

**THE DEVELOPMENT OF WEB-BASED INSTRUCTION
ON RELATIVE CLAUSES FOR MATHAYOMSUKSA V STUDENTS
AT KHAM-SAKAESAENG SCHOOL, NAKHON RATCHASIMA**

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Suranaree University of Technology has approved this thesis submitted
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การวิจัยนี้มีวัตถุประสงค์คือ 1) เพื่อพัฒนาการสอนผ่านเครือข่ายคอมพิวเตอร์เรื่องสัมพันธานุกรมประโยค 2) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักเรียนในกลุ่มทดลองและกลุ่มควบคุม 3) เพื่อศึกษาเจตคติของนักเรียนที่มีต่อการเรียนผ่านเครือข่ายคอมพิวเตอร์

กลุ่มตัวอย่างคือนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่กำลังเรียนวิชาภาษาอังกฤษหลัก 13 (๑019) ในภาคเรียนที่ 1 ปีการศึกษา 2545 โรงเรียนขามสะแกแสง อำเภอขามสะแกแสง จังหวัดนครราชสีมา จำนวน 80 คน โดยแบ่งเป็นกลุ่มทดลองและกลุ่มควบคุม หลังจากได้ทำการทดสอบก่อนเรียนทั้งสองกลุ่มแล้ว กลุ่มทดลองได้เรียนผ่านเครือข่ายคอมพิวเตอร์เรื่องสัมพันธานุกรมประโยคและกลุ่มควบคุมได้เรียนแบบปกติ จากนั้นให้นักเรียนทำแบบทดสอบหลังเรียน กลุ่มทดลองจะตอบแบบสอบถามเจตคติ การวิเคราะห์ข้อมูลใช้การวิเคราะห์ความแปรปรวนร่วม (ANCOVA) การหาค่าเฉลี่ย และค่าร้อยละ

ผลการวิจัยพบว่าการสอนผ่านเครือข่ายคอมพิวเตอร์เรื่องสัมพันธานุกรมประโยคที่สร้างขึ้นมีค่าประสิทธิภาพ 83.33/80.13 คะแนนที่ได้จากการสอบหลังเรียนของกลุ่มทดลองแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 และนักเรียนมีเจตคติที่ดีต่อการสอนผ่านเครือข่ายคอมพิวเตอร์

ลายมือชื่อนักศึกษา.....

ลายมือชื่ออาจารย์ที่ปรึกษา.....

สาขาวิชาภาษาอังกฤษ ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

ปีการศึกษา 2545 ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

BONGKOT SUWANBENJAKUL : THE DEVELOPMENT OF WEB-BASED INSTRUCTION ON RELATIVE CLAUSES FOR MATHAYOMSUKSA V STUDENTS AT KHAM-SAKAESAENG SCHOOL, NAKHON RATCHASIMA. THESIS ADVISOR : DR.BANJERT CHONGAPIRATTANAKUL, 145 PP. ISBN 974-533-208-9.

The purposes of this study were 1) to develop the web-based instruction entitled relative clauses; 2) to compare students' English learning achievement of both experimental group and control group; 3) to explore students' attitudes toward learning through web-based instruction.

Through randomly assigned, 80 students were selected from Mathayomsuksa V students who learned English 13 (E019) in the first semester in the academic year 2002 at Kham-sakaesaeng School, Kham-sakaesaeng District, Nakhon Ratchasima. They were divided into the experimental group and the control group. After giving a pre-test, the experimental group was taught by web-based instruction entitled relative clauses whereas the control group was taught by the teacher's manual. After that, both groups were asked to do a post-test. For the experimental group, a classroom observation and attitude questionnaires were administered. The statistical analysis of the data included ANCOVA, arithmetic mean, and percentage.

The findings of the research showed that the efficiency of the web-based instruction developed was 83.33/80.13. The English learning achievement of students in the experimental group was higher than those of students in the control group with statistically significant differences at the level 0.01, and students' attitudes toward learning through the web-based instruction was positive.

Student's signature.....

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Academic Year 2002

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CHAPTER 1

INTRODUCTION

1.1 Introduction and Purpose of the Chapter

This chapter is an introduction to the thesis and provides a background as well as a context for the present study. This section includes the rationale and significance of the study, purposes of the study, research hypothesis, scope and limitations of the research, definitions of key terms, and finally the expected outcomes. The chapter concludes with an outline of the thesis.

1.2 Rationale and Significance of the Study

According to the 1999 National Education Act, where it is stated that the trend of education management must hold the premise that all learners have the ability to learn, and to improve themselves. It is believed that learners are central. It is also stated that learners should have enough knowledge and skills in using educational technology to search for knowledge for lifelong learning (The Bureau of National Education Committees, 1999). In the age of education reform, there is an awareness of the importance of educational technology in the learning achievement of Thai students. Furthermore, to change a learning and teaching process into a child-centred approach, educational technology should be used extensively in learning and teaching (Chullachart, 2002).

In this age of information and communication technology, the great world languages which are international channels of communication become more important (Wallace, 1991). English, an international language used as a medium of

communication worldwide, is vital for effective learning. It is used in political, commercial, educational, and technological areas (Tantrakul, 2000). Since the importance of English has emerged, English is now the language most widely taught as a foreign language in many countries (Crystal, 1997). It is used as a vehicle to communicate and to exchange knowledge and technology with people in foreign countries.

In Thailand, the Ministry of Education declared that the English language should become part of the curriculum taught in primary, secondary, and higher education. However, the learning and teaching of English, especially in secondary schools, is not satisfactory. Foreign language learning does not enable learners to use foreign languages, especially the English language, in communicating and searching for knowledge from various learning resources (The Ministry of Education, 2002). Noisaengsri (1980) stated that there were some weakness in current English teaching. These weaknesses included, for example, poor teaching, lack of expert advice, uncertainty about teaching methods and inadequate teaching materials.

Kornchaurat (1996) studied the educational quality of secondary schools in educational region 11, including secondary schools in Nakhon Ratchasima, Buriram, Surin, Srisakate, and Chaiyapoom provinces. He found that the English ability of students in Mathayomsuksa IV to Mathayomsuksa VI was low. He also mentioned that learning and teaching in secondary schools was not successful because of many factors. These factors were, for example, different background knowledge, bad attitudes toward learning English, too many students in a class, work load of the teacher, a traditional teaching method, lack of learner-centre-ness, and lack of suitable and appropriate instructional materials.

As a language teacher, the researcher has found similar problems as mentioned. A summary of Kham-sakaesaeng students' learning achievement indicated that an average learning achievement in the English subject of upper secondary students in the first semester in the academic year 2001 was at the level 2.16 (The Statistics and Measurement Department of Kham-sakaesaeng school, 2001). Most students have problems in reading and writing skills, especially writing skill which should be emphasized for students at the upper-secondary level (Mathayomsuksa IV to Mathayomsuksa VI). Moreover, they have had difficulties in using English grammar in their writing. One of the most difficult aspects of English grammar for the students to master is relative clauses, which is usually introduced into English lesson during Mathayomsuksa V.

Relative clauses are a part of English grammar taught to assist the students in placing a pronoun or an adverb within a sentence. This aspect of grammar can cause many problems for bilingual students. Raimes (2002) mentioned that some errors on relative clauses have been made by Arabic, Farsi, French, Russian, Spanish, and Thai. These bilingual students usually have the same problem of using a non-human distinction for relative pronoun "who" and "which," for example, "Here is the student which you met her last week." Furthermore, a pronoun object added at the end of relative clauses is one of the problems, as in "The house that I used to live in it is big." In addition, an error found in the writings of Korean and Thai students is writing a defining relative clause without a relative pronoun, for instance: "The book is on the table is mine." The errors mentioned above were found in Kham-sakaesaeng students' writing, such as in written work associated with relative clauses, including made those in short paragraphs, essays, and compositions.

Therefore, practicing relative clauses can help students write English sentences correctly. Furthermore, students will be able to develop their skills in more extended pieces of writing.

At present, information and communication technologies are currently being used in education to assist learners to learn more effectively. These technologies also provide teachers with access to a wide range of new pedagogy (Flecknoe, 2002). Therefore, it can be said that information and communication technologies become educational technologies. Ellington, Percival, and Race (1993) pointed out that the principal role of educational technologies is to help improve over all efficiency of learning and teaching. Those are, for example, increasing the quality of learning or the degree of mastery, increasing the efficiency of teachers in terms of numbers of learners taught, increasing the independence of learners, and the flexibility of education, decreasing the time taken for learners, and reducing costs without affecting the quality. One of advanced educational technologies is the web-based teaching.

The web-based teaching or the web-based instruction is an educational innovation that integrates the Internet and the World Wide Web technology into learning and teaching. Many pieces of research using the World Wide Web as a teaching and learning tool have been conducted. This can be supported by the following studies.

Wu (1998) conducted a study of the development and assessment of a prototype descriptive statistic course on the World Wide Web, using Web-based instruction with fourteen graduate students taking the web-based instruction course segment through the web in the School of Education at the University of Pittsburgh.

It was reported that students' attitudes toward the web-based instruction, including the structure and content, components and features, interface design, and multimedia function were generally positive. Students also commented that the design of effective web-based instruction demanded clear and specific instructional objectives utilizing available components and features of the web, including interaction and feedback.

Using the World Wide Web to integrate language and culture has been examined by many researchers. Osuna and Meskill (1998), for example, investigated the potential role of Internet resources as a means of gaining a deeper sense of the culture of the Spanish-speaking world by thirteen undergraduate students enrolled in the first college trimester of Elementary Spanish. The results of the research revealed that the Web is a suitable tool to increase language and cultural knowledge, as well as a means to increase motivation.

Vate-u-lan (2001) studied learning achievement of Mathayomsuksa 4 students learning social studies on general knowledge about states, democracy, and dictatorship through the computer network. The study was carried out with 90 students in an experimental group and 90 students in a control group at the University of Srinakarinrawirot Demonstration School, Bangkok. The research results showed that learning achievement of students learning through the computer network were significantly higher than those of students learning by the traditional classroom instruction at the level of .01, and students had a positive attitude toward learning through the computer network.

Smith, Ferguson, and Caris (2001-2002) investigated and described the current instruction experience of teaching college courses over the Web versus in

face-to-face formats in terms of the teaching strategies, social issues, and emergent issues. Interview fragments were categorized and counted for frequency to highlight emerging trends. Results indicated that teaching Web-based classes has many positive aspects, such as forcing the instructor to think about the course material in new ways, access to a profusion of informational resources over the Web, deeper class discussions involving all students in the class, and a class environment where there is greater equality between students and instructor.

Thorsteinsson, Espinoza, and Justice (2002) studied the advantages of a computer network in language learning and teaching. The purpose of this research was to determine what activities were reported as fostering successful use of the Icelandic Educational Network or IEN which was the only educational network in Iceland, and most schools at the primary and secondary levels were connected to the network. The research findings showed that the IEN was an important instrument in keeping up with the latest developments in education. It was discovered that the participants used the IEN in their quest to do well and improve learning. The information available via the World Wide Web assisted educators in finding authentic teaching materials. It was also found that email and the will to communicate electronically with friends and peers motivated participants to utilize the IEN.

With regard to a review of related literature, it was found that learning through a computer network is a new way of language learning and teaching which can help learners learn more effectively. Moreover, positive attitudes toward a new way of learning and teaching can be enhanced.

In addition to the problems of learning and teaching English as well as the usefulness of the Internet and the World Wide Web stated above, the researcher realizes the advantages of using the Internet and the World Wide Web for learning and teaching English. Therefore, the researcher aims to develop the web-based instruction on relative clauses in order to help students improve reading and writing skills, to help students have higher English learning achievement, and to explore students' attitudes toward learning through the web-based instruction.

1.3 Purposes of the Study

The three main purposes of the study are:

1. to develop the web-based instruction on relative clauses,
2. to compare English learning achievement of students in both an experimental group and a control group, and
3. to explore students' attitudes toward learning through web-based instruction.

1.4 Research Hypothesis

The following are the research hypothesis of the present study :

1. The English learning achievement of students taught by the web-based instruction is higher than those of students taught by the teacher's manual.
2. Students have positive attitudes toward learning through web-based instruction.

1.5 Scope and Limitations of the Study

The present study aims at developing web-based instruction on relative clauses, and comparing students' learning achievement of Mathayomsuksa V Science-Math programme students taking English 13 (E019) in the first semester in

the academic year 2002 at Kham-sakaesaeng School. Thus, the samples of the study may not be representative of Mathayomsuksa V students studying in other programmes at Kham-sakaesaeng School and in other schools.

1.6 Definitions of Key Terms

1. "**Students**" refers to Mathayomsuksa V students who learned English 13 (E019) in the first semester in the academic year 2002 at Kham-sakaesaeng School, Kham-sakaesaeng District, Nakhon Ratchasima.

2. "**Web-based instruction**" is a web site designed to teach English grammar on relative clauses for Mathayomsuksa V students at Kham-sakaesaeng School. It was constructed by the researcher using hypermedia programmes. It can be delivered through public or private computers, and displayed by a web browser.

3. "**Attitudes**" refers to opinions about learning through the web-based instruction on relative clauses.

1.7 Expected Outcomes

The followings are results expected from this research.

1. The web-based instruction on relative clauses is developed based on 80/80 standard criterion.

2. Students learning through the web-based instruction have better English learning achievement.

3. Students have positive attitudes toward learning through the web-based instruction.

1.8 Outline of the thesis

To achieve the purposes of the study, the researcher first reviews related literature and previous research. This is developed in Chapter 2 and includes a

literature review on network-based language teaching, constructivist theory, the idea of learning environment, and language learning process. Then, the Internet and the World Wide Web in English as a second or foreign language learning and teaching focus are described. It also includes the definition and features of web-based instruction. Lastly, previous research on web-based learning environment is included and analyzed.

In Chapter 3, a research procedure will be presented. It discusses the main research method including variables, sampling, instruments, construction and efficiency of instruments, and data collection. The data analysis will be included in the last part of this chapter.

Chapter 4 describes and discusses the results of the research findings of the present study.

Finally, Chapter 5 summarizes the main findings of the present study in response to the research hypothesis, including discussions of the research results and recommendations for further studies.

1.9 Summary

In this chapter, the researcher has given a description of the significance of the study. This was followed by purposes of the study and research hypothesis. Then, the scope and limitations of the study, the definitions of key terms, and the expected outcomes are presented. Lastly, the outline of the thesis is concluded.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction and Purpose of the Chapter

This chapter deals with a large body of related literature on network-based language teaching, constructivism theory, the idea of a learning environment, and the language learning process. The use of the Internet and the World Wide Web in English as a foreign language learning and teaching and web-based instruction are also reviewed. Lastly, the chapter concludes with previous research on web-based learning environment.

2.2 Network-Based Language Teaching

Network-based language teaching is language teaching that involves the use of computers connected to one another in either local or global networks. It represents a new and different side of computer-assisted language learning, where communication is the focus. Learners can communicate either on a one-to-one or a many-to-many basis in local-area network. Therefore, opportunities for communicative practice of learners have been increased. To date, although the changes in language teaching have shifted from structural to communicative perspectives, there is an overlapping of three theoretical movements: structural, cognitive, and socio-cognitive. Each of these three theoretical perspectives has influenced how computer technology has been used in language teaching (Kern and Warschauer, 2000).

Kern and Warschauer (2000) stated that in structural perspective, language teaching emphasized the formal analysis of the system of structures that make up a language. Audiolingual teaching focused on spoken language. John Watson and B.F. Skinner conceived of language learning as habit formation. Students practiced dialogues and pattern drills designed to condition learners to produce automatic and correct responses. In other words, the emphasis in speaking, reading, and writing was the achieved linguistic product, not built on cognitive or social processes.

In exploring a cognitive or a constructivist perspective, B.F. Skinner's behaviorist notion of language learning was rejected by Noam Chomsky (1959). It was argued that since speakers of a language can understand and practice numbers of well-formed utterances, language competence could not be explained by a model based on imitation and habit formation. Language learning had come to be understood not as conditional response, but as an active process of generating and transforming knowledge.

From a sociocognitive view point, the term "communicative competence" was coined by Hymes (1971). Grammaticality was not separable from social acceptability, nor was cognition separable from communication. That is, communicative process became as important as linguistic product, and instruction became more learner-centered (Kern and Warschauer, 2000).

With this shifting context of structural, cognitive and sociocognitive perspectives, one can understand changes in how computers have been used in language teaching, especially the role of network-based language teaching.

Kern and Warschauer (2000) also pointed out the role of computer-assisted language learning or CALL in structural, cognitive, and sociocognitive perspectives as follows.

Structural approaches to CALL The earliest CALL programmes consisted of grammar and vocabulary tutorials, drill and practice programmes, and language testing instruments. The programmes were designed to provide immediate positive or negative feedback to learners on the formal accuracy of their responses. It emphasized repeated drilling on the same material.

Cognitive approaches to CALL Constructivist generation of CALL was a significant advance over earlier tutorial and drill programmes. With a cognitive view of learning, learners construct new knowledge and utilize their existing knowledge to develop new understandings.

Sociocognitive approaches to CALL The dynamic was shifting from learners' interaction with computer to interaction with other humans via the computer. The basis for this new approach to CALL lies in both theoretical and technological developments. Theoretically, there has been an emphasis on meaningful interaction in authentic discourse communities. Technologically, there has been the development of computer networking, where a computer is used as a vehicle for interactive human communication. Computers can play the role of mediational tools that shape the way we interact with the world, such as accessing and organizing information through databases, spreadsheets, and word processors. Computer networking allows a powerful extension of the computer as a tool which facilitates access to other people and to information and data.

Computer networking in the language classroom arises from two important technological developments, computer-mediated communication and globally linked hypertext. Computer-mediated communication or CMC allows language learners with network access to communicate with other learners or speakers of the target language in both asynchronous and synchronous modes. Through tools such as electronic mail, or Internet Relay Chat which allows learners all around the world to have a simultaneous conversation. Computer-mediated communication permits not only one-to-one communication, but also one-to-many communication. Therefore, teachers or students are allowed to share a message with a small group, the whole class, or an international discussion involving hundreds or thousands of people. Globally linked hypertext and hypermedia, as shown in the World Wide Web, represents a new medium for organizing, linking, and accessing information (Kern and Warschauer, 2000).

