

**EFFECTIVENESS OF USING WEBQUEST TO TEACH COMPUTER SCIENCE TO
MIDDLE SCHOOL STUDENTS IN SAUDI ARABIA**

by

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled EFFECTIVENESS OF USING
WEBQUEST TO TEACH COMPUTER SCIENCE TO MIDDLE SCHOOLSTUDENTS IN
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Science in Education, Curriculum and Instruction in Inclusive Education, is acceptable in form
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ABSTRACT

This study investigated the effectiveness of using WebQuest to teach computer science to middle school students in Saudi Arabia. This research study aimed to answer the research question: How did the use of WebQuest impact first middle school Saudi students' learning in computer science? This experimental study focused on first middle school students in two schools in Hail city in Saudi Arabia. In each of the two schools, the researcher chose 16 to 17 students by the use of a convenience sampling method. The total participants in this study were 65 boys aged between 12-13 years. The experimental group was taught computer using WebQuest while the control group was taught using traditional teaching methods. The results yielded that there was an increase in the scores when using the traditional approach and WebQuest approach. The students taught by the WebQuest had higher scores as compared to those in the group taught by the traditional approach, but the difference was not statistically significant.

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Effectiveness of Using WebQuest to Teach Computer Science to Middle School Students in Saudi Arabia

Introduction

WebQuest has been used in learning institutions in various countries as a model to improve and develop the education process (Gokalp, Manjula Sharma, Johnston & Mia Sharma, 2013). WebQuest is a teaching method in which some or all of the information that is passed to students comes from resources online. This model aims at integrating computer skills to learning and thus allows students to acquire more knowledge. WebQuest ensures a high level of critical thinking in students by enabling them to analyze information in the decision making processes (Barack, 2011).

There have been various studies conducted in different parts of the world to determine the effectiveness of WebQuest in teaching various subjects and disciplines (Awada & Ghaith, 2014; Gulbahar, Madran, & Kalelioglu, 2010; Winebrenner, & Brulles, 2012). The results and findings from these studies indicate positive impacts when using WebQuest to teach students at various grades. However, very few studies have been directly dedicated to determining the effectiveness of WebQuest to teach students in the Saudi Arabian education system as this model has not been used before, nor have there been studies on WebQuest in the country. This research conducted a detailed and in-depth study to determine the impact of using WebQuest to teach computer science to students in first middle school in Saudi Arabia.

Statement of the Problem

WebQuest is designed to improve both the learning and teaching process. It enables educators to avail to learners' multiple learning information and choices. These in turn improve the capacity for the learners to relate the information acquired through WebQuest to real world complexities and realities (Gulbahar, Madran, & Kalelioglu, 2010). WebQuest bolsters the goal of

education, which is to use critical thinking and apply what is learned in classroom to solve problems and bring positive change in the world. The WebQuest model is new in Saudi Arabia. Although this model has been used for a long time in most western countries, it was just introduced in Saudi Arabia in 2013. WebQuest was introduced to Saudi Arabia as a project by King Abdullah to develop the public education system in the country. The purpose of this research project, therefore, was to determine the effectiveness of using WebQuest to teach computer science to first middle school students. WebQuest in Saudi Arabia is among the many new programs and strategies, which have been introduced to enhance teachers' skills and help them achieve effective outcomes with their students. So far, it has only been implemented in a few public schools so as to evaluate its effectiveness before implementing it to all public schools in the country. This creates the need for researchers to conduct studies to determine the effectiveness of this program before it can be adopted by the entire public educational system. Various scholars across the world have cited that the use of WebQuest has a positive impact on the learning performance of students across various grades (Gokalp, Manjula Sharma, Johnston & Mia Sharma, 2013). However, since this program is new in Saudi Arabia, it is important to ensure that WebQuest is compatible to the country's educational system and its benefits outweigh any costs and challenges encountered during the implementation process. For this reason, this study would contribute in the process of determining the effectiveness of WebQuest.

The Purpose of This Study

Most teachers in the middle and high schools in Saudi Arabia had never heard of the WebQuest learning and teaching program before the beginning of 2013 when King Abdullah proposed his intention to have it implemented in the country's public educational system. Since the model was undergoing the testing stages or pilot study to determine its effectiveness, this study also helped the stakeholders gain more insight regarding how to implement the use of

WebQuest in the country's public educational system. The research helped uncover the potential of using WebQuest to teach students not only in first middle school but also in other grades in elementary, middle and high school. Moreover, the results from this study not only guided the implementation of WebQuest in teaching computer studies, but also other subjects taught in schools in Saudi Arabia. This study helped foster confidence of using WebQuest to teach students in public schools.

Research Question

This research study aimed to answer the following research question: How did the use of WebQuest impact first middle school Saudi students' learning in computer science? The hypothesis of this study was that impact of WebQuest approach to teach computer science in Saudi Arabia.

Theoretical Framework

WebQuest was developed in line with the idea that the learning process should give the learners the opportunity to relate what is learned with real world situations. WebQuests also enables learners to analyze what was learned in the classroom, through critical thinking, to solve problems (Chang, Chen, & Hsu, 2011). This program utilizes information from the Internet to make learning extensive and interesting for students and thus, enable them to make positive improvements in their performance. This research project was based on the concept that WebQuest can be used to teach a wide range of subjects, and it increases students' motivation and level of understanding compared to traditional teaching methods. This in turn motivates students to put more effort into learning activities, making them stay alert to what is being taught since it's fun and more relatable to real life situations. In addition, WebQuest enables students to use various resources, as compared to traditional learning resources, which provide a single point of view presentation and thus limit critical thinking.

