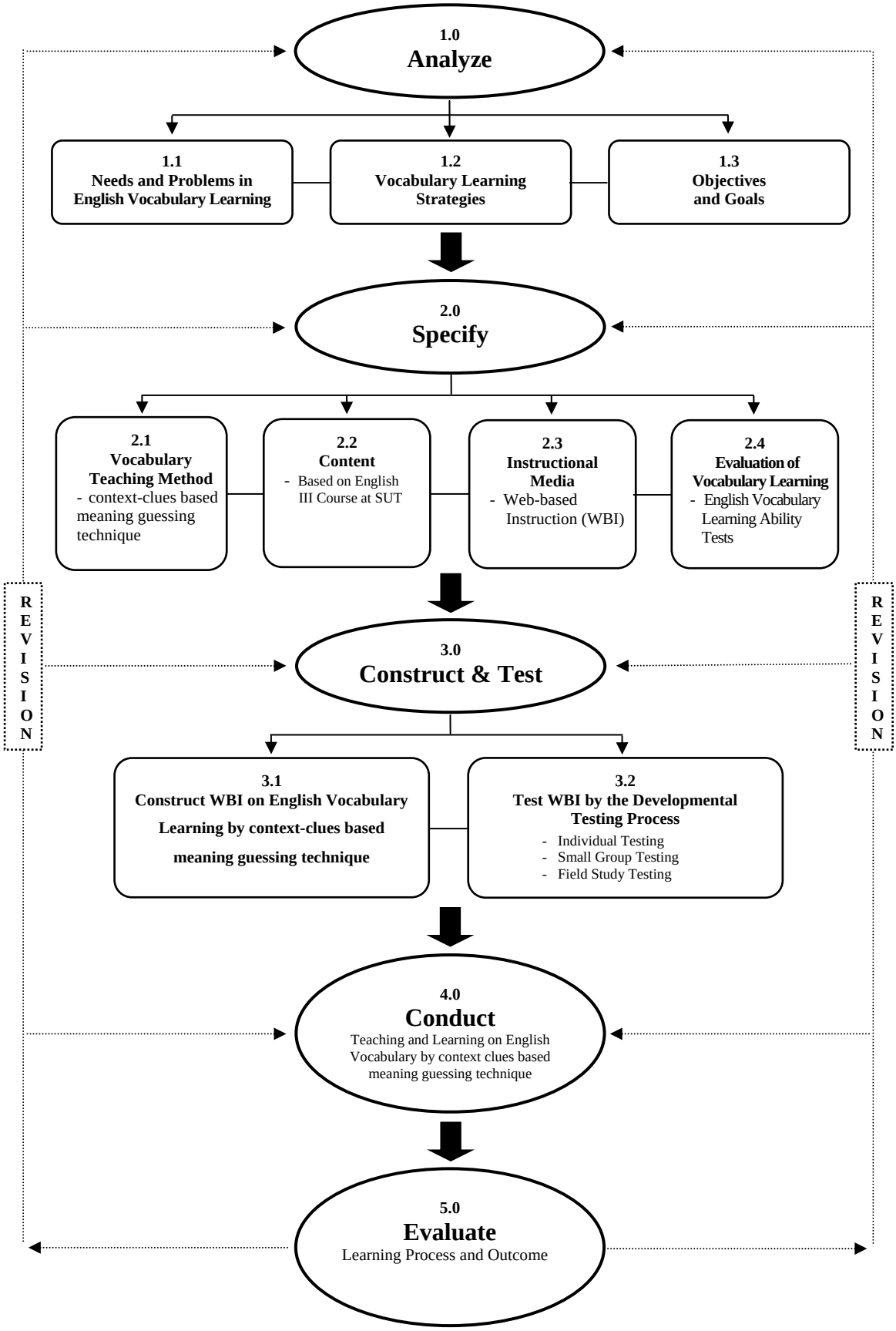


Figure 5.2 The Saitakham Model

As figure 3.7 shows, the Saitakham Model consists of five stages: analyze, specify and identify, construct and test, conduct, and evaluate.

1.0 Analyze

Analysis is the basis of the whole process. During this stage, teachers are required to analyze the students' needs and problems in English vocabulary learning, their use of English vocabulary learning strategies, and objectives and goals.

1.1 Needs and Problems in English Vocabulary Learning

During the preliminary phase of this study, the researcher examined the needs and the problems of SUT students with English vocabulary learning and the results show that most of the students have problems with the meaning of words. They cannot understand the meanings in context so they don't achieve as much as they should from English reading. The qualitative data showed that good vocabulary learning strategies are required in classroom learning. The students give priority to vocabulary learning strategies because they believe that those strategies are very useful and can affect their vocabulary learning ability.

1.2 The Use of English Vocabulary Learning Strategies

The use of English vocabulary learning strategies was also analyzed in the preliminary study. It was found that most students relied on context-clues based meaning guessing technique, using a dictionary, and using memory strategies.

1.3 Objectives and Goals

To analyze the objectives and goals is the last step of the analysis process. This step can help teachers write what they expect the students to accomplish. For this

study, it is anticipated that the students can expand and improve their vocabulary knowledge in order to succeed in their classroom learning.

2.0 Specify

The second stage in the process involves specifying and identifying. In this phase, teachers are required to specify their vocabulary teaching method, identify contents, specify instructional media, and specify evaluation of vocabulary learning.

2.1 Vocabulary Teaching Method

The researcher's preliminary study attempted to find out good strategies for enhancing students' English vocabulary learning ability. The results show that high SUT students most frequently use the strategy of guessing meanings from context clues, while poor students most frequently use dictionary strategies for learning English vocabulary. This finding supports many other studies that context-clues based meaning guessing technique is one good learning strategy to enhance students' vocabulary learning ability. Therefore, this strategy was selected as the teaching and learning method in this research study.

2.2 Content

The content of this study is based on the English III course at SUT. The objectives of this course aim to promote and enhance the students' vocabulary learning ability in order to succeed in English reading. Therefore, the course description of English III was analyzed to design the contents and lesson plans in classroom learning.

2.3 Instructional Media

To specify instructional media, the teachers should decide what media will be useful for teaching and learning. They should have a clear idea and consider their objectives for the instruction. The teachers should think about what method is appropriate for delivery of the lessons or learning tasks. What types of instructional media need to complete the tasks and are required for the course? Web-based instruction (WBI) is one of the best ways to promote student learning. It provides access to instruction anytime and anywhere. For example, a student can sit at the computer, in their home or take courses at a university. Many studies support that learning via WBI is a very important way to enhance the students' learning ability and their willingness to participate in the classroom (Hinnon, 2007; Duangjai , 2006; Napapong, 2006; Suppasetseree , 2005; Pateepsut, 2004; Bunnag, 2003; Somjai and Supaka, 2003; Dejthongpong, 2002; Suwanbenjakul, 2002; Vate-U-lan, 2001). SUT is one of many institutions that have adopted World Wide Web as one of the feasible delivery methods for teaching and learning. The computers and Internet network in classrooms and buildings are provided so the students can learn via WBI anytime, anyplace, and both inside and outside classroom. Because of the usefulness of WBI in teaching and learning, the researcher decided to select WBI on English vocabulary learning by guessing meanings from context clues as the instructional media of this study.

2.4 Evaluation of Vocabulary Learning

At this stage in the process, it is necessary to specify the evaluation. The teachers should decide what methods are to be used to evaluate the course or students' abilities such as by tests, exercises, assignments, questionnaires, interviews,

peer evaluation, self-evaluation, self-reflection, or students' folios. For this study, the tests were used to assess and compare students' English vocabulary learning ability before and after the experiment. The tests were constructed by the researcher and employed as a parallel pre-test and post-test. They are in the form of multiple choices consisting of 80 questions with four alternatives.

3.0 Construct and Test

In this process, teachers have to construct and test the instructional media they will employ. For this study, web-based instruction on English vocabulary learning by context-clues based meaning guessing technique was constructed as the instructional media.

3.1 Construct

The steps in the construction and determination of the efficiency of English vocabulary learning lessons via web-based instruction are:

1) A study of the course description of the English III course focused on English vocabulary used in the course.

2) A review of related literature regarding English vocabulary learning by using context clues.

3) A study of how to create the website.

4) Designing the web pages for web-based instruction to enhance English vocabulary learning ability by using context clues.

5) Creating the web pages for the on-line web-based instruction.

6) An Examination by the experts of "Web-based Instruction to Enhance English Vocabulary by Guessing Meanings from Context Clues".

7) A Revision of the website before using it in the try-out stages.

3.2 Test

To evaluate the effectiveness of English vocabulary learning lessons via web-based Instruction, three steps of try-out in the developmental testing process (the individual testing, small group testing, and field study testing) were done to evaluate the lessons. The students' scores obtained from the exercises and the post-test from the individual testing, small group testing, and field study testing were used to determine the efficiency of English vocabulary learning lessons, based on the criteria of the 85/85 standard level (Brahmawong, 1978).

4. Conduct

At this stage in the process, the instructional media was utilized in teaching and learning. Web-based instruction on English vocabulary learning by guessing meanings from context clues was provided to the students for learning. In this study, 40 students who enrolled in English III course at SUT received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via WBI.

5. Evaluate

It is always necessary to evaluate learning processes and outcomes. This is the way to determine the significance of the model. Both formative and summative evaluations were used to assess the overall worth or the need for revision of the instruction.

Formative evaluation is part of the instructional process. It takes place during the development and subsequent try-out of the course. It provides the information needed to adjust teaching and learning while they are happening. Formative evaluation was to validate or ensure that the goals of the instruction or the learning process in the Saitakham Model were being achieved. Besides that, it also helped for improvement all stages in the Saitakham Model. As the processes of the Saitakham Model, formative evaluation is very useful at the step of WBI testing. At this phrase, teachers might ask the students to look over the webpages to see if they are graphically pleasing, if there are errors teachers have missed, or if they have problems. Formative evaluation looks over the development process in using the Saitakham Model. It helps teachers catch things that are missing.

Summative Evaluation was also used in the Saitakham Model. It is a method of judging the worth of all process at the end of the instruction. It helps to focus the students' performance to see how well a group did on English vocabulary learning by context-clues based meaning guessing technique via WBI. This evaluation can evaluate the learning materials and learning process utilized in the Saitakham Model.

The Saitakham Model was designed with the analysis and synthesis of the characteristics, the principles, and the approaches of many models mentioned previously. It was created by using the system process and focusing on examining and solving the instructional problems, identifying the ways to teach, and assessing the effectiveness of the instruction. It is anticipated that the Saitakham Model will be one of the best approaches to provide the effectiveness in learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

5.4 The Pedagogical Implications of the Saitakham Model

The Saitakham Model is a web-based instructional model for English vocabulary learning based on guessing meanings from context clues. It was designed for enhancing students' vocabulary learning ability. To apply the model and create an effective web-based instruction lessons, teachers should understand the framework and be clear on each stage of the whole process especially, the stage of conduct where students have to learn through web-based instruction. Teachers should take into consideration the individual differences in English proficiency of students. They should be allowed to study and have access the lessons as long as they need. In addition, teacher should bear in mind that the Saitakham Model was designed with the beneficiaries for learning via web-based instruction, so high speed of the computer and Internet is needed.

According to the processes of the Saitakham Model, we can say that the Saitakham Model is also useful and helpful for the teachers who need systematic guidance to make technology and media decisions. Teachers can apply the Saitakham Model for designing courses using different kinds of media.

To conclude, this chapter provides general introduction to the study. It begins with the part of introduction, The Saitakham's Study Plan (SS Plan), the Saitakham Model, and the pedagogical implications of the Saitakham Model are presented. The conclusion of the study, the recommendations for the study, and the suggestions for further study will be presented in the next chapter.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

The present study attempts to develop web-based instructional model to enhance English vocabulary learning ability by context-clues based meaning guessing technique. This last chapter contains three main sections. These are the conclusion of the study, the recommendations for the study, and the suggestions for further study.

6.1 Conclusions

The present study has been conducted for (1) developing a web-based instructional model for enhancing English vocabulary learning ability by context-clues based meaning guessing technique of the students who enrolled on English III course at Suranaree University of Technology, (2) determining the efficiency of English vocabulary learning lessons via web-based instruction based on the criteria 85/85, (3) comparing the achievement of English vocabulary learning ability of students who receive tutoring via web-based instruction and those who receive tutoring via the face-to-face method, and (4) exploring the students' opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

The samples of the study were 80 purposively selected students who enrolled in the English III course in the trimester 1, academic year 2010 at Suranaree University of Technology, Nakhon Ratchasima, Thailand. The samples included two

groups: the control, and the experimental group. The control group consisted of 40 students who received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via the face to face method. The experimental group consisted of 40 students who received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique via Web-based instruction. Both the control group and experimental group received tutoring to enhance English vocabulary learning ability by context-clues based meaning guessing technique based on the content of English III course.

The research procedures were divided into two main parts. The first part included the procedures of a web-based instructional model for English vocabulary learning based on guessing meanings from context clues (the Saitakham Model) and determination of the efficiency of English vocabulary learning lessons via web-based instruction. The second part included comparing the achievement of English vocabulary learning ability and exploring students' attitudes toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction. In the first part, the Saitakham Model was examined by the experts and English vocabulary learning lessons via web-based instruction were tried out to determine the efficiency. The lessons were tried out with three students in the individual testing, six students in the small group testing, and thirty students in the field study testing. In the second part, there was a comparison of students' achievement of English vocabulary learning ability and exploration of students' opinions learning English vocabulary by context-clues based meaning guessing technique via web-based instruction, while the control group received tutoring by face-to-face method. Then the post-test was administered.

The research instruments consisted of (1) a web-based instructional model for English vocabulary learning based on guessing meanings from context clues or the Saitakham Model, (2) evaluation form of the Saitakham Model, (3) an English vocabulary learning lessons via web-based instruction, (4) lesson plans, (5) English vocabulary learning tests on context-clues based meaning guessing technique, (6) the questionnaire, and (7) the interview. The data obtained from different methods of the study was analyzed and interpreted in two main ways, by quantitative and qualitative data analysis.

The findings of the present study can be summarized as follows:

1. The development of web-based instructional model (the Saitakham Model) to enhance English vocabulary learning ability by context-clues based meaning guessing technique consists of five stages: analyze, specify and identify, construct and test, conduct, and evaluate. In addition, the Saitakham Model was rated by the experts in Instructional Systems Design and English Language Teaching field as “Very Appropriate”.

2. The efficiency of web-based instruction lessons to enhance English vocabulary learning ability by context-clues based meaning guessing technique was 83.50/84.25 which met the prescribed criteria of 85/85.

3. The achievement of English vocabulary learning ability of the students who receive tutoring via web-based instruction was higher than those who receive tutoring via face-to-face method.

4. The students had positive opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction.

6.2 Recommendations from the Present Study

The following are four specific recommendations for using web-based instruction which this study has identified:

1. A large amount of images, video, sound or animation are provided to motivate the students in learning via web-based instruction. Therefore, high speed of the computer and Internet is needed. Institutions should focus on this problem of learning via WBI.

2. Web-based instruction should be colorful with graphics and pictures. It should also provide links to other useful websites or entertaining websites in order to enhance students' enjoyment or relaxation while learning.

3. According to the interview data, the students have individual differences in English proficiency. The students may prefer spending an extended amount of time in learning to achieve maximum understanding. Therefore, they should be allowed to study and have access to the lessons as long as they need.

4. At present, educational technology like web-based instruction is one of the most effective learning tools, so teachers should be trained in the use of web technology and knows how to create web-based instruction for classroom learning. Moreover, the policy makers and the curriculum developers should focus attention on the advantages of web-based instruction and integrate web-based instruction into the classroom.

6.3 Suggestions for Further Study

The following suggestions are proposed for further study.

1. According to the findings of the present study, learning via web-based instruction can enhance their English vocabulary ability. Moreover, the students have

positive opinions toward learning via web-based instruction, so the development of other web-based instructions to enhance students' ability in English learning such as the ability in English skills of listening, speaking, reading, or writing should be carried out.

2. Similar research should be conducted with other groups of students who have different levels of English proficiency, gender, skills in using the Internet, etc.

3. A comparative study of the learning achievement between the students who learn via web-based instruction and other learning methods or approaches, such as Collaborative Learning, Cooperative Learning, Discovery-Based Learning, Engaged Learning, or Problem-Based Learning should be carried out.

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APPENDIX A

The Evaluation of the Efficiency of Web-based Instruction Lessons to Enhance English Vocabulary Learning Ability by Context-clues Based Meaning Guessing Technique in the Developmental Testing Process

A. The Individual Testing for Effectiveness of English Vocabulary Learning Lessons by Guessing Meanings from the Context Clues

Student Number	Exercises (30 points)	Self-test (20 points)	E_1	E_2
1	17	13		
2	22	16	**71.10**	**78.35**
3	25	18		
Total Score	64	47		
Mean Score	21.33	15.67		
Percentages	71.11	78.33		

$\bar{X}$ = 64/3
= 21.33
E1 = (21.33/30) x 100
= **71.10**

$\overline{F}$ = 47/3
= 15.66
E2 = (15.67/20) x 100
= **78.35**

B. The Small Group Testing for Effectiveness of English Vocabulary Learning Lessons by Guessing Meanings from the Context Clues

Student Number	Exercises (30 points)	Self-test (20 points)	E_1	E_2
1	22	14		
2	20	15	**80.00**	**80.85**
3	24	15		
4	25	18		
5	26	17		
6	27	18		
Total Score	144	97		
Mean Score	24.00	16.17		
Percentages	80.00	80.83		

$\bar{X}$ = 144/6

= 24

E1 = (24/30) x 100

= **80.00**

$\overline{F}$ = 97/6

= 16.17

E2 = (16.17/20) x 100

= **80.85**

C. The Field Study Testing for Effectiveness of English Vocabulary Learning Lessons by Guessing Meanings from the Context Clues

Student Number	Exercises (30 points)	Self-test (20 points)	E_1	E_2
1	22	15	**82.90**	**83.00**
2	22	14		
3	22	15		
4	24	15		
5	21	14		
6	23	15		
7	24	15		
8	26	16		
9	24	15		
10	25	17		
11	24	17		
12	24	16		
13	24	17		
14	25	17		
15	26	17		
16	27	16		
17	23	17		
18	26	16		
19	24	17		
20	24	16		
21	25	17		
22	25	17		
23	26	18		

Student Number	Exercises (30 points)	Self-test (20 points)	E_1	E_2
24	27	18		
25	26	17		
26	26	19		
27	27	18		
28	27	17		
29	29	20		
30	28	20		
Total Score	746	498		
Mean Score	24.87	16.60		
Percentages	82.89	83.00		

$\bar{X}$ = 746/30

= 24.87

E1 = (24.87/30) x 100

= **82.90**

$\overline{F}$ = 498/30

= 16.60

E2 = (16.60/20) x 100

= **83.00**

APPENDIX B

The Evaluation of the Efficiency of Web-based Instruction Lessons to Enhance English Vocabulary Learning Ability by Context-clues Based Meaning Guessing Technique in Experimental Group

Student Number	Exercises (30 points)	Self-test (20 points)	E_1	E_2
1	23	16		
2	24	18	**83.50**	**84.25**
3	23	14		
4	25	16		
5	25	14		
6	25	16		
7	25	15		
8	26	15		
9	28	19		
10	26	18		
11	26	17		
12	25	17		
13	23	14		
14	24	16		
15	26	17		
16	27	16		
17	25	16		

Student Number	Exercises (30 points)	Self-test (20 points)	E_1	E_2
18	27	18		
19	27	17		
20	25	18		
21	24	17		
22	24	16		
23	23	17		
24	24	17		
25	23	17		
26	25	18		
27	26	18		
28	27	19		
29	29	20		
30	24	16		
31	26	18		
32	24	17		
33	24	17		
34	25	17		
35	23	17		
36	22	15		
37	25	17		
38	26	18		
39	26	17		
40	27	19		
Total Score	1,002	674		
Mean Score	25.05	16.85		
Percentages	83.50	84.25		

$\bar{X}$ = 1,002/40

= 25.05

E1 = (25.05/30) x 100

= **83.50**

$\overline{F}$ = 674/40

= 16.85

E2 = (16.85/20) x 100

= **84.25**

APPENDIX C

Pre-test of English Vocabulary Learning on

Context-clues Based Meaning Guessing Technique

Instructions: Read the following sentences and choose the closet meaning of the underlined words.