In short, a conceptual rationale for network-based language teaching in terms of trends in language acquisition theory and educational theory has been described. The three shifting perspectives, which are structural, cognitive, and sociocognitive, have influenced how computer technology has been used in language teaching.

2.3 Constructivism Theory

Constructivism is a theory of knowledge and learning (Fosnot, 1996 quoted in Liaw, 2001). The constructivist believes that knowledge is not transmitted by the teacher to the students. Rather, the teacher helps the learners to construe their own meaning (Jonassen, Peck, and Wilson, 1999, quoted in Duhaney, 2001).

It is believed that meaning is imposed on the world rather than existing in the world independently of us. It was stated that :

“The most important epistemological assumption of constructivism is that meaning is a function of how the individual creates meaning from his/her experiences. What we know is internally generated by the individual rather than received from any external source” (Jonassen et al, 1993, quoted in Boyle, 1997, p.232).

Similar ideas presented by McDonough (2001) is that knowledge is constructed by the individual, as she said,

“Constructivists believe that knowledge is *constructed* by the individual rather than *transmitted* to the individual. People make sense out of whatever they experience by constructing their own meaning based on what they already know, and how they perceive the new information. In this view of learning, it is assumed that one individual cannot fully understand anything in exactly the same way that another individual understands it. Meaning making, Jonassen (1999) explains, is at the core of constructivist philosophy” (p.77-78).

From this perspective, teachers should try to create classroom conditions in which learners actively construct their own learning. Liaw (2001) has drawn up a list of six characteristics of constructivist learning environments. These environments are : Firstly, providing multiple representations of reality. Secondly, emphasising on knowledge construction. Thirdly, placing the focus on authentic tasks in a meaningful context. Fourthly, encouraging thoughtful reflection on experience. Fifthly, enabling context dependent and content-dependent knowledge construction. Lastly, supporting collaborative construction of knowledge through social negotiation.

There are some general principles about learning which are derived from the theory of constructivism. The principles are as follows.

Firstly, 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. Put simply, learners should be allowed to raise their own questions, generate their own hypothesis and test them for viability.

Secondly, disequilibrium facilitates learning. Errors need to be reviewed, not avoided. Learners should be offered challenging, open-ended investigations in realistic and meaningful contexts.

Thirdly, 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 reflective abstraction.

Lastly, 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 (Fosnot, 1996, quoted in Mcdonough, 2001).

In constructivist learning theory, modern technology offers opportunities to be exploited in language learning. This approach now directs much of technology-based teaching and learning. It contends that for students to learn through a computer-based learning environment, the materials must engage the learners and support cognitive processing leading to knowledge construction (Reeves, 1993, quoted in Oliver, Omari, and Herrington, 1998). The materials, such as graphical or visual aids, are seen as valuable external aids to support their internal mental activity (Fosnot, 1984, quoted in Brown and Kerr, 2000).

As pointed out by Mcdonough (2001), the technology which support constructivist learning theory is the use of the World Wide Web. For example, in one exercise, the student answers multiple choice questions which are comprehension checks on vocabulary. If the student answers correctly, a piece to a puzzle appears. If all the questions are correctly answered, the completed puzzle becomes a picture of something authentic within the target culture. That picture is a link to relevant sites on the World Wide Web, so the learners may click on the picture and go exploring topics relating to the target culture. This is the opportunity for discovery learning, constructing one's own meaning at one's own pace.

As it is seen that technology, especially computers, become a powerful tool if it uses teaching strategies with a solid theoretical basis. Constructivist theories of learning can be used to show that technology can be a useful tool in language learning and teaching (Duhaney and Duhaney, 2000).

In conclusion, constructivism emphasizes the learner rather than the teacher. Constructivist views learners learning by adding new information to what they already know. It is believed that learners learn best when they are involved in the

process of understanding, and the instructional materials have to engage the learners and enhance the process of knowledge construction.

2.4 The Idea of Learning Environment

A learning environment is the place or space where learning happens. A learning environment is a setting or space wherein learners collect and interpret information, interact with other people and so on. The environment gives learners room to explore, determine goals and participate in learning activities. In other words, the learning environment is a place where learning is fostered and supported. When learners are given access to information resources, such as books, print and video materials, word processing programmes, e-mail, and search tools, they are likely to learn something. However, the access to information resources and tools has to be given with proper support and guidance (Wilson, 1996).

Understanding and creating an optimal language learning environment is the pedagogical task of language teachers. Egbert, Chao, and Smith (1999) pointed out the conditions for optimal language learning environment. Those conditions are, first, language learners should have opportunities to interact and negotiate meaning. It is noted that learning is the result of interaction between learners and others, and learning is also a social process. Therefore, the interaction with other people is necessary. Moreover, learners have to interact in the target language with an authentic audience. It means that language learners have a purposeful interaction. They are involved in authentic social interaction in the target language with a knowledgeable source, for example, the teacher, another learner or another person who can negotiate in the target language. Besides, learners are involved in authentic tasks. Learners involve not only a real audience, but also an authentic goal for their

work. In addition, learners are exposed to and encouraged to produce varied and creative language. Furthermore, learners should have enough time and feedback. They must be motivated to take the opportunities presented to them and to be cognitively engaged in their learning process. Furthermore, teachers can help learners by creating a learner-centred classroom so that learners can have control over their learning. Finally, learner autonomy should be supported.

To sum up, to create a fruitful learning environment is an important pedagogical task of language teachers. A learning environment should be provided to support or enhance learning. Learning tools and resources should be given to learners with proper guidance.

2.5 Language Learning Process

In English as a Second Language (ESL) and English as a Foreign Language (EFL) learning, the learning process in terms of its potential meaningfulness is clarified as a process of knowledge development. Knowledge is not stored in individual minds, in texts, and it cannot be transmitted from one person to another. The conception of knowledge is that what learners understand does not have a straightforward correspondence to what they have been told or have read; nor can knowledge be directly transmitted through talk or text (Redd, 1979, quoted in Wells, 1999).

In a language learning process, each learner tries to achieve the management of meaning. Learners can achieve productive and receptive meaning successfully because they integrate linguistic forms and cultural background knowledge into their personal meaning-making mechanisms. Learning is considered

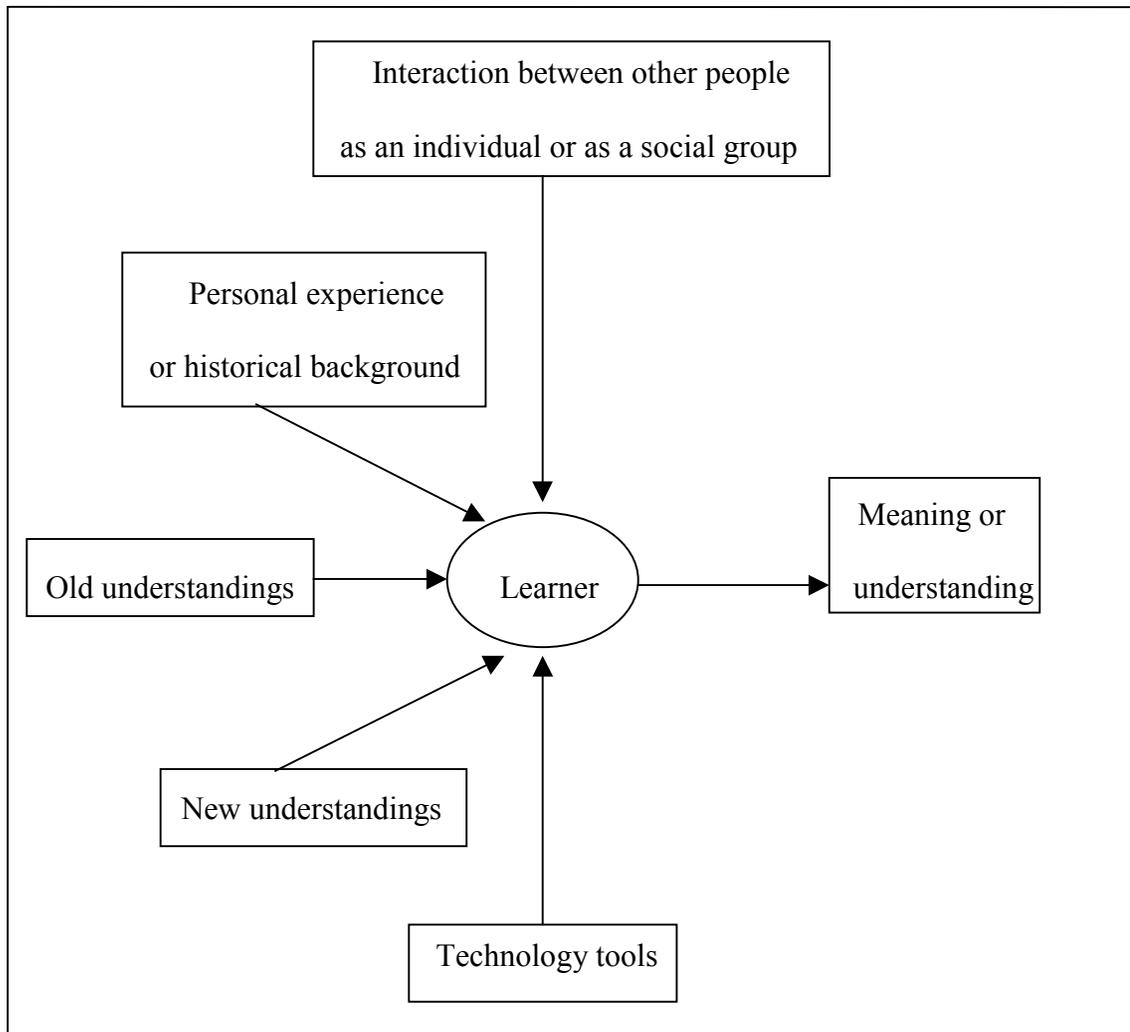
as a meaning-making process in which linguistic knowledge development is embedded in communicative structures (Lian, 2000).

To get to meaning or understanding, learners use personal experience or historical background as well as interaction between other people as individuals and as a social group. Moreover, they construct meaning from pre-existing knowledge. If the new knowledge does not make sense with the former, they have to readjust it in order for it to be effective to meaning (Piaget, 1954).

As pointed out above, it follows that the teachers' task is to create a learning environment that will help learners to understand better. To create a learning environment, teachers assist learners by providing technology tools and using them as aids or means to support learning. Technology tools, such as a computer network, enhance learners to communicate and to get unlimited rich access to authentic texts or information.

The following diagram illustrates learners' language learning process.

Figure : 2.1 : Learner's Language Learning Process



2.6 The Internet and the World Wide Web

In reviewing the Internet and the World Wide Web, the researcher will start with a discussion of definitions of the Internet by different writers. Then, this is followed by the definitions of the World Wide Web.

2.6.1 Definition of the Internet

The term “Internet” is defined differently by different people, however, the definitions share the common features and characteristics of the Internet. Different people give the definitions of the Internet as follows.

Harris and Kidder (1995) stated that the Internet is “thousands of computers all over the world that communicate with each other minute-by-minute over an unbelievably complicated network of cables, fiber optic filaments and satellite links” (p.2).

Lumpkin and Durnbaugh (1995) offered a definition of the Internet as “a collection of interrelated and connected computer networks. They form the largest and most widely used network in the world, which is a source of volumes of information and service”(p.1).

Stout (1996) said that technically, the Internet was not a network of computers. It was “a network of networks. Local networks throughout the world are tied together by wires, telephone lines, fiber-optic cables, microwave transmissions, and satellites in orbit” (p.4).

Ribar (1997) stated that the Internet is a huge collection of networks, spread out all around the world. It has been described as “ a network of networks ... The Internet uses cables and phone lines to connect everything together very similarly to most office networks” (p.2-3).

From the definitions of the Internet produced by different writers, it can be said that the Internet is a worldwide network of networks that communicate with one another over cables, satellites, optical fibers and phones by using the Internet Protocol. When the computer networks are linked, people can make use of the

Internet for communicating and sharing information resources. In other words, the Internet allows people to communicate with people from all over the world and use the services they offer.

2.6.2. Definition of the World Wide Web

There are many writers reporting and determining the World Wide Web's terms as follows:

Eager (1994) stated that the World Wide Web is “an Internet-based navigational system, an information distribution and management system, and a dynamic format for mass and personal communications” (p.39).

Neou (1994) explained that the World Wide Web is “a hypertext and hypermedia system that spans the Internet. ... A hypertext link is just some information in a document that provides information on where additional information can be found” (p.33).

Hunt (1998), who has similar ideas to Ribar, explained that the WWW is “an interlinked network of hypertext servers based on the Hypertext Transfer Protocol (HTTP) that runs on top of TCP/IP. The Web is accessed via a browser, a programme that provides a consistent graphical interface to the user” (p.405).

From the World Wide Web's terms introduced above, it can be concluded that the World Wide Web is a system that is designed to access documents or information online over the Internet. The Web uses the concepts of hypertext and hypermedia to link related information in a document so that one can follow connections from one document to the next.

2.7 The Internet and the World Wide Web in ESL/EFL Learning and Teaching

As we know, the multimedia-networked computer, which is one of the advanced technologies, has had a considerable impact on language learning and teaching nowadays. It offers a lot of benefits in English as a second and a foreign language learning. There are a lot of discussions on how the Internet and the World Wide Web can support language learning and teaching.

The advantages of the Internet include the convenience of sending international messages to many receivers, and the access to enormous quantities of text, computer programmes, and multimedia resources (Barron, 1995, quoted in Barron and Ivers, 1996). There are various kinds of Internet services, such as, the World Wide Web or the WWW, electronic mail, newsgroup, and chat. Currently the World Wide Web plays an important role in education. Language teachers incorporate the WWW into their teaching. Boswood (1997) suggested that through activities on the web, learners will develop and build many skills, such as reading skills (skimming and scanning), and writing skills (paraphrasing and summarizing).

The WWW provides not only authentic materials, but also interaction among language learners and teachers. A wider communication is free from time restrictions and distance limitation. Learners can access a wider variety of teachers and learners, both native and non-native speakers of the target language all over the world (Hoffman, 1996). Therefore, offering learners the opportunity to interact with native speakers outside language classrooms helps learners acquire cultural background of the target language as well.

To sum up, the Internet and the World Wide Web can enhance language learning and teaching in three main ways. Firstly, it offers a vast resource for both learners and teachers. Secondly, it offers the possibility of interaction between student-student, student-teacher, and student and other people or experts. Thirdly, it offers authentic materials which can be found to make classroom teaching more real and attractive for students.

2.8 Web-Based Instruction

2.8.1 Definition of Web-Based Instruction

Web-based instruction or WBI was defined by Khan as a hypermedia-based instructional programme which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported (Khan, 1997).

Web-based instruction, also called web-based training (WBT), was given a definition by Clark (1996) as, “Individualized instruction delivered over public or private computer networks and displayed by a Web browser” (p.1-2).

Relan and Gillani (1997) defined web-based instruction as the application of a repertoire of cognitively oriented instructional strategies within a constructivist and collaborative learning environment, utilizing the attributes and resources of the World Wide Web.

Web-based instruction is a method of delivery instruction over the World Wide Web. Web-based instruction involves hypermedia elements. This kind of instruction uses WWW pages to support educational activities (“Web-Based Instruction,” n.d.).

Fuchs and Szabo (1997) stated, “web-based instruction is 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” (p.1).

Fuchs and Szabo (1997) also explained that web-based instruction can be divided into three categories. These are stand-alone courses, web-supported courses, and web teaching resources. The first two categories involve whole courses whereas the third category deals with educational activities, experiences or resources which could be part of a course. For stand-alone courses, materials and resources are accessed and delivered by the Internet. This kind of web-based instruction can take place on a campus where students are physically present. In web-supported courses, students and teachers can actually meet. Activities such as assignments, reading, computer-mediated communications are integrated into the course activity. For web teaching resources, the World Wide Web is used to offer materials that could be integrated into a larger course or serve as a resource for an educational activity. These resources, for instance, can be texts, graphics, animations and communications.

Generally speaking, web-based instruction is an innovative approach which takes advantage of the Internet and the World Wide Web, and the resources of the web are used to create a learning environment.

2.8.2 Features of Web-Based Instruction

Web-based instruction consists of interactivity, online searches, cross cultural interaction, and is not restricted by time limits. Interactivity refers to students, teachers, or experts communicating among with each other, providing

support, feedback, and guidance. Online searches means that students can find online resources to support course content and resources. Time independent refers to students' participating in this learning environment at their convenience. Cross-cultural interaction means that students and teachers can communicate with other people throughout the world to explore ideas, cultures, and civilizations (“Web-Based Instruction,” n.d.).

Web-based instruction is a powerful way to support a learning environment. There are several ways that web-based instruction can be used :

Firstly, it can be used for information resources. As we know, there are millions of potential WWW sites, therefore, these sites can be used to support student research, discovery, and exploration.

Secondly, web-based instruction can be used for supporting materials, assignments, lesson or course information. Students can access materials that teachers put in a central place or on the web site. For example, teachers create a workbook for a lesson, including text, graphics, links to other sites, and then 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.

Thirdly, 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.

Finally, complete courses can be offered through this kind of teaching. That means an entire class online or entire programmes can be taken by students. For this entire learning experience, teachers might not see their students at all (“Web-Based Instruction,” n.d.).

As mentioned above, web-based instruction takes advantage of the Internet and the World Wide Web. The web offers many features for both learners and teachers. Web-based instruction can be seen as an integral part of instructional activities.