Definition of Key Terms

WebQuest. This is defined as an inquiry-oriented learning structure that utilizes links to essential resources on the internet to promote students' learning by ensuring that most or all of the information and data that students interact with originates from internet sources (Gulbahar, Madran, & Kalelioglu, 2010).

Traditional teaching. This is the concept of the teaching and learning process where the teacher takes full control of students' learning process and environment and expects them to learn because he or she tells them to. Most of the learning resources are structured by the teacher in a manner that he or she thinks is best for the students. In addition, the knowledge passed to students is mostly from textbooks with little use of online sources (Chang, Chen, & Hsu, 2011).

First middle school. First middle school in Saudi Arabia is the first year in middle school which is called the sixth grade in the USA (Royal Embassy of Saudi Arabia in Washington, DC. 2010).

Significance of The Study

The researcher who conducted this study has taught at several middle and high schools in Saudi Arabia for three years. During this period of time, the researcher had never heard of WebQuest in Saudi Arabia. This was common for most of the teachers in Saudi Arabia. However, the introduction of this teaching program in the country since 2013 has changed the public educational system. This change is expected to last, as the government wishes to implement WebQuest to develop the education process in all public schools. However, before its implementation, there is the need for educators to be informed of all issues, challenges and advantages associated with the use of WebQuest to teach students (Awada & Ghaith, 2014). Therefore, the significance of this study lies in that it identified the effectiveness of WebQuest in teaching students

in first middle school and consequently, other educators in the country can replicate the same learning structure to all other grades in the public schools.

This study also helped the government and policy makers in the public education sector gain some insights regarding the adoption of WebQuest in Saudi Arabia. Through the findings of this study, all of the stakeholders will be able to understand and evaluate whether the use of WebQuest to teach students in Saudi Arabia has any positive impacts or not.

Literature Review

Introduction

This paper reviews past studies on WebQuest's use in teaching and learning processes. In this study, the instruction through the use of WebQuest is the independent variable, whereas the student achievement in computer science is the dependant variable.

Information and studies were found through the use of ERIC, the Educational Resources Information Center, through the SUNY at Fredonia's connection. Google Scholar was also utilized to find a wider selection of relevant, scholarly, peer-reviewed resources. Useful key terms that were used to find resources included: "WebQuest," "Middle School," "Computer Science," "Internet in education," and "Educational technology."

The WebQuest model has been embraced by many educators in different levels of education. There is an ongoing debate on whether the use of WebQuest in teaching computer science to first middle school students is more effective than the use of traditional means of teaching. There are very few studies that have attempted to directly determine which method is more effective in teaching computer science to the first middle school students. This literature review attempts to clarify the debate by focusing on the use of WebQuest in teaching computer science to the first middle school students.

The main goal of this literature review is to examine research on the use of WebQuest in teaching. In order to fully describe which computer teaching method is more effective for the first

middle school students, the researcher investigated a number of factors that may contribute to performance of the first middle school students in computer lessons. The factors that will be keenly analyzed included motivations of students when taught through WebQuest, barriers to teaching through WebQuest and the experience of teachers who teach computer science using WebQuest (Miralles, Gómez, & Arias, 2013).

Based on the research topic, this literature review will look at what has been written and published by various scholars and researchers regarding the effectiveness of WebQuest. On reviewing the literature, the researcher found that WebQuest has not yet been implemented in the area of computer science. Therefore, this research investigated the use of WebQuest in teaching computer science to first middle school students and compared results with those taught in the traditional way.

WebQuest Design

WebQuest is defined as a teaching method in which some or all of the information that is passed to students comes from resources in the Internet (Lee & Friedman, 2009). The instructional goal of WebQuest is knowledge acquisition and integration of computer skills to all learners (Schutten & McFarland, 2009). According to Miralles, Gómez, and Arias (2013), studies from countries where WebQuests have been incorporated in teaching curriculum indicate that through the use of WebQuest learners are able to grab a significant amount of new information and make sense out of it. Kurtulus and Ada (2012) pointed out that WebQuest in the teaching fraternity could be designed in either short term or long term. A long term WebQuest is designed and completed in longer periods and carried out over three class periods while short term WebQuest is designed and completed in one to three class periods. The WebQuest means to initiate critical thinking in the students because it enables them to analyze information in decision making processes (Polly & Ausband, 2009; Kurtulus and Ada, 2012). WebQuest is designed to

avail learners of multiple kinds information and choices in order to enable the learners to relate real world complexities and realities where the information is applied (Barack, 2011).

Steps to Effectively Implement/Design WebQuest in Schools

Researchers have pointed out that WebQuests have several advantages, including an increase in knowledge of subjects being studied, an increased familiarity with technology and web skills, and others (Wiske & Breit, 2011). On the other hand, various scholars have pointed out that if WebQuest is not implemented well, the process could fail and lead to students failing to score higher marks after being taught with WebQuest as compared to when they were taught using traditional classroom instructional techniques. A study by Yang (2014), comparing the effectiveness of using WebQuest to traditional IT-integrated approaches revealed that a failure to correctly and carefully implement WebQuests may lead to poor academic performance. In their research, Ikpeze and Boyd (2007) agreed with this claim. They conducted a survey where two groups of students in 7th grade were taught, one using WebQuest and the other using traditional instructions. Both WebQuest and traditional instructions were used as an advancement of the close unit. The findings of the study indicated that the control group that was taught using traditional instructions scored higher compared to those taught with WebQuest on an exam that was given to the two groups of students after the end of the unit. The researcher went ahead to compare the results of their findings with other studies on the teaching and learning methods. According to this research, the major reason that led to the difference between the performance of students taught with WebQuest and those taught with traditional curriculum instruction was a lack of appropriate implementation of the model. In addition, failure to adhere to the six steps of WebQuest design and implementation was also attributable to this difference in examination scores between the two units (Ikpeze & Boyd).