1. My university has unveiled plans to build a new stadium. It is a very big building.

   a. canceled b. showed

   c. postponed d. hid

2. Anzu likes spicy food especially the chili sauce and chili pepper.

   a. bland food b. strong taste food

   c. preserved food d. fresh food

3. The writing systems of many languages are very complicated. We have to learn a lot of characters.

   a. complete b. clear

   c. complex d. comprehensive

4. Yesterday, I saw a tall, smart and elegant young girl in front of our school.

   a. selfish b. dirty

   c. beautiful d. ignorant

5. This year, Thailand has the big project of Thai education system in order to reduce the illiteracy rate in the country.

a. inability to read and write
b. inability to apply for a job
c. inability to get new ideas
d. inability to play sports

6. Henry is afraid to convey his opinions to his teacher about the test.

a. express
b. grow
c. break
d. leave

7. This plan is too intricate so it is difficult to understand.

a. complex
b. simple
c. unclear
d. perfect

8. Now, we live in an era of information technology.

a. village
b. community
c. period
d. history

9. Every student is unique, with their own needs and talents.

a. different
b. identical
c. important
d. emotional

10. I often saw horror movies when I was a child. They were so terrifying that they gave me bad dreams.

    a. ashamed b. amused

    c. frightened d. tired

11. Because of her weight, Susan's chair collapsed under her.

    a. started b. constructed

    c. divided d. fall down

12. Some of the travel information provided in this brochure is inaccurate or incomplete.

    a. unclear b. wrong

    c. helpful d. perfect

13. Jessy thought that her illness had made her sterile. Therefore she is unable to have babies.

    a. a person cannot produce babies b. a person cannot read books

    c. a person cannot eat fruits d. a person cannot do exercise

14. The temperature of this city is high, however; it didn't feel hot because of the cool ocean breezes.

    a. wind b. hails

    c. planes d. birds

15. Big boulders always fall down from the mountain into a car on the road below.

a. rocks b. sand

c. forest d. sky

16. I tried to arrive along this road but there were many people blocking my way.

a. moving b. catching

c. preventing d. transferring

17. The rumble of the train wakes me up in the morning.

a. rail b. size

c. sound d. bogie

18. The submarine submerged to hide enemy ships.

a. underway b. underwater

c. undersized d. underweight

19. There were many people on this island many years ago, but now it is uninhabited.

a. dark b. apparent

c. crowded d. empty

20. Now there are very cheap fares for flights from Thailand to Beijing. Therefore, we should make bookings now before the prices go up.

a. distance b. luggage

c. ticket prices d. destination

21. Motocross is a dangerous sport not only to the rider but also to the spectators.

a. jokers b. sport players

c. actors d. audience

22. Our prime minister often wears such casual dresses as shirts without ties, shoes without socks, and trousers without a belt.

a. informal b. impolite

c. remarkable d. polite

23. When Janet turned to 60 years old, she retired from her job and spent her time with her family.

a. fired from a job b. stopped working

c. did a part time job d. earned more salary

24. There are many important inventors in prehistoric time, but nobody knows them because they

invented things in ancient times.

a. the past b. present day

c. the future d. recently

25. Roger couldn't believe his luck because he won the lottery. He was so amazed.

a. zealous b. afraid

c. surprised d. proud

26. Many <u>beverages</u> are served in the hotel. For example, fruit juices, vegetable juices and alcohol.

a. drinks b. dishes

c. deserts d. cakes

27. Both England and Brazil football teams won the semifinal games, thus they will <u>face off</u> in the final.

a. fight b. select

c. leave d. join

28. The waiter gave me bad services so I <u>complained</u> to the manager.

a. gave new information b. spoke loudly

c. showed dissatisfaction d. announced the programs

29. Tiger Woods is a very <u>ambitious</u> golf player. He plans to win all of the competitions within three years.

a. lazy b. shy

c. competitive d. indifferent

30. It was so noisy in the party house so I had to <u>shout</u> to make Tom hear me.

a. gossip b. speak with a loud voice

c. cry d. make a humble sound

31. Hotel reception is my dream job. I love to work with people. I think this job is glamorous.

    a. boring b. helpful

    c. attractive d. fearful

32. When I was studying in school, I was a carefree person. However, I become very a serious person when I was studying in college.

    a. smart b. grateful

    c. brave d. joyful

33. Rob doesn't like the climate in Switzerland. This is because it is too cold and there is too much snow in the winter.

    a. weather condition b. way of life

    c. political system d. cost living

34. People deposit, or put, their money in the bank, and then they can write cheques any time.

    a. spend the money c. put money into the bank

    c. take money out of the bank d. transfer money to other banks

35. The temperature here varies a lot. In contrast, the temperature in my hometown usually stays the same.

    a. often changes b. incredible

    c. stay the same d. logical

36. Today, Tata Young is a prominent Thai pop star, but only a few years ago, she was unknown.

    a. large b. noticeable

    c. well-known d. elegant

37. Lora's performance on singing was so accomplished that the audience stood up and applauded her.

    a. excellent b. vague

    c. disappoint d. unclear

38. After the harvest, we had an abundant amount of apples. We made apple pie, apple sauce, and apple juice because we had so many apples.

    a. very red b. plentiful

    c. a shortage d. not enough

39. Nowadays we can get information from a variety of media; newspapers, magazines, radio, television, and website.

    a. places that support a project

    b. ways of receiving information

    c. companies that provide a training

    d. universities that provide the knowledge

40. Some countries require all men to be soldiers whereas others depend on volunteers.

    a. someone who is rich

    b. someone who is selfish

    c. someone who is important

    d. someone who is willing to do something

APPENDIX D

Post-test of English Vocabulary Learning on

Context-clues Based Meaning Guessing Technique

Instructions: Read the following sentences and choose the closet meaning of the underlined words.

1. Eric uses the book to settle arguments about scientific facts while Sam uses it to resolve debates about sports.

   a. debate b. information

   c. fact d. topic

2. The Bangkok Park is the new hotel so we can't find the hotel's phone number in the phonebook because it isn't updated.

   a. poor b. smart

   c. out of date d. new

3. The venomous animals such as a snake, scorpion, or spider are very dangerous for people.

   a. victorious b. poisonous

   c. tremendous d. courageous

4. Mike, an English teacher, asked the school authorities for the permission to study a doctoral degree. At first, the authorities refused him. However, two years latter, he asked the officials again if he could leave for studying.

   a. agencies b. organizations

   c. companies d. officials

5. The novels are divided into three categories. These are historical, romantic, and crime.

   a. type b. behavior

   c. environment d. style

6. Generally, our company committees usually meet annually, but this year, they met twice.

   a. once a week b. once a month

   c. once a year d. once every two years

7. My uncle's house is enormous because there are many people in his family.

   a. very strong b. very big

   c. very beautiful d. very clean

8. My car is quite old but it is still reliable. Its engine is checked every year.

   a. beneficial b. alive

   c. troubled d. trusting

9. There was a car accident last night. The driver has a serious head injury.

a. damage b. sickness

c. operation d. control

10. Kenny has brilliant ideas. He creates many good inventions for his family.

a. rough b. famous

c. very good d. shocking

11. Tigers may look fierce, but they are actually gentle and intelligent animal.

a. brave b. violent

c. gentle d. natural

12. Lucy is a very affectionate student. She always hugs and kisses her teacher.

a. caring b. cheerful

c. upset d. ignorant

13. Tommy is a curious boy. He loves to learn and wants to investigate new things.

a. very embarrassed b. strong desire

c. bad tempered d. bad behavior

14. I want to apply the job, so I am writing my resume.

a. assignment b. annual

c. presentation d. personal information

15. Johnson is a realist painter. He paints scenes from ordinary life, and the people in them look very real. On the other hand, Jonathan is an abstract painter. There aren't figures or shapes in his paintings, just masses of color.

    a. unreal things b. touchable things

    c. broken things d. perfect things

16. Many students are waiting outside for the chance to see some Thai celebrities such as Ta Ta Young, Bird Thongchai, and Dome Pakorn Lum.

    a a long tradition b. a people belief

    c. a famous person d. an important culture

17. The Kiwi bird, a national symbol of New Zealand, appears on some stamps and the country's coins.

    a. idea b. logo

    c. attitude d. weather

18. While my daughters were watching the terror movie, they screamed loudly.

    a. yelled b. gossiped

    c. laughed d. talked

19. English classes are very difficult, but don't let that intimidate you.

    a. frighten b. negotiate

    c. imagine d. bow

20. In Thailand, students learn English bit by bit over the years. However, when they travel or study in the native speaker countries such as U.S.A or England, they can learn quickly.

a. over and over
b. a little at a time
c. more correctly
d. less correctly

21. Peter would like to introduce his colleagues whom he works with to the administrators.

a. friends
b. neighbors
c. relatives
d. parents

22. My first impression of "Harry Porter" was not very positive, but at the second time, I knew what a fantastic movie it was.

a. behavior
b. investigation
c. feeling
d. suspect

23. My family never traveled abroad. We always go many places in our country.

a. countryside
b. overseas
c. domestic
d. hometown

24. Last month, I submitted my plan to the manager and he just approved it this week.

a. accepted
b. corrected
c. refused
d. disliked

25. The children were watching the little dog with interest and amusement.

a. fun b. sadness

c. boredom d. envy

26. Tim is the expert on etiquette. He writes a book about manners and polite behavior.

a. rule b. life

c. method d. animal

27. My boss bluntly told me that I would be fired if I miss the next meeting.

a. giving the truth b. crying with a loud noise

c. solving the problem d. speaking in a direct way

28. In the past, most marriages were arranged by their parents. Nowadays, young people marry anyone they want.

a. the present day b. the future time

c. a long time ago d. not along ago

29. My English teacher can tolerate and kind of students' behavior.

a. accepts b. lose

c. refuse d. check

30. Jenny is an <u>eccentric</u> person. Sometimes, she thinks she is a dog, a rabbit, a chicken, or a pig.

    a. normal b. simple

    c. unusual d. sensitive

31. Patty is a lucky person. She <u>inherited</u> a diamond ring, a golden necklace, and other jewelry from her aunt

    a. established b. advised

    c. borrowed d. received

32. I went to apply for a job yesterday and I asked my teacher to write the letter of <u>recommendation</u> for me to the company.

    a. reception b. contribution

    c. suggestion d. education

33. The football match between Thailand and Vietnam was <u>broadcasted</u> on both radio and television.

    a. picked up b. sent out

    c. turned off d. kept on

34. Kindy is one of my friends. His name is <u>appropriate</u> for him because he always cares and helps others.

    a. crazy b. scaring

    c. familiar d. suitable

35. Tommy can solve all of the problems. He is a very genius guy.

a. serious b. stingy

c. intelligence d. stupid

36. Mike wants to be the champion of Thai boxing. Therefore, he practices every day.

a. winner b. audience

c. joker d. loser

37. I am struggling to finish my assignment this week because I have to submit it next week.

a. doing b. predicting

c. finding d. trying

38. Jim's brother was a soldier. He was killed in a street battle last year.

a. location b. parade

c. festival d. fighting

39. The core of this book focuses on the social problems.

a. main part b. detail

c. unit d. exercise

40. When you sign up for your e-mail address, you must enter your password with six characters.

a. opinion b. statement

c. letters d. address

APPENDIX E

Item Analysis

I. Item Analysis for Pretest of English Vocabulary Learning on Context-clues Based Meaning Guessing Technique (40 items)

The results of item analysis for pretest show the level of difficulty (p), discrimination index ®, and reliability (rtt by KR-20).

Items	Item Level of Difficulty (p)	Discrimination Index (r)	Reliability (rtt by KR-20)
1	0.250	0.587	
2	0.650	0.269	
3	0.450	0.224	**0.775**
4	0.500	0.506	
5	0.800	0.200	
6	0.700	0.285	
7	0.450	0.430	
8	0.450	0.272	
9	0.500	0.292	
10	0.300	0.496	
11	0.400	0.457	
12	0.250	0.687	
13	0.400	0.364	
14	0.250	0.454	

Items	Item Level of Difficulty (p)	Discrimination Index (r)	Reliability (rtt by KR-20)
15	0.550	0.373	
16	0.750	0.297	
17	0.550	0.364	
18	0.450	0.298	
19	0.450	0.290	
20	0.750	0.254	
21	0.400	0.322	
22	0.450	0.454	
23	0.450	0.339	
24	0.450	0.339	
25	0.400	0.432	
26	0.350	0.568	
27	0.400	0.432	
28	0.450	0.290	
29	0.600	0.316	
30	0.200	0.547	
31	0.550	0.323	
32	0.250	0.435	
33	0.350	0.482	
34	0.300	0.523	
35	0.250	0.454	
36	0.350	0.542	
37	0.400	0.280	
38	0.650	0.312	
39	0.650	0.303	
40	0.500	0.407	

II. Item Analysis for Posttest of English Vocabulary Learning on Guessing Meanings from the Context Clues (40 items)

The results of item analysis for post-test show the level of difficulty (p), discrimination index (r), and reliability (rtt by KR-20).

Items	Item Level of Difficulty (p)	Discrimination Index (r)	Reliability (rtt by KR-20)
1	0.800	0.265	
2	0.250	0.539	
3	0.450	0.372	**0.819**
4	0.450	0.430	
5	0.500	0.350	
6	0.300	0.532	
7	0.750	0.292	
8	0.450	0.330	
9	0.200	0.208	
10	0.450	0.281	
11	0.500	0.226	
12	0.550	0.381	
13	0.300	0.487	
14	0.800	0.208	
15	0.350	0.295	
16	0.300	0.371	
17	0.700	0.249	
18	0.500	0.292	
19	0.550	0.323	

Items	Item Level of Difficulty (p)	Discrimination Index (r)	Reliability (rtt by KR-20)
20	0.300	0.209	
21	0.400	0.356	
22	0.450	0.380	
23	0.500	0.309	
24	0.400	0.516	
25	0.800	0.255	
26	0.400	0.381	
27	0.250	0.202	
28	0.150	0.261	
29	0.300	0.452	
30	0.350	0.421	
31	0.250	0.216	
32	0.550	0.414	
33	0.350	0.277	
34	0.550	0.306	
35	0.350	0.352	
36	0.400	0.482	
37	0.700	0.329	
38	0.500	0.498	
39	0.450	0.339	
40	0.400	0.356	

APPENDIX F

The Results of the Students' Pre-test and Posttest Scores

A. The Results of the Students' Pre-test and Posttest Scores in Control Group

Student Number	Pre-test Score (40 points)	Post-test Score (40 points)
1	13	16
2	12	15
3	14	21
4	15	26
5	22	29
6	11	15
7	21	25
8	17	31
9	16	18
10	25	29
11	21	32
12	15	20
13	17	20
14	7	15
15	11	17
16	14	19

Student Number	Pre-test Score (40 points)	Post-test Score (40 points)
17	23	28
18	11	16
19	25	30
20	10	15
21	14	25
22	22	25
23	21	28
24	19	28
25	22	25
26	11	16
27	9	12
28	16	17
29	14	16
30	14	20
31	10	14
32	16	23
33	11	20
34	11	19
35	18	33
36	14	16
37	14	18
38	9	17
39	10	19
40	20	28
TOTAL	**615**	**856**
MEAN	**15.38**	**21.40**

B. The Results of the Students' Pre-test and Posttest Scores in Experimental Group

Student Number	Pre-test Score (40 points)	Post-test Score (40 points)
1	16	25
2	18	27
3	9	25
4	15	28
5	17	25
6	6	25
7	13	21
8	15	23
9	16	25
10	12	26
11	19	26
12	7	19
13	21	31
14	8	19
15	24	35
16	16	22
17	14	20
18	21	26
19	18	24
20	19	25
21	20	29
22	22	30
23	18	26

Student Number	Pre-test Score (40 points)	Post-test Score (40 points)
24	17	27
25	20	25
26	12	20
27	24	33
28	20	35
29	15	23
30	23	29
31	15	20
32	17	23
33	18	27
34	10	18
35	18	26
36	17	23
37	19	27
38	18	25
39	17	23
40	18	23
TOTAL	**660**	**1,023**
MEAN	**16.50**	**25.58**

APPENDIX G

Lesson Plans

A. Lesson Plan for a Control Group

Subject: English III (203203)

Level: The students who enrolled on English III course at Suranaree University of Technology

Class Size: 45 Students

Periods: 10 periods (50 minutes per period)

Topic: The Context Clues

Objectives:
1. Students will be able to identify the context clues, i.e. definitions, examples, synonym or restatement, comparison and contrast, and cause and effect clue.
2. Students will be able to apply the context clues to find out the meanings of new words.

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
1	1. Learning objectives, contents, and assessment	1. Students are informed the learning objectives, contents, and assessment.	1. Handouts	1. Answering questions orally
2	1. Pretest of English vocabulary learning test on guessing meaning from the context clues	1. Students do the pretest.	1. A multiple choice pretest with 40 questions	1. Results from doing a pretest
3	1. The meaning of the context clues 2. The process to use the context clues to find Vocabulary leanings.	1. Students read the handouts about the meaning and how to use the contexts clues. 2. Teacher explains and give more example according to the handout contents. 3. Students were asked to cover the text and recall the important information. 4. Students do the exercises on worksheet 1: the passage “It’s New World Record.”	1. Handouts 2. Worksheet 1	1. Answering questions orally 2. Checking from doing the exercises

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
		5. According to the exercise, students find the meaning of underlined words by cycling the words or sentences that describe or give the information about the underlined words. 6. Students check their answers with the explanation by the teacher.		
4	Type of Context Clues	1. Teacher explains briefly on the overall of the type of context clues. These are definition clues, example clues, synonym or restatement clues, comparison and contrast clues, and cause and effect clues.	1. Handouts	1. Answering questions orally
5	Definition Clues	1. Teacher explains about how to find out the word meanings with the signal words of definition clues.	1. Handouts 2. Worksheet 2	1. Answering questions orally 2. Checking from doing the exercises

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
		2. Teacher gives the example sentences of definition clues and students find the meaning of new words by using the signal words of definition clues. 3. Students do exercises on worksheet 2: finding the word meanings with definition clues. 4. Students check their answers with the explanation by the teacher.		
6	Example Clues	1. Teacher explains about how to find out the word meanings with the signal words of example clues. 2. Teacher gives the example sentences of example clues and students find the meaning of new words by using the signal words of example clues. 3. Students do exercises on worksheet 3: finding the word meanings with example clues.	1. Handouts 2. Worksheet 3	1. Answering questions orally 2. Checking from doing the exercises

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
		4. Students check their answers with the explanation by the teacher.		
7	Synonym or Restatement Clues	1. Teacher explains about how to find out the word meanings with the signal words of synonym or restatement clues. 2. Teacher gives the example sentences of synonym or restatement clues and students find the meaning of new words by using the signal words of synonym or restatement clues. 3. Students do exercises on worksheet 4: finding the word meanings with synonym or restatement clues. 4. Students check their answers with the explanation by the teacher.	1. Handouts 2. Worksheet 4	1. Answering questions orally 2. Checking from doing the exercises

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
8	Comparison and Contrast Clues	1. Teacher explains about how to find out the word meanings with the signal words of comparison and contrast clues. 2. Teacher gives the example sentences of comparison and contrast clues and students find the meaning of new words by using the signal words of comparison and contrast clues. 3. Students do exercises on worksheet 5: finding the word meanings with comparison and contrast clues. 4. Students check their answers with the explanation by the teacher.	1. Handouts 2. Worksheet 5	1. Answering questions orally 2. Checking from doing the exercises
9	Cause and Effect Clues	1. Teacher explains about how to find out the word meanings with the signal words of cause and effect clues.	1. Handouts 2. Worksheet 6	1. Answering questions orally 2. Checking from doing the exercises

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
		2. Teacher gives the example sentences of the cause and effect clues and students find the meaning of new words by using the signal words of cause and effect clues. 3. Students do exercises on worksheet 6: finding the word meanings with cause and effect clues. 4. Students check their answers with the explanation by the teacher.	1. Handouts 2. A multiple choice pretest with 40 questions	1. Results from doing a pretest
10	Posttest	1. Students do the posttest.	1. A multiple choice posttest with 40 questions	1. Results from doing a posttest

B. Lesson Plan for an Experimental Group

Subject: English III (203203)

Level: The students who enrolled on English III course at Suranaree University of Technology

Class Size: 45 Students

Periods: 10 periods (50 minutes per period)

Topic: The Context Clues

Objectives: 1. Students will be able to identify the context clues, i.e. definitions, examples, synonym or restatement, comparison and contrast, and cause and effect clue.

2. Students will be able to apply the context clues to find out the meanings of new words.

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
1	1. Learning objectives, contents, and assessment	1. Teacher inform students about the learning objectives, contents, and assessment.	1. Handouts	1. Answering questions orally
2	1. Pretest of English vocabulary learning test on guessing meaning from the context clues	1. Students do the pretest.	1. A multiple choice pretest with 40 questions	1. Results from doing the pretest
3	1. Meaning of context clues 2. How to use the context clues	1. Students launch to WBI on www.welmc.net 2. Students are introduced to the website and learning menus to see the ways to learn. 3. Teacher assigns students to study on WBI about the meaning of context clues, and how to use the context clues 4. Teachers answers or replies the students' questions, comments, and ideas via e-mail or webboard.	1. A computer connected with the internet	1. Answering questions orally

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
4	1. Types of context clues: - Definition clues	1. Students launch to WBI on www.welmc.net 2. Students study the contents of definition clues. 3. Students do the practice of definition clues. 4. Students do the exercise of definition clues. 5. Teachers answers or replies the students' questions, comments, and ideas via e-mail or webboard.	1. A computer connected with the internet	1. The result from doing the practice and exercise
5	- Example clues	1. Students launch to WBI on www.welmc.net 2. Students study the contents of example clues. 3. Students do the practice of example clues. 4. Students do the exercise of example clues. 5. Teachers answer or replies the students' questions, comments, and ideas via e-mail or webboard.	1. A computer connected with the internet	1. The result from doing the practice and exercise

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
6	- Synonym or restatement clues	1. Students launch to WBI on www.welmc.net 2. Students study the contents of synonym or restatement clues. 3. Students do the practice of synonym or restatement clues. 4. Students do the exercise of synonym or restatement clues. 5. Teachers answer or replies the students' questions, comments, and ideas via e-mail or webboard.	1. A computer connected with the internet	1. The result from doing the practice and exercise
7	- Comparison and contrast clues	1. Students launch to WBI on www.welmc.net 2. Students study the contents of comparison and contrast clues. 3. Students do the practice of comparison and contrast clues. 4. Students do the exercise of comparison and contrast clues. 5. Teachers answer or replies the students' questions, comments, and ideas via e-mail or webboard.	1. A computer connected with the internet	1. The result from doing the practice and exercise

Period	Content	Learning and Teaching Activities	Teaching Material	Assessment
8	- Cause and effect clues	1. Students launch to WBI on www.welmc.net 2. Students study the contents of cause and effect clues. 3. Students do the practice of cause and effect clues. 4. Students do the exercise of cause and effect clues. 5. Teachers answer or replies the students' questions, comments, and ideas via e-mail or webboard.	1. A computer connected with the internet	1. The result from doing the practice and exercise
9	Self-test	1. Students launch to WBI on www.welmc.net 1. Students do the self-test	1. A multiple choice pretest with 40 questions 2. A computer connected with the internet	1. The result from doing the self-test
10	Posttest	1. Students do the posttest.	1. A multiple choice posttest with 40 questions	1. Results from doing the posttest

APPENDIX H

Questionnaire on Students' Opinions toward Learning English Vocabulary by Context-clues Based Meaning Guessing Technique via Web-based Instruction

The questionnaire aims to collect the data on students' attitudes toward learning English vocabulary by context-clues based meaning guessing technique via web-based Instruction. It consists of 2 parts.