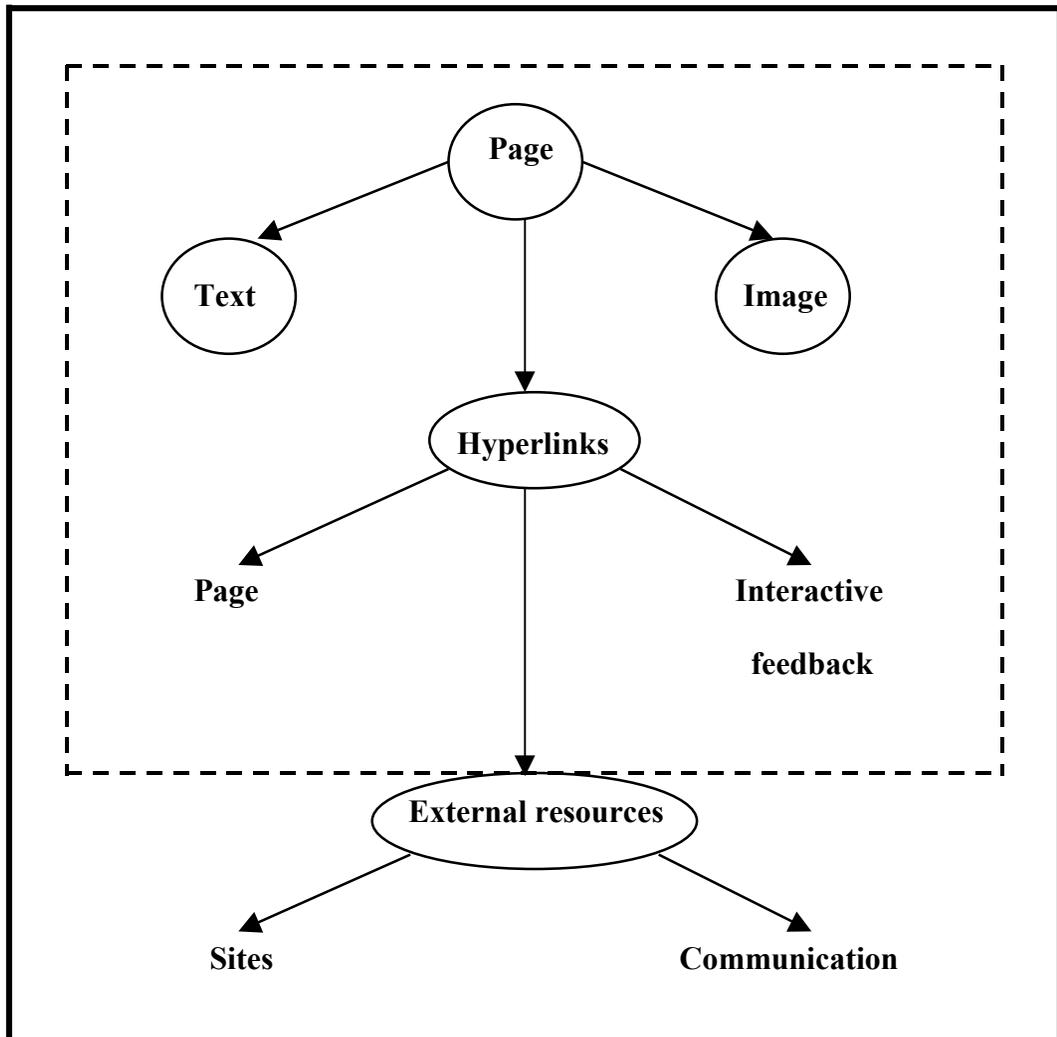
2.8.3 Designing Web-Based Instruction

To create an effective web-based instruction site, a great deal of design knowledge is needed. Ritchie and Hoffman (quoted in Latham, 1998) suggested a well-designed web-based instructional site,

“When properly structured, pages can guide users through a series of instructional activities which present information, afford practice, and provide feedback to inform users of the strengths, weaknesses, and suggestions for enrichment or remediation” (p.1).

McCormack and Jones (quoted in Latham, 1998) noted, “The design of a web-based classroom must draw on technical, educational, artistic, design factors, and personal preference” (p.93). That is to say, web-based instruction needs the combination between the instructional design and web design. The framework of instructional web site design by Hall is presented in Figure 2.5.

Figure 2.2 : Instructional Web Site Design Model



Source : Hall, Appendix

From this design model, Hall explained that the basic starting point of web site design is the page, which displays a text and image. The other basic component page is made up by links. The links are the beginning point for determining the overall structure of the web sites. The self-contained site is represented by the area inside the dotted box, and the external web is represented by the area outside. The web-based instruction without external web is only a self-contained hypertext or hypermedia programme.

For the hypertext, it offers a lot of benefits in a classroom. Hofstetter (1994) stated that hypertext can be used beneficially to represent learning topics, objectives, lessons, and learning resources as he pointed out:

“Hypertext is especially well suited to the classroom because of the way in which curriculum is organized. The course syllabus consists of a list of topics to be covered in class. Each topic has a list of objectives that must be met. Lesson plans are designed to teach each objective. The lesson plan use learning resources to meet the objectives. This curriculum structure of topics, objectives, lessons, and learning resources can be thought of as a multidimensional web that can be represented by hypertext, which teachers can use to have instant access to any topic, objective, lesson plan, or learning resources” (p.11).

Reynolds (1998) suggested that the web designer should realize the link of hypertext to other sites. He stated,

“the designer must be aware that hypertext linking to various sites requires constant scrutiny. First, since HTML is easily implemented, anyone can create a site and pass themselves off as experts. It’s therefore advisable to check out a site’s credibility before including it as a link. Secondly, sites change their Uniform Resource Locate (URL, the location description of a site) which means that a hypertext link within the HTML document may be wrong after a period of time” (p.165).

However, a self-contained hypertext environment does not always have to be located on the World Wide Web. These within-site links can include interactive activities where learners are able to respond to some types of questions or exercise provided by the instructor (Hall, n.d.).

Latham (1998) suggested that to create effective instructional web sites with the combination between instructional design and web design includes three main sections; instructional design, site design, and page design.

2.8.3.1 Instructional Design

In instructional designing, the design issues related to web-based instruction will be considered.

As pointed out by Latham (1998), there are six frameworks for the delivery of web-based instruction.

1. Information delivery which provides easy delivery of course materials such as the syllabus, lecture notes, and assignments.
2. Information delivery with pre-defined resources which provides course information and also links to other web resources.
3. Information delivery with online interaction. This means that web-based instruction offers some kind of communication by e-mail or web boards, for example.
4. Pre-designed instructional delivery. It means that pre-designed instructional modules with discrete chunks of information, learner's response and feedback are included.
5. Information synthesis and creation of resources. This issue links to a constructivist view, in which students are asked to locate, organize, and synthesize information such as, in the form of a webography or individual web pages.

6. Immersive collaborative environments. To create these environments, simultaneous communication can be used by the students.

2.8.3.2 Site Design

The second section to be considered when creating effective web-based instruction is web site design. Latham (1998) stated that good web site design consists of three factors; organization, orientation, and navigation.

Organization is the way in which pages are arranged on a particular site. According to Latham (1998), to organize a web site is to group the elements in ways that a user is able to predict where certain kinds of information can be found. There are four ways in which web pages are organised.

The first type of organisation is *linear* (Oliver, et al., quoted in Latham, 1998). It means that the web structure is similar to the structure of a book, moving through the pages one after the other. The second type of organization is *grid*. In this type, each column and each row of pages would be linked, but there would be no cross linking like from the top of column one to the middle of column two. The grid shows that everything is of equal weight or value. The third type of organisation is *hierarchical* (Lynch and Horton, quoted in Latham, 1998). It means that sub pages branch off from a main page. This web-organization type is a good way to show the relationship between topics and sub-topics, or between the whole and its part. The organised hierarchical web may be a deep/narrow structure or a shallow/broad structure. A deep/narrow structure refers to the structure with three or four levels of pages each branching from the level above it, whereas a shallow/broad structure refers to the structure with only one level of pages branching from the main page (Latham, 1998).

The fourth type of organisation is *free form*. This type of organization is called “web,” “referential linking,” “eclectic,” and “hypermedia” (Lynch and Horton, Oliver, et al., James, McCormack and Jones, quoted in Latham, in 1998). It is a web where any given page is linked in all directions to any other given page, it is like a free flow of ideas. This method supports students in building on prior knowledge by discovering their own paths to new knowledge (Oliver et al., quoted in Latham, 1998).

Orientation is one of the important factors in designing good web sites. Latham (1998) stated that it is the way the user is made aware of where he is with the site at any given time. There are many ways to show learners where they are within the web sites. The easy way is to use colour-coded banners or bars on pages. For example, a course web site has four parts, syllabus, assignments, reading, and class notes. Each page in the syllabus section should have a blue bar at the top, and assignment pages have a red bar. The clear labelled pages can tell learners where they are within the site.

Designing good web sites also involves navigation. Latham (1998) suggested that navigation is the means by which a learner can move from one page to another, within the web site or outside the web site. To do this, a learner can click on a text anchor or navigation button, and a graphic identifier. A text anchor or a navigation button includes a visual cue, such as an arrow, or a textual cue, such as the word “Home.” Each page should include a link to get to the next page or the previous page (Nielsen, 1996).

2.8.3.3 Page Design

Besides instructional design and site design, page design is another factor to be considered in the design of a web-based classroom. Students may find it easy to read, follow, or understand a well designed web page.

Shotsberger (1996, quoted in Reynolds, 1998) pointed out three important features to designing web pages:

1. Limit links to those that are important to the topic and avoid presenting these links in a red format. Information should be organised for easy understanding;
2. Use a consistent format in order to enhance comprehension;
3. Avoid overloading students with inappropriate, extraneous or redundant materials. Instead, cute animations and blinking titles could be put on some pages.

Latham (1998) pointed out that page design consists of six basic categories: page content, page elements, layout, typography, illustration, and page size. Each element will be clarified as follows:

1. Page Content

Page content depends on the purpose of the page. Oliver et al. (quoted in Latham, 1998) said that page content intend to be instructional. In the page, key terms should be defined in the text or linked to a glossary. Literal and inferential questions should be placed throughout the text to stimulate thought. To introduce materials, overviews should be used, and summaries should be included to review material.

2. Page Elements

Page elements involve three main parts, the header, the body, and the footer. The header may include the banner or logo, the title and subtitle, and the

navigation bar. The header should not take more than about the top third of the screen. The body of the page may contain a section title or page title and the content of the page. The footer should include the navigation bar and the instructor's name and the date of revision (Jame, quoted in Latham, 1998).

3. Layout

Lynch and Horton (quoted in Latham, 1998) suggested that the graphic balance is an important thing to be considered in a page. It should be balanced between text and graphics. A page with the full text is not very interesting, and the page full of graphics may lack information value. Furthermore, visual elements should be given consideration. Visual elements are, for example, between background and text or between text and graphics Williams and Tollett 118 (quoted in Latham, 1998) suggest that contrast between visual elements can create a visual hierarchy of information.

Designers should use space in the margins and between chunks of text to break up the page and create visual interest. In general, backgrounds should be light while text should be dark in order to make a contrast, making the text clear.

4. Typography

Lunch and Horton (quoted in Latham, 1998) suggested that web page should not have text that has wide columns. The line length should be between forty and sixty characters to avoid eye strain and fatigue.

5. Illustration

On a web page, the graphics may be included in order to help the viewers understand the content more clearly. However, instructional graphics should be used carefully. The designer should avoid the "image for image sake" mentality, but

should use images to clarify or illustrate textual content (Compute Services, NC State University, quoted in Latham, 1998).

6. Page Size

Page size refers to page length and file size. From an instructional point of view, it is necessary to think about how much information to be included on a page. MaCormack and Jones (quoted in Latham, 1998) suggested that no more than five elements per page be used because most people's short term memory can handle no more than five pieces of information at a time.

In conclusion, web-based instruction is a new way of teaching and learning supported by the use of the Internet and the World Wide Web. To create an effective web-based instruction, one should consider the instructional web site design. The site designer have to be careful to provide the learner with instructional web-based environment. The text or information, or graphics have to be taken into consideration. The web-based instruction designer should make use of the diversity of resources available on the web to enrich instructional materials as well as make use of the interactive and collaborative learning from the World Wide Web. This paradigm of instruction can lead to creating learning environment if learners are provided effective web-based instruction. Hence, learning will happen.

2.9 Previous Research Studies on Web-Based Learning

Environment

Many of the initial studies of new technologies in education were directed towards the web-based learning environment. The primary purpose of this section is to describe a survey of research of learning on the hypertext networking environment and web-based instruction carried out by different researchers in different contexts.

As we know, the hypertext networking environment, known as the World Wide Web (WWW) gives opportunities to access powerful sources of information which can be used for teaching and learning, based on hypertext and hypermedia. Such powerful sources as WWW based instructional materials can be used and developed to enhance the learning environment. This can be supported by the study of Oliver, Omari, and Herrington (1998). They investigated the impact of various implementation strategies on learner behaviour and learning outcomes from a WWW-based learning activity of sixty university students enrolled on the Multimedia Networking and Communications course. The results showed that the use of collaborative groups and support materials were a useful implementation in their nature and scope and supported a high level of learner autonomy.

Hambrick (1997) investigated the effects of World Wide Web use on the problem solving ability of fifth grade students at the Casita Elementary School in Vista, California. The results of the study indicated that World Wide Web use did enhance problem solving abilities. Students spending more time on the World Wide Web had greater increase on the IPSP (Iowa Problem Solving Project) Problem Solving Test than students from the control group.

In a study of University Faculty and student perceptions of web-based instruction, Daugherty and Funke (1998) examined perspectives of University Faculty members and students involved in web-based instruction. The study was carried out with nineteen graduate students and thirty-six undergraduate students enrolled in web-based instruction coursework at a southeastern University. Students and faculty members were surveyed on the advantages, disadvantages, and general effectiveness of using the Internet as a teaching and learning tool. The research

findings showed that the student benefits included a more meaningful learning of technology through the integration of course content and computer applications, as well as greater access to current and global content information, motivation, and convenience. Some of the disadvantages which were identified were lack of technical support, lack of software and/or equipment, lack of faculty or administrative support, as well as the amount of preparation time required to create assignments, and student resistance.

Russell (1998) examined the impact that complete hypertext and focused hypertext design had on the cognitive process. The study used two identical computer based lessons. One set of lessons used a complete set of hypertext resources that supported all of the learning objectives throughout the lessons. The other one focussed on the hypertext resources by limiting them to the immediate learning objective. The research results indicated that there was a significant difference on the means score of the pre-test and post-test, as well as the means of the measures of interactivity and navigational options.

Wang (1998) studied the learner control with advice in a web-based learning environment. The research was carried out with undergraduate students at the National Taiwan Normal University in Taipei, Taiwan. The research questions were:

- a) whether learner control with advice would effect an English-as-foreign-language distant learner's task performance in a web-based learning environment ;
- b) whether a distant learner's prior English skill would effect task performance under learner control with advice ;
- c) whether a distant learner's preference toward hypermedia elements could be the major effect to influence performance under learner control with advice in a web-based learning environment.

The research findings indicated that the distant learners' scores improved significantly in both web-based learning methods. However, the score of the learner-control-with-advice group was significantly higher than another group. A distant learner's prior English skills did not significantly effect task performance under learner control with advice. Moreover, a distant learner's level of preference toward hypermedia elements did not significantly effect task performance in a web-based learning environment.

Zhuo (1998) examined the relationships among hypermedia-based instruction, cognitive styles, and teaching subject-verb agreement to sixteen adult ESL learners to find an effective way to teach grammar. It was found that the hypermedia-based instruction was very effective for grammar teaching and learning. However, there was a significant difference related to learning time of the cognitive style groups and a significant two-way interaction between cognitive style and treatment.

Bronack (1998) conducted a study of an analysis of the impact of a web-based, case-based learning environment, called CaseNET, on teachers' abilities to make decisions about an innovation such as web-based instruction. Bronack reported in his study that there was no significant difference in the problem solving abilities between the CaseNET and non-CaseNET students during the time examined. However, there was a significant difference between the CaseNET and the non-CaseNET students with regard to the innovation of web-based instruction.

In a study of students' perceptions of the web as an information source, Lunsford (1999) explored one hundred and ten undergraduate business students' perceptions of the accuracy, relevance, and currency of information presented on the World Wide Web. The students enrolled in various sections of an introductory

Management Information System course, and they were asked to rank various information sources in terms of perceived accuracy, relevance, and currency. The information sources studied included the Web, business magazines, scholarly journals, general-interest magazines, and books. The findings indicated that the subjects perceived the Web to be more accurate than several other information sources, and newspapers and the Web were equal in terms of currency.

Kitchen and Mcdougall (1999) conducted a study of students' perceptions of the educational value of collaborative learning when using the Internet for course delivery with twenty six students from both Master and Doctoral programmes. The results of the study showed that although the students enjoyed the convenience and opportunities for collaboration, a number of dissatisfactions were expressed concerning the instructional strategy and the delivery medium.

The students' participation in whole-class, face-to-face discussions and in World Wide Web-based bulletin board discussions in a TESOL teacher preparation course titled *Methods of Teaching Second Languages* was investigated by Kamhi-Stein (2000). The participants in this study were twenty students enrolled in *Methods of Teaching Second Languages*. Participation patterns and attitudes toward the Web-based discussion were identified through quantitative and qualitative analyses. The research results revealed that the students contributed a substantially larger number of turns in the Web-based bulletin board interactions than the instructor did, and the students also had positive attitudes toward Web-based bulletin board discussions. The results appeared to indicate that the integration of Web-based instruction helped future ESOL teachers develop knowledge through collaboration while increasing the growth in their experience in learning through technology.

Hajizainuddin (1999) investigated the influence of learning styles and hypermedia's organizational structures on learning in a web-based instructional environment with sixty-three graduate students in a Diploma of Education programme at the International Islamic University, Malaysia. The results of the research showed that there were no significant relationships between the information processing characteristics of learning style and performance, and between hypermedia's organizational structure and performance. There were also no significant interactions among the factors of learning style, hypermedia's organizational structure and attitude. However, it was found that there were significant relationships between computer experience and performance on the pre-test, and web experience and performance on the post-test.

Lin (1999) explored the effects of self-efficacy and task values on students' commitment and achievement in web-based instruction for Taiwan higher education with thirty students enrolled in a class on educational technology, at a teacher education institution in northern Taiwan. The results of the study indicated that:

- 1) the higher task value students' perceive; the stronger commitment they make;
- 2) the higher motivation students hold, the easier the task is perceived;
- 3) the training workshop had positive impacts on students' perceived motivation, interest, and importance.

Buchanan et al. (2000) conducted a systematic study to compare traditional classroom instruction with web-based equivalent courses in a graduate programme. The researchers compared the student learning outcomes and perceived effectiveness of several students for credit courses offered via the World Wide Web with

traditional on-campus section of the same courses in the Master of Library and information Science programme at the University of Wisconsin-Milwaukee (UWM). The research findings revealed that there were no significant differences in student performance and that students felt the web-based experience worked well in certain environments.