Six Steps of WebQuest Design for its Effective Implementation

According to Schutten and McFarland (2009), regardless of whether a WebQuest is designed in short term or long term basis, there are six basic steps that should be followed by educators and learning institutions in order to ensure that effective results be obtained. The first step in designing a WebQuest is the introduction stage. This stage involves searching and providing background information about the WebQuest to the involved parties such as the teachers, students and parents (Hassanien, 2006). At this stage, the goals and objectives of the WebQuest are outlined together with all materials that are needed for effective establishment of a WebQuest (Schutten & McFarland). The second step involves assigning doable and interesting tasks to learners in order to allow them to utilize WebQuest. This stage helps make students interested in this model and thus be willing to participate in the learning process. In addition, students are made to understand that the introduction of this model uses the internet to make learning easy, interesting and practical. In the third step, WebQuest has already fully been integrated in the learning process and thus learners make use of it to complete the tasks assigned to them by their teachers. In the fourth stage, learners outline the WebQuest they used in the completion of their tasks. This is meant for the teachers to evaluate whether the WebQuest used by students is useful and aligned to the task assigned to them. The teacher evaluation determines whether changes in terms of the WebQuest being used are needed or not. This is in line with what Ikpeze and Boyd (2007) said that learning activities should be aligned to the learning style in use. In the fifth stage, results are measured to assess whether the goals and objectives of the study have been met or not. At this stage, evaluation on whether the WebQuest helped the students in accomplishing the task assigned to them is done (Schutten & McFarland). The sixth and last stage in the WebQuest design is conclusion in which the use of the WebQuest comes to an end. At this stage,

a review on the usefulness of the WebQuest is carried out. The teachers evaluate whether the students have made effective use of WebQuests in completion of tasks assigned by comparing the situation before and after the implementation of WebQuest (Nordin, Mohd, Isa, & Embi, 2011). Further at this stage, areas for further study on the WebQuest are also highlighted. Various scholars have commonly agreed that the advantages of using WebQuest surpass the disadvantages involving designing and implementing WebQuests that are well-organized, easy to navigate, and effective. Schools that have implemented WebQuest in teaching students have had many positive things to say about its effectiveness. For example, a well-designed WebQuest provides students with cognitive tools and technical direction, especially when a balance is created between the WebQuest guide and traditional teacher (Mizoguchi, Dillenbourg, & Zhu, 2006). Furthermore, using WebQuest promotes considerable literacy since it enables learners to process information using a variety of complex thinking skills.

Effectiveness of WebQuest in Teaching

Various studies have been carried out by scholars in the fields of learning and teaching styles to evaluate the effectiveness of using WebQuest as a teaching method. For example, findings from a study by Strickland (2005) indicated that the use of WebQuests to teach students in seventh grade were more effective compared to traditional teaching instructions. In this study, the researcher conducted an experimental study whereby as 86 seventh grade students were divided into two groups. One group of the class was taught two subjects by using WebQuest, while the other group of the class was taught the same exact subjects with traditional instruction. The researcher analyzed the end of term exam scores and found out that 86 percent of the students taught using WebQuests scored more than 70 percent in the two subjects, while in the group that was taught using traditional instructions only 27 percent of the students scored above 70 marks in the three units.

WebQuest has been defined as an “inquiry-oriented activity” (Gulbahar, Madran, & Kalelioglu, 2010). When used in the learning process, it means that most or all of the information and data that students or learners interact with originates from Internet sources. WebQuests were created in 1995, and since then, more and more schools have been implementing them in teaching students at various grades (Gokalp, Manjula Sharma, Johnston & Mia Sharma, 2013). Researchers have revealed that WebQuests are effective in teaching students basically all subjects. A study by Alias, DeWitt, and Siraj (2014) suggested that WebQuests were effective in facilitating student’s learning of physics in high school. 32 students and eight teachers were selected randomly from two schools to participate in this study, which aimed at evaluating the usability and effectiveness of teaching gas law to high school students with WebQuest. The experimental group was taught gas law by teachers using WebQuests, while the control group was taught with traditional instruction teaching styles. The results of this study were obtained through interviews as well as looking at student achievement scores. The results of the study indicated significant differences between the students taught with WebQuest and those taught with traditional teaching methods in terms of test scores and the gas law concept understanding capacity. 90 percent of the experimental group were able to score above average marks on a test. In addition, they were also able to explain the concept of gas law clearly and coherently. This was impressive compared to the scores of the control group. The study indicated that only 20 percent of the control group were able to explain the concept of gas law with a fair degree of coherency, while only 30 percent scored above average marks on the same test that was given to the participants after the research study or the experiment.