Part 1: You are asked about your computer and Internet using skills.

Part 2: You are asked to rate your opinions toward learning English vocabulary by context-clues based meaning guessing technique from the context clues via web-based Instruction.

PART 1: Computer and Internet Using Skills

Instructions: Please provide the information about your computer and Internet using skills by making a check mark (✓) in the box provided.

1. Gender	☐ Male	☐ Female	
2. Ability in Using Computer	☐ Good	☐ Fair	☐ Poor
3. Ability in Typing	☐ Good	☐ Fair	☐ Poor
4. Ability in Working on the Internet	☐ Good	☐ Fair	☐ Poor
5. Frequency of Surfing on the Internet	☐ Often	☐ Sometimes	☐ Rarely

PART 2: Opinions on Learning English Vocabulary by Context-clues Based Meaning Guessing Technique via Web-Based Instruction (WBI)

Instructions: Please read each item of the questionnaire and make a check mark (✓) in a rating box that describes your opinions toward learning English vocabulary by context-clues based meaning guessing technique via web-based instruction (WBI). The criteria for rating your opinions are as follow:

5 = Strongly agree

4 = Agree

3 = Uncertain

2 = Disagree

1 = Strongly disagree

No	Statements	Rating Scales				
		5	4	3	2	1
1	Learning English vocabulary by context-clues based meaning guessing technique via WBI is a modern way of learning.					
2	Learning English vocabulary by context-clues based meaning guessing technique via WBI is convenient to learn, you can review the lessons anywhere and anytime.					
3	Learning English vocabulary by context-clues based meaning guessing technique via WBI is the way to enhance your self-directed learning.					
4	Learning English vocabulary by context-clues based meaning guessing technique via WBI is enjoyable.					

No	Statements	Rating Scales				
		5	4	3	2	1
5	Learning English vocabulary by context-clues based meaning guessing technique via WBI don't make you feel isolated or alone.					
6	Learning English vocabulary context-clues based meaning guessing technique via WBI is useful in learning.					
7	Learning English vocabulary context-clues based meaning guessing technique via WBI helps you remember more new vocabulary.					
8	Learning English vocabulary by context-clues based meaning guessing technique via WBI has clear explanation of contents and exercises.					
9	Learning English vocabulary by context-clues based meaning guessing technique via WBI has the appropriate contents with learning objectives.					
10	Learning English vocabulary by context-clues based meaning guessing technique via WBI is easy to understand the lessons.					
11	Overall, learning English vocabulary context-clues based meaning guessing technique via WBI is satisfied.					

Please express other opinions, ideas or suggestions in learning English vocabulary by guessing meaning from the context clues via the web-based instruction.

……

……

……

……

Thank you so much for your cooperation

APPENDIX I

An Evaluation Form of "The Saitakham Model"

for the Experts in Instructional Systems Design and English Language Teaching Field

Instruction: Read each item in the form, then make a check mark (✓) in a rating box which best describes your opinion about each statement.

5 = Very strongly agree

4 = Strongly agree

3 = Agree

2 = Slightly agree

1 = Least agree

No	Statements	Rating Scales				
		5	4	3	2	1
1	Each component of the model has appropriate connection.					
2	The steps of the model are clear and easy to understand.					
3	The steps of the model are easy to implement.					
4	Overall, the model is appropriate to be used in teaching English Vocabulary by context-clues based meaning guessing technique.					
5	In conclusion, the model is satisfied.					

Other ideas and comments:

……

……

……

APPENDIX J

Interview Guided Questions

1. Do you like learning English vocabulary by context-clues based meaning guessing technique via web-based instruction? Why or why not?
2. What do you like and dislike most when learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?
3. How do you feel while you are learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?
4. Are you convenient in learning English vocabulary by context-clues based meaning guessing technique via web-based instruction? If not, what are the problems? Would you give any suggestions or comments?
5. How should web-based instruction on English vocabulary by context-clues based meaning guessing technique be adjusted to meet your needs?
6. Would you like to learn English or English vocabulary through the web-based instruction like “web-based instruction on English vocabulary by context-clues based meaning guessing technique” the next time? If you would, what content or subjects you would like to learn?

APPENDIX K

The Results of the Semi-interview on Learning English Vocabulary by Context-clues Based Meaning Guessing Technique via Web-based Instruction (www.welmc.net)

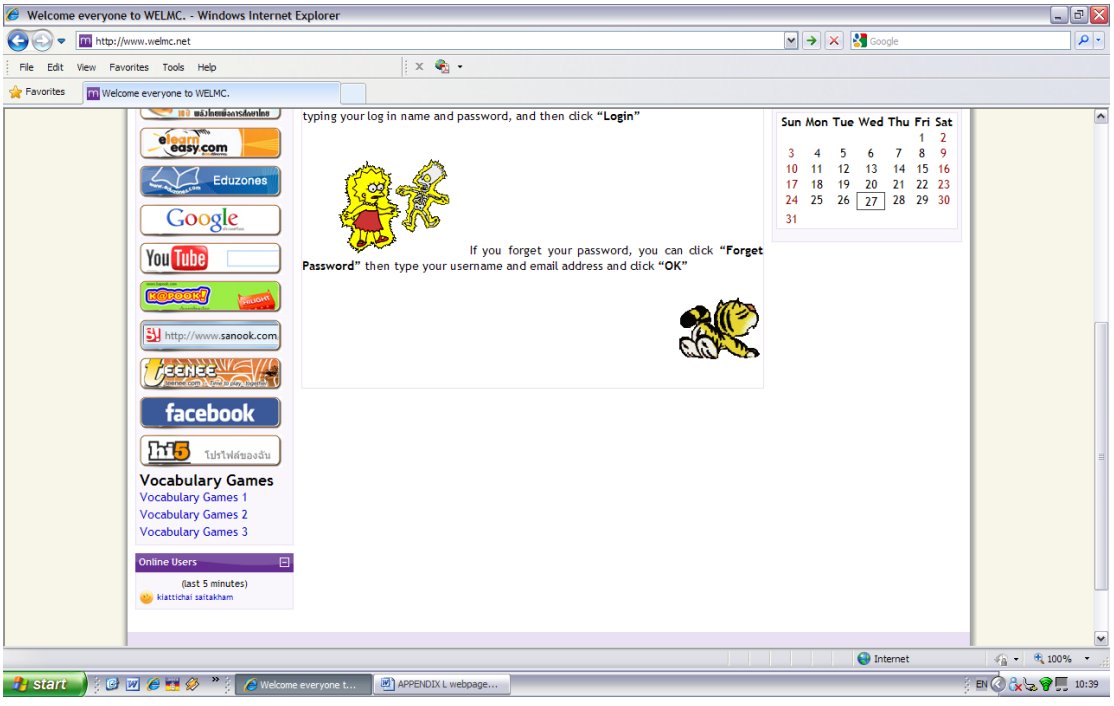
Interview Guided Questions	**Student 1**	**Student 2**	**Student 3**	**Student 4**	**Student 5**	**Student 6**	**Student 7**	**Student 8**	**Student 9**	**Student 10**
1. Do you like learning English vocabulary by context-clues based meaning guessing technique via web-based instruction? Why or why not?	*"Yes, I like it because this is the way of self-directed learning. I can study without a teacher"*	*"Yes, I like it. It is a systematic learning. I can check and evaluate my understanding after learning."*	*"Yes, I like it because it is convenient. I can learn anywhere and anytime while I am going online."*	*"Yes, I like it. This kind of learning helps me learn continuously."*	*"Yes, I like it. It is very fun so I can learn continuously."*	*"Yes, I like it because it is convenient. I can find the word meanings from the context so dictionary is unnecessary."*	*"Yes, I like it because it is convenient. I know the way to find the word meanings without using dictionary."*	*"Yes, I like it because I can learn anywhere and anytime.*	*"Yes, I like it because when I find unknown vocabularies, I can guess their meaning from the context clues."*	*"Yes, I like it. It is so fun."*
2. What do you like and dislike most when learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?	*"I like the contents in this web because it isn't out of date and I like the animated cartoons. There are lovely."* *"I don't like the speed of Internet connection. It is slow."*	*"I like the contents in this web. They are useful. Website has a beautiful color and animated cartoons."* *"I don't like the system of the password set-up. It is difficult to remember."*	*"I like the animated pictures. They are beautiful."* *"I don't like the system of password set-up because it is difficult to remember.*	*"I like the contents of this website because it is easy to understand. The webpage is also beautiful."* *"I don't have anything I don't like."*	*"I am good at computer so I like to learn via WBI. It is convenient. This website has beautiful animated cartoons and I also like the exercises."* *"I don't think I have anything I dislike."*	*"WELMC is well organized so it is easy to learn. The tests are suitable for my ability."* *"Nothing I dislike in this website."*	*"I like the exercises. They help me get more understanding. And I like the cartoon pictures. They are interesting. The contents are good too."* *"I don't like something in this website like there are not enough explanations of the answer when I do the exercises. I want more explanations."*	*"I like the examples and exercises because they make me understand the lessons clearly. The cartoon pictures are nice."* *"There are a few examples in the lesson."*	*"The website is beautiful. The content is suitable and the pictures are nice."* *"I don't like the Internet connection. It is slow."*	*"I like all cartoon pictures."* *"I don't like the system of password set-up because I always forget my password."*

Interview Guided Questions	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10
3. How do you feel while you are learning English vocabulary by context-clues based meaning guessing technique via web-based instruction?	*"I feel relax while I am learning. It is very useful. This helps me get more knowledge about vocabulary."*	*"I enjoy learning via WELMC."*	*"I feel enjoyable, relaxed, and I have freedom when I learn."*	*"This kind of learning motivates me in learning."*	*"I feel enjoyable."*	*"I really enjoy and relax in learning."*	*"I am very enjoyable because I can listen to music while learning."*	*"This website is so good. I am so enjoyable."*	*"I feel relaxed while learning. It is very useful."*	*"I feel enjoyable. It helps me to learn continually. "*
4. Are you convenient in learning English vocabulary by context-clues based meaning guessing technique via web-based instruction? If not, what are the problems? Would you give any suggestions or comments?	*"The computer and Internet connection is slow"*	*"No problem. It is convenient"*	*"No problem. It is convenient."*	*"No problem. It is convenient"*	*"The computer and Internet connection is slow"*	*"I have a problem about the Internet connection."*	*"When I have a problem or question, I cannot ask the teacher at that time."*	*"No problem. It is convenient"*	*"When I have a problem, nobody helps me solve it."*	*"No problem."*
5. How should web-based instruction on English vocabulary by context-clues based meaning guessing technique be adjusted to meet your need?	*"WBI should provide more contents to practice other skills such as a grammar and speaking."*	*"I want more contents and they should be divided into the level of difficulty."*	*"WBI should have more contents."*	*"WBI should have more contents."*	*"WBI should contain Thai contents. The website should decorate with a colorful picture."*	*"WBI should have more cartoon pictures for more colorful."*	*"The exercises and tests should provide the answer with explanation."*	*"I want answer keyswith explanation."*	*"Each webpage should not contain a lot of contents or alphabets."*	*"WBI should have more contents of vocabulary learning strategies."*
6. Do you like to learn English or English vocabulary through the web-based instruction like "web-based instruction on English vocabulary by context-clues based meaning guessing technique" for the next time? If you do, what contents or subjects you would like to learn?	*"Yes, I like to learn via WBI. I want to learn about grammar and speaking."*	*"Yes, I like to learn via WBI. I want to learn about listening and speaking."*	*"Yes, I like to learn via WBI. I want to learn about writing."*	*"Yes, I like to learn via WBI. I want to learn about grammar and reading."*	*"Yes, I like to learn via WBI. I want to learn about listening and writing."*	*"Yes, I like to learn via WBI. I want to learn about speaking."*	*"Yes, I like to learn via WBI. I want to learn about reading and speaking."*	*"Yes, I like to learn via WBI. I want to learn about grammar."*	*"Yes, I like to learn via WBI. I want to learn about reading."*	*"Yes, I like to learn via WBI. I want to learn about speaking."*

APPENDIX L

The Examples of Webpage from Web-based Instruction

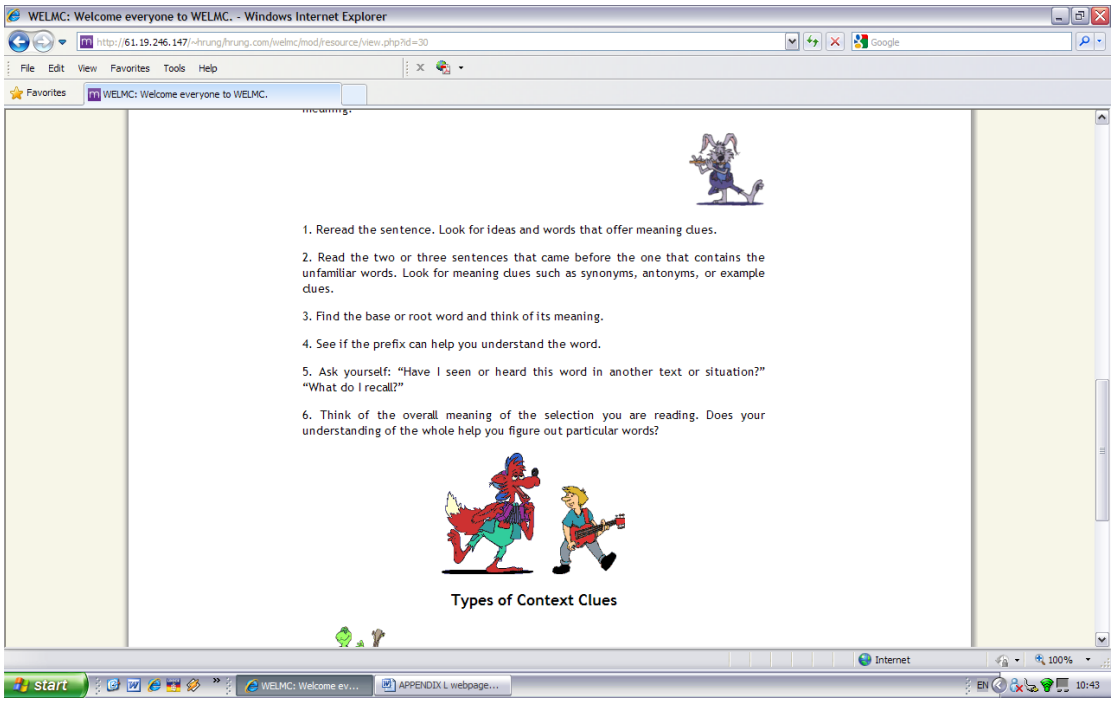
(www.welmc.net)

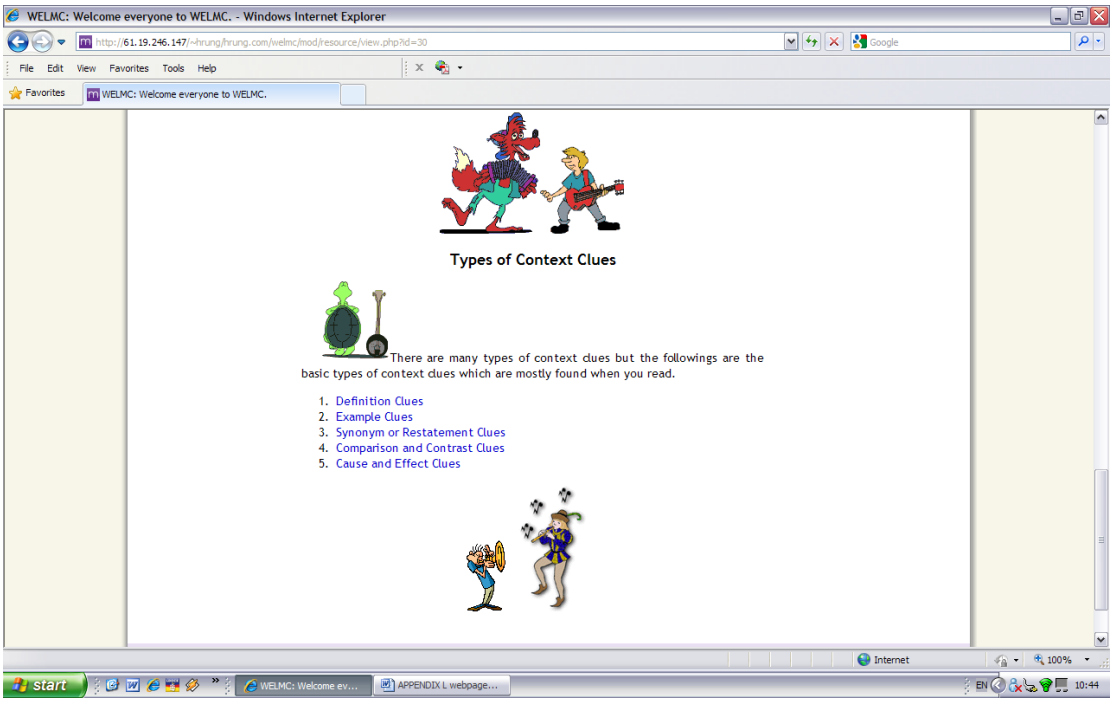


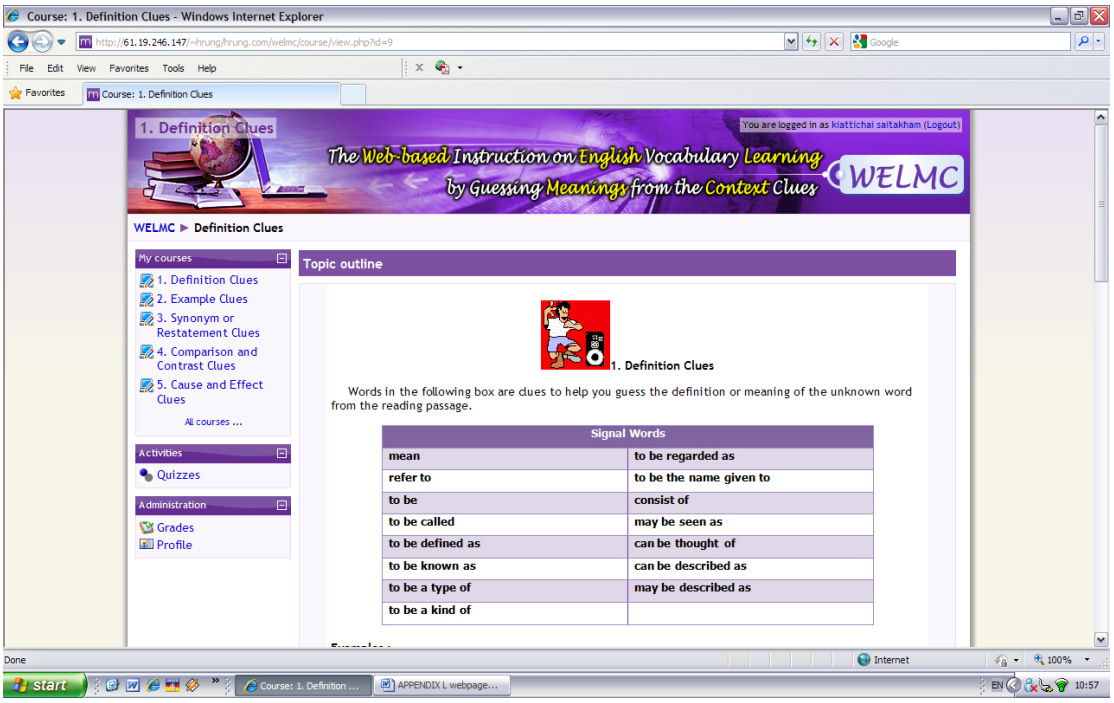

WELMC: Welcome everyone to WELMC. - Windows Internet Explorer
Welcome everyone to WELMC.
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
Main Menu
Learning Objectives
Lessons
Self Test
Announcement
Webboard
Send e-mail to teacher
WEBLINKS
Learning Objectives
Welcome everyone to WELMC. WELMC is designed to enhance your English vocabulary learning ability by guessing meanings from the context clues. After completing this lesson, you will be able to accomplish two main objectives:
Identify the context clues, i.e. definitions, examples, synonym or restatement, comparison and contrast, and cause and effect clues.
Apply the context clues to find out the meanings of new words.
Calendar
October 2010