Praditpong (2002) conducted a study of development of the computer-assisted instruction on life and evolution for upper secondary school students with linkage through the computer network. The sample were 42 upper secondary students of Sripruetta school in Bangkok. The findings were as follows:

1) the efficiency of the computer-assisted instruction lessons through the Internet was 82.92/82.33,

2) the science achievements of the students studied with the computer-assisted instruction lessons through the Internet were statistically higher than before studying at the .01 level of significance,

3) the science process skills of the students studied with the computer-assisted instruction lessons were statistically higher than before studying at the .01 level of significance.

Sukha (2002) conducted a study of the development of a web page model for self-directed learning on the Internet. The purposes of the study were 1) to develop the appropriate web page model for self-directed learning, 2) to study the opinion of the students towards the web page model for self-directed learning, 3) to study the students' needs for learning the content from web page model on the Internet, and 4) to compare the pretest and the post-test of the students' self-directed learning on the Internet. It was reported that the web page model developed in six

aspects; namely content presentation, multimedia material, users' interaction, navigation system, illustration, and menu support were suitable for self-directed learning on the Internet at a high level. Besides, the students' needs for learning the content from the web page model on the Internet were at a high level. The results also showed that students' post-test score was higher than the pretest result with statistically significant difference at the .05 level.

From the research presented above, it can be seen that Web-based instruction has been used not only for distance learning, but also for supporting traditional classroom instruction. Teachers created Web-based learning lessons as a medium to deliver the instruction. The Internet and the World Wide Web were made use of for lesson delivery as well as for hypertext resources that support learning throughout the lessons. As can be seen, most of the research findings showed that learners' performance in a Web-based learning environment was developed. Furthermore, learners' attitudes toward Web-based instruction were generally positive.

2.10 Summary

This chapter first takes a look at the details of network-based language teaching and constructivist learning theory. This was followed by the notion of learning environment, and language learning process. It also explores the Internet and the World Wide Web. In addition, it covers the details on using the Internet and the World Wide Web in language pedagogy. Furthermore, the web-based instruction is described. Lastly, research on web-based learning environment is presented.

CHAPTER 3

RESEARCH PROCEDURE

3.1 Introduction and Purpose of the Chapter

The purpose of this chapter is to describe how the study will be carried out. It explains the research method, population and samples, and research design of the present study. This is followed by a description of variables and instruments. The construction and efficiency of research instruments is also presented. The last part of this chapter deals with how the data obtained are analysed and interpreted.

3.2 Research Methodology

The present study was a quasi-experimental design with both quantitative and qualitative data analysis. The study included two groups ; the control, and the experimental group. The former was taught relative clauses with the instruction based on a teacher's manual, whereas the latter was instructed using the web-based instruction. Prior to the experiment, both groups were measured in their learning achievement by a pre-test. After the experiment was conducted, a post-test was given to all subjects. For the experimental group a classroom observation and the attitude questionnaire were administered. Then, the data obtained were analyzed to find out whether the two groups were significantly different.

3.3 Population and Samples

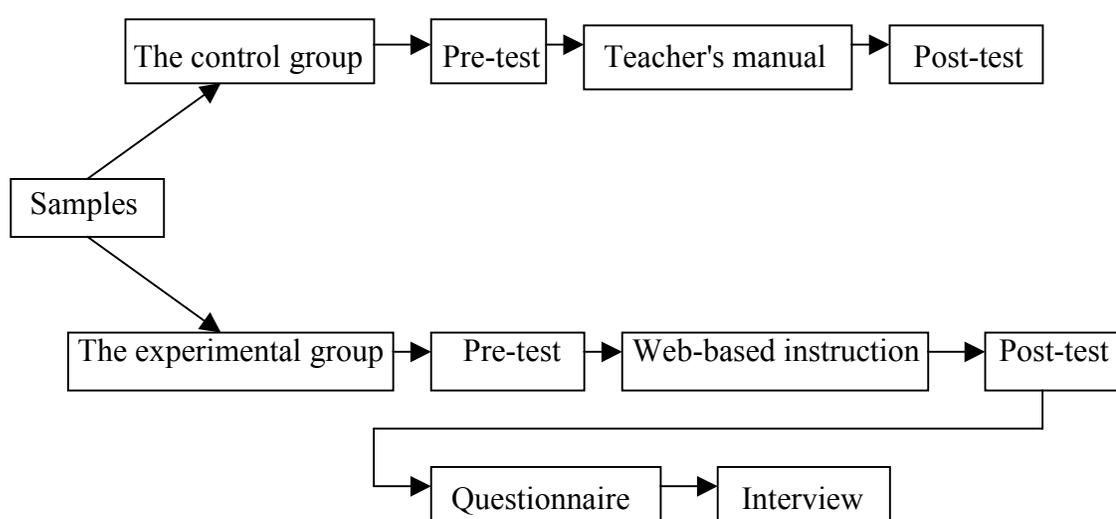
The population were 295 Mathayomsuksa V students who were studying English 13 (E019) in the first semester in the academic year 2002 at Kham-sakaesaeng School, Kham-sakaesaeng District, Nakhon Ratchasima.

A total of 80 Mathayomsuksa V students studying in a Science-Maths Programme at Kham-sakaesaeng School, Kham-sakaesaeng District, Nakhon Ratchasima served as the samples in the study. In Kham-sakaesaeng School, Mathayomsuksa V students were assigned into 7 classes, consisting of 3 classes of science-maths programme, 3 classes of a business programme, and 1 class of a mechanics programme. In each class of science-maths programme, there were students with different English levels. Therefore, a cluster random sampling was used to choose 2 classes out of 3 science-math programme classes. The results were that Mathayomsuksa V class 1 and class 2 were random sampled. Thirty-seven students in Mathayomsuksa V class 1 were assigned into the experimental group whereas forty-three students in Mathayomsuksa V class 2 were assigned into the control group. The experimental group was taught by the web-based instruction entitled relative clauses, while the control group was taught by the instruction based on a teacher's manual with the content of relative clauses. Each group was taught for ten 50-minutes' periods.

3.4 Research Design

Both control and experimental groups were instructed by the researcher in the first semester in the academic year 2002. The control group was traditionally taught by a teacher's manual, whereas the experimental group was taught by the web-based instruction. In order to make sure that the samples can use computer and the Internet, there was 6-hour training on how to use the computer and the Internet for the experimental group. Since the researcher intended to explore students' opinions about learning by the web-based instruction, the questionnaire was administered to the experimental group. The research design can be illustrated as follows.

Figure 3.1 : Research Design



3.5 Variables

As shown above, the theoretical framework indicated two main types of variables; independent and dependent variables.

3.5.1 Independent variables. The independent variables included two types of instruction; an instruction based on a teacher's manual, and a web-based instruction.

3.5.2 Dependent variables. The dependent variables which could be affected by the independent variables were students' English learning achievement and attitudes toward learning through the web-based instruction.

3.6 Instruments

The following instruments were used to collect data for this study.

3.6.1 Web-Based Instruction on Relative Clauses The web-based instruction on relative clauses constructed by the researcher was employed by the samples in the experimental group after the pre-test. The web-based instruction was constructed in order to help students learn English grammar on relative clauses.

3.6.2 Lesson Plans

The lesson plans of English 13 with the content of relative clauses were employed by the samples in the control and the experimental group after the pre-test.

3.6.3 Tests

Relative clause tests constructed by the researcher was employed as a pre-test and post-test for both groups of samples. The parallel tests consisted of a multiple choice. The tests were constructed to assess students' learning achievement for both groups. Through students' learning achievement score of relative clause tests, the researcher can see whether students improve their learning.

3.6.4 Attitude Questionnaire

To explore students' opinions about learning by the web-based instruction on relative clauses, attitude questionnaire was used to collect the data.

3.6.5 Classroom Observation

A classroom observation was done by the researcher to observe the behaviour of students during learning through the web-based instruction in a class.

3.6.6 Video Camera and Video Tape Cassette

To observe the classroom activity, a video camera and a video tape cassette was used to videotape students' learning through the web-based instruction.

3.6.7 Semi-structured Interview

To elicit students' opinions about learning through the web-based instruction, students were asked to express their opinions or comments about learning through the web-based instruction.

3.7 Construction and Efficiency of the Instruments

The construction and efficiency of the research instruments was carried out after consulting research professionals and research specialists. The standard criteria used to determine the efficiency of the web-based instruction on relative clauses was 80/80 (Promwong, 1978). It was stated that the criteria for content-based subject can be 80/80 to 90/90, but for skill-based subject, it should be 75/75, but a low criteria should not be specified (Tanhikorn, Rodpotong, Pichitpornchai, and Saengsap, 2001). The procedures of instrument construction and the determination of the instruments' efficiency were as follows:

3.7.1 Web-Based Instruction on Relative Clauses

The web-based instruction on relative clauses was conducted by the researcher. The followings were the steps of the construction and efficiency evaluation of the web-based instruction.

1. The researcher studied a curriculum for upper-secondary level of the English subject for Mathayomsuksa V.
2. The researcher reviewed related literature on relative clauses.
3. The researcher studied on how to create a web site by using a Dreamweaver Programme, Version 4.0.
4. The researcher studied on how to create exercises and tests in the web site by using a Hotpot Programme.
5. The researcher designed web pages for the web-based instruction site. The main menus for the web-based instruction on relative clauses consisted of a "home", "learning method", "learning objectives", "pre-test", "lessons", "practices and exercises", "post-test", "e-mail teacher", "dictionary", "links," and "web board discussion." The following were the details of the main menus:

"Home" is a homepage or a first page of the web site. It is an introduction page presenting a title, a subtitle, a name of the English lesson, an instructor's name, a school's name, and a location. The page also contains the navigation bars taking the students to other main pages.

"Learning method" is a page that explains the method for learning through the web-based instruction on relative clauses. Students are encouraged to start from studying learning objectives, doing a pre-test, studying lessons, doing exercises, and doing a post-test respectively.

"Learning objective" is a page that tells students the objective of learning English grammar on relative clauses.

"Pre-test" is a page providing a multiple choice test that students can do before studying the lessons. Students can check their answer and get their points as a result.

"Lessons" is a page containing twelve lessons on relative clauses. The lessons include the following.

1. What is a relative clause?
2. What are defining and non-defining relative clauses?
3. How to use a relative pronoun "who."
4. How to use a relative pronoun "whom."
5. How to use a relative pronoun "which."
6. How to use a relative pronoun "that."
7. How to use a relative pronoun "whose."
8. How to use a relative adverb "where."
9. How to use a relative adverb "when."

10. How to use a relative adverb "why."
11. Review of reduced defining relative clause.
12. Review of relative pronoun and relative adverb.

"Practices and Exercises." The content of this page is divided into 3 parts; practices, exercises, and fun stuff or games. It provides nine practices which students can do as an electronic homework and mail teacher later. The three different kinds of exercises are included. There are multiple choice, matching, and writing exercises. Students can check their answer and know how many points they score. After doing the exercises, students can relax with games.

"E-mail teacher" is a page giving the easiest way for students outside the class to contact their teacher in case they have questions or problems, while they are learning or doing their electronic homework.

"Dictionary" is a page providing lists of dictionary web sites. Students are able to link to these resources looking up the meanings of vocabulary.

"Links" is a page giving lists of useful English learning resources that students can learn by themselves.

"Web board discussion" is a page for a conversation between a teacher and students or between students and students. Both teacher and students can have a conversation, asking and answering questions, exchanging their ideas in both simultaneous communication and non- simultaneous communication. Web board discussion is also as a bulletin board for students.

6. The researcher used a Dreamweaver Programme, Version 4.0 and a Hotpot Programme to create web pages for the web-based instruction.

7. The web site for the web-based instruction was examined by a specialist, Asst. Prof. Dr. Chonawat Srisa-An.

8. The web site for the web-based instruction was revised before being used in the try out step.

To evaluate the effectiveness of the web-based instruction on relative clauses, various pre trials were carried out. The steps of the pre trials were as follows.

3.7.1.1 The Individual Trial

The web-based instruction on relative clauses was tried out with 1 moderate student, and 1 less able student in Mathayomsuksa V who were not samples in the study. The criteria of distinguishing the samples into different levels of English learning achievement were as follows. The students who had got grade 4 in English in the first semester in the academic year 2001 were able students, the students who had got grade 2 or 3 were moderate students, and the students who had got grade 1 were identified as the less able students. In this trial, the two students were assigned to do a pre-test, then they learned English on relative clauses through the web-based instruction for 10 fifty minute periods. After that, they were asked to do a post-test. The researcher also asked the samples for opinions about the web-based instruction in order to improve the instrument.

From useful comments, the researcher improved the web-based instruction by using easier language in the lesson pages.

3.7.1.2 The Small Group Trial

Six students participated in the small group trial. There were 2 able, 2 moderate, and 2 less able students. Before learning by the web-based instruction, the participants were asked to do a pre-test. After studying by the web-based instruction for 10 fifty-minute periods, a post-test was administered. Finally, the researcher asked the participants opinions about the web-based instruction.

After this step, the researcher improved the instrument by changing some background colour of some pages so that the pages could be read easily. Furthermore, the font size in some pages were also changed for easy reading.

3.7.1.3 The Field Trial

This step included 22 students with three different levels of English learning achievement. There were 8 able, 7 moderate, and 7 less able students. All of them were asked to do a pre-test. After studying through the web-based instruction on relative clauses for 10 fifty-minute periods, the students did a post-test. Students' achievement scores of the exercises in the web-based instruction on relative clauses, and the post-test scores from the three try outs were determined for efficiency of the web-based instruction based on 80/80 standard level (Promwong, 1978). The following formula was used to determine the efficiency (See Appendix A).

$$1. E_1 = \frac{\bar{x}}{A} \times 100$$

E_1 = Efficiency of the process

\bar{x} = Average score all students obtain from the exercises

A = Total score of the exercises in the lessons

$$2. E_2 = \frac{\bar{x}}{B} \times 100$$

E_2 = Efficiency of the outcomes

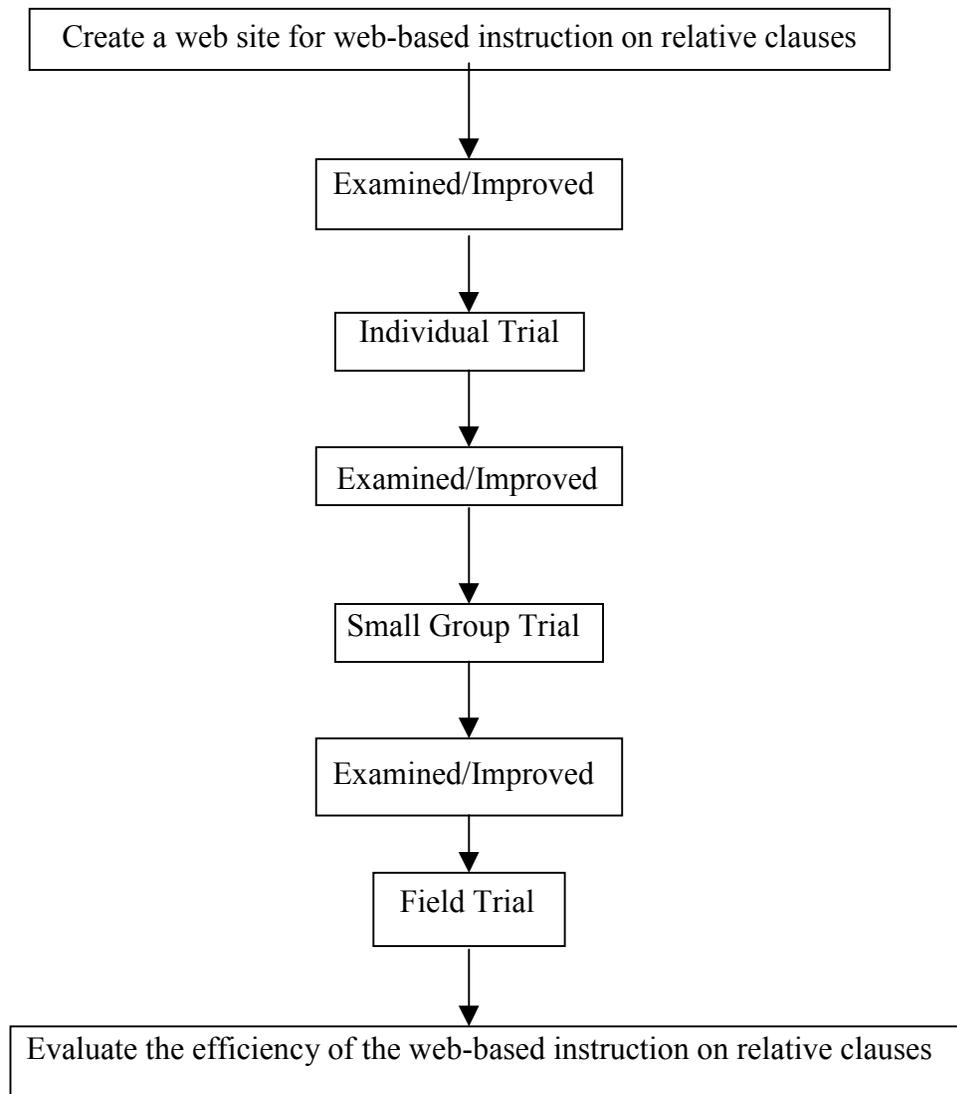
\bar{x} = Average score all students obtain from the post-test

B = Total score of the post-test in the lessons

(Promwong, 1978).

To administer the pilot study, the evaluation of efficiency of the web-based instruction was conducted as shown in the following figure.

Figure 3.2 : Steps of Trying out Web-Based Instruction



3.7.2 Lesson Plans

There were two lesson plans. The first one was constructed for a control group, and another one was constructed for an experimental group. These were the procedure for a lesson plan construction for a control group.

1. The researcher studied Mathayomsuksa V's English syllabus.
2. The researcher constructed a lesson plan on relative clauses based on the teacher's manual book..
3. The lesson plan was examined by Archarn Chintana Aebjunad, Archarn 2, Kham-sakaesaeng School , Nakhon Ratchasima.
4. The researcher improved and revised the lesson plan before it was used with samples in a control group.