The results from this study are in line with what various other scholars have published about the effectiveness of WebQuest. For example, Gokalp, Manjula Sharma, Johnston and Mia

Sharma (2013) conducted a study to evaluate the effectiveness of using WebQuest to teach mathematics. Research reveals that WebQuest has been infrequently used in teaching mathematics at all levels of the education process. However, for the few learning institutions which have used this, 90 percent reported effective results of integrating WebQuest in mathematical teaching. A research by Brown and Zahner (2006) indicated that 94 percent of students taught mathematics using WebQuest were able to reach pass marks as compared to when they were taught with traditional IT –integrated curriculum. In the study, Brown and Zahner selected 52 students in a Taiwanese elementary school. They divided the participants into two groups, where one group was taught by using WebQuest, while the other group was used as the control group and was taught the same topic in mathematics, but using traditional IT-integrated instruction for five weeks. The results from this study indicated that students who were taught mathematics using WebQuest demonstrated a superior level of learning performance and achievement compared to the control group that was taught topics in mathematics using the traditional IT-integrated program of study (Brown & Zahner). They scored higher in continuous assessment tests and when given a random calculation they were able to finish it two times faster than students that were not taught with WebQuest. In addition, due to the increased speed and accuracy of their calculations, more than 89 percent received higher marks than the leading students in the group that were not taught using WebQuests.

Further studies by Abbitt and Ophus (2008) indicated an increased level of subject understanding by students when taught using WebQuest as compared to when taught with traditional learning instructions of curriculum. This has been confirmed by studies by Yang (2014), which indicated that 87 percent of students taught mathematics using WebQuest understood the subject better compared to a group in the same class that was taught mathematics using traditional IT-intergraded curriculum. More than 80 percent of the students in the control group complained

about the subject and also viewed it as hard to learn and pass the exam. Therefore, this revealed that the use of WebQuest in teaching students subjects such as sciences and mathematics made them demonstrate high levels of understanding of the topics. In addition, this style of teaching and learning resulted in scoring high marks on exams as students learn a lot of information regarding a particular subtopic, integrated the information and were able to apply it practically and theoretically in examination.

Another study by MacGregor and Lou (2005) concluded that 8th grade students who used WebQuest in their learning had positive attitudes towards the use of the technology. In this study, 80% of the students who used WebQuests in handling of their assignments performed twice as well as the students who did not make use of WebQuests (MacGregor & Lou).

Various studies reveal effectiveness on the use of WebQuest in teaching all types of subjects including social sciences, languages like English, among others, as well as sciences and mathematics. For example, studies on how effective WebQuest has been in teaching languages such as English indicated that students taught with WebQuest had a superior command of vocabulary as well as other aspects of learning second or foreign languages such as sentence structure and word alignment (Lee & Friedman, 2009).

In addition, some of the few studies conducted on the use of WebQuest to teach computer science to students at various academic levels showed that computer studies can also be effectively taught using WebQuest as compared to using traditional IT-integrated instructions or curriculum. Based on the above researches and surveys on the effective use of WebQuest to teach various subjects, it is reasonable to assume that this model can also be effective in teaching computer science to students in first middle school in Saudi Arabia. This is in line with few studies that indicated that students taught computer studies with WebQuest acquired more IT and computer skill and knowledge compared to students taught using traditional instructions and

curriculum (Kurt, 2010). In general, the use of WebQuest in teaching whatever subject results to acquiring high levels of computer knowledge and skills by the students.

A survey on the effectiveness of using WebQuest to teach computer studies to students in first middle and elementary school in Taiwan indicated that 98 percent of the students acquired superior computer skills and knowledge using WebQuest as compared to students who were taught using traditional curriculum/model instruction (Chang, Chen & Hsu, 2011). In their survey, Chang, Chen and Hsu randomly selected a group of students in one Taiwanese school and had one experienced computer teacher taught them computer studies using WebQuest for six weeks. The same teacher also taught the rest of the class computer studies for the same amount of time. After the completion of the study, all the students sat for a theoretical and practical computer examination. The results of the study indicated that 99 percent of the students taught using WebQuest scored higher in the theoretical paper compared to the rest of the class that was taught using traditional teaching or instruction models. In addition, 97 percent of the students taught using WebQuest showed a superior level of practical computer skills and knowledge compared to students taught using traditional teaching styles.

Pros and Cons of WebQuests

Ikpeze and Boyd (2007) argued that WebQuest facilitated the development of reading comprehension and motivation to read, when assignments given to students are carefully selected, organized and delivered in the right manner. They further pointed out that multiple assignments handled by students through use of WebQuest provided the students with skills such as ability to connect ideas and critical reading skills (Kundu & Bain, 2006). These skills increase students' motivation in learning as learning becomes enjoyable and less restricting as is the case of traditional teaching techniques.

Several studies have been carried to assess the value of WebQuest in a number of fields.

A study by Wiske and Breit (2011) on how WebQuest improved learning environments showed that teaching through use of WebQuests increased students technology skills by increasing critical thinking and problem solving skills.

Despite the many advantages/merits associated with the use of WebQuest, scholars on children's learning process also point out that the use of WebQuest in teaching computer science to first middle school students poses some problems. The first major problem associated with learning through WebQuest is navigational confusion which arises due to having too much information in the WebQuest. According to Kurt (2012), too much information in the WebQuest might overwhelm the learners and consequently make them lose track of the subject they were studying. Subramaniam (2012) further pointed out that students not only lose track of the subject under study due to too much information in the web but also they lost track out of fatigue of scrolling through web pages in search of relevant information. Another critical limitation of teaching through WebQuest is associated with the nonlinear hypertext setting of the web pages which makes information sometimes to be unorganized (Kurtulus & Ada, 2012). This places significant cognitive demands on learners to make appropriate connections between concepts. It is unlikely that many first middle school students possess adequate skills and strategies to efficiently and effectively navigate the realms of available information to learn new content knowledge. An exploratory study conducted to determine effectiveness of using WebQuests in teaching environmental studies indicated that 20% the students had difficulties in navigating web pages and 40% of the students searched information unrelated to the area of their study (Chang, Chen & Hsu, 2011). The study concluded that before a WebQuest was fully implemented, the students should be thoroughly guided on how to browse through web pages.