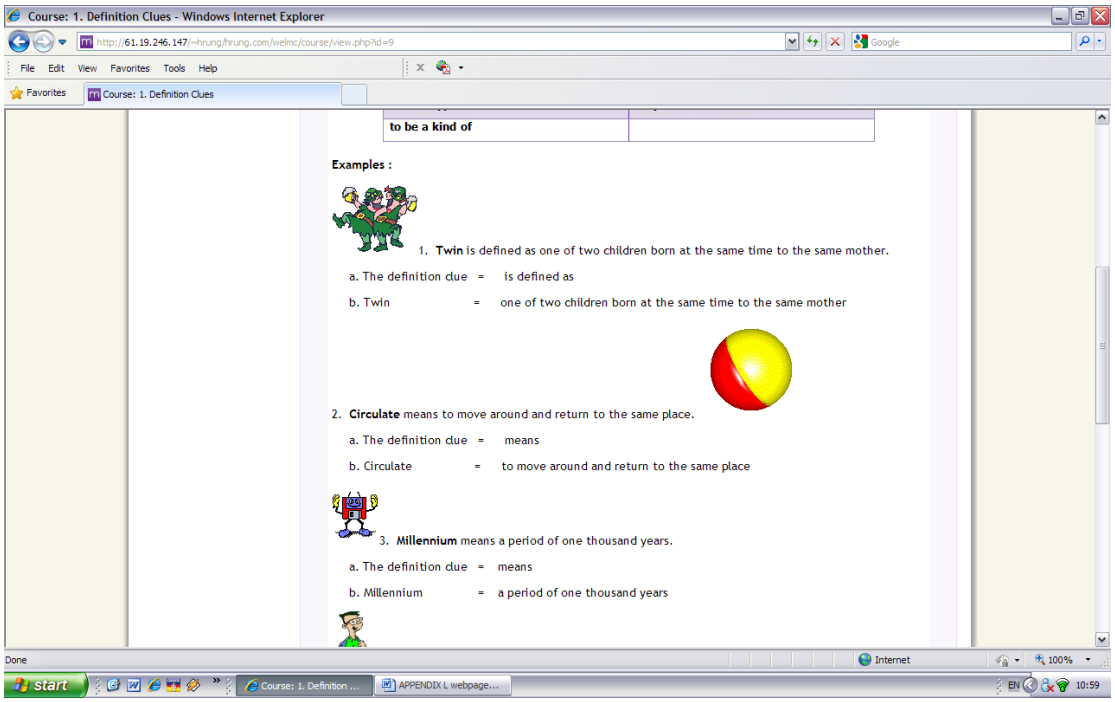

WELMC: Welcome everyone to WELMC. - Windows Internet Explorer
Welcome everyone to WELMC.
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
Main Menu
Learning Objectives
Lessons
Self Test
Announcement
Webboard
Send e-mail to teacher
WEBLINKS
Context Clues
English reading is not easy for English as a foreign language student. One of the main problems is about vocabulary. However, there are several ways to find the words meaning you don't know such as looking them up in a dictionary or figuring them out using word part. Sometimes i t takes time to look up the meanings of all difficult words in the dictionary when you read. Often you don't need to know the exact meaning of all the words if you can understand the ideas they contain. However, a specific word can be essential for your understanding of an idea. If that word is not already a part of your vocabulary, you have to guess its meaning. One of the good ways to guess the meanings of unfamiliar words is using context clues.
Context clues are clues to the meaning of particular words.
Calendar
October 2010

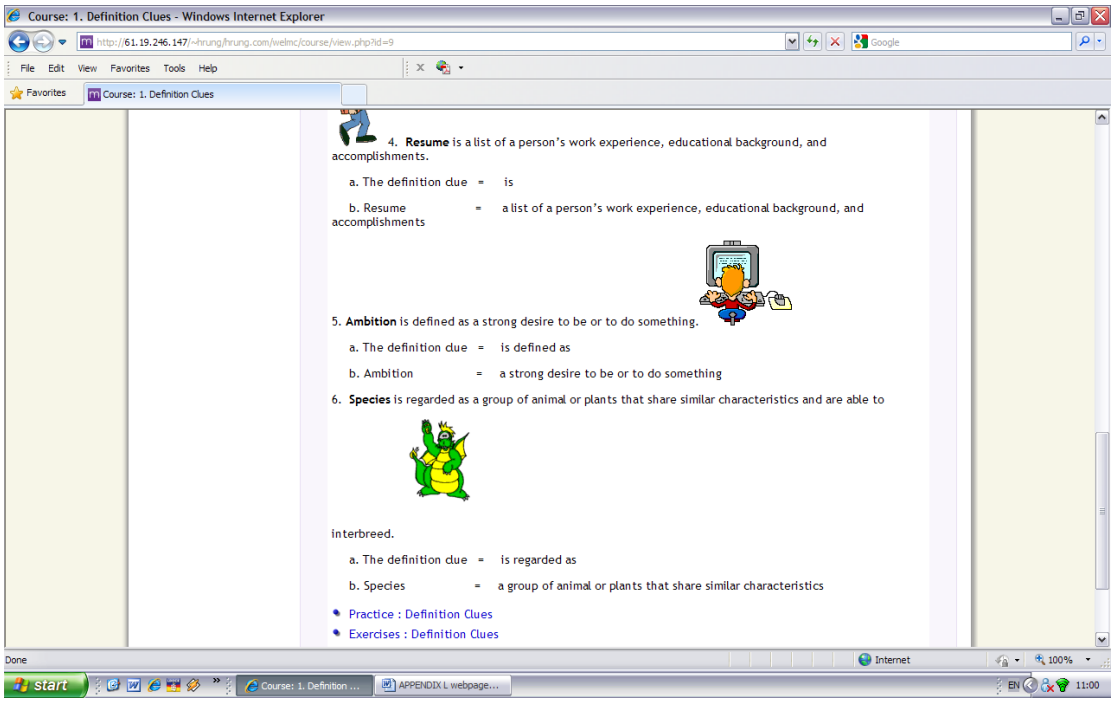

WELMC: Welcome everyone to WELMC. - Windows Internet Explorer
Eduzones
Google
YouTube
http://www.sanook.com
facebook
Vocabulary Games
Vocabulary Games 1
Vocabulary Games 2
Vocabulary Games 3
Online Users
(last 5 minutes)
Context clues are clues to the meaning of particular words. These clues can be found in the context or surroundings of the word. They may give a general idea about a word's meaning or a very specific meaning for the particular word. Therefore, this way can help you understand the meaning of unfamiliar words.
How to Use the Context Clues to Find Out the Meanings of Words
Guessing vocabulary from context clues is one of the most frequent ways to discover the meaning of new words . To help and support you become fluent and skillful in guessing meanings of vocabulary from the contexts, these are following six-step procedures for using the context clues to finding the word's meaning.

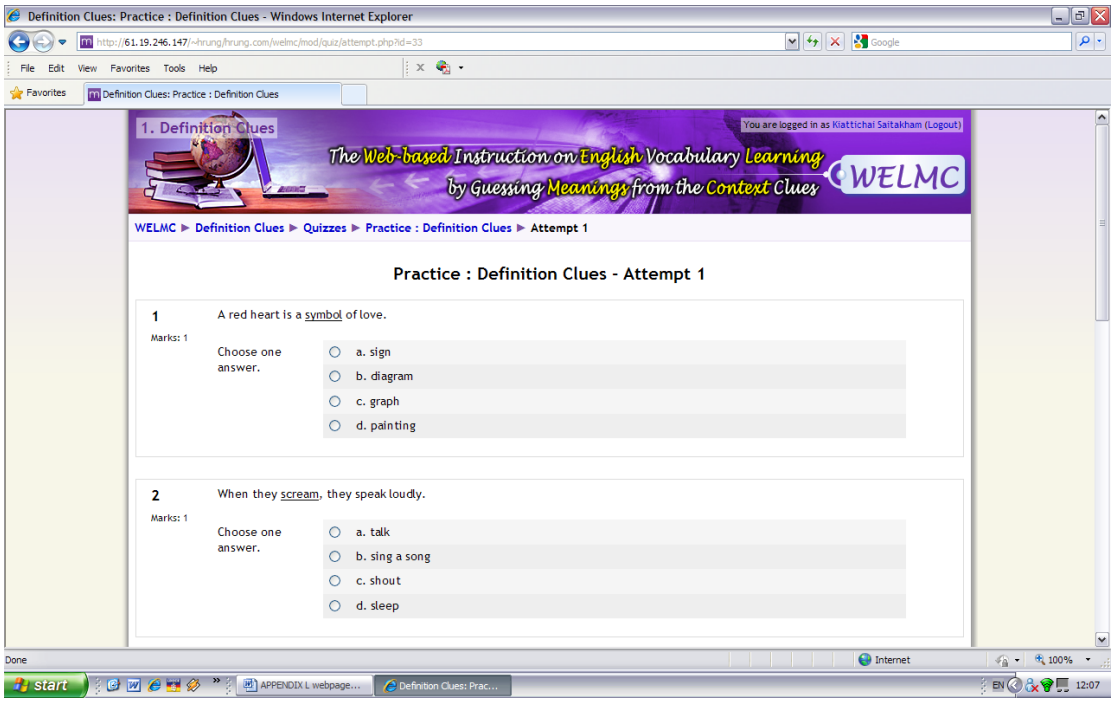

WELMC: Welcome everyone to WELMC. - Windows Internet Explorer
1. Reread the sentence. Look for ideas and words that offer meaning clues.
2. Read the two or three sentences that came before the one that contains the unfamiliar words. Look for meaning clues such as synonyms, antonyms, or example clues.
3. Find the base or root word and think of its meaning.
4. See if the prefix can help you understand the word.
5. Ask yourself: "Have I seen or heard this word in another text or situation?" "What do I recall?"
6. Think of the overall meaning of the selection you are reading. Does your understanding of the whole help you figure out particular words?
Types of Context Clues

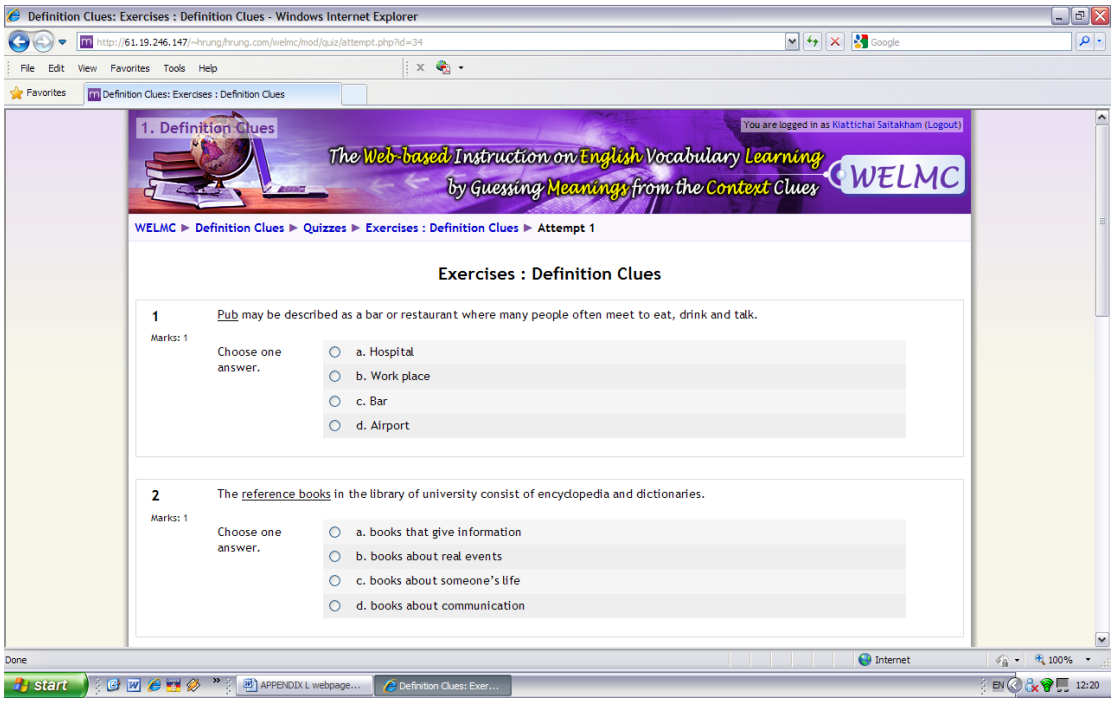

WELMC: Welcome everyone to WELMC. - Windows Internet Explorer
Types of Context Clues
There are many types of context clues but the followings are the basic types of context clues which are mostly found when you read.
1. Definition Clues
2. Example Clues
3. Synonym or Restatement Clues
4. Comparison and Contrast Clues
5. Cause and Effect Clues

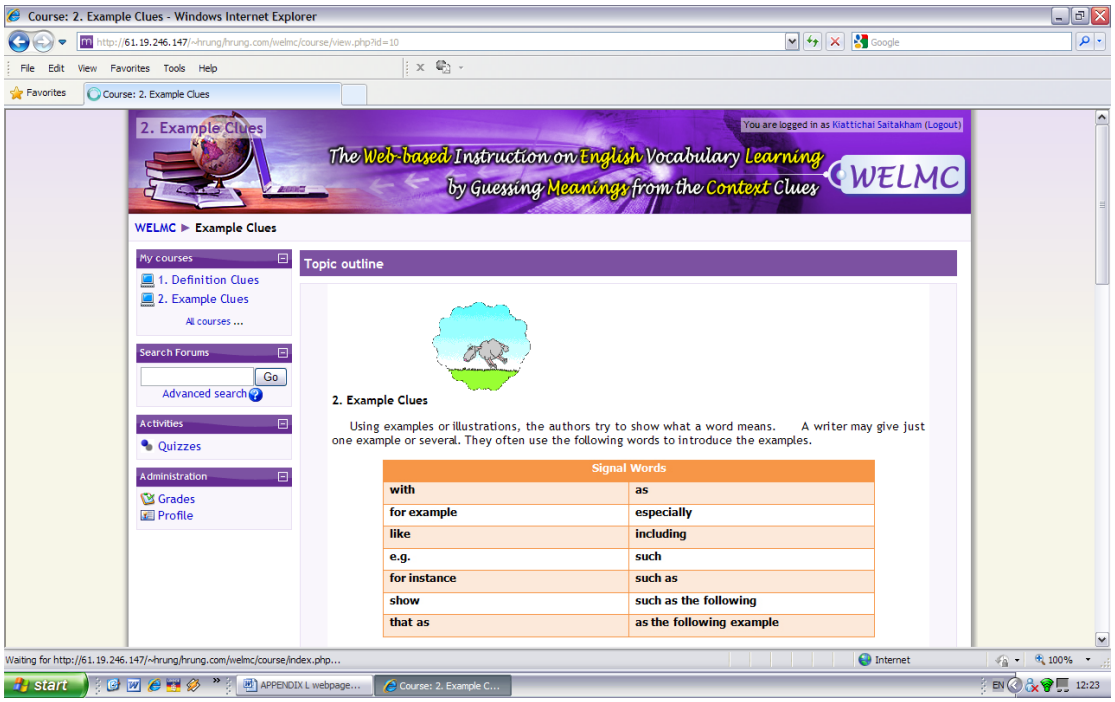

Course: 1. Definition Clues - Windows Internet Explorer
1. Definition Clues
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
WELMC ▶ Definition Clues
My courses
1. Definition Clues
2. Example Clues
3. Synonym or Restatement Clues
4. Comparison and Contrast Clues
5. Cause and Effect Clues
Activities
Quizzes
Administration
Grades
Profile
Topic outline
1. Definition Clues
Words in the following box are clues to help you guess the definition or meaning of the unknown word from the reading passage.
Signal Words
mean | to be regarded as
refer to | to be the name given to
to be | consist of
to be called | may be seen as
to be defined as | can be thought of
to be known as | can be described as
to be a type of | may be described as
to be a kind of

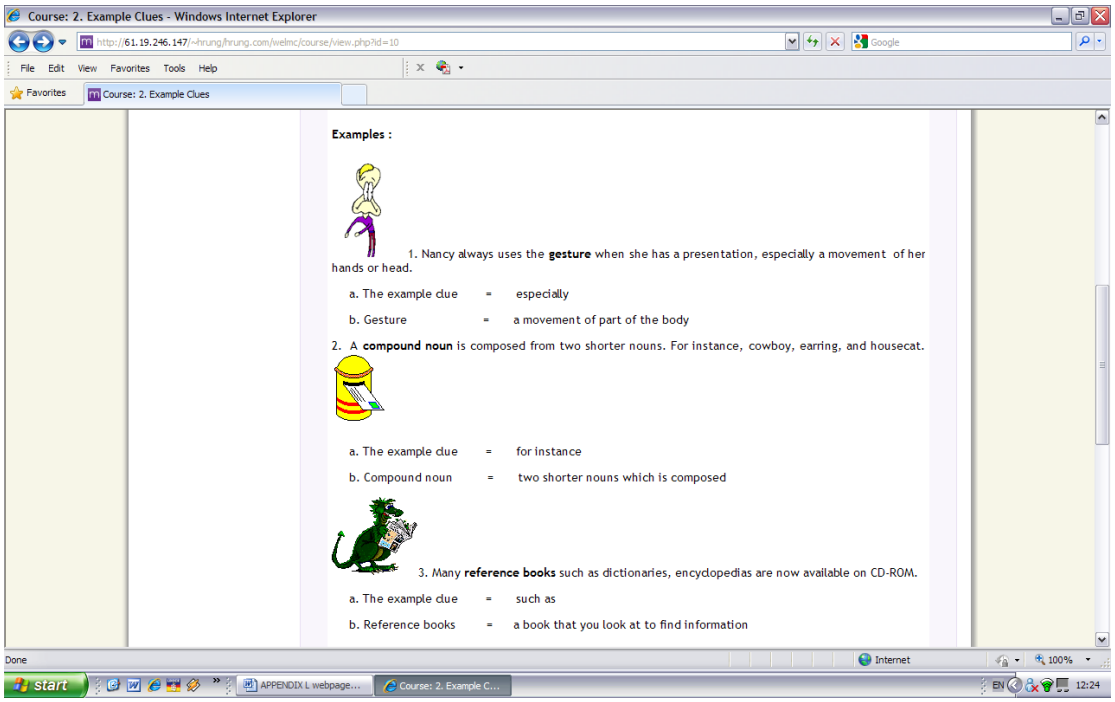

Course: 1. Definition Clues - Windows Internet Explorer
to be a kind of
Examples :
1. Twin is defined as one of two children born at the same time to the same mother.
a. The definition clue = is defined as
b. Twin = one of two children born at the same time to the same mother
2. Circulate means to move around and return to the same place.
a. The definition clue = means
b. Circulate = to move around and return to the same place
3. Millennium means a period of one thousand years.
a. The definition clue = means
b. Millennium = a period of one thousand years

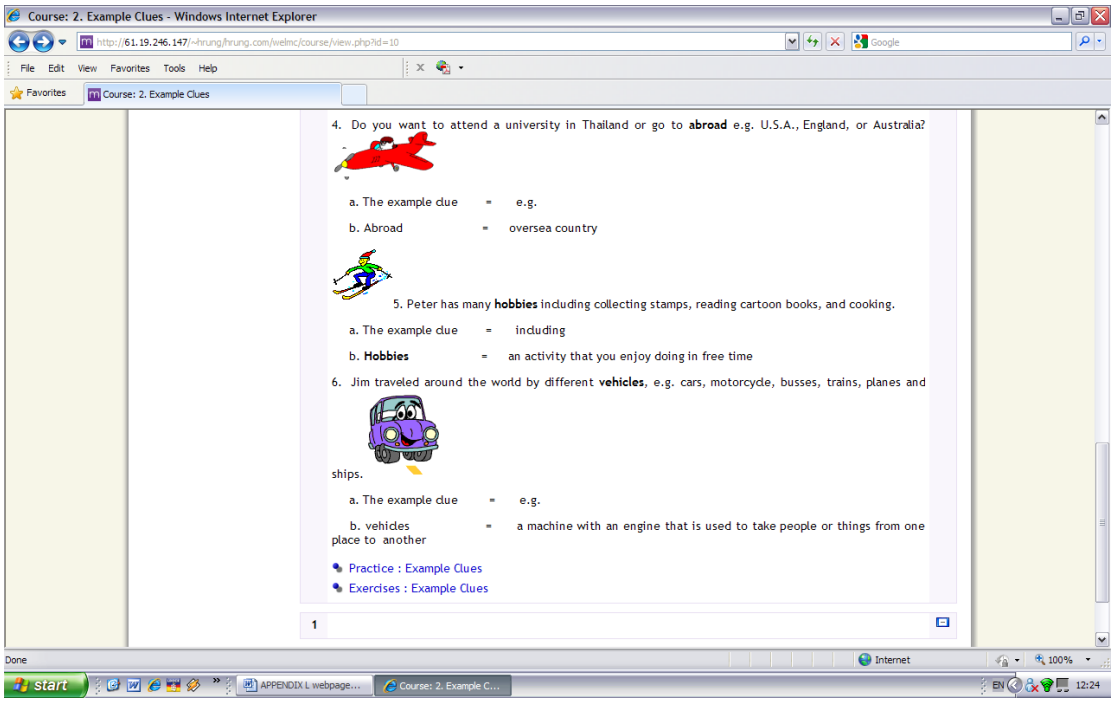

Course: 1. Definition Clues - Windows Internet Explorer
4. Resume is a list of a person's work experience, educational background, and accomplishments.
a. The definition clue = is
b. Resume = a list of a person's work experience, educational background, and accomplishments
5. Ambition is defined as a strong desire to be or to do something.
a. The definition clue = is defined as
b. Ambition = a strong desire to be or to do something
6. Species is regarded as a group of animal or plants that share similar characteristics and are able to
interbreed.
a. The definition clue = is regarded as
b. Species = a group of animal or plants that share similar characteristics
Practice : Definition Clues
Exercises : Definition Clues