The process of lesson plan construction for the experimental group were as follows :

1. The researcher studied Mathayomsuksa V's English syllabus ;
2. The researcher constructed a lesson plan based on the web-based instruction on relative clauses ;
3. The lesson plan was examined by Archarn Chintana Aebjunad, Archarn 2, Kham-sakaesaeng School , Nakhon Ratchasima. ;
4. The researcher improved and revised a lesson plan before it was used with samples in an experimental group. (See Appendix B).

3.7.3 Pre-test and Post-test

Relative clauses tests which were constructed by the researcher were employed as a parallel pre-test and post-test for both groups of students. The tests were consisted of a multiple choice with thirty questions in each. The construction of the test was conducted as follows :

1. The researcher studied a curriculum for upper-secondary level of the English subject for Mathayomsuksa V. ;
2. The researcher studied related literature on relative clauses ;

3. The researcher constructed multiple choice test with four alternatives ;
4. The contents and items of the constructed tests were revised and corrected by a specialist, Archarn Chucheeep Rahannok from Sriratprachanukraw School, Nakhon Ratchasima ;
5. A pilot study was conducted with Mathayomsuksa students who were not samples in the study ;
6. Based on the data obtained from the pilot study, an item analysis was carried out. The Item Response Theory or IRT software programme developed by Assoc. Prof. Dr. Sirichai Kanjanavasi, Assoc. Prof. Dr. Kanit Khaimook, and Assoc.Prof. Dr. Suwimol Wongwanit, the lecturers at Suranaree University of Technology, was employed to examine the level of difficulty, and the discrimination power (r). The criteria used to select the test items were $0.3 \leq p \leq 0.7$, and r was ≥ 0.2 ;
7. Sixty test items were selected as a pre-test and a post-test with 30 items in each. (See Appendix C) ;
8. Kuder Richardson Formula 20 (KR-20) was employed to determine the reliability of the tests. The IRT software programme was used to calculate the reliability of the tests, which was accepted at $KR-20 > 0.7$. (Richardson, 1939, quoted in Boonplong, 1998),

3.7.4 Attitude Questionnaire

The attitude questionnaire was used to see how students go about learning through the web-based instruction on relative clauses. The attitude questionnaire consisted of two main parts. The first part was five-point rating scale questionnaire. It aimed at eliciting students' opinions about learning through the web-based

instruction on relative clauses. To measure attitudes, Likert's rating scale was used. Likert's scale had five categories and each scale consisted of two parts; an initial statement and a list of responses categories ranging from "strongly agree" to "strongly disagree." All scale categories were labeled. Although the initial statement changed for each scale, the response categories were constant across all scales (Peterson, 2000).

The attitude questionnaire in the first part contained ten items. After students read each item, they ticked in one box; strongly agree, agree, uncertain, disagree, and strongly disagree. Five point rating scale used for rating students' attitudes were as follows:

5	means	Strongly agree
4	means	Agree
3	means	Uncertain
2	means	Disagree
1	means	Strongly disagree

In the second part of the attitude questionnaire, there were open-ended questions. Three free-response questions left a blank space where the students composed their own answers or gave their opinions on learning via the web-based instruction on relative clauses. To report results from open-ended questions, the percentage of respondents giving each of the most common responses was used.

Regarding to Likert's scale method, the questionnaire was constructed and developed as the following procedures :

1. The researcher studied literature review on how to construct the attitude questionnaire according to Likert's method ;

2. The researcher compiled the issues concerning learning through the web-based instruction on relative clauses ;

3. The researcher constructed twenty-three statements based on the issues compiled from learning through the web-based instruction on relative clauses. The statements included thirteen positive statements, and ten negative statements.

Rating scale used for positive statements were followed.

5	means	Strongly agree
4	means	Agree
3	means	Uncertain
2	means	Disagree
1	means	Strongly disagree

Rating scale used for negative statements were followed.

1	means	Strongly agree
2	means	Agree
3	means	Uncertain
4	means	Disagree
5	means	Strongly disagree

4. All of the statements were examined by specialists, Assoc. Prof. Dr. Kanit Khaimook and Dr. Banjert Chongapirattanakul from Suranaree University of Technology, Archarn Arrom Baysungnean, Archarn 2 from Nonsung Srithani School, and Archarn Sabaitip Rayain, Archarn 1 from Kham-sakaesaeng School.

5. The statements or the items were tried out with 30 samples.

6. The t-test for each item for five-point rating scale questionnaire was calculated.

7. Ten items which each one has the most significant differences at the level 0.05 were chosen to be questionnaire (See Appendix G). Then, these ten items were tried out again to find out the reliability.

8. The reliability of the questionnaire was checked, using the method of Coefficient Alpha of Cronbach (Cronbach, quoted in Aumpayab, 1990). To accept the reliability of the attitude questionnaire, the reliability coefficient value must be more than 0.80 (A-kakul, 1999). The reliability coefficient value calculated was 0.8215 (See Appendix G).

In the step of questionnaire trial, the data obtained were calculated by SPSS software programme.

3.7.5 Classroom Observation

In this present study, the researcher has attempted to identify students' learning by observing their behaviour in a natural classroom setting. A meaningful classroom observation required examining the nature of student participation in class, that was, how students acted or performed during learning through the web-based instruction, how they interacted with their classmates and teacher, whether or not students shared interest and sought for clarification.

The categories for describing and analyzing the observational data included a learning interest, an interaction, a control of learning, a cooperative learning, and an engagement in assignments.

3.7.6 Interview

In an effort to collect qualitative data, the researcher used triangulation methods. One of the main qualitative data collection tools in this research was an interview.

A group interview with guidelines was carried out. The reasons for choosing an interview guide was that it had an outline of topics and subtopics to be covered, therefore, it can help the researcher develop areas of enquiry, remember areas of information, record answers, recognize relevant and irrelevant answers, and determine which probing questions to ask. The interview guide or topics were formed into questions, asking about their opinions about learning through the web-based instruction or relative clauses. These unfixed questions were examined by the thesis advisor and co-advisor before using with the subjects in this study (See Appendix G).

The interview took place after students were given the attitude questionnaire. Group of five to six students were interviewed in Thai. Each interview lasted between fifteen and twenty minutes. Tape recording was used while the interview was taking place.

3.8 Data Collection

To collect data, the present study made use of a triangulation technique which included tests, an attitude questionnaire, and a classroom observation. The procedures for collecting data were as follows.

1. A study was done with a pre-post quasi-experimental design. A pre-test was given to all of the students in both control and experimental group at the beginning of a class to determine if their existing knowledge was the same.

2. The researcher taught students in both groups. The students in the control group were taught by the method based on the teacher's manual, while the students in the experimental group were taught by the web-based instruction. Both groups learned the same content, relative clauses, for ten 50-minute periods.

3. The samples in the experimental group were videotaped while studying by the web-based method.

4. A post-test was given to all of the samples after the last class.

5. After doing a post-test, the samples in the experimental group completed attitude questionnaires asking for their opinions about learning via the web-based instruction.

6. A semi-structured oral interview was used with the samples in the experimental group to find out the attitudes toward learning English on relative clauses through the web-based instruction.

3.9 Data Analysis

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

3.9.1 Quantitative Data Analysis

Quantitative data analysis included the data obtained from a pre-test, a post-test, and an attitude questionnaire.

3.9.1.1 The Data Obtained from the Pre-test and Post-test

To compare both groups of students' learning achievement, the Analysis of Covariance or ANCOVA model by Scheffe was used to remove extraneous variability that derived from pre-existing individual differences, such as students' English background knowledge or English proficiency level of the students. The computer software programme, SPSS, was used for the analysis.

3.9.1.2 The Data Obtained from the Attitude Questionnaire

Since the attitude questionnaire was consisted of two types of question : five-point rating scale question and open-ended question, the data obtained was analyzed in two ways.

The Data Obtained from Five-point Rating Scale Items. After being tallied for frequency, the data from five-point rating scale was calculated for the arithmetic means (\bar{x}). These means showed the students' attitudes toward learning by the web-based instruction. The criteria of means was from a range divided by numbers of levels created. This was $(5 - 1) \div 5 = 0.80$. For each level, the means was added up with 0.80. The following criteria was used for interpretation.

Table 3.1 : The Criteria of Interpretation for Five-point Rating Scale Questions.

Means (\bar{x})	Interpretation
1.00-1.80	Students have very bad attitudes.
1.81-2.60	Students have bad attitudes.
2.61-3.40	Students have neutral attitudes.
3.41-4.20	Students have good attitudes.
4.21-5.00	Students have very good attitudes.

The Data Obtained from Open-ended Questions. The data obtained from students' expressions and suggestions in the questionnaire part 2 were collected and categorized. The number of students who had similar answers or comments were calculated into percentages and then interpreted to support the data from other instruments.

3.9.2 Qualitative Data Analysis

Qualitative data included the data obtained from a classroom observation and a guided interview.

3.9.2.1 The Data Obtained from a Classroom Observation

The data analysis from videotaping was presented and discussed in order to investigate students' behaviour during learning through the web-based instruction.

3.9.2.2 The Data Obtained from an Interview

The data analysis from a semi-structure interview was finally presented.

3.10 Summary

In short, this chapter proposed a research procedure. There was a description of population and samples in the study. Besides, the research design and variables, including independent and dependent variables were indicated. In addition, collecting both quantitative and qualitative data as well as instruments used were described. Finally, the data analysis from variety of instruments were identified.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction and Purposes of the Chapter

This chapter presents the research findings which are organized according to the three main purposes of the study as stated in Chapter 1, which are:

- 1) to develop web-based instruction on relative clauses,
- 2) to compare students' English learning achievement in both experimental group and control group, and
- 3) to explore students' attitudes toward learning through the web-based instruction.

The findings are thus presented in three parts. The first part presents the results of the web-based instruction development. The second part presents the results of a statistical comparison of the students' learning achievement. Finally, the results of students' attitudes toward learning through the web-based instruction will be presented in the last part.

4.2 Results

4.2.1 Results of the Web-Based Instruction Development

In order to develop the web-based instruction on relative clauses, the researcher determined the efficiency of the web-based instruction by conducting three trials. The results were shown in Table 4.1.

Table 4.1 : The Results of Three Trials

Trials	E₁ (Efficiency of process)	E₂ (Efficiency of results)
Individual	76.66	65.00
Small Group	82.20	76.66
Field	83.33	80.13

From Table 4.1, it can be seen that after the individual and small group trials, the efficiency index of the web-based instruction on relative clauses was 83.33/80.13, which met the specified criteria.

4.2.2 Results of Comparing Students' English Learning Achievement

The data from pre-test and post-test scores was compared using an analysis of covariance or ANCOVA model by Scheffe in order to see if there were significant differences. The results were presented in Table 4.2.

Table 4.2: The Results of Students' English Learning Achievement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	544.774	2	272.387	16.986	.000
Intercept	864.383	1	864.383	53.903	.000
PRETEST	215.072	1	215.072	13.412	.000
MODE	307.980	1	307.980	19.205	.000
Error	1234.776	77	16.036		
Total	25792.000	80			
Corrected Total	1779.550	79			

a R Squared = .306 (Adjusted R Squared = .288)

As can be seen in Table 4.2, the mean scores for the post-test of students in both groups were statistically highly significant at 0.01 ($F = 16.986$, $\text{sig} = .000$).

Therefore, it can be concluded from the results in Table 4.2 that students' English learning achievement in both groups were different. The mean score of students in the experimental group was higher than that of the control group, which corresponded to the first hypothesis stated in Chapter 1.

4.2.3 Results of Students' Attitudes toward Learning through Web-Based Instruction on Relative Clauses.

To investigate the attitudes of students learning via web-based instruction, the researcher collected data using an attitude questionnaire which consisted of two main parts: a five-point rating scale questionnaire and open-ended questions. The collected data from the five-point rating scale questionnaire was calculated for the arithmetic means. The results of the analysis were presented in Table 4.3 below.

Table 4.3 : The Results of Students' Attitudes toward Learning through the Web-Based Instruction.

Items	\bar{x}	S.D.
1. Learning English through the web-based instruction on relative clauses is new.	4.27	.45
2. Learning English through the web-based instruction on relative clauses is difficult.	3.38	.76
3. Learning English through the web-based instruction on relative clauses helps you understand the lessons.	4.08	.60
4. You enjoy learning English through the web-based instruction on relative clauses.	4.22	.67
5. You are more enthusiastic when learning English through the web-based instruction on relative clauses.	3.92	.76

Items	\bar{x}	S.D.
6. Learning English through the web-based instruction on relative clauses makes the lessons and learning and teaching activity uninteresting.	3.86	.67
7. You get worried when learning English through the web-based instruction on relative clauses.	3.51	.80
8. You lack concentration when learning English through the web-based instruction on relative clauses.	3.70	.62
9. Learning English through the web-based instruction on relative clauses makes you get more interested in learning English.	4.05	.66
10. Learning English through the web-based instruction on relative clauses spends amount of time inappropriately.	3.97	.60
Total	3.90	0.66

Table 4.3 demonstrated that students had good attitudes toward learning through web-based instruction ($\bar{x} = 3.90$). Considering for each item, it was revealed that students thought that learning English on relative clauses through the web-based instruction was new and interesting (= 4.27). They enjoyed learning the web-based instruction on relative clauses (= 4.22), and they also agreed that learning English through the web-based instruction on relative clauses helped them understand the lessons. (= 4.08). The students also agreed that learning through the web-based instruction was not difficult (= 3.38) and they did not get worried (= 3.51).

The data obtained from three open-ended questions were collected and categorized. The numbers of students who had similar opinions or comments were calculated into percentages. The first open-ended question revealed the perspectives on how students like learning English through the web-based instruction. The results for this question followed below.

Seventy percent of students said that they had a good opportunity to practice their computer skills. Forty-three percent of them liked communicating with their friends and teacher by using electronic mail and web board. Thirty-five percent of them thought that they could practice reading and writing skills as well as gain more knowledge on new vocabulary. Thirty percent of them understood and enjoyed the lesson. Fourteen percent of them liked getting to learning resources from various web sites. Eight percent of them said that they learned brand new and interesting things they had never learned before. Five percent of them thought that they could learn fast and conveniently without English textbooks. Three percent of them liked learning outside of class.

For the second open-ended question, students' opinions on how they did not like learning English using the web-based instruction, the results were as follows.

Thirty percent of students said that they had too short time for learning. Sixteen percent of them said that they lacked good skills in using computers which was the reason why they did not like learning through the web. Eight percent of them said that they did not like the web-based instruction because they could not understand the lesson written in English. Five percent of them thought that they learned repeatedly only the lesson on relative clauses. Three percent of them said that they could not follow their friends, ask for details and explanation about the

lesson, and finish assignment in time during the class. Three percent of them also said that the thing they did not like was having not enough computers at school as well as having some problems connecting to the Internet.

The last open-ended question freely let students make suggestions about learning through the web-based instruction. Those suggestions followed below.

Firstly, the web-based instruction on many other subjects, such as in Physics, Chemistry, Biology, Social Studies, Math, and Thai, should be provided for students. Secondly, there should be more time for learning through the web. Thirdly, other English lessons or contents should be included in the web-based instruction, not just the lesson on relative clauses. Lastly, students wanted more training on typing in order to type properly and quickly.

4.2.4 Results of Classroom Observation

In order to investigate the students' learning behavior, the researcher has attempted to identify students' methods of learning by observing their behaviours in a classroom setting. Meaningful classroom observation required examining the nature of student participation in class, that was, how students acted or performed during learning through the web-based instruction, how they interacted with their classmates and teacher, whether or not students shared interest and sought for clarification.

It started with students' preparation. The teacher talked to the students about the English content that they were going to learn, the duration, and the way of learning. They were likely to sit in a group of two for one computer. Also students were advised how to learn using the web-based instruction. Then, preparation was followed by the learning and teaching activities in the lesson plan for the experimental group.

Classroom observation lists included a learning interest, an interaction, a control of learning, a cooperative learning, and an engagement in assignments. The findings of a classroom observation were revealed as follows.

Learning Interest.

Investigating a learning interest of students, the researcher found that during the class students participated in learning actively. They sometimes made loud noises and walked around in class in order to ask questions and talk about the sentences they did not understand in web lessons with their friends in other groups. They often asked the teacher about lessons, practice and exercises that they did not comprehend. All of them enjoyed doing exercises with immediate feedback. For pair work, they helped each other to do the exercises. They got excited and laughed when they clicked and then got correct answers. If the answers were wrong, they were eager to find the correct ones. Besides, they wanted to continue doing exercises, practices as well as playing games at fun stuff menu even though the time for that period was over.

Interaction

While learning, students interacted with their classmates in both pair work and group work by asking and answering questions, telling what they know or explaining what they understood to their friends. They sometimes mailed their classmates or posted messages on the web board, and waited for reply.

There was not only an interaction between student and student, but also between student and teacher. Most of students consulted the teacher when they had questions or problems while learning in a class. They also sent the teacher a short note and electronic homework through an electronic mail. On the other hand, the

interaction between students and teacher was always happened both by face to face and by electronic mail.

Besides a human interaction, there was a computer interaction as well. They interacted with computer while doing a pre-test, a post-test, and exercises by clicking on a check mark icon which provided feedback or displayed an answer on the page.

Control of Learning

While students studied web lessons, they were allowed to repeat lessons or exercises that they did not comprehend. Most of them spent little time on studying lessons. They wanted to go quickly to the exercise or practice pages. However, they had to go back to the lesson page again because they did not have any idea about that exercise or practice. A few students skipped the lesson page, just went directly to the exercises. Therefore, the teacher suggested that they study lesson first, and then do the exercises later. If they understood the explanation of how to use each relative clause and saw many examples in the lessons, then they could do exercises and practices correctly. The researcher noted that most students often accessed to dictionary web site so as to look up words and meaning while learning.

Engagement in Assignments.

During the class assignment, students were very interested in the assigned practices and exercises on the web-based instruction. All of them paid attention and were responsible for their pair work or group work. They helped each other to finish their work. While doing assignments, they usually compared and discussed their work with other groups of students. They spent a lot of time doing their assignment in class, although some of them did not finish their work in time. It was also

noted that students hardly took turns using a computer and keyboard with their partners. The students who were adept on the computer did not let their partners use computer and keyboard or type their work. On the other hand, the students who were not skillful using the computer let their friends use it alone.