Approach to Learning with WebQuests

There are limited studies on elements needed to ensure the success of the use of

WebQuest in teaching any given subject. Many studies in WebQuest have mainly focused on students and teachers. For example, Polly and Ausband (2009) conducted a study to investigate teachers' self-effectiveness and result expectancies related to using WebQuests as a plan to increase examination skills among grade four students. From the study, Polly and Ausband found that the use of WebQuests increased student's examination skills by 15%. On the other hand, the study showed that teachers who implemented self-designed WebQuests recorded lower scores in the expectation outcomes as compared to teachers who implemented WebQuests designed by other people. The study showed that WebQuests were very difficult to create and design, and that to be effective, teachers should be very careful about how WebQuests were used in the classroom. The authors went on to suggest that WebQuests that have been developed and organized by professionals, but were chosen and implemented by the teachers to meet their students' needs, may be more effective.

Today the internet is full of thousands of WebQuests created by people covering all disciplines and grade levels. When selecting the WebQuest to use, teachers and school administrators should be careful to select a well-designed WebQuest that reflects the learning need and style. The teachers should use their experience or consult more experienced people in the field of WebQuest to ensure the best one is selected. This is because not all WebQuests available in the internet are effective and able to promote the learning process. Wui and Saat (2008) pointed out some WebQuests created today had limitations because they did not represent the WebQuest model and majority of them were worksheets that lacked adequate and intensive research on various fields of study. Teachers should avoid selecting these ones as they cannot guarantee good results. In a survey conducted on teachers and education administrators, Strickland (2005) found out that 68% of the participants had positive comments on use of WebQuests in teaching computer science to first middle school students. Although the respondents said that they had some

uncertainties with use of WebQuest in teaching, 80% said they had used WebQuest in one way or the other in teaching. In addition, 55% of the respondents asserted that if WebQuests were designed and used properly in classroom, they provided an appealing way to all learners to tackle real problems in a focused way. Therefore, teachers and educators should be keen to select WebQuests that have already been developed and those that are in line with what they are to teach (Laborda, 2009).

Designing and implementing of high quality WebQuest calls for a clear understanding of how to select a WebQuest that has the quality to improve the student learning process and performance (Chang, Chen & Hsu, 2011). Studies show that some teachers do not know how to create quality WebQuests. But this does not mean that teachers are insufficient in implementing of WebQuests in teaching; they can use computer aided instructional strategies on how to apply WebQuest framework.

There has been much research into the efficacy, advantages, and disadvantages of using WebQuests in the Middle school classroom. The literature has revealed that, in general, WebQuests are a useful tool in generating interest and motivation in students, and helping to support learning through technology (Subramaniam, 2012). WebQuests are, however, difficult to organize well, and may be cognitively confusing for students (Kurtulus & Ada, 2012). These, and similar issues, can be solved through training in how to introduce WebQuests into the classroom and good design strategies, and by using one of the many WebQuests available online.

This study will add more to the effectiveness of using WebQuest in teaching computer science to students. This is because the use of WebQuest to teach students in public schools started just last year in the country and at the sites where the study was carried out. The government plans to implement WebQuest, and therefore, this study enabled the public education sys-

tem as well as the public schools to understand the effectiveness of using WebQuest to teach students in all subject. This study helped establish the benefits of WebQuest in classroom. The findings of this study will help teachers understand the most essential elements of an effective WebQuest and how best to apply it to improve students learning. Above all, the study will help determine the effectiveness of WebQuest in improving the academic performance of students in first middle school when used to teach them computer science.

Research Methodology

Introduction

This chapter explains the research design, site, research participants and the procedure. It provides the researcher a clear plan of the study prior to going to the field to collect the data. The student participants and data collection and sampling methods are discussed in this chapter.

Research Design

This research study was an experimental study which applied two sets of instruments that were pre-test and posttest to examine the effectiveness of using WebQuest to teach computer science to first middle school students. Experimental design is described as "when one group receives a treatment and the other group does not, the experimenter can isolate whether it is the treatment and not other factors that influence the outcome." (Creswell, 2014, p.15). This research used a control group and an experimental group. The experimental group was taught through WebQuests (the independent variable), and the control group was not. Pretest and posttest involved giving an examination at the beginning and at the end of a unit in order to compare the results between the control group and the experimental group. These were used to compare participant groups and measure the degree of change occurred as a result of using WebQuest to teach computer science to the participants. The researcher began this study by first examining and evaluating the general performance of the participants of the study on the computer science.

This helped determine the baseline performance of the students at the first middle school before the experiment.