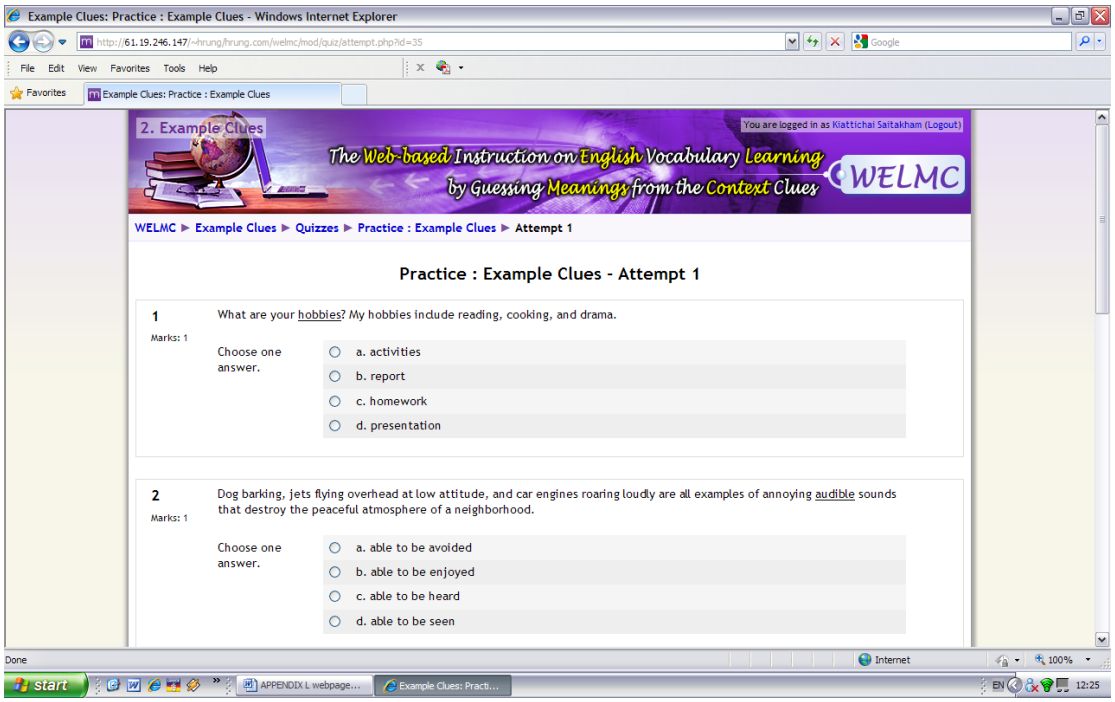

Definition Clues: Practice : Definition Clues - Windows Internet Explorer
1. Definition Clues
You are logged in as Kiattichai Saitakham (Logout)
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
WELMC ▶ Definition Clues ▶ Quizzes ▶ Practice : Definition Clues ▶ Attempt 1
Practice : Definition Clues - Attempt 1
1
Marks: 1
A red heart is a symbol of love.
Choose one answer.
a. sign
b. diagram
c. graph
d. painting
2
Marks: 1
When they scream, they speak loudly.
Choose one answer.
a. talk
b. sing a song
c. shout
d. sleep

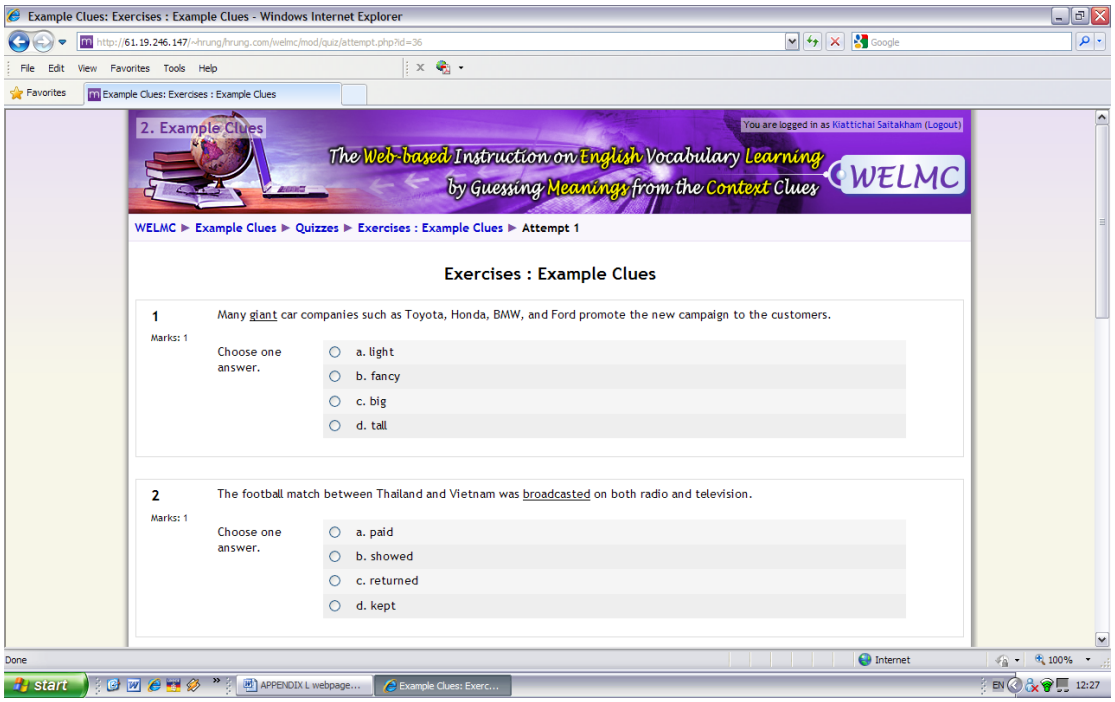

Definition Clues: Exercises : Definition Clues - Windows Internet Explorer
1. Definition Clues
You are logged in as Kiattichai Saitakham (Logout)
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
WELMC ▶ Definition Clues ▶ Quizzes ▶ Exercises : Definition Clues ▶ Attempt 1
Exercises : Definition Clues
1
Marks: 1
Pub may be described as a bar or restaurant where many people often meet to eat, drink and talk.
Choose one answer.
a. Hospital
b. Work place
c. Bar
d. Airport
2
Marks: 1
The reference books in the library of university consist of encyclopedia and dictionaries.
Choose one answer.
a. books that give information
b. books about real events
c. books about someone's life
d. books about communication


Course: 2. Example Clues - Windows Internet Explorer
2. Example Clues
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
You are logged in as Kiattichai Saitakham (Logout)
WELMC ▶ Example Clues
My courses
1. Definition Clues
2. Example Clues
All courses ...
Search Forums
Go
Advanced search
Activities
Quizzes
Administration
Grades
Profile
Topic outline
2. Example Clues
Using examples or illustrations, the authors try to show what a word means. A writer may give just one example or several. They often use the following words to introduce the examples.
Signal Words
with
as
for example
especially
like
including
e.g.
such
for instance
such as
show
such as the following
that as
as the following example


Course: 2. Example Clues - Windows Internet Explorer
Examples :
1. Nancy always uses the gesture when she has a presentation, especially a movement of her hands or head.
a. The example clue = especially
b. Gesture = a movement of part of the body
2. A compound noun is composed from two shorter nouns. For instance, cowboy, earring, and housecat.
a. The example clue = for instance
b. Compound noun = two shorter nouns which is composed
3. Many reference books such as dictionaries, encyclopedias are now available on CD-ROM.
a. The example clue = such as
b. Reference books = a book that you look at to find information


Course: 2. Example Clues - Windows Internet Explorer
4. Do you want to attend a university in Thailand or go to **abroad** e.g. U.S.A., England, or Australia?
a. The example clue = e.g.
b. Abroad = oversea country
5. Peter has many **hobbies** including collecting stamps, reading cartoon books, and cooking.
a. The example clue = including
b. **Hobbies** = an activity that you enjoy doing in free time
6. Jim traveled around the world by different **vehicles**, e.g. cars, motorcycle, busses, trains, planes and ships.
a. The example clue = e.g.
b. vehicles = a machine with an engine that is used to take people or things from one place to another
Practice : Example Clues
Exercises : Example Clues


Example Clues: Practice : Example Clues - Windows Internet Explorer
2. Example Clues
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
WELMC ▶ Example Clues ▶ Quizzes ▶ Practice : Example Clues ▶ Attempt 1
Practice : Example Clues - Attempt 1
1
Marks: 1
What are your hobbies? My hobbies include reading, cooking, and drama.
Choose one answer.
a. activities
b. report
c. homework
d. presentation
2
Marks: 1
Dog barking, jets flying overhead at low attitude, and car engines roaring loudly are all examples of annoying audible sounds that destroy the peaceful atmosphere of a neighborhood.
Choose one answer.
a. able to be avoided
b. able to be enjoyed
c. able to be heard
d. able to be seen


Example Clues: Exercises : Example Clues - Windows Internet Explorer
2. Example Clues
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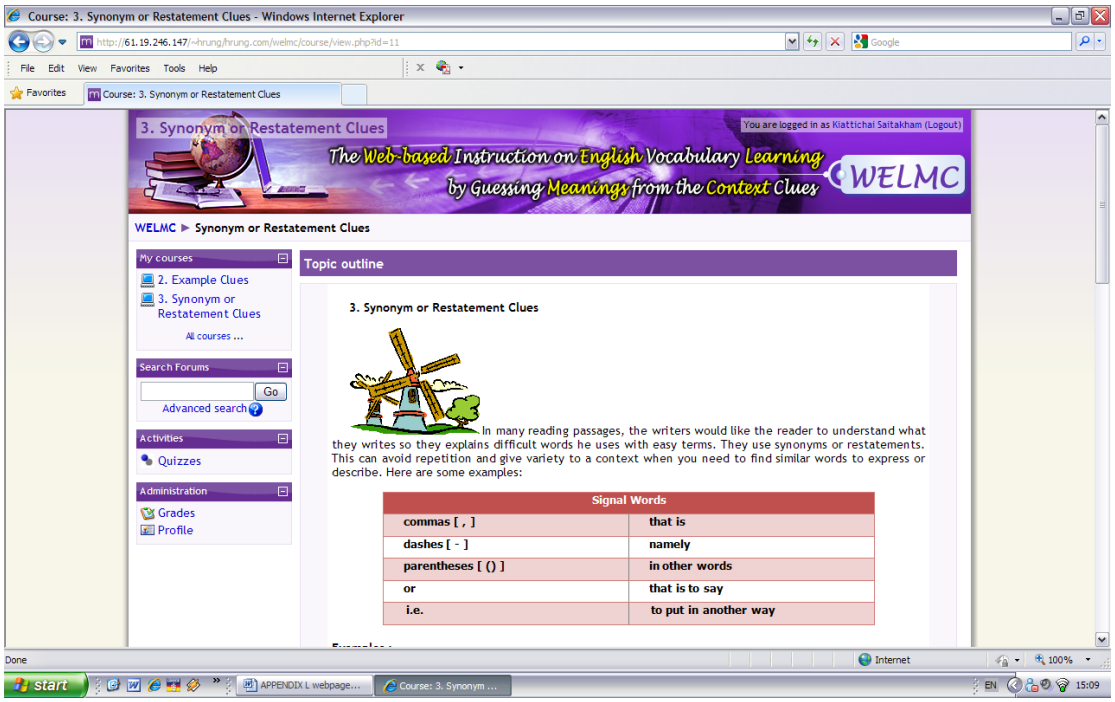
WELMC ▶ Example Clues ▶ Quizzes ▶ Exercises : Example Clues ▶ Attempt 1
Exercises : Example Clues
1
Marks: 1
Many giant car companies such as Toyota, Honda, BMW, and Ford promote the new campaign to the customers.
Choose one answer.
a. light
b. fancy
c. big
d. tall
2
Marks: 1
The football match between Thailand and Vietnam was broadcasted on both radio and television.
Choose one answer.
a. paid
b. showed
c. returned
d. kept


Course: 3. Synonym or Restatement Clues - Windows Internet Explorer
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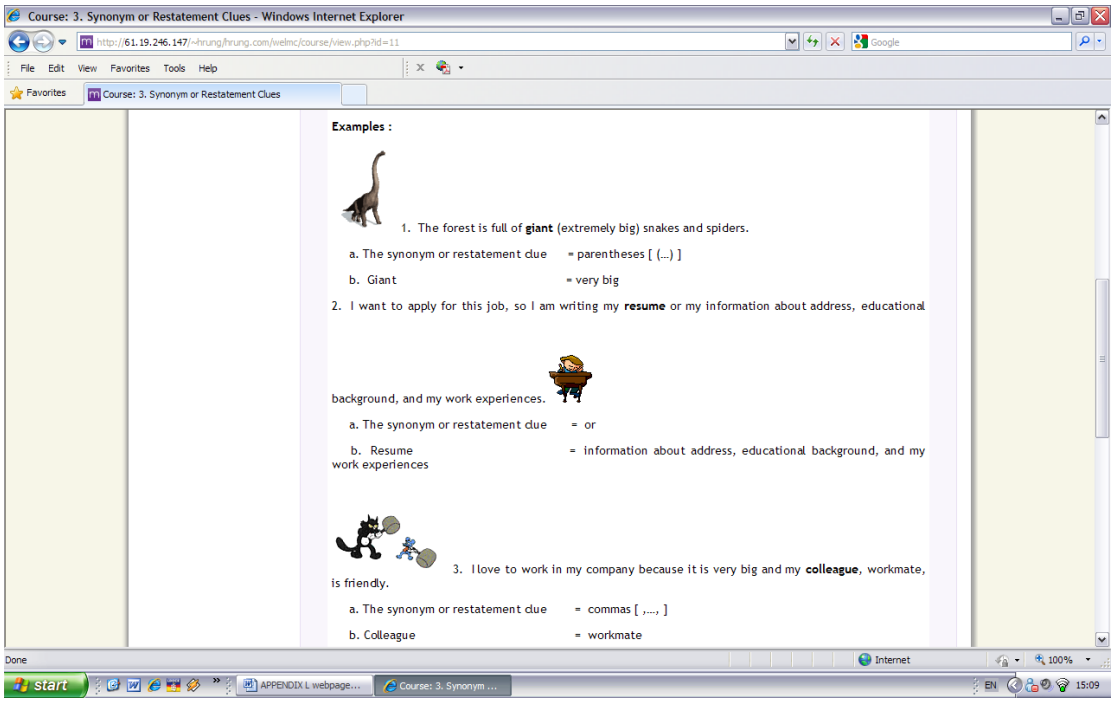
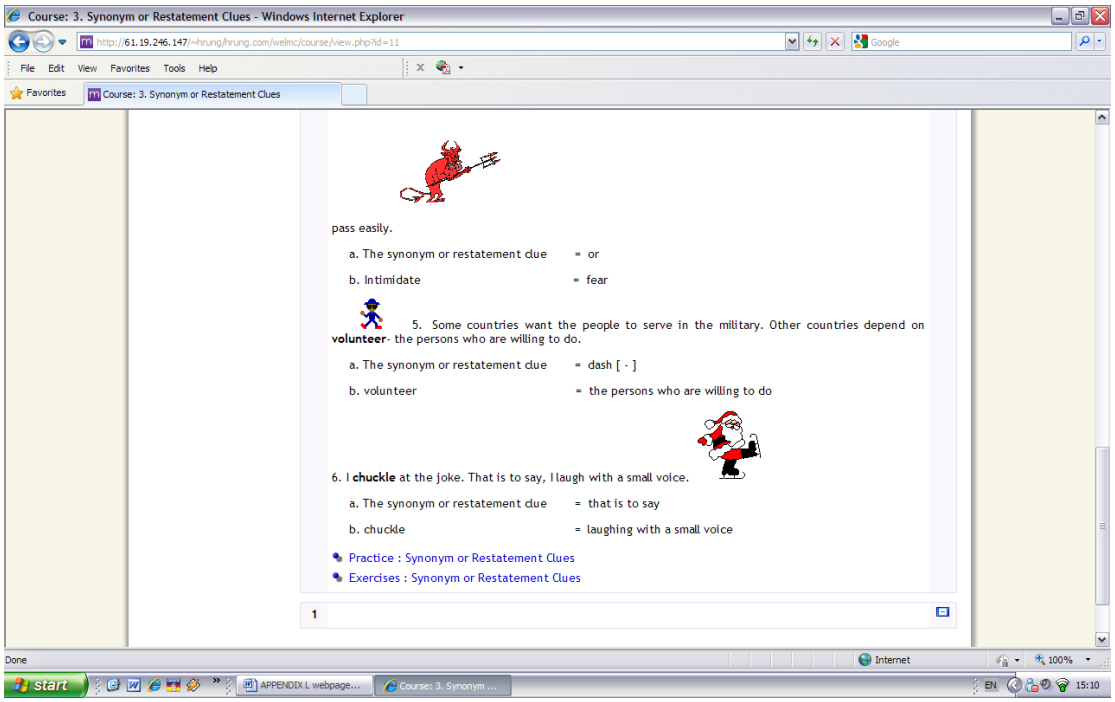
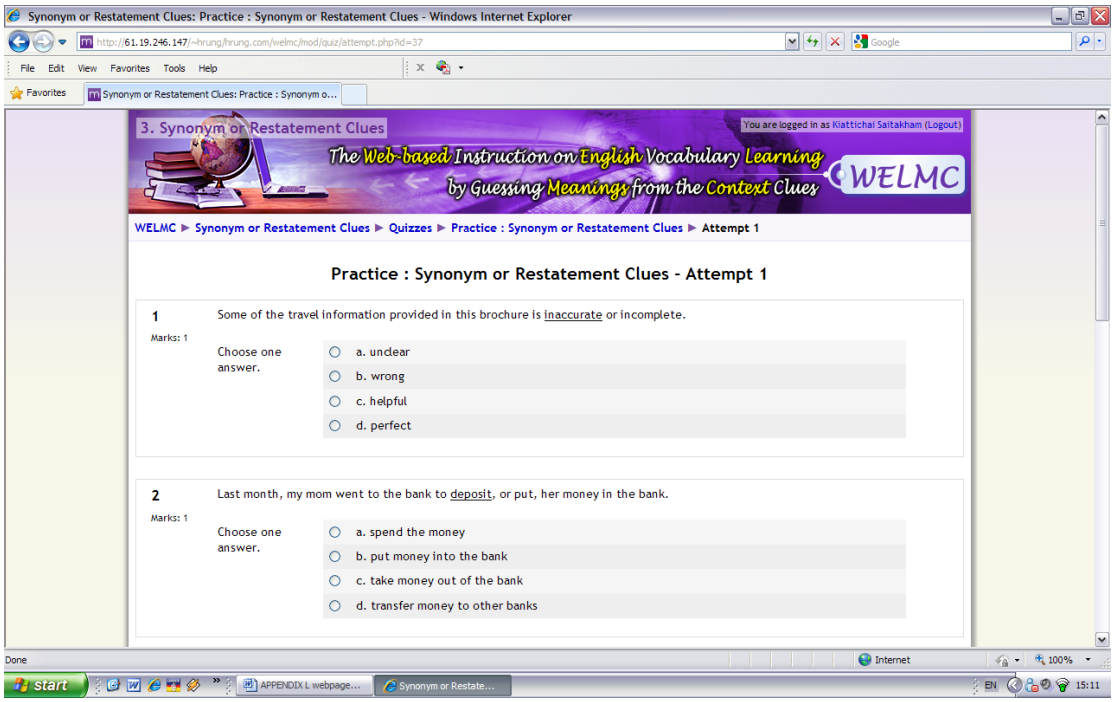
2. Example Clues
3. Synonym or Restatement Clues
All courses ...
Search Forums
Go
Advanced search
Activities
Quizzes
Administration
Grades
Profile
Topic outline
3. Synonym or Restatement Clues
In many reading passages, the writers would like the reader to understand what they writes so they explains difficult words he uses with easy terms. They use synonyms or restatements. This can avoid repetition and give variety to a context when you need to find similar words to express or describe. Here are some examples:
Signal Words
commas [,] | that is
dashes [-] | namely
parentheses [()] | in other words
or | that is to say
i.e. | to put in another way