In order to measure and evaluate, the teacher observed pair working and group working as well as checked assignments, such as writing exercises. Most of them could use relative clause structure correctly. Moreover, they learned more writing skills through electronic mail because they had to use English to write to their teacher or friends for clarifications and exchange ideas and opinions.

4.2.5 Results of Semi-Structured Interview

The results from semi-structured interview were presented as follows.

When students were asked if they liked learning English on relative clauses through the web-based instruction, ninety-five percent of them responded positively. The reasons why they liked learning English through the web-based instruction were, for example, they had opportunities to learn English and to use computer connected to the Internet at the same time. They said that learning English from the relative clause web site and from other linking web sites as learning resources was very helpful for improving English reading and writing. Besides the knowledge of English, they gained more computer skills such as typing and using word processing programme.

When asked about the thing that the students liked most from learning through the web-based instruction, different responses were given. Eighty percent of the students who expressed a preference said that they enjoyed doing exercises from the web-based instruction. They also found that using electronic mail in English

class was interesting because they could use easy English language to talk to the teacher or their friends. Some of the students stated that this kind of learning was convenient because they could learn English without textbooks or dictionary. Some students agreed that getting to dictionary web sites was beneficial. Searching words in order to write sentences as well as looking up the meaning of words in the practice and exercises was fun and easy. One of the students' favourite things was working in pair work or group work. They reported that they had good opportunities to consult and share ideas with their partners all the time. Therefore, the English class was not boring.

When the students were asked to describe what they did not like from learning through the web-based instruction, ten percent of them found that understanding the English lessons was the toughest task for them. Since the text or explanation was all in English, they could not understand it clearly. Therefore, they had to spend a lot of time on reading or getting to dictionary web site in order to search for meanings of difficult words, which prevented them from learning as fast as other students.

Eight percent of them said that they found this kind of learning was time consuming. Writing exercises or doing electronic homework needed time, and they could not finish their assignments in class in time.

When asked about advantages or problems they found from learning via the web-based instruction, ten percent agreed that computers should be available for every student. They thought that it was not convenient when one computer was used for two students. They should be able to use one computer for each. They also suggested that their school provide more computers connected to the Internet. They also commented about the speed of computers. They sometimes had to wait for minutes when connecting to network.

When asked about the learning atmosphere in class, ninety percent of the students stated that they found that the learning atmosphere was not too serious. They could discuss, consult, and help each other all the time.

When asked if they wanted to learn by the web-based for next time, ninety-five stated that they wanted to learn English through the web-based instruction again. However, they would prefer to have other grammars or other contents, such as English conversation and English for tourism. Lastly, they wanted to learn other subjects through the web as well.

4.3 Discussions

The outcomes of this research were presented above. What follows was a discussion of the research findings in response to the hypothesis stated in the first chapter.

Firstly, the web-based instruction on relative clauses had an efficiency at the level 83.33/80.13, which met the specified criteria 80/80. This was because the web-based instruction was completely developed in three trials; an individual, a small group, and a field trial. For each step, the researcher could see both good and bad points. Thus, every step of trying out helped to develop the web-based instruction. It can be seen that the efficiency of the process (E_1) was higher than the efficiency of the outcomes (E_2). It might be that students were interested in doing exercises on the web. Doing exercises on the web, students could learn and checked their answers with immediate feedback. This might motivate them to pay attention in doing exercises in order to get high scores. Besides, the post-test had more difficulty than exercises, therefore, the efficiency of the outcomes was lower than the efficiency of the process.

Secondly, comparing learning achievement for both groups showed that the experimental group had a higher average post-test score than the control group with a statistically significant difference at the 0.01. This might be due to the fact that students had more of a chance to learn collaboratively and help and support their friends. Those students with high levels of English could help explain and gave more clarification to the students with low levels of English who were in their pairs of work or groups of work. Furthermore, learning with computers and the Internet might motivate students to be enthusiastic to learn and get interested in a new way of learning without getting bored rather than learning in the traditional way.

However, when comparing the learning achievement of students in the experiment, it was found that the average post-test score was not very high. One explanation for this was that each student had different English ability. Some of them were good, and the others were fair and poor. Notably, the time for the experiment was limited. Since there were detailed lessons and lots of practices and exercises on the web-based instruction, students may have needed more time understanding and doing their assignments.

Thirdly, the attitudes toward learning using the web-based instruction were generally positive. It was interesting to note that this mode of learning and teaching might affect students' attitudes because it promoted interaction between both students-to-students, and students-to-teacher. A teacher played a role as a facilitator, giving support and guidance. Therefore, a learning atmosphere was created. This corresponded to Brooks and Brooks (1993) who stated that atmosphere in a class was an important factor to build and change attitudes toward learning.

Lastly, from the classroom observation, students paid a lot of attention while learning. They enjoyed and were satisfied with learning English grammar on relative clauses through the web-based instruction. The students got excited when they correctly answered the questions from exercises or tests. Apparently, students always interacted with peers, discussed, and helped each other. Able students helped to clarify or gave explanations to the less able ones. From the interview, most students agreed that the web-based instruction was new and interesting for them. Also the web-based instruction enabled them to have an opportunity to learn both English and the Internet simultaneously. This kind of learning helped to improve reading, writing, and computer skills.

The results from the observation and the interview mentioned above supported the findings of the students' learning achievement. It was seen that the students in the experimental group were interested in learning English through the web-based instruction. These explanations help to account for this finding. The web-based instruction was a new way of learning which might encourage the students to learn attentively and, as a result, demonstrated higher learning achievement scores on the post-test. In addition, students in the experimental group, whose English learning achievement was increased, may have benefited from collaborative learning, such as a peer work or a group work. On the other hand, collaborative learning is one of techniques used to facilitate individualized learning. It is mentioned that that collaborative learning is the use of instructional techniques which encourage students to learn from one another. The creation of a collaborative classroom environment is believed to result in better motivated and more successful students (Kitchen and Mcdougall, 1999).

In conclusion, the web-based instruction on relative clauses for Mathayomsuksa Five was a suitable tool for increasing student knowledge of English. Moreover, it was a means for increasing student motivation as well as bringing many benefits of meaningful learning using educational technology.

4.4 Summary

This chapter revealed the research results and discussed these results in association with the stated hypothesis. Chapter 5, which is the last chapter of the thesis, will be a summary of the research findings and contains recommendations for further research.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction and Purposes of the Chapter

This final chapter of the research restates the purposes of the study and reviews the major methods used in the study. The major sections of this chapter summarize the results and make suggestions for additional research.

5.2 Conclusions

The present study has been conducted in order to develop the web-based instruction on relative clauses, to compare the learning achievement of students who learned by using the web-based instruction and with the achievement of those students who learned by the instruction based on a teacher's manual, and to explore students' attitudes toward learning by the web-based instruction.

The samples were Mathayomsuksa Five Science-Maths programme students who learned English 13 at Kham-sakaesaeng School in the first semester in the academic year 2002. They were randomly divided into two groups, thirty-seven students in the experimental group, and forty-three students in the control group.

The research procedures were divided into two main parts. The first part included the procedures of development and determination of the efficiency of the web-based instruction based on the 80/80 standard criterion. The second part included comparing learning achievement and exploring students' attitudes. In the first part, the web-based instruction on relative clauses was constructed by the researcher and was examined by experts. After that, it was tried out to determine its

efficiency. The web-based instruction was tried out with two students in the individual trial, six students in the small group trial, and twenty-two students in the field trial.

In the second part, there was a comparison of students' English learning achievement and an exploration of students' attitudes toward learning through the web-based instruction. After giving the pre-test, the experimental group learned English on relative clauses by web-based instruction, whereas the control group learned by traditional instruction. Then the post-test was administered. The research instrument consisted of the web-based instruction or web site on relative clauses created by the researcher, lesson plans for both control and experimental group, a pre-test, a post-test, an attitude questionnaire, a classroom observation, and a group interview. The data obtained from different instruments were analyzed in two main ways; quantitative data analysis and qualitative data analysis. The quantitative data analysis included the data from a pre-test score, a post-test score, and an attitude questionnaire. The qualitative data was the data from a classroom observation and an interview. The statistical analysis of the data included ANCOVAs, calculations of means of frequency, and percentage.

The results of the research can be summarized as follows.

1. The efficiency of the web-based instruction on relative clauses was 83.33/80.13, which met the prescribed criterion 80/80 level.
2. The English learning achievement of students in the experimental group was higher than those of students in the control group with statistically significant differences at 0.01.
3. The students had good attitudes toward learning through the web-based instruction.

5.3 Recommendations for the Present Study

Some recommendations based on this research may be made as follows.

1. Learning through the web-based instruction, students need to have knowledge of basic computer skills so that they will be able to use computers and the Internet, and develop confidence using them.

2. Web-based learning requires time. The time for learning should not be limited since students have different English ability. Good students can learn fast, but the poor students cannot.

3. The English lessons in the web-based instruction should include variety of content so that students have more opportunity to choose an interesting content that they wish to learn.

4. Web-based instruction can be used as an extra resource for conventional instruction.

5. Teachers of many subjects should be trained in using web technology to create web-based learning and teaching for their classes, for example, in Science, Social Studies, Maths, and the Thai language.

6. Schools should support not only teacher training, but also provide technology tools. There should be enough computers in good condition connected with the Internet available for both students and teachers.

5.4 Suggestions for Further Research

Based on the results of this study, several suggestions are proposed for future research.

1. A comparative study of the learning achievement of students learning other English contents through web-based instruction should be done.

2. Researchers should investigate the effects of samples on gender, numbers of samples, and knowledge of basic computer skills.

3. There should be similar research that involves students at other levels or other programmes as research subjects.

4. Research on using the web for resource-based learning should be investigated.

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Appendix A

The Evaluation of Efficiency of the Web-Based Instruction

The individual trial for effectiveness evaluation of web-based instruction on relative clauses

Student Number	Pre-test score (30 points)	Exercise score (30 points)	Post-test score (30 points)	E ₁	E ₂
1	8	21	17		
2	11	25	22		
Total score	19	46	39		
Mean score	9.50	23.00	19.50		
Percentages	31.66	76.66	65.00	76.66	65.00

$$X = \frac{46}{2}$$

$$\bar{x} = 23$$

$$E_1 = \frac{23}{30} \times 100$$

$$E_1 = 76.6$$

$$X = \frac{39}{2}$$

$$\bar{x} = 19.5$$

$$E_2 = \frac{19.5}{30} \times 100$$

$$E_2 = 65$$

The small group trial for effectiveness evaluation of web-based instruction on relative Clauses.

Student Number	Pre-test score (30 points)	Exercise score (30 points)	Post-test score (30 points)	E₁	E₂
1	11	25	24		
2	10	27	22		
3	10	21	22		
4	7	24	20		
5	12	28	27		
6	11	23	23		
Total score	67	148	138		
Mean score	10.16	24.66	23.00		
Percentages	33.86	82.20	76.66	82.20	76.66

$$x = \frac{148}{6}$$

$$\bar{x} = 24.6$$

$$E_1 = \frac{24.6}{30} \times 100$$

$$E_1 = 82.2$$

$$X = \frac{138}{6}$$

$$\bar{x} = 23$$

$$E_2 = \frac{23}{30} \times 100$$

$$E_2 = 76.6$$

The field trial for effectiveness evaluation of web-based instruction on relative Clauses.

Student Number	Pre-test score (30 points)	Exercise score (30 points)	Post-test score (30 points)	E₁	E₂
1	12	23	24		
2	10	23	19		
3	15	28	27		
4	9	25	26		
5	12	26	25		
6	18	25	24		
7	16	28	27		
8	9	21	20		
9	7	21	18		
10	17	28	28		
11	14	27	27		
12	14	26	24		
13	15	21	23		
14	12	28	26		
15	17	25	24		
16	18	24	25		
17	13	26	24		
18	19	27	25		
19	15	24	23		
20	12	21	20		

Student Number	Pre-test score (30 points)	Exercise score (30 points)	Post-test score (30 points)	E₁	E₂
21	12	27	26		
22	13	23	24		
Total score	250	550	529		
Mean score	11.36	25.00	24.04		
Percentage	37.86	83.33	80.13	83.33	80.13

$$X = \frac{550}{22}$$

$$\bar{x} = 25$$

$$E_1 = \frac{25}{30} \times 100$$

$$E_1 = 83.33$$

$$X = \frac{529}{22}$$

$$\bar{x} = 24.04$$

$$E_2 = \frac{24.04}{30} \times 100$$

$$E_2 = 80.13$$

Appendix B

Lesson Plan for a Control Group

Subject	:	English 13 (E019)
Level	:	Mathayomsuksa V
Week	:	8 th week
Periods	:	10 periods
Main Topic	:	Meaning, types, and usage of relative clauses
Objectives	:	<p>The learning objectives of the lesson are to have students,</p> <ol style="list-style-type: none"> 1. understand what relative clauses are, types of relative clauses and how they are used. 2. define which sentences are defining relative clauses and which ones are non-defining relative clauses, 3. correctly use defining and non-defining relative clauses in sentences.
Content	:	<p>Relative clauses (Relative pronoun and relative adverb)</p> <ul style="list-style-type: none"> - Types of relative clauses - How to use who, whom, which, that, whose, where, when, and why - Reduced defining relative clauses - Relative adverb replacement

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
1 st - 2 nd	<ol style="list-style-type: none"> 1. Learning objectives, content, and assessment. 2. Pretest 3. Listening and reading a text about "Oxford" 4. Vocabulary 	<ol style="list-style-type: none"> 1. Students are informed learning objectives, content, and assessment. 2. Students do a pretest. 3. Students read the text about Oxford, guessing the meaning of any new words as they read. Ask them to cover the text and to try and recall the important information. 4. A teacher plays the tape and asks students to listen to, or to listen and read. 5. Students complete the chart on worksheet 1 (Opinion about Oxford). 6. A teacher pauses after each person's opinion to give time for students to complete the chart. 7. Students check their answers. 8. Both teacher and students spend some time checking the meaning of new words from the text, list them on the board, and pronounce the words. 	<ol style="list-style-type: none"> 1. A multiple choice pretest with 30 questions. 2. The text about "Oxford." 3. Worksheet1 (Opinions about Oxford). 	<ol style="list-style-type: none"> 1. Results from doing a pretest. 2. Completing the chart.

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
3 rd	<p>1. Meaning and types of relative clauses.</p> <p>1.1 Non-defining Relative clauses.</p> <p>1.2 Functions and usage of relative clauses: "who," "whom," "which," and "whose."</p>	<p>1. Before reading the grammar note on worksheet 2, the teacher writes on the board the following pairs of sentences.</p> <p>-Simon is an undergraduate. -Simon is at Merton College.</p> <p>-Malee sits next to me. -Malee is absent today.</p> <p>-I wanted to see the girl. -The girl has gone to England.</p> <p>-Cowley is a suburb of Oxford. -Cowley is an industrial area.</p> <p>-This is Peter. -Peter's wife teaches French at a Merton College.</p> <p>2 The teacher shows students how to join the two facts in each sentence using who, whom, which, and whose respectively. Joined sentences are followings.</p> <p>-Simon, <u>who</u> is an undergraduate, is at Merton College.</p> <p>-Malee, <u>who</u> sits next to me, is absent today.</p>	<p>1. Worksheet (Grammar Note)</p> <p>2. Worksheet 3</p>	<p>Checking the exercise 1.</p>

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<p>-The girl (<u>who whom</u>) I wanted to see, has gone to England.</p> <p>-Cowley, <u>which</u> is an industrial area, is a suburb of Oxford.</p> <p>-This is Peter, <u>whose</u> wife teaches French at a Merton College.</p> <p>3. The teacher points out a main clause and a relative clause, and also points out the need for the commas on either sides of the clauses in the sentences. If possible, compare with students' own language. Explain this type of relative clause (non-defining relative clauses) and the functions of relative clauses who, whom which, and whose. Then ask students to read through the Grammar Note on worksheet 2.</p> <p>4. Students do the exercise 1 on worksheet 3 by creating two separate sentences. Then, a teacher asks students to come to the front and write the full sentence with commas on the board.</p> <p>5. The teacher checks students' answers.</p>		

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
4 th	<p>1. Grammar focused on non-defining relative clauses; where, when, and why</p> <p>2. Replace of relative adverbs (where, when, why) by using preposition and relative pronoun "which"</p> <p>Where = at, in, to, from +which</p> <p>When = in, on during + which</p> <p>Why = for + which</p>	<p>1. The teacher shows the picture of Pattaya in Thailand and says, -Pattaya, where is famous for tourists, is not very far from Bangkok.</p> <p>2. The teacher shows the picture of "Wat Pra Kaew," and asks the question "Where is it? Ask students as volunteer to say about "Wat Pra Kaew."</p> <p>3. Students write the sentences about "Wat Pra Kaew" on the board. Examples: -Wat Pra Kaew is a great place for tourists. -Wat Pra Kaew is a famous tourist attraction in Thailand. -There is no monks in "Wat Pra Kaew. Etc.</p> <p>4. Students write a sentence joining Example: -Wat Pra Kaew, where no monk lives in, is a famous tourist attraction in Thailand.</p> <p>5. The teacher shows a picture of important holiday or festival in Thailand, such as Loy Kra Tong and asks students to say about it.</p>	1. Pictures of places, holidays, and festivals	1..Sentence joining using relative adverb where, when, and why

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<p>Example: -The moon is full on Loy Kra Tong Day. -Loy Kra Tong is a famous festival for Thai people.</p> <p>The teacher asks students to join the sentence using "when" Example: -Loy Kra Tong Day, when the moon is full, is a famous festival for Thai people.</p> <p>6 The teacher shows other examples of how to use a relative clause "why," and explains the functions of relative adverb "where", "when," "why," and how to replace relative adverbs "where," "when," "why" with preposition+ which</p>		
5 th	<ol style="list-style-type: none"> 1. Review of how to use relative pronouns (who, whom, which, whose) and relative adverbs (where, when, why). 2. Game Who Consequence 	<ol style="list-style-type: none"> 1. Review of how to use who, whom, which, whose, where, when, and why. 2. Play "Who Consequence Game." Students sit in groups of four. Each student must have a piece of A4 paper. The game has four stages: <ol style="list-style-type: none"> 2.1 Everybody writes the name of a familiar or famous person followed by a comma, and 	<ol style="list-style-type: none"> 1. Piece of A4 paper 	-

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<p>Folds the paper over backwards so that the next person can write immediately underneath without seeing the name. He/She then passes the folded paper on to the person sitting on the left.</p> <p>2.2 Everybody writes a "who" fact followed by a comma, folds the paper again and passes it on.</p> <p>2.3 Everybody writes a final fact in a main clause (without who) and passes it on.</p> <p>2.4 Everybody unfolds the paper they receive and reads the sentence aloud, e.g. -Madonna, who plays football for Man-U, wears socks in bed.</p> <p>3. Students write about a famous historical city in their city or in Thailand, illustrating it if possible with photographs.</p>		
6 th	<ol style="list-style-type: none"> 1. Reading text (Scotland) 2. Vocabulary 	<ol style="list-style-type: none"> 1. The teacher brings to the class a map of Britain to show where Scotland is and to point out the Lowlands and Highlands when students come to this in the reading text. 2. The teacher asks questions to find out how much students already know about Scotland. 	1. Worksheet 4	

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<p>3. The teachers asks students to work in pairs and to complete the quiz on worksheet 4. When they have finished, ask them to skim the reading text, Scotland, and skim the Scottish glossary to check their answers to the quiz. Check these around the class.</p> <p>4. Students read the text again silently and to guess the meaning of the words listed. The teacher asks comprehension questions to the whole class, e.g</p> <p>-What is Gaelic? -How many people live in Scotland? -What is the southern half of Scotland called?</p>		
7 th	1. Defining relative clauses (who, whom, which, that, whose).	<p>1. Play game "Guess the Object" Each student has to define an object without naming it and the others must guess what it is. The other students may ask up to five Yes/No questions if they cannot immediately guess the object, e.g</p> <p>S1: It's something which helps you clean the floor. S2: Is it a machine? S1: Yes, it is. S2: Is it a vacuum cleaner?</p>	1. Worksheet 5- 6	1. Doing exercises on worksheet 6.