The researcher used convenient sampling due to his personal knowledge and contacted with the computer teachers in those schools. The participants were selected from the chosen schools and divided into two groups for the study. One group was the experimental group and the other one was the control group. The study involved giving both groups a standard/ homogenous computer assessment pretest in a specific chapter at the beginning of the study (see Appendix A). The results from the pretest were recorded on a data collection sheet and kept for comparison at the end of the experiment. Next, the researcher ensured that the computer teachers in all selected schools taught a chapter in computer to both the experimental and control groups for two weeks; four lessons a week. The same chapter that the experimental and control group were tested at the beginning of the study was taught to both groups by the same teacher. However, for the experimental group, the teacher taught the chapter using WebQuest while for the control group, the teacher taught using traditional instruction methods. Each school has one computer teacher. All the teachers in the schools selected for the study have experience of more than six years in teaching computer. The same teacher taught both the groups and, this ensured that the difference that was witnessed in the performance of any group is attributable to the instruction method (either WebQuest or traditional) and not because of the variance in experience of the teacher. The researcher attended all the computer lessons for the two groups on weekly basis. Since the researcher has worked as a computer teacher in Hail city in Saudi Arabia for about three years in the past, he has had good relationships with most computer teachers there. He also graduated from the same college with most of them. Because of the rapport between the researcher and the teachers, he have easier access to the participants, and research sites.

The experimental group was taught computer using WebQuest while the control group

was taught using traditional teaching methods. The experimental groups in each of the schools selected were taught by the teacher as a whole group and give instructions on the chapter using learning material and resources from the computer and internet.

The control group was also taught as a whole group and gave the students instruction on the chapter using traditional teaching method resources from a text book. All the schools selected had one computer lab and students went to the lab only during computer lessons. During the research the experimental group went to the computer lab for four lessons in a week. Each participant in the experimental group had access to one computer during the lessons. However, for the control group, the participants did not go to the computer lab but had access to the textbook that the teacher was using to teach them the topic in the computer unit. The control group also had four lessons a week. The study lasted two weeks and each lesson was be 45 minutes long. At the end of the two weeks both groups were given a posttest. The results of the posttest assessment were recorded on a data collection sheet. Comparison on the performance of the participants at the pretest and posttest assessments were done by SSPS. This comparison was done in order to compare how the performance of both the experimental and control group changed from pretest to posttest after being taught either with WebQuest or traditional instruction method. This helped in making conclusions in the effectiveness of using WebQuest to teach computer to first middle school students.

Since the same teacher taught the two groups, the research study design used was appropriate in facilitating effective comparison that enabled drawing of meaningful conclusions regarding the effectiveness of using computer to teach computer science to first middle school students. In addition, this research design enabled the researcher to meet the research objectives and also answer the research questions identified in the introductory chapter.

Research Site

The research study was carried out specifically in two public schools in Hail city in Saudi Arabia. Hail city is one of the 13 regions of Saudi Arabia. The schools were located in two different neighborhoods. One of the schools had a population of 200 students while the other had a population of 180 students. Each school had one computer teacher and one computer lab and students went to the computer lab during computer class. For both schools, school day began around 7:30 am and ended around 1:30 pm. In addition, there were seven lessons a day 45 minutes for each lesson (Royal Embassy, 2010). Students had different social class levels, some rich, some poor. All the students had to get primary school certificate to attend first middle school. Additionally, Hail city was selected as the best location for this study because it comprises of students from diverse backgrounds.

Sampling Technique and Sample Size

This research study focused on first middle school students in two schools in Hail city in Saudi Arabia. In each of the two schools, the researcher chose two first middle school classes, selected through the use of a convenience sampling method. The total participants in this study was 65 and was only boys aged between 12-13 years. This was because even though boys and girls undergo the same type of education in Saudi Arabia, they go to separate schools.

Data Collection

This research study used data collection sheet to collect data on the effectiveness of WebQuest to teach computer science to first middle school students, as reflected on their scores on the posttest versus their pretests assessments. The sheet was structured and designed in a way that allowed the researcher to record the pretest and post test results and also allowed for the difference in test scores to be calculated, recorded and compared. Two data collection sheets (blue and red) were developed or designed (see Appendix B). The blue one was used to record the test

scores for the experimental group while a red one was used to record the test scores for the control group.

Recording and observation techniques were used to collect data. As this was an experimental research study, the researcher attended all the computer lessons taught to the participants and graded the assessments done by the participants. The researcher recorded the scores and made comparisons on how each group performed in pretest and posttest exams and saw the progress by the participants after being taught using either WebQuest or traditional teaching methods.

Validity and Reliability of the Study

Validity of the study. *External validity.* This is a validity that faces a study regarding the generalization of the findings and conclusion made in the study (Kirk & Miller, 2006). Being an experimental design study it may be faced by the two types of external validity, including population and ecological validities. The study only took place in two schools and involved 100 participants. The sample size may be too small to generalize the findings on the effectiveness of WebQuest to all first middle school students in Saudi Arabia who total to more than 50, 000. The environmental or ecological factors may also affect the validity of the study. For example, the study only took place in Hail City and it involved only boys, and therefore, the results of this study may not necessarily be applicable to girls, who may have needs or ways of engaging with the WebQuests that are different from boys. The fact that the study took place an urban area may make it invalid to extend the conclusions to students studying in rural areas.

Internal validity. This may be affected by the construct of the study. The experimentation design of the study were constructed to measure the effectiveness of WebQuest when used to teach computer science to first middle school students. The study may not be able to measure the underlying element it is supposed to measure. This is because other factors such as excitement of

the students using the WebQuest tool may influence the results. For example, the students taught using WebQuest may become excited as it is new in Saudi Arabia. This may make them be attentive in class and thus score better in posttest. However, it may not reflect the effectiveness of WebQuest because when they are eventually used to it and it is not new to them, it may stop being that interesting and thus the positive results may not be observed any more.