Course: 3. Synonym or Restatement Clues - Windows Internet Explorer
Examples :
1. The forest is full of giant (extremely big) snakes and spiders.
a. The synonym or restatement clue = parentheses [(...)]
b. Giant = very big
2. I want to apply for this job, so I am writing my resume or my information about address, educational background, and my work experiences.
a. The synonym or restatement clue = or
b. Resume = information about address, educational background, and my work experiences
3. I love to work in my company because it is very big and my colleague, workmate, is friendly.
a. The synonym or restatement clue = commas [,...,]
b. Colleague = workmate


Course: 3. Synonym or Restatement Clues - Windows Internet Explorer
pass easily.
a. The synonym or restatement clue = or
b. Intimidate = fear
5. Some countries want the people to serve in the military. Other countries depend on volunteer- the persons who are willing to do.
a. The synonym or restatement clue = dash [-]
b. volunteer = the persons who are willing to do
6. I chuckle at the joke. That is to say, I laugh with a small voice.
a. The synonym or restatement clue = that is to say
b. chuckle = laughing with a small voice
Practice : Synonym or Restatement Clues
Exercises : Synonym or Restatement Clues


Synonym or Restatement Clues: Practice : Synonym or Restatement Clues - Windows Internet Explorer
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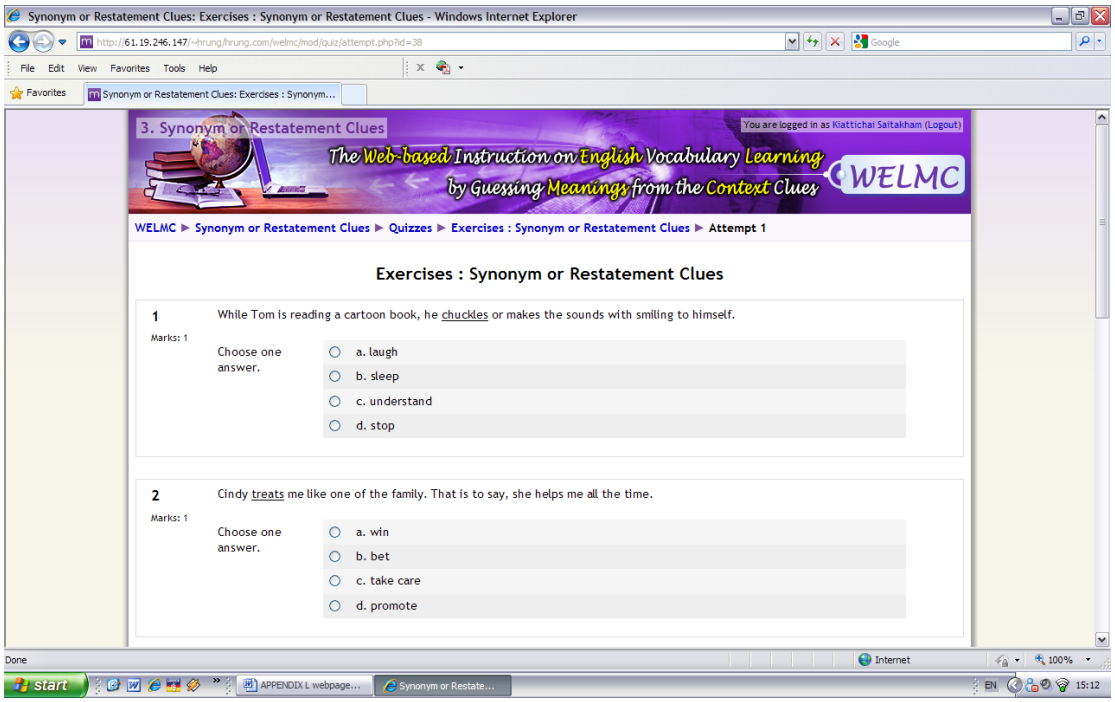
Practice : Synonym or Restatement Clues - Attempt 1
1
Marks: 1
Some of the travel information provided in this brochure is inaccurate or incomplete.
Choose one answer.
a. unclear
b. wrong
c. helpful
d. perfect
2
Marks: 1
Last month, my mom went to the bank to deposit, or put, her money in the bank.
Choose one answer.
a. spend the money
b. put money into the bank
c. take money out of the bank
d. transfer money to other banks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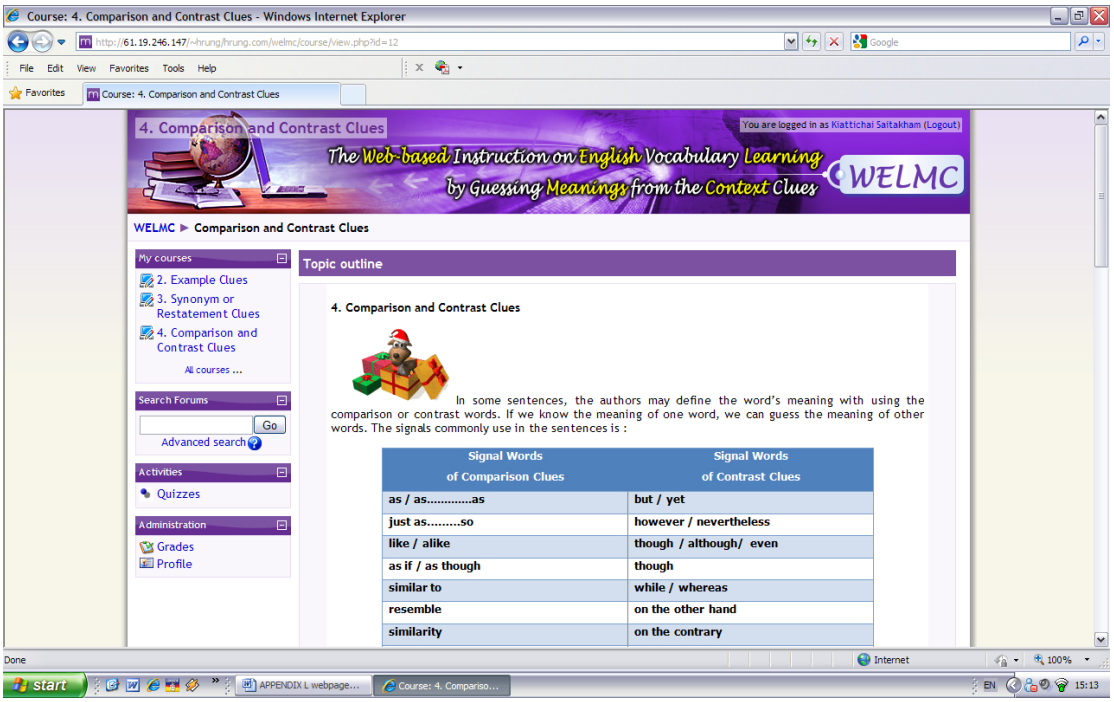
Exercises : Synonym or Restatement Clues
1
Marks: 1
While Tom is reading a cartoon book, he chuckles or makes the sounds with smiling to himself.
Choose one answer.
a. laugh
b. sleep
c. understand
d. stop
2
Marks: 1
Cindy treats me like one of the family. That is to say, she helps me all the time.
Choose one answer.
a. win
b. bet
c. take care
d. promote


Course: 4. Comparison and Contrast Clues - Windows Internet Explorer
4. Comparison and Contrast Clues
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2. Example Clues
3. Synonym or Restatement Clues
4. Comparison and Contrast Clues
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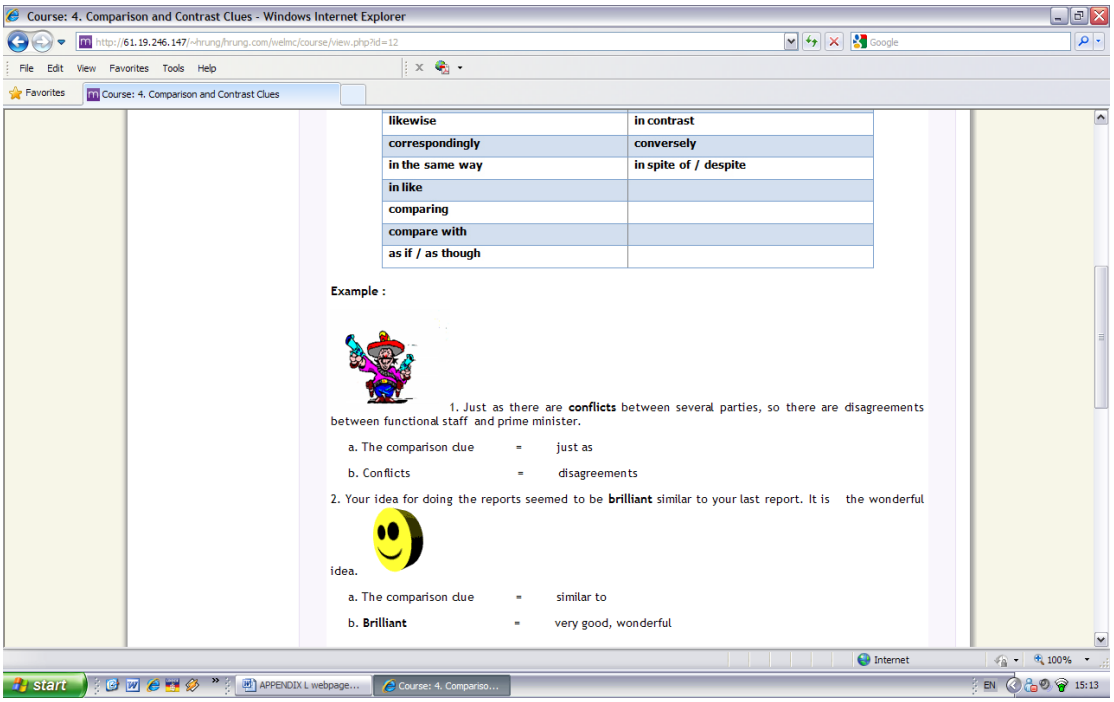
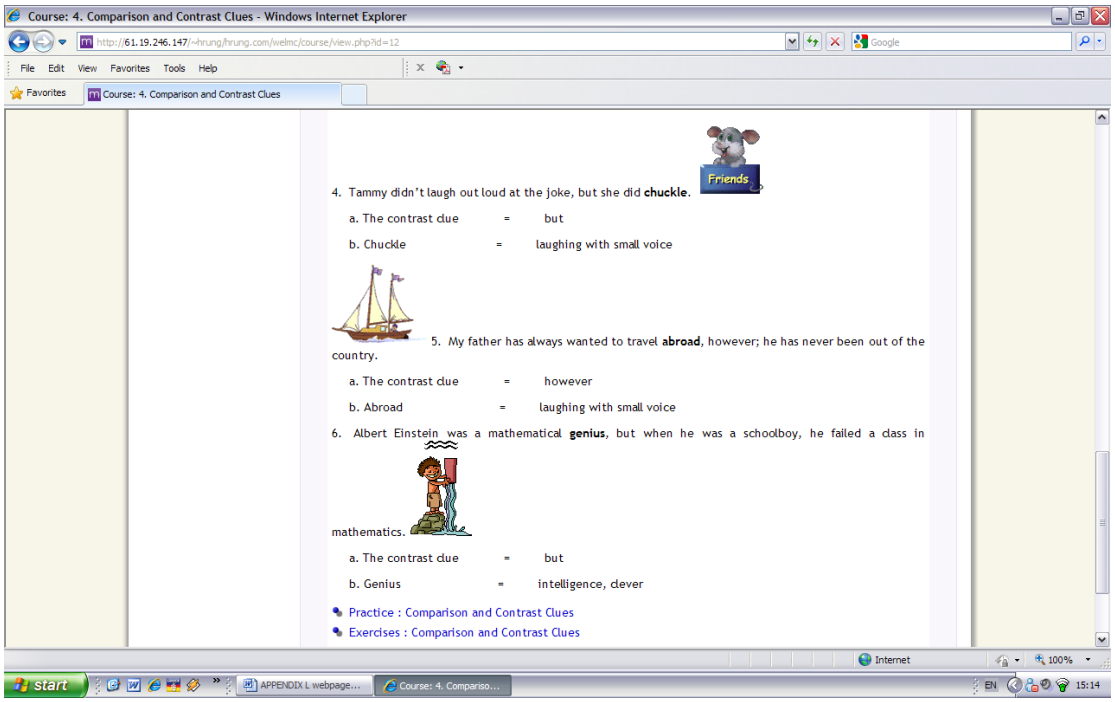
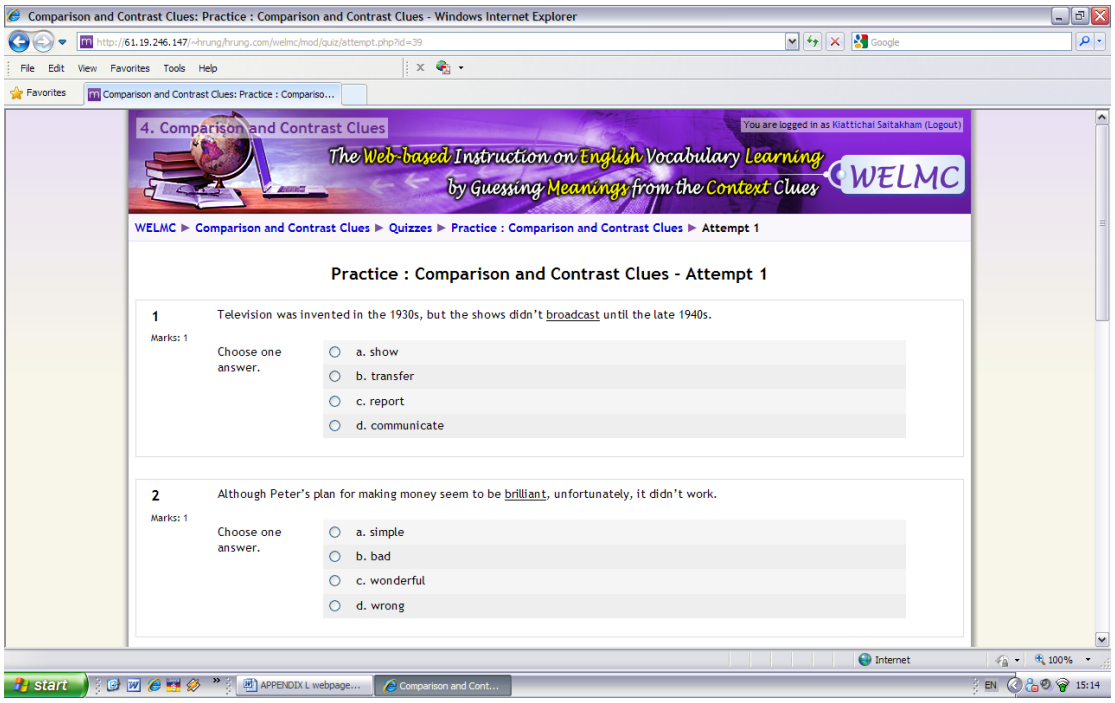
Go
Advanced search
Activities
Quizzes
Administration
Grades
Profile
Topic outline
4. Comparison and Contrast Clues
In some sentences, the authors may define the word's meaning with using the comparison or contrast words. If we know the meaning of one word, we can guess the meaning of other words. The signals commonly use in the sentences is :
Signal Words of Comparison Clues
Signal Words of Contrast Clues
as / as.....as
but / yet
just as.....so
however / nevertheless
like / alike
though / although/ even
as if / as though
though
similar to
while / whereas
resemble
on the other hand
similarity
on the contrary


Course: 4. Comparison and Contrast Clues - Windows Internet Explorer
likewise
in contrast
correspondingly
conversely
in the same way
in spite of / despite
in like
comparing
compare with
as if / as though
Example :
1. Just as there are conflicts between several parties, so there are disagreements between functional staff and prime minister.
a. The comparison clue = just as
b. Conflicts = disagreements
2. Your idea for doing the reports seemed to be brilliant similar to your last report. It is the wonderful idea.
a. The comparison clue = similar to
b. Brilliant = very good, wonderful


Course: 4. Comparison and Contrast Clues - Windows Internet Explorer
Course: 4. Comparison and Contrast Clues
Friends
4. Tammy didn't laugh out loud at the joke, but she did **chuckle**.
a. The contrast clue = but
b. Chuckle = laughing with small voice
5. My father has always wanted to travel **abroad**, however; he has never been out of the country.
a. The contrast clue = however
b. Abroad = laughing with small voice
6. Albert Einstein was a mathematical **genius**, but when he was a schoolboy, he failed a class in mathematics.
a. The contrast clue = but
b. Genius = intelligence, clever
Practice : Comparison and Contrast Clues
Exercises : Comparison and Contrast Clues


Comparison and Contrast Clues: Practice : Comparison and Contrast Clues - Windows Internet Explorer
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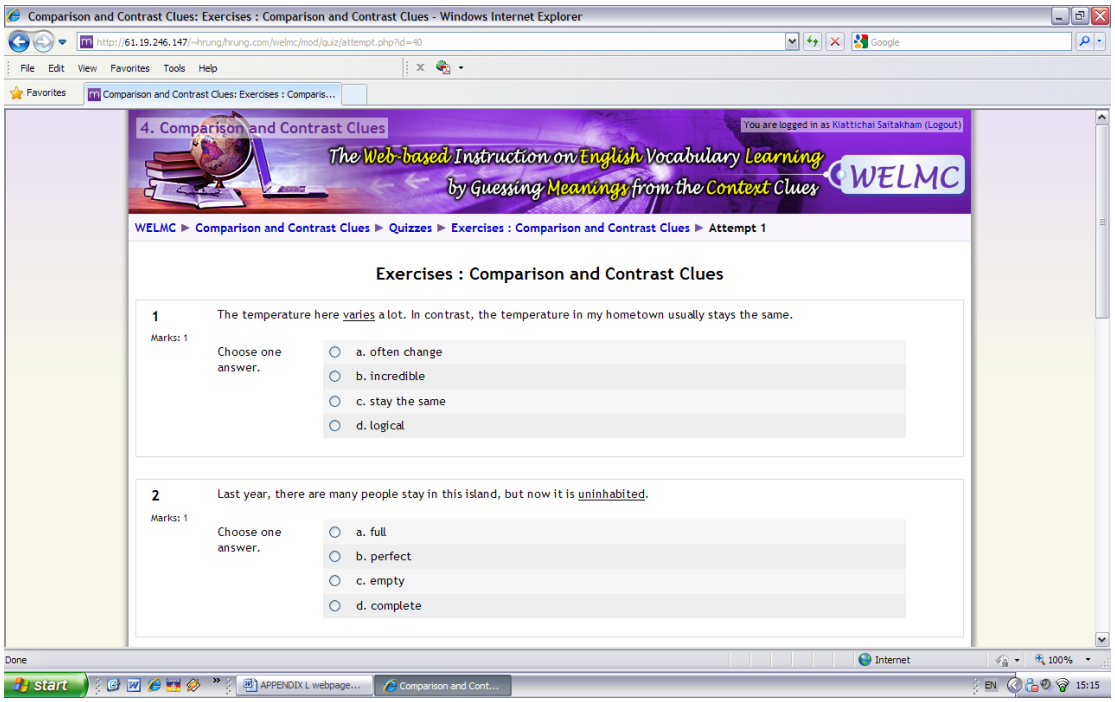
Practice : Comparison and Contrast Clues - Attempt 1
1
Marks: 1
Television was invented in the 1930s, but the shows didn't broadcast until the late 1940s.
Choose one answer.
a. show
b. transfer
c. report
d. communicate
2
Marks: 1
Although Peter's plan for making money seem to be brilliant, unfortunately, it didn't work.
Choose one answer.
a. simple
b. bad
c. wonderful
d. wrong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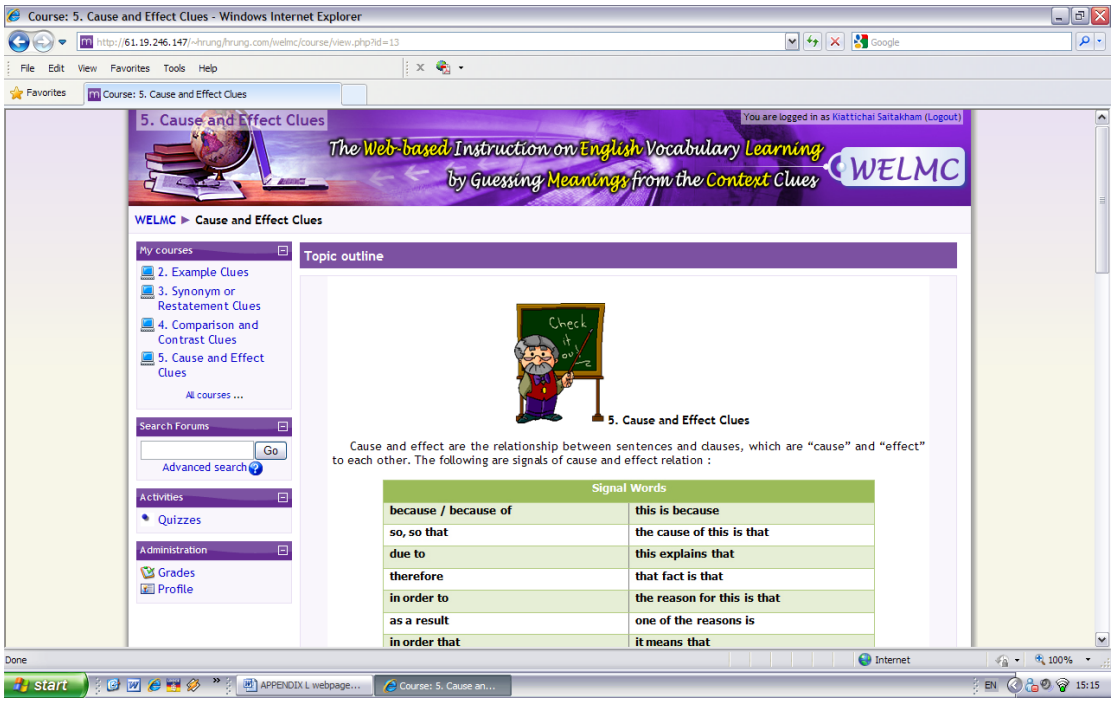
Exercises : Comparison and Contrast Clues
1
Marks: 1
The temperature here varies a lot. In contrast, the temperature in my hometown usually stays the same.
Choose one answer.
a. often change
b. incredible
c. stay the same
d. logical
2
Marks: 1
Last year, there are many people stay in this island, but now it is uninhabited.
Choose one answer.
a. full
b. perfect
c. empty
d. complete