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<ol style="list-style-type: none"> 2. Students read the examples of defining relative clauses on worksheet 5. The teacher points out that no comma is need before relatives (who, whom which, whose) in a defining clause. 3. The teacher explains how to use a relative pronoun "that," "where," "when," "why" in a defining relative clauses. 4. Ask students to make similar sentences defining jobs, animals, places, time, and reasons, e.g -A teacher is a person who ... -A lion is an animal which ... -A library is a place where ... 5. On worksheet 6, students work individually or in pairs. Check answer with the whole class afterwards. 		
8 th -10 th	<ol style="list-style-type: none"> 1. Reduce defining clauses 2. Posttest 	<ol style="list-style-type: none"> 1. The teacher reviews a defining relative clause. 2. The teacher explains reducing defining clause (Worksheet 7). 3. Students do "Annoying Habits Activity." This activity gives students a chance to vent feelings about types of people who annoy them. Each student 	<ol style="list-style-type: none"> 1. A map and pictures of famous places. 2. Worksheet 7. 3. A multiple choice posttest with 30 questions. 	<ol style="list-style-type: none"> 1. Results from doing a posttest .

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<p>has to make a true statement starting with "I don't like.../ I hate people who (smoke while I'm eating/using a mobile phone in the cinema). Etc.</p> <p>4. The teacher brings a map or a picture of a well-known place in Thailand or abroad. Ask students about that place. Collect vocabulary and list it on the board. Students write a paragraph about the place for homework</p> <p>5. The students' work are checked and put on the board.</p> <p>6. Students do a posttest.</p>		

Lesson Plan for an Experimental Group

Subject	:	English 13 (E019)
Level	:	Mathayomsuksa V
Week	:	8 th week
Periods	:	10 periods
Main Topic	:	Meaning, types, and usage of relative clauses
Objectives	:	<p>The learning objectives of the lesson are to have students,</p> <ol style="list-style-type: none"> 1. understand what relative clauses are, types of relative clauses and how they are used, 2. define which sentences are defining relative clauses and which ones are non-defining relative clauses, 3. correctly use defining and non-defining relative clauses in sentences.
Content	:	<p>Relative clauses (Relative pronoun and relative adverb)</p> <ul style="list-style-type: none"> - Types of relative clauses - How to use who, whom, which, that, whose, where, when, and why - Reduced defining relative clauses - Relative adverb replacement

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
1 st - 2 nd	<ol style="list-style-type: none"> 1. Pretest 2. Learning objectives 3. Pretest on WBI 	<ol style="list-style-type: none"> 1. Students are assigned to do a pretest. 2. Students are divided in groups of two. Each student studies the pages on the web-based instruction site. 3. Each group goes to the web-based instruction site (http://www.thai.net/kswbi) 4. Students are introduced to the web site and the ten main menus. 5. Students are assigned to go to the learning method menu to see the ways they learn. 6. After learning method, students go to the learning objective page, studying the three learning objectives. 7. Students are assigned to do a multiple choice pretest with 10 questions at the pretest menu. They are asked to mail the teacher the results or the points they get from doing a pretest. They can use both e-mail and web board. 	<ol style="list-style-type: none"> 1. A multiple choice pretest with 30 questions. 2. Computer connected with the Internet. 	<ol style="list-style-type: none"> 1. Results from doing a pretest. 2. Results from doing a pretest on WBI

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
3 rd	1. Meaning and types of relative clauses 1.1 Non-defining relative clauses 1.2 Defining relative clauses	1. Students study in groups of two. Each student is assigned to study lesson 1 (What is a relative clause?) and lesson 2 (What are defining and non-defining relative clauses?) 2. After studying the lessons, students do the exercise 1 and exercise 2. Students are given printed content of the lesson 1 and 2. While studying the lessons, students ask teacher questions and discuss with their friends by using e-mail or web board.	1. Computer connected with the Internet.	1. Results from doing the exercises.
4 th - 5 th	1. Non-defining relative clauses. 2. Defining relative clauses. 3. Relative pronouns; "who," "whom," "which," "that."	1. Students study in the same group. 2. Each student studies how to use relative pronoun "who," "whom," "which," and "that" from the explanation and examples in lesson 3, 4, 5, and 6. 3. Students are given printed content of the lessons. 4. Students discuss with their friends and ask teacher if they have questions.	1. Computer connected with the Internet.	1. Results from doing the practices and exercises.

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		5. Students are assigned to do exercise 1, 2 and 6. 6. Students are assigned to do electronic homework in practice 3, 4, 5, 7, and 9.		
6 th - 7 th	1. Non-defining relative clauses. 2. Defining relative clauses. 3. Relative pronouns and relative adverbs; "whose," "where," "when," and "why."	1. Students study in the same group. 2. Each student studies how to use relative pronoun "whose" and relative adverbs "where," "when," and "why" from the explanation and examples in lesson 7, 8, 9, and 10. 3. Students are given printed materials of the lessons. 4. Students discuss with their friends and ask teacher questions. 5. Students are assigned to do exercise 3, and electronic homework in practice 1, 2, and 8.	1 Computer connected with the Internet.	1. Results from doing the practices and exercises.
8 th	1. Reduced defining relative clauses. 2. Relative adverb replacement.	1. Students study in the same group. 2. Each student studies how to reduce defining relative clauses and how to replace relative adverb by preposition and "which" in the lesson 11 and 12.	1 Computer connected with the Internet.	1 Results from doing the practices and exercises.

Period	Content	Learning and Teaching Activities	Teaching Materials	Assessment
		<ol style="list-style-type: none"> 3. Students are given printed materials of the lessons. 4. Students discuss with their friends and ask teacher questions. 5. Students are assigned to do exercise 4 and 5. 6. Students are assigned to electronic homework in practice 6. 		
9 th - 10 th	<ol style="list-style-type: none"> 1. Relative clauses from English learning resources. 2. posttest 	<ol style="list-style-type: none"> 1. Students study in the same group. 2. Each group goes to web sites as learning resources as they like. 3. Students are assigned to do a posttest. 	<ol style="list-style-type: none"> 1. Computer connected with the Internet. 2. Lists of web sites linking to ESL learning 3. A multiple choice posttest with 30 questions. 	<ol style="list-style-type: none"> 1. Results from doing a posttest.

Appendix C

Pre-test on Relative Clauses

Instruction : Choose the best answer.

<p>1. The thief.....plundered the bank yesterday was arrested.</p> <p>a. who b. whom c. when d. where</p> <p>2. They want to know the reasons.....he Was late.</p> <p>a. why b. when c. where d. which</p> <p>3. The girl.....father is dead is very unhappy.</p> <p>a. who b. whom c. that d. whose</p> <p>4. He can remember the day of the week.....he was married.</p> <p>a. when b. what c. who d. why</p> <p>5. I'd like to know the day.....you were born.</p> <p>a. for which b. at which c. on which d. to which</p>	<p>6. A reason.....I-Sarn people move to Bangkok is to find job opportunities.</p> <p>a. for which b. to which c. on which d. at which</p> <p>7. Smoking,.....is a bad habit, is nevertheless popular.</p> <p>a. when b. whose c. which d. that</p> <p>8. The day.....she is twenty-five will certainly be a great day.</p> <p>a. who b. that c. whom d. where</p> <p>9. I also put all of my money into traveler's checks,.....was a good idea.</p> <p>a. where b. which c. whose d. when</p> <p>10. He received a letter from his son.....he had not seen for many years.</p> <p>a. where b. whom c. which d. why</p>
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<p>11. Somsri,.....daughter is just starting school, is very busy.</p> <p>a. who b. whom c. which d. whose</p> <p>12. Do you have any reasons.....you choose to study abroad?</p> <p>a. when b. whom c. who d. why</p> <p>13. This is the town.....I was born.</p> <p>a. who b. when c. which d. where</p> <p>14. The chair.....was broken is now mended.</p> <p>a. whose b. which c. where d. when</p> <p>15. I'll never forget the place..... I met my first love.</p> <p>a. on which b. for which c. during which d. from which</p>	<p>16. The book.....you lost is here.</p> <p>a. that b. which c. whose d. a and b are correct.</p> <p>17. The policeman.....wife came yesterday is asking to see you.</p> <p>a. who b. whom c. that d. whose</p> <p>18. Do you know the time.....she will come?</p> <p>a. which b. when c. where d. why</p> <p>19. The authors.....he mentioned are well known.</p> <p>a. that b. who c. whom d. All correct</p> <p>20. The music.....we listened to last night was written by Mozart.</p> <p>a. who b. whom c. where d. which</p>
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21. Which sentence is correct?

- a. Halloween is a strange holiday, who children wear costumes and ask for candies.
- b. Halloween is a strange holiday, when children wear costumes and ask for candies.
- c. Halloween is a strange holiday, where children wear costumes and ask for candies.
- d. Halloween is a strange holiday, that children wear costumes and ask for candies.

22. Which sentence is **wrong**?

- a. The province which you spoke about is Lampang.
- b. The province about you spoke is Lampang.
- c. The province you spoke about is Lampang.
- d. The province about which you spoke is Lampang.

23. Which sentence is correct?

- a. Nop knows a man father owns a cinema.
- b. Nop knows a man who father owns a cinema.
- c. Nop knows a man whose father owns a cinema.
- d. Nop knows a man which father owns a cinema.

24. Which sentence is correct?

- a. Jeff got a warm welcome on the first day which he came here.
- b. Jeff got a warm welcome on the first day whose he came here.
- c. Jeff got a warm welcome on the first day when he came here.
- d. Jeff got a warm welcome on the first day where he came here.

25. Which sentence is correct?

- a. I'd like to go to the Suan Son Park, whose I can sit and read quietly.
- b. I'd like to go to the Suan Son Park, that I can sit and read quietly.
- c. I'd like to go to the Suan Son Park, when I can sit and read quietly.
- d. I'd like to go to the Suan Son Park, where I can sit and read quietly.

Instruction : Read the following passage, then choose the correct relative pronouns for each blanks. (26 - 30)

The trip which lasted 15 hours was the longest trip I had ever taken. Seated on my left was a lady.....(26).....had a baby. The lady.....(27).....name was Mary talked nonstop to me and the man on her left the entire 15 hours.

Apparently, she was going to visit her husband. She hadn't seen him for quite a long time. Her husband.....(28).....is in the army is stationed in Frankfurt. The last time he was home was two years before.....(29).....he came home for the Christmas holiday. Mary told us that her husband had never even seen the baby.....(30).....name was Billy. Although Mary was very nice, I did get very tired of her chatter which did not seem to end.

My one break occurred when the movie *Found in Space* was shown on the screen. The man who was sitting on Mary's left side and I gladly watched the whole picture from start to finish with our earphones firmly in place!

26. a. whom
b. which
c. who
d. how

27. a. whose
b. When
c. That
d. Which

28. a. whose
b. which
c. whom
d. who

29. a. that
b. when
c. which
d. why

30. a. who
b. whose
c. whom
d. where

Post-test on Relative Clauses

Instruction : Choose the best answer.

<p>1. The man.....came here last week is standing there.</p> <p>a. who b. whom c. which d. whose</p> <p>2. The school is looking for a teacher.....speaks Japanese.</p> <p>a. who b. when c. whom d. which</p> <p>3. Paris is.....the Eiffel Tower is located.</p> <p>a. which b. what c. where d. that</p> <p>4. One of the reasons.....he refuses to do this job is that he doesn't like to go abroad.</p> <p>a. in which b. to which c. for which d. from which</p> <p>5. Ramadon is the day.....Muslims refrain eating in the day time.</p> <p>a. to which b. on which c. at which d. for which</p>	<p>6. The day.....Dara become a movie star completely changed her life.</p> <p>a. why b. which c. where d. when</p> <p>7. Wipada bought a BMW,.....was made in Germany.</p> <p>a. where b. which c. that d. how</p> <p>8. My wife,.....you were speaking to, is a teacher.</p> <p>a. that b. which c. where d. whom</p> <p>9. He gave me many reasons.....he came late.</p> <p>a. who b. why c. which d. where</p> <p>10. Manop,.....first wife died, has just got married again.</p> <p>a. that b. whose c. where d. which</p>
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<p>11. Are those the reasons.....you choose to go to America instead of Australia?</p> <p>a. where b. whom c. why d. who</p> <p>12. Peter's car,.....he bought last year, has broken down.</p> <p>a. which b. where c. when d. that</p> <p>13. The cake.....was in the fridge was very delicious.</p> <p>a. when b. that c. where d. whose</p> <p>14. The student.....won the contest received a \$1,000 scholarship.</p> <p>a. that his essay b. who his essay c. which essay d. whose essay</p> <p>15. All.....glitters is not gold.</p> <p>a. who b. which c. whom d. that</p>	<p>16. The knife.....we use to cut the mango with is very sharp.</p> <p>a. which b. that c. whose d. a and b are correct.</p> <p>17. The police.....questioned the man.....car was stolen.</p> <p>a. whom b. whose c. which d. where</p> <p>18. Dang,.....we saw at the dance, wants to go out with me.</p> <p>a. that b. which c. when d. whom</p> <p>19. Sombat has already taken Math,.....is the most difficult subject for him.</p> <p>a. which b. where c. when d. why</p> <p>20. I am looking for an apartment..... I can live in.</p> <p>a. where b. what c. when d. why</p>
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21. Which sentence is correct?
- a. Kai drank coffee, that woke him up.
 - b. Kai drank coffee, when woke him up.
 - c. Kai drank coffee, which woke him up.
 - d. Kai drank coffee, woke him up.
22. Which sentence is correct?
- a. Please tell me about the man whose luggage was lost.
 - b. Please tell me about the man which luggage was lost.
 - c. Please tell me about the man whom luggage was lost.
 - d. Please tell me about the man that luggage was lost.
23. Which sentence is correct?
- a. Martin Luther King, that was a black clergyman and civil rights leader, won the Nobel Peace Prize in 1964.
 - b. Martin Luther King, who was a black clergyman and civil rights leader, won the Nobel Peace Prize in 1964.
 - c. Martin Luther King, which was a black clergyman and civil rights leader, won the Nobel Peace Prize in 1964.
 - d. Martin Luther King, whom was a black clergyman and civil rights leader, won the Nobel Peace Prize in 1964.
24. Which sentence is correct?
- a. Somsak knows the time where we're meeting.
 - b. Somsak knows the time what we're meeting.
 - c. Somsak knows the time when we're meeting.
 - d. Somsak knows the time why we're meeting.

Instruction : Read the following passage, then choose the correct relative pronouns for each blanks. (25 - 30)

Michelle has finally realized one of her lifelong dreams. She has always wanted to attend the cooking school.....(25).....Master Chef Troisgros had attended. The school accepts only 80 students per year. The students,.....(26).....are accepted generally have at least three years of cooking experience.

Chef Troisgros gave Michelle his card and invited her to cook pastries at his restaurant the next month. It was this invitation that began her career baking for a big restaurant. Right now, she is waiting for the plane.....(27).....will fly her to Paris. There she will begin the three month course as Chef Troisgros had recommended.

Michelle started the pastry class which the cooking school suggested. The chef.....(28).....she is studying with is Chef Lyon. He is the same chef.....(29).....trained Chef Troisgros. The pastry course focuses on yeast cakes. This is a type of cake.....(30).....is dry and breadlike. Right now, Chef Lyon is explaining how the yeast must rise slowly.

25. a. why
b. that
c. when
d. who

26. a. who
b. whom
c. which
d. whose

27. a. whose
b. when
c. that
d. how

28. a. when
b. whose
c. which
d. whom

29. a. whose
b. whom
c. who
d. how

30. a. whose
b. where
c. which
d. when

Appendix D

Item Analysis

The item analysis results showing the level of difficulty (p), the discrimination index (r), and the reliability (KR-20) of the pre-test on relative clauses.

Item	p	r
1	.647	.411
2	.600	.329
3	.365	.607
4	.765	.367
5	.482	.519
6	.435	.450
7	.576	.510
8	.553	.295
9	.600	.314
10	.529	.332
11	.482	.433
12	.647	.279
13	.435	.358
14	.647	.312
15	.365	.376

Item	p	r
16	.459	.335
17	.388	.344
18	.624	.309
19	.624	.373
20	.459	.462
21	.576	.426
22	.482	.534
23	.412	.515
24	.600	.446
25	.529	.545
26	.624	.469
27	.647	.634
28	.788	.560
29	.671	1.008
30	.647	.980

CKR20 = .830

The item analysis results showing the level of difficulty (p), the discrimination index (r), and the reliability (KR-20) of the post-test on relative clauses.