Reliability of the study. This section describes the extent to which the research study consistently measures the element it is supposed to measure (Kirk & Miller, 2006). The fact that various qualified teachers (with experience with both WebQuest and traditional teaching methods) in both of the two schools will be teaching the participants assures the reliability of this research study. Additionally, the same teacher in every school taught both experimental and control groups. This ensured that biased results attributed to heterogeneity of teacher experience in the subject are avoided and eliminated. Standardized pretest and posttests were used and they ensured that all the participants both in experimental and control groups were measured against standard assessment.

Data Analysis

The researcher analyzed the data using mean scores and median scores to show performance and progress of both experimental and control group. The data were analyzed by using the SPSS 22 software. The mean and median scores were presented using tables and graphs to analyze the test/ assessment scores attained by the experimental and control groups on pretest and posttest assessments. Comparison also was done in order to ensure the researcher to answer the research questions and draw meaningful conclusion on the effectiveness of using WebQuest to teach computer science to first middle school students.

Logistical and, Ethical Considerations

Before conducting the study, the researcher got a letter of consent and approval from the

Ministry of education in Saudi Arabia as well as public education administrators in Hail city. In addition, prior to selecting any school, the researcher got the consent of the head teacher as well as the subject teachers. He first explained to them what participating in this study entails as well as what information was need to disclosed. The researcher gave the participants' parents consent forms soliciting their willingness to participate in the study to sign as a proof of their informed consent to participate in the study. This was necessary because the participants were underage and thus were not able to legally make decisions on their own. The researcher personally attended all the assessment and computer lessons for the four groups and also personally record what needed to be recorded on the data collection sheets. The data about the student scores were not be disclosed to outside parties. The researcher handle the data with discreet and confidentiality as this is ethical.

Results

This section presents the results and findings of the quantitative experimental study that was carried out in Saudi Arabia between December 2014 and January 2015. The data were analyzed by using the SPSS 22 software. The data were collected from the sample of 65 study participants from two different schools. The participants were taught in either the traditional method or the WebQuest approach.

The data collected in the study were analyzed using mean scores to show the performance and progress of both the experimental and control groups. The mean and median scores were presented using tables and graphs to analyze the assessment scores attained by the experimental and control groups on the pretest and posttest assessments. Comparisons were done using the paired t-test (Creswell, 2014) in order to answer the research questions and draw a meaningful conclusion on the effectiveness of using WebQuest to teach computer science to first middle school students.

The mean of the groups was calculated by adding the individual scores of the respondents

during the training period and dividing by the number of the participants in that group.

Table 1: Descriptive statistics of both the experimental and control groups of School 1 during the two week experiment period

Variable	Group	N	Mean	Median	Std. Deviation	Sum	Skewness
Pre-test 1	Control	17	3.18	3.00	1.510	54	.033
Post-test 1	Control	17	6.41	6.00	2.123	109	-.350
Pre-test 2	Control	17	3.06	3.00	1.197	52	-.126
Post-test 2	Control	17	6.35	6.00	1.455	108	.399
Pre-test 1	Experimental	17	3.24	3.00	1.437	55	.249
Post-test 1	Experimental	17	7.35	7.00	1.656	125	-.175
Pre-test 2	Experimental	17	3.00	3.00	1.414	51	-.301
Post-test 2	Experimental	17	7.06	7.00	1.886	120	-.222

Table 2: Descriptive statistics of both the experimental and control groups of School 2 during the two week experiment period

Variable	Group	N	Mean	Median	Std. Deviation	Sum	Skewness
Pre-test 1	Control	16	3.25	3.00	1.291	52	.531
Post-test 1	Control	16	6.50	6.50	1.751	104	-.213
Pre-test 2	Control	16	3.13	3.00	.957	50	.244
Post-test 2	Control	16	6.31	6.50	1.580	101	-.127
Pre-test 1	Experimental	15	3.27	3.00	1.163	49	.344
Post-test 1	Experimental	15	7.27	7.00	1.792	109	-.806
Pre-test 2	Experimental	15	3.07	3.00	1.100	46	-.148
Post-test 2	Experimental	15	7.00	7.00	1.964	105	.522

From the descriptive statistics shown in tables 1 and 2, the mean of the control group (traditional approach method) in School 1 before the experimental Pretest 1 was 3.18 and Pretest 2 was 3.06 and after the experiment the mean of Posttest 1 and 2 increased to 6.41 and 6.35, respectively. The mean of control group in School 2 before the experiment was 3.25 for Pretest 1 and 3.13 for Pretest 2 and after the experiment the mean of Posttest 1 and 2 increased to 6.50 and 6.13, respectively.

On the other hand, the experimental groups had the highest mean after the experiment,

which was 7.35 and 7.06 in School 1 and 7.27 and 7.00 in School 2, as shown above (Table 1 and 2.)