Course: 5. Cause and Effect Clues - Windows Internet Explorer
5. Cause and Effect Clues
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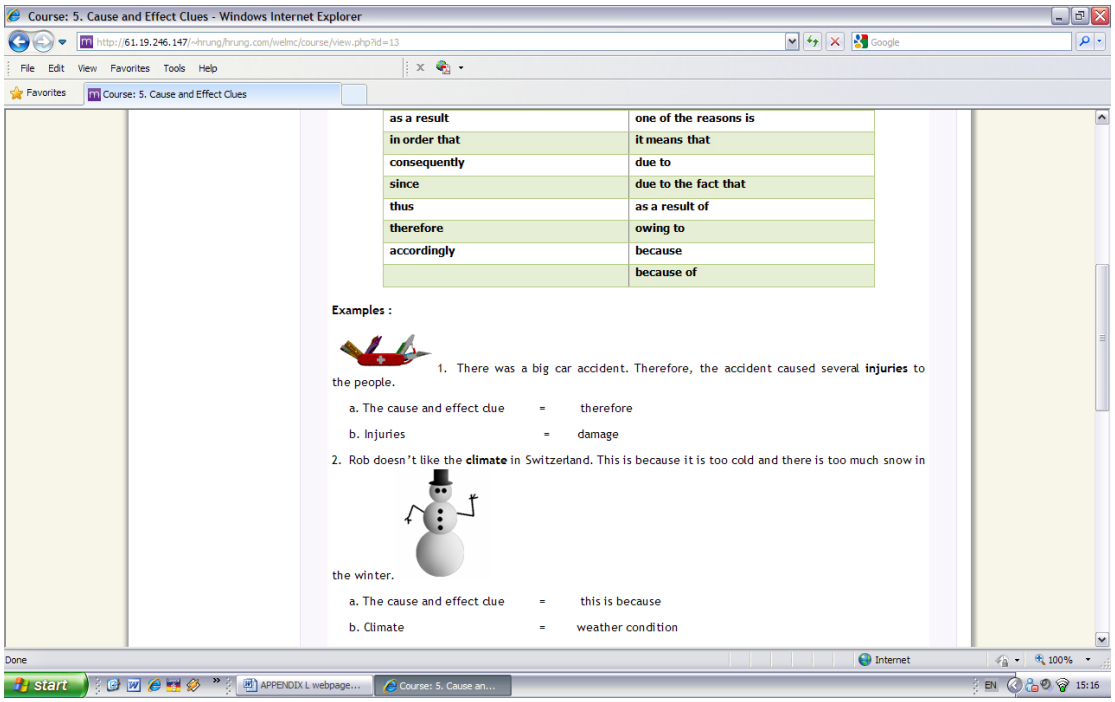
My courses
2. Example Clues
3. Synonym or Restatement Clues
4. Comparison and Contrast Clues
5. Cause and Effect Clues
All courses ...
Search Forums
Go
Advanced search
Activities
Quizzes
Administration
Grades
Profile
Topic outline
Check it out
5. Cause and Effect Clues
Cause and effect are the relationship between sentences and clauses, which are "cause" and "effect" to each other. The following are signals of cause and effect relation :
Signal Words
because / because of
this is because
so, so that
the cause of this is that
due to
this explains that
therefore
that fact is that
in order to
the reason for this is that
as a result
one of the reasons is
in order that
it means that


Course: 5. Cause and Effect Clues - Windows Internet Explorer
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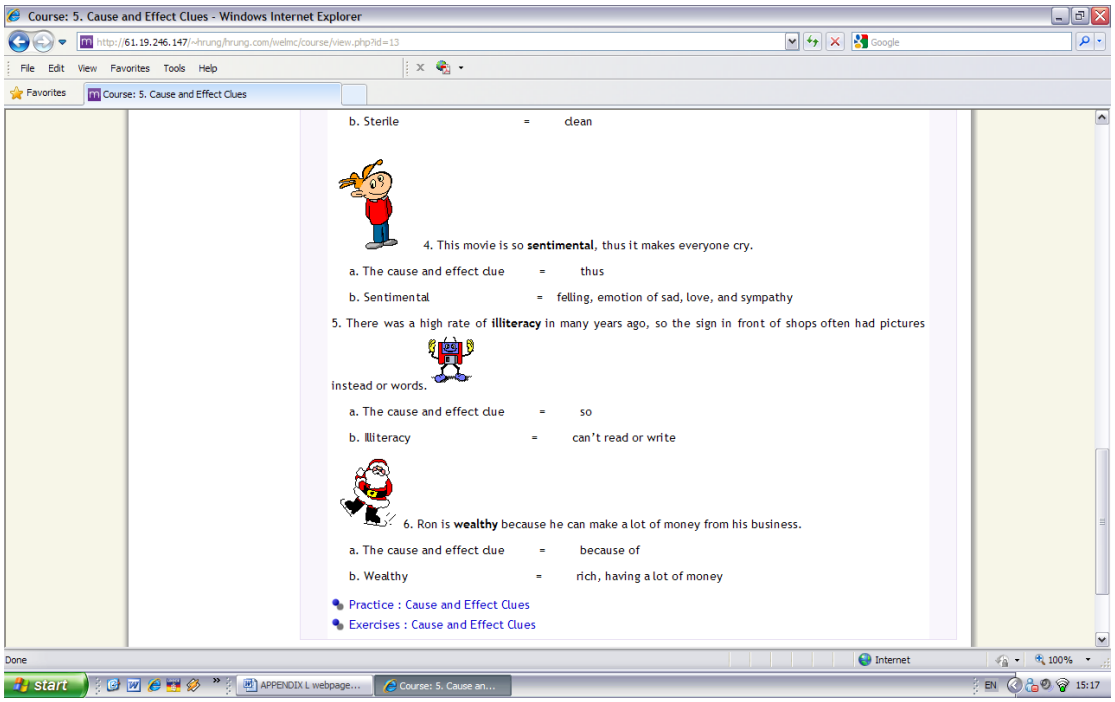
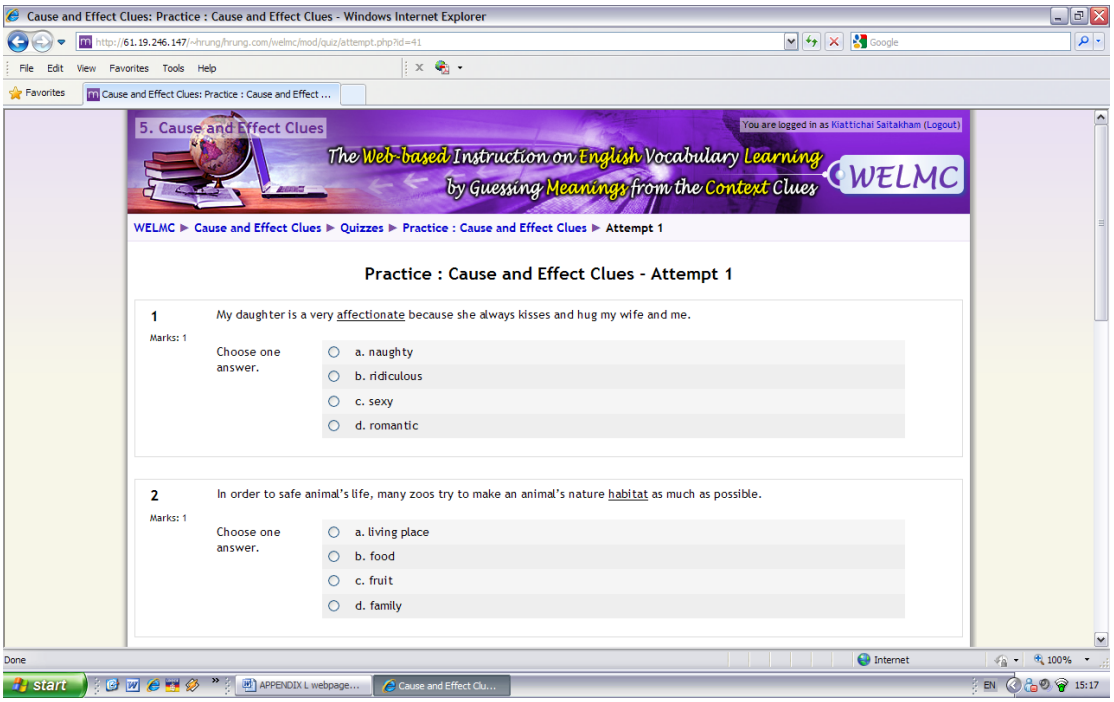
Course: 5. Cause and Effect Clues
as a result
in order that
consequently
since
thus
therefore
accordingly
one of the reasons is
it means that
due to
due to the fact that
as a result of
owing to
because
because of
Examples :
1. There was a big car accident. Therefore, the accident caused several injuries to the people.
a. The cause and effect clue = therefore
b. Injuries = damage
2. Rob doesn't like the climate in Switzerland. This is because it is too cold and there is too much snow in the winter.
a. The cause and effect clue = this is because
b. Climate = weather condition
Done
Internet
100%
start
APPENDIX L webpage...
Course: 5. Cause an...
15:16


Course: 5. Cause and Effect Clues - Windows Internet Explorer
b. Sterile = clean
4. This movie is so sentimental, thus it makes everyone cry.
a. The cause and effect clue = thus
b. Sentimental = felling, emotion of sad, love, and sympathy
5. There was a high rate of illiteracy in many years ago, so the sign in front of shops often had pictures instead or words.
a. The cause and effect clue = so
b. Illiteracy = can't read or write
6. Ron is wealthy because he can make a lot of money from his business.
a. The cause and effect clue = because of
b. Wealthy = rich, having a lot of money
Practice : Cause and Effect Clues
Exercises : Cause and Effect Clues
Done
Internet
100%
start
APPENDIX L webpage...
Course: 5. Cause an...
15:17


Cause and Effect Clues: Practice : Cause and Effect Clues - Windows Internet Explorer
5. Cause and Effect Clues
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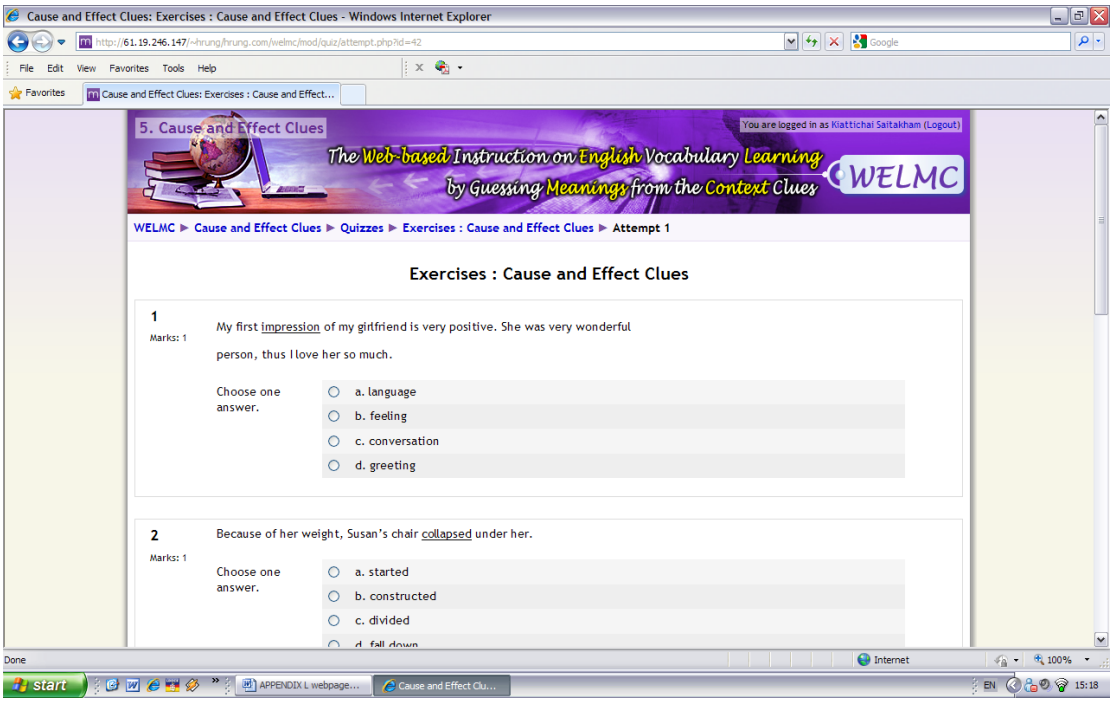
Practice : Cause and Effect Clues - Attempt 1
1
Marks: 1
My daughter is a very affectionate because she always kisses and hug my wife and me.
Choose one answer.
a. naughty
b. ridiculous
c. sexy
d. romantic
2
Marks: 1
In order to safe animal's life, many zoos try to make an animal's nature habitat as much as possible.
Choose one answer.
a. living place
b. food
c. fruit
d. family


Cause and Effect Clues: Exercises : Cause and Effect Clues - Windows Internet Explorer
5. Cause and Effect Clues
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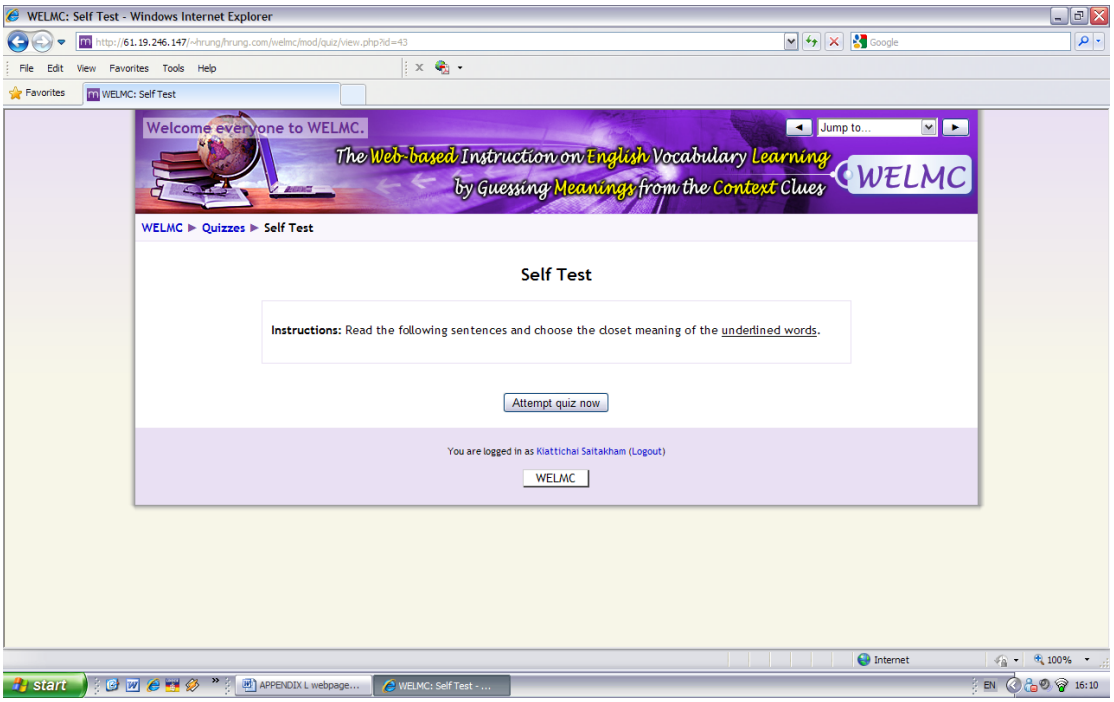
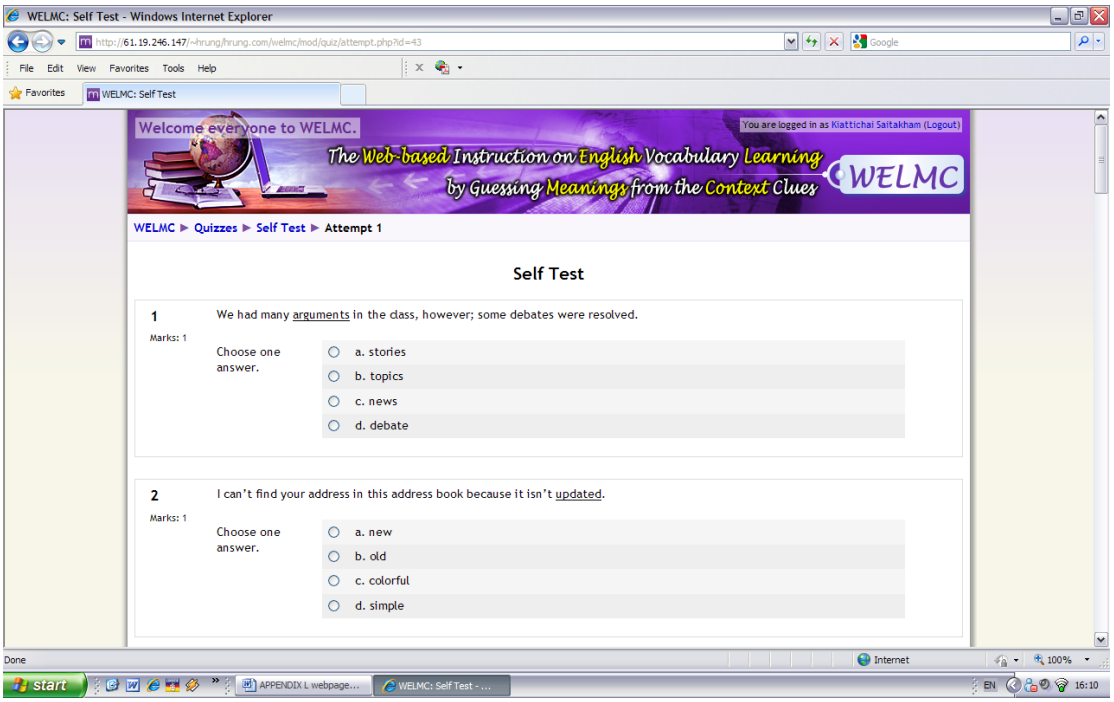
WELMC
WELMC ▶ Cause and Effect Clues ▶ Quizzes ▶ Exercises : Cause and Effect Clues ▶ Attempt 1
Exercises : Cause and Effect Clues
1
Marks: 1
My first impression of my girlfriend is very positive. She was very wonderful person, thus I love her so much.
Choose one answer.
a. language
b. feeling
c. conversation
d. greeting
2
Marks: 1
Because of her weight, Susan's chair collapsed under her.
Choose one answer.
a. started
b. constructed
c. divided