Item	p	r
1	.529	.500
2	.553	.302
3	.435	.628
4	.506	.680
5	.529	.562
6	.459	.730
7	.624	.594
8	.624	.428
9	.647	.415
10	.506	.413
11	.600	.280
12	.365	.611
13	.459	.583
14	.553	.393
15	.600	.449
16	.529	.361
17	.482	.849
18	.553	.393
19	.576	.269
20	.647	.283

Item	p	r
-------------	----------	----------

21	.694	.774
----	------	------

22	.576	.477
----	------	------

23	.553	.435
----	------	------

24	.600	.265
----	------	------

25	.459	.423
----	------	------

26	.600	.390
----	------	------

27	.647	.834
----	------	------

28	.576	.269
----	------	------

29	.412	.317
----	------	------

30	.412	.350
----	------	------

CKR20 = .847

Appendix E

The Results of Pre-test and Post-test Scores of Students in Experimental and Control Group

The Results of Pretest, Exercise, and Posttest Scores of Students in Experimental Group.

Student Number	Pretest Score (30 points)	Exercise Score (30 points)	Posttest Score (30 points)
1	6	28	18
2	15	28	24
3	12	29	23
4	8	27	20
5	9	27	16
6	10	27	11
7	8	25	19
8	8	23	19
9	7	26	19
10	9	27	20
11	5	26	22
12	6	27	14
13	9	22	19
14	5	22	16
15	7	29	22

Student Number	Pretest Score (30 points)	Exercise Score (30 points)	Posttest Score (30 points)
16	13	28	23
17	10	19	10
18	12	23	19
19	11	23	26
20	8	25	21
21	9	24	15
22	9	29	22
23	4	24	16
24	7	22	14
25	12	28	22
26	12	25	20
27	8	24	24
28	13	25	17
29	4	23	22
30	9	17	15
31	7	20	14
32	11	24	24
33	7	29	24
34	13	26	28
35	10	28	23

Student Number	Pretest Score (30 points)	Exercise Score (30 points)	Posttest Score (30 points)
36	10	26	20
37	10	22	21
Total score	333	927	722
Mean score	9.00	25.05	19.51

The Results of Pretest, Exercise, and Posttest Score of Students in Control Group.

Student Number	Pretest Score (30 points)	Exercise Score (30 points)	Posttest Score (30 points)
1	9	22	21
2	10	21	20
3	9	20	16
4	9	20	15
5	12	20	15
6	10	18	20
7	9	24	17
8	8	19	12
9	10	21	16
10	7	20	16
11	12	22	12
12	7	20	13
13	9	18	13
14	10	23	22
15	12	23	21
16	11	18	10
17	7	22	23
18	12	19	18
19	10	23	22
20	11	24	20

Student Number	Pretest Score (30 points)	Exercise Score (30 points)	Posttest Score (30 points)
21	5	18	6
22	7	18	7
23	9	20	19
24	7	23	18
25	8	20	15
26	12	25	18
27	11	22	12
28	9	21	17
29	7	16	11
30	8	19	11
31	5	20	15
32	18	27	23
33	8	23	15
34	9	17	17
35	8	20	14
36	8	19	11
37	7	15	11
38	7	23	13
39	9	25	22
40	3	21	18

Student Number	Pretest Score (30 points)	Exercise Score (30 points)	Posttest Score (30 points)
41	5	20	9
42	6	22	10
43	8	21	10
Total score	378	892	664
Mean score	8.79	20.74	15.44

Appendix F

Questionnaire of Students' Attitudes towards Learning English on Relative Clauses through the Web-Based Instruction

This questionnaire is designed to gather information about students' attitudes towards learning English through the web-based instruction on relative clauses. The questionnaire is divided into 2 parts.

Part 1 The questionnaire asks for opinions about learning English on relative clauses through the web-based instruction.

Part 2 The open-ended questions asking about learning English through the web-based instruction.

Part 1

Instructions : Read each item in the questionnaire, then put in the space corresponding to your opinion.

Example

Items	Levels of Opinions				
	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
0. Learning English on relative clauses through the web-based instruction helps you have a chance practicing skills on using computer and the Internet.					

Items	Levels of Opinions				
	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1. Learning English through the web-based instruction on relative clauses is new.					
2. Learning English through the web-based instruction on relative clauses is difficult.					
3. Learning English through the web-based instruction on relative clauses helps you understand the lessons.					
4. You enjoy learning English through the web-based instruction on relative clauses.					
5. You are more enthusiastic when learning English through the web-based instruction on relative clauses.					
6. Learning English through the web-based instruction on relative clauses makes the lessons and learning and teaching activity uninteresting.					
7. You get worried when learning English through the web-based instruction on relative clauses.					
8. You lack concentration when learning English through the web-based instruction on relative clauses.					
9. Learning English through the web-based instruction on relative clauses makes you get more interested in learning English.					
10. Learning English through the web-based instruction on relative clauses spends amount of time inappropriately.					

Part 2

Instructions : Express your ideas or give suggestions about learning English through the web-based instruction.

1. How do you like learning English through the web-based instruction?

.....
.....
.....
.....
.....
.....

2. How do not you like learning English through the web-based instruction?

.....
.....
.....
.....
.....
.....

3. Other.....

.....
.....
.....
.....
.....

Thank you very much for your cooperation.

Appendix G

The t - test for Each Item of Five-Point Rating Scale Questionnaire

Item No.	t	Sig.	Statement
4	5.158	.000	Positive Statement
5	5.048	.000	Positive Statement
6	4.166	.001	Negative Statement
2	4.851	.002	Negative Statement
9	4.353	.002	Positive Statement
8	3.214	.008	Negative Statement
1	3.084	.008	Positive Statement
7	3.070	.008	Negative Statement
3	3.070	.015	Positive Statement
10	2.631	.030	Negative Statement

Reliability Analysis - Scale (Alpha)

Reliability Coefficients

Numbers of Cases = 30

Numbers of Items = 10

Alpha = .8215

Appendix H

Interview Guided Questions

Do you like learning English through the web-based instruction? Why?

What do you like most when learning English through the web-based instruction? Why?

What do not you like most when learning English through the web-based instruction? Why?

Are you convenient in learning English through the web-based instruction? If not, what are the problems? Would you give any suggestions or comments?

What is your English class atmosphere?

Do you want to learn English through the web-based instruction for the next time? If you do, what contents or subjects you would like to learn?

Appendix I

List of Specialists

Names	Position	Instrument Examined
1. Assoc. Prof. Dr. Kanit Khaimook	A lecturer at Suranaree University of Technology, Nakhon Ratchasima	- Questionnaire - Interview Guides
2. Dr. Banjert Chongapirattanakul	A lecturer at Suranaree University of Technology, Nakhon Ratchasima	- Questionnaire - Interview Guides
3. Asst. Prof. Dr. Chonawat Srisa-An	A lecturer at Rangsit University, Bangkok	- Web-based instruction
4. Archarn Arrom Baysungnoen	Archarn 2 Nonsung Srithani School, Nakhon Ratchasima	- Questionnaire
5. Archarn Chucheep Rahannok	Archarn 2 Sriratprachanukraw Schol, Nakhon Ratchasima	- Tests
6. Archarn Chintana Aebjunad	Archarn 2 Kham-sakaesaeng School, Nakhon Ratchasima	- Lesson Plans

Names	Position	Instrument Examined
7. Archarn Sabaitip Rayain	Archarn 1 Kham-sakaesaeng School, Nakhon Ratchasima	- Questionnaire

Appendix J

Examples of Web Pages from the Web-Based Instruction on Relative Clauses



The screenshot shows a Microsoft Internet Explorer browser window displaying the homepage of 'Web-Based Instruction Kham-Sakaesaeng School'. The browser's address bar shows 'D:\wb3\index.html'. The page features a navigation menu on the left with the following items: HOME, LEARNING METHOD, LEARNING OBJECTIVE, PRETEST, LESSONS, PRACTICE EXERCISE, POSTTEST, E-MAIL TEACHER, DICTIONARY, LINKS, and WEBBOARD. The main content area has a yellow header with the text 'WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL'. Below this, the text reads: 'WEB-BASED INSTRUCTION', 'Hypertext English Language Instruction', 'on', '"Relative Clauses"', 'by Bongkot Suwanbenjakul', 'Kham-Sakaesaeng School, Kham-Sakaesaeng District, Nakhonratchasima, Thailand.' At the bottom of the main content area, there are two small cartoon illustrations of children. The browser's taskbar at the bottom shows the Start button, several icons, and the system tray with the time '23:51'.

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address <D:\wb3\index.html> Go Links File Edit View Back

Hotbar Search... The Web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
EMAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number

Learning Method

Where should I go first, Uncle Bob?



Well, why don't you go to ["learning objectives"](#) first.



Then, do the ["pretest"](#).

After that, study the ["lessons"](#).

Start Exploring - wb3 Web-Based Instr... Microsoft Word My Computer 23:54

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address <D:\wb3\index.html> Go Links File Edit View Back

Hotbar Search... The Web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
EMAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number

Learning Objectives

The learning objectives are ...

1. After you have learned about relative clauses, you can understand what relative clauses are, types of relative clauses and how they are used.
2. After you have learned about relative clauses, you can define which sentences are defining relative clauses and which ones are non-defining relative clauses.
3. After you have learned about relative clauses, you can correctly use defining and non-defining relative clauses in sentences.

[Back](#)  [Next](#)

Done Exploring - wb3 Web-Based Instr... Microsoft Word My Computer 23:56

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address: D:\wb3\index.html

Home Search... The Web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

- HOME
- LEARNING METHOD
- LEARNING OBJECTIVE
- PRETEST
- LESSONS
- PRACTICE EXERCISE
- POSTTEST
- E-MAIL TEACHER
- DICTIONARY
- LINKS
- WEBBOARD

You are visitor number:

Pretest

- The girl..... you met in the street is my sister.
 - who
 - whom
 - that
 - a, b, and c are correct
- I don't see anything..... you explained.
 - that
 - which

Start | Exploring - wb3 | Web-Based Instr... | Microsoft Word | 0:02

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address: D:\wb3\index.html

Home Search... The Web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

- HOME
- LEARNING METHOD
- LEARNING OBJECTIVE
- PRETEST
- LESSONS
- PRACTICE EXERCISE
- POSTTEST
- E-MAIL TEACHER
- DICTIONARY
- LINKS
- WEBBOARD

You are visitor number:

- They live in an old house..... roof is full of holes.
 - how
 - whom
 - whose
 - where
- I'd like to find out the place..... I could go holiday.
 - on which
 - during which
 - to which
 - for which

Check Try again

Start | Exploring - wb3 | Web-Based Instr... | Microsoft Word | 0:01

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

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Home Search... The web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
EMAIL TEACHER
DICTIONARY
LINKS
WEBBOARD
You are visitor number



Choose the lesson.

- ◆ Lesson 1 : What is a Relative Clause?
- ◆ Lesson 2 : What are Defining and Non-defining Relative Clause?
- ◆ Lesson 3 : How to Use Relative Pronoun "Who."
- ◆ Lesson 4 : How to Use Relative Pronoun "Whom."
- ◆ Lesson 5 : How to Use Relative Pronoun "Which."
- ◆ Lesson 6 : How to Use Relative Pronoun "That."
- ◆ Lesson 7 : How to Use Relative Pronoun "Whose."
- ◆ Lesson 8 : How to Use Relative Adverb "Where."
- ◆ Lesson 9 : How to Use Relative Adverb "When."

Start Exploring - wb3 Web-Based Instr... Microsoft Word My Computer 0:04

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WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
EMAIL TEACHER
DICTIONARY
LINKS
WEBBOARD
You are visitor number



The boy is my brother. (Which boy?)

- The boy **who** is playing the guitar is my brother.

"the boy" = A noun phrase or antecedent
 "who" = A relative
 "who is playing the guitar" = A relative clause
 "The boy is my brother." = A main clause.



Done My Computer 0:05

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Home Search... The web Shop Games Free Diet Downloads Links

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
E-MAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number:

Practices & Exercises

PRACTICE			EXERCISE	
Practice 1	Practice 2	Practice 3	Exercise 1	Exercise 2
Practice 4	Practice 5	Practice 6	Exercise 3	Exercise 4
Practice 7	Practice 8	Practice 9	Exercise 5	Exercise 6
FUN STUFF			Fun stuff 1	Fun stuff 2

Me: //D:/wb3/ea4.htm My Computer

Start Exploring - wb3 Web-Based Instr... Microsoft Word 0:06

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WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
E-MAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number:

Practice 1

Read the following letter, then complete the letter with "who," "which," or "where."









Done My Computer

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Address Go Links File Edit View Back

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- LEARNING OBJECTIVE
- PRETEST
- LESSONS
- PRACTICE EXERCISE
- POSTTEST
- E-MAIL TEACHER
- DICTIONARY
- LINKS
- WEBBOARD

You are visitor number 

Practice 9

(Electronic Homework)

Practice 9: Writing sentences using relative clause "who."

Instruction : Look at the pictures of occupations, then write a sentence about each picture by using relative clause "who."

Example

Ae Bb Cc Dd Ee Ff

28 + 32 = 60

0.  = . A teacher is someone who teaches in a school.

Done My Computer

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- LEARNING METHOD
- LEARNING OBJECTIVE
- PRETEST
- LESSONS
- PRACTICE EXERCISE
- POSTTEST
- E-MAIL TEACHER
- DICTIONARY
- LINKS
- WEBBOARD

You are visitor number 

Join these pair of sentences using a relative clause.
(Defining relative clause)
Type your answer, then press "Check."

1/10

1 I have a friend.
He can speak five languages.

Check Show answer

file:///D:/wb3/learningobjective.htm My Computer

Start Exploring - wb3 Web-Based Instr... Microsoft Word 0:11

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address Go Links File Edit View Back

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WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
EMAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number

Peter is going to the United States next year. Complete what he says about his visit using whose, who/whom, where and when.

Exercise 5

I'm going to the States at the beginning of January , hopefully, it won't be too cold. I'm flying to New York, my friend Brian has been living for the past two years. I'm really looking forward to meeting his American girlfriend Cyndy, I met when they both came over to London last year. Cyndy, brother is quite a famous jazz musician, has promised to take me to Greenwich Village, there are a lot of jazz clubs. After two weeks in New York, I'll take the Greyhound bus to Cleveland, Ohio.

Done My Computer

Start Exploring - wb3 Web-Based Instr... Microsoft Word 0:13

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address Go Links File Edit View Back

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WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
EMAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number

Peter is going to the United States next year. Complete what he says about his visit using whose, who/whom, where and when.

~~I'm really looking forward to meeting his American girlfriend Cyndy,~~
 brother is quite a famous jazz musician, has promised to take me to Greenwich Village, there are a lot of jazz clubs. After two weeks in New York, I'll take the Greyhound bus to Cleveland, Ohio. I'm going to stay there with my Aunt Jackie, son - my cousin Abe - I met last summer in England. Then, if I have enough money, I'll travel south to New Orleans. I hope to get there by the first two weeks of February, the Mardi Gras Festival takes place.

Check Hint

Done My Computer

Start Exploring - wb3 Web-Based Instr... Microsoft Word 0:14

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address: D:\wb3\index.html

Navigation: Home Search... The Web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
E-MAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number:

Match the idea on the left with the most suitable idea on the right.

Exercise 6

She lent me the money,	<input data-bbox="927 736 1252 768" type="text" value="???"/>
They had to wait for over an hour,	<input data-bbox="927 774 1252 806" type="text" value="???"/>
There was a lot of snow on the road,	<input data-bbox="927 811 1252 844" type="text" value="???"/>
I knew you didn't want to go to the concert,	<input data-bbox="927 849 1252 881" type="text" value="???"/>
There was a bus strike,	<input data-bbox="927 887 1252 919" type="text" value="???"/>
There was a delicious smell coming from the kitchen,	<input data-bbox="927 924 1252 956" type="text" value="???"/>

Me:///D:/wb3/learningobjective.htm | My Computer

Start | Exploring - wb3 | Web-Based Instr... | Microsoft Word | 0:15

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address: D:\wb3\index.html

Navigation: Home Search... The Web Shop Games Free Diet Downloads Tools

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
E-MAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number:

E-mail Teacher

Send your questions or problems to your teacher at :



sbongkot@yahoo.com

Me:///D:/wb3/practice/exercises.html | My Computer

Start | Exploring - wb3 | Web-Based Instr... | Microsoft Word | 0:16

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

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WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
E-MAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number

Dictionary



You can find the meanings of words or phrases
by linking to these sites :

<http://www.cyberc.com/crcd/ehelp/base.htm>

<http://www.links.nectec.or.th/lexit/>

<http://www.thailandlife.com/language/dictionary/index.html>

<http://www.wiwi.uni->

Done My Computer

Start Exploring - wb3 Web-Based Instr... Microsoft Word 0:17

Web-Based Instruction Kham-sakaesaeng School - Microsoft Internet Explorer

Address: D:\wb3\index.html

Home Search... The web Shop Games Free Diet Downloads Links

WEB-BASED INSTRUCTION KHAM-SAKAESAENG SCHOOL

HOME
LEARNING METHOD
LEARNING OBJECTIVE
PRETEST
LESSONS
PRACTICE EXERCISE
POSTTEST
E-MAIL TEACHER
DICTIONARY
LINKS
WEBBOARD

You are visitor number

<http://www.englishtown.com/master/home/default.asp?buffer=true>

<http://www.writesite.org/>

<http://www.lineone.net/dictionaryof/diffcultwords/>

<http://esl.about.com>

<http://www.mdxtelematica.com>



<http://www.eckersley.co.uk>

<http://www.miguelmllap.com>

<http://www.miguelmllap.com/>

Done My Computer

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Curriculum Vitae

Mrs. Bongkot Suwanbenjakul was born on August 7, 1967 in Nakhon Ratchasima. She went to study in the Department of English, Faculty of Humanities and Social Science at Nakhon Ratchasima Teachers' College, where she graduated with a B.A. first class honored degree of English in 1989. After that, she had worked for Wangnamyen Withayakom School in Prachinburi Province for 2 years. Then, she has worked for Kham-sakaesaeng School, in Kham-sakaesaeng District, Nakhon Ratchasima since 1892. She studied in the School of English, Institute of Social Technology, Suranaree University of Technology for a Master's Degree.