WELMC: Self Test - Windows Internet Explorer
Welcome everyone to WELMC.
The Web-based Instruction on English Vocabulary Learning by Guessing Meanings from the Context Clues
WELMC
Jump to...
WELMC ▶ Quizzes ▶ Self Test
Self Test
Instructions: Read the following sentences and choose the closet meaning of the underlined words.
Attempt quiz now
You are logged in as Klattichai Saitakham (Logout)
WELMC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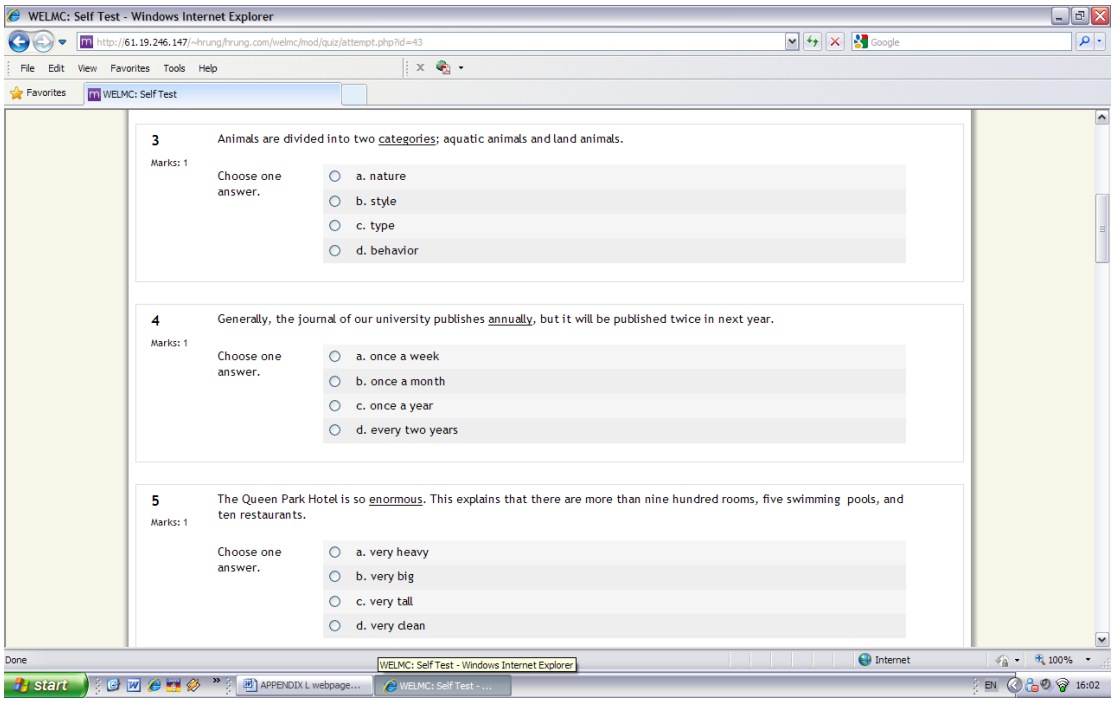
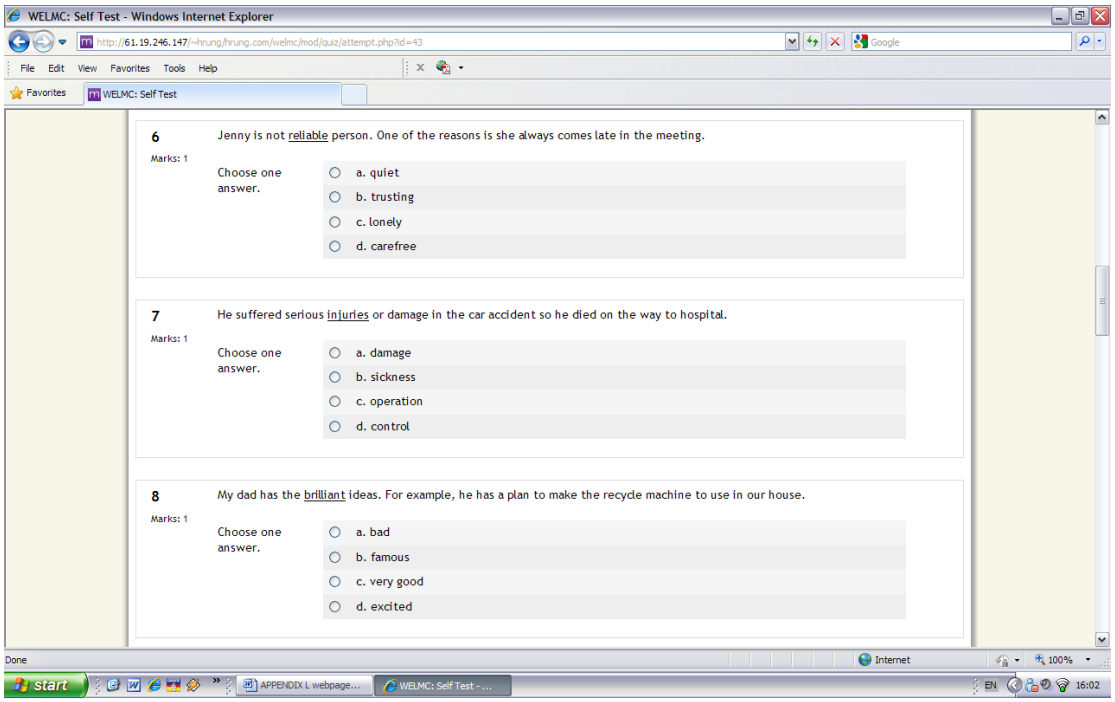
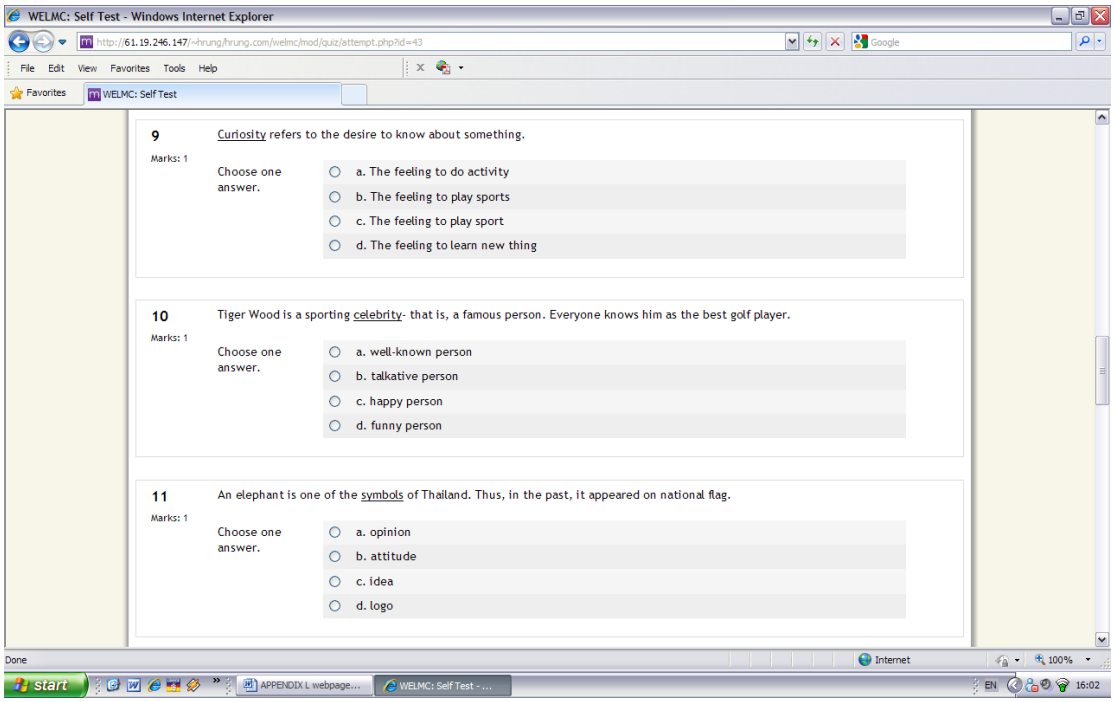
WELMC
WELMC ▶ Quizzes ▶ Self Test ▶ Attempt 1
Self Test
1
Marks: 1
We had many arguments in the class, however; some debates were resolved.
Choose one answer.
a. stories
b. topics
c. news
d. debate
2
Marks: 1
I can't find your address in this address book because it isn't updated.
Choose one answer.
a. new
b. old
c. colorful
d. simple


WELMC: Self Test - Windows Internet Explorer
3
Marks: 1
Animals are divided into two categories; aquatic animals and land animals.
Choose one answer.
a. nature
b. style
c. type
d. behavior
4
Marks: 1
Generally, the journal of our university publishes annually, but it will be published twice in next year.
Choose one answer.
a. once a week
b. once a month
c. once a year
d. every two years
5
Marks: 1
The Queen Park Hotel is so enormous. This explains that there are more than nine hundred rooms, five swimming pools, and ten restaurants.
Choose one answer.
a. very heavy
b. very big
c. very tall
d. very clean


WELMC: Self Test - Windows Internet Explorer
6
Marks: 1
Jenny is not reliable person. One of the reasons is she always comes late in the meeting.
Choose one answer.
a. quiet
b. trusting
c. lonely
d. carefree
7
Marks: 1
He suffered serious injuries or damage in the car accident so he died on the way to hospital.
Choose one answer.
a. damage
b. sickness
c. operation
d. control
8
Marks: 1
My dad has the brilliant ideas. For example, he has a plan to make the recycle machine to use in our house.
Choose one answer.
a. bad
b. famous
c. very good
d. excited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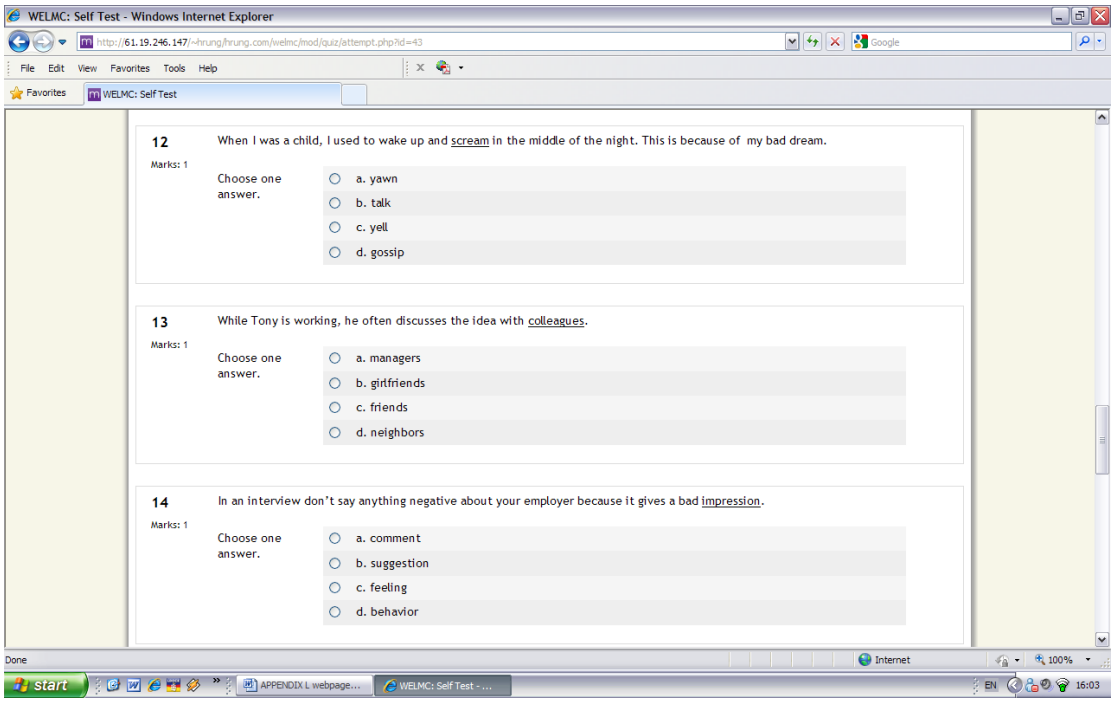
File Edit View Favorites Tools Help
Favorites
WELMC: Self Test
9
Curiosity refers to the desire to know about something.
Marks: 1
Choose one answer.
a. The feeling to do activity
b. The feeling to play sports
c. The feeling to play sport
d. The feeling to learn new thing
10
Tiger Wood is a sporting celebrity- that is, a famous person. Everyone knows him as the best golf player.
Marks: 1
Choose one answer.
a. well-known person
b. talkative person
c. happy person
d. funny person
11
An elephant is one of the symbols of Thailand. Thus, in the past, it appeared on national flag.
Marks: 1
Choose one answer.
a. opinion
b. attitude
c. idea
d. logo
Done
Internet
100%
start
APPENDIX L webpage...
WELMC: Self Test - ...
EN
16:02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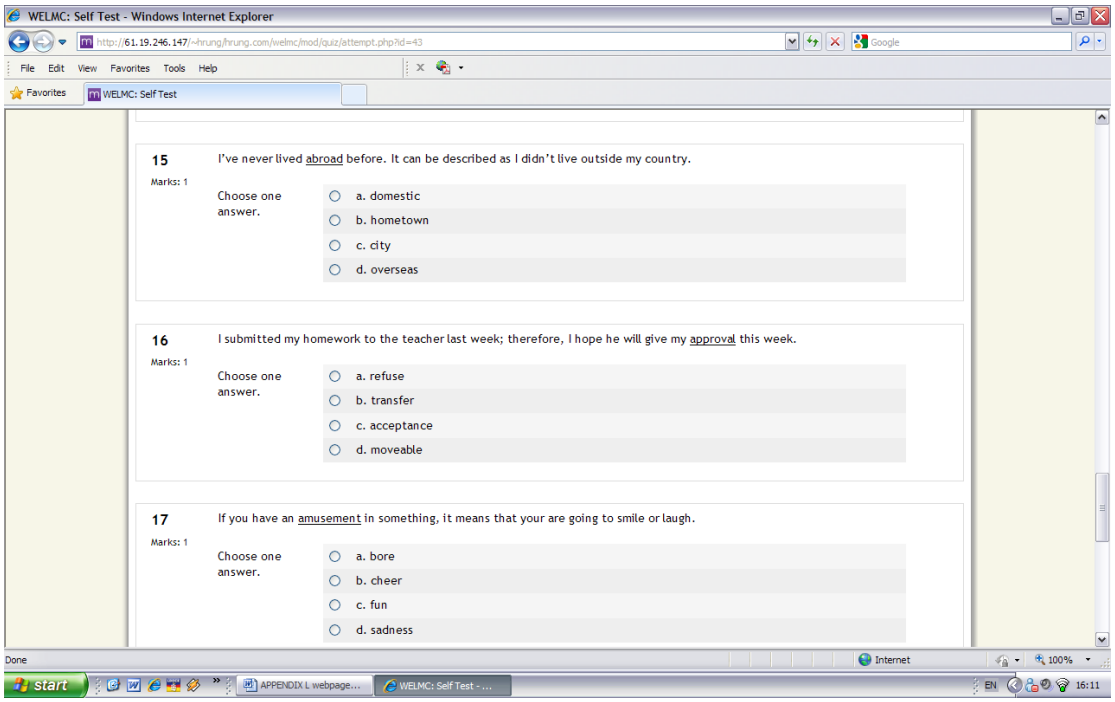
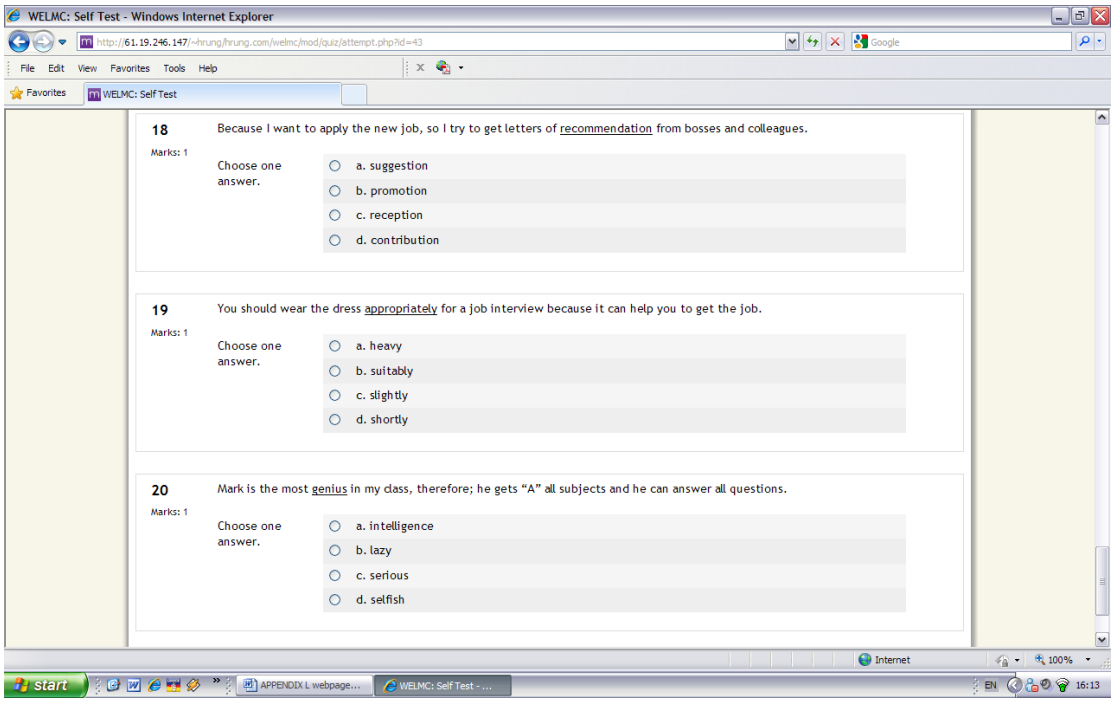
Favorites
WELMC: Self Test
12
When I was a child, I used to wake up and scream in the middle of the night. This is because of my bad dream.
Marks: 1
Choose one answer.
a. yawn
b. talk
c. yell
d. gossip
13
While Tony is working, he often discusses the idea with colleagues.
Marks: 1
Choose one answer.
a. managers
b. girlfriends
c. friends
d. neighbors
14
In an interview don't say anything negative about your employer because it gives a bad impression.
Marks: 1
Choose one answer.
a. comment
b. suggestion
c. feeling
d. behavior
Done
Internet
100%
start
APPENDIX L webpage...
WELMC: Self Test - ...
EN
16:03


WELMC: Self Test - Windows Internet Explorer
15
Marks: 1
I've never lived abroad before. It can be described as I didn't live outside my country.
Choose one answer.
a. domestic
b. hometown
c. city
d. overseas
16
Marks: 1
I submitted my homework to the teacher last week; therefore, I hope he will give my approval this week.
Choose one answer.
a. refuse
b. transfer
c. acceptance
d. moveable
17
Marks: 1
If you have an amusement in something, it means that your are going to smile or laugh.
Choose one answer.
a. bore
b. cheer
c. fun
d. sadness


WELMC: Self Test - Windows Internet Explorer
18
Marks: 1
Because I want to apply the new job, so I try to get letters of recommendation from bosses and colleagues.
Choose one answer.
a. suggestion
b. promotion
c. reception
d. contribution
19
Marks: 1
You should wear the dress appropriately for a job interview because it can help you to get the job.
Choose one answer.
a. heavy
b. suitably
c. slightly
d. shortly
20
Marks: 1
Mark is the most genius in my class, therefore; he gets "A" all subjects and he can answer all questions.
Choose one answer.
a. intelligence
b. lazy
c. serious
d. selfish

APPENDIX M

List of Experts

Names	Position	Instrument Examined
1. Prof. Dr. Chaiyong Brahmawong	- Chief of Operating Officer, College of Internet Distance Education, Assumption University of Thailand - Program Director, Ph.D. in eLearning Methodology, Assumption University of Thailand, Thailand	- The Saitakham Model - Web-based Instruction English Vocabulary Learning by Guessing from the Context Clues (www.welmc.net)
2. Assoc. Prof. Dr. Kanit Khaimook	- Vice Rector for Planning, Suranaree University of Technology, Thailand - A lecturer, Suranaree University of Technology, Thailand	- Questionnaire on Students' Opinions toward Learning English Vocabulary by Guessing Meanings from the Context Clues via a Web-Based Instruction

Names	Position	Instrument Examined
3. The Rev. Dr. Kenneth C. Dobson	- Counselor to the President Payap University, Thailand - A lecturer, Payap University, Thailand	- The Saitakham Model - Questionnaire on Students' Opinions toward Learning English Vocabulary by Guessing Meanings from the Context Clues via the Web-Based Instruction - Lesson Plans
4. Dr. Peerasak Siriyothin	- Dean of Institute of Social Technology, Suranaree University of Technology, Thailand - A lecturer, Suranaree University of Technology, Thailand	- The Saitakham Model - Web-based Instruction English Vocabulary Learning by Guessing from the Context Clues (www.welmc.net) - English Vocabulary Learning Tests on Guessing Meanings from the Context Clues

Names	Position	Instrument Examined
		- Questionnaire on Students' Opinions toward Learning English Vocabulary by Guessing Meanings from the Context Clues via the Web-Based Instruction - Lesson Plans
5. Dr. Sarit Srikhao	- A lecturer, Suranaree University of Technology, Thailand	- The Saitakham Model - Web-based Instruction English Vocabulary Learning by Guessing from the Context Clues (www.welmc.net) - Questionnaire on Students' Opinions toward Learning English Vocabulary by Guessing Meanings from the Context Clues

Names	Position	Instrument Examined
		via the Web-Based Instruction - English Vocabulary Learning Tests on Guessing Meanings from the Context Clues - Lesson Plans
6. Dr. Chittima Kaweera	- Associate Dean for Academic Affairs, Faculty of Arts, Payao University, Thailand - A lecturer, Faculty of Arts, Payao University, Thailand	- Web-based Instruction English Vocabulary Learning by Guessing from the Context Clues (www.welmc.net) - Questionnaire on Students' Opinions toward Learning English Vocabulary by Guessing Meanings from the Context Clues via a Web-based Instruction - Lesson Plans

CURRICULUM VITAE

Acting Sub Lt. Kiattichai Saitakham was born in Chiangmai on July 17, 1978. He received B.Ed. (English) from Chiangmai Rajabhat University, Thailand in 2000, and M.A. degree in English from Naresuan University, Thailand, in 2002. He was chosen for the UNESCO/China Co-Sponsored Fellowships Programme 2008/2009 as a senior scholar at Northeast Normal University, China. His research interest includes educational technology enhance learning, EFL learning strategies, and autonomous learning.