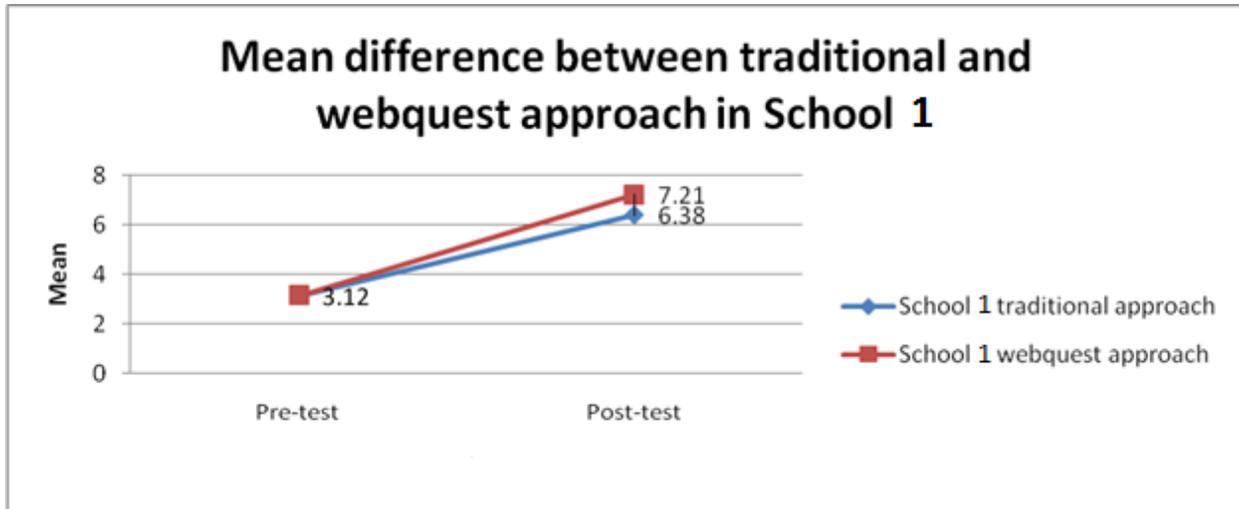


Figure 1: Mean difference between traditional and WebQuest approach in School 1.

The figure above shows the mean difference of the traditional and WebQuest approaches before and after the training in School 1 (fig. 1). This means that there was an increase in the scores in School 1 when using the traditional approach and WebQuest approach. The figure also shows that students taught by the WebQuest had higher scores as compared to those in the group taught by the traditional approach, but the difference was not statistically significant. The mean in the figure above was the average mean of Pretest 1 and 2 and Posttest 1 and 2.

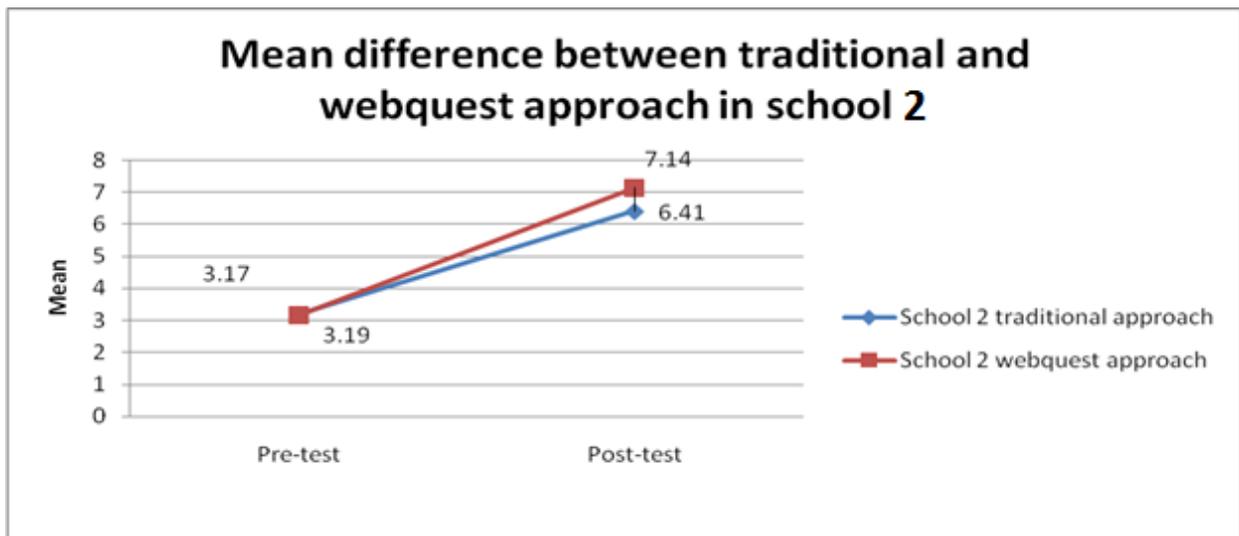


Figure 2: Mean difference between traditional and WebQuest approach in School 2.

The figure above shows the mean difference of the traditional and WebQuest approaches

before and after the training in School 2 (fig. 2). The figures above (fig. 1 and 2) shows the mean difference of the experimental group between, before and after the implementation of the WebQuest teaching approach in both School 1 and School 2. This means that there was an increase in the scores of both schools using the WebQuest approach.

Table 3: Paired correlation association between different groups

		N	Correlation	Sig.
Pair 1	S1TPre1 & S1TPost1	17	.600	.011
Pair 2	S1TPre2 & S1TPost2	17	.741	.001
Pair 3	S1WPre1 & S1WPost1	17	.856	.000
Pair 4	S1WPre2 & S1WPost2	17	.843	.000
Pair 5	S2TPre1 & S2TPost1	16	.708	.002
Pair 6	S2TPre2 & S2TPost2	16	.854	.000
Pair 7	S2WPre1 & S2WPost1	15	.821	.000
Pair 8	S2WPre2 & S2WPost2	15	.860	.000

Where S=school; T=traditional approach; W=WebQuest approach; Pre=pre-test; and Post=post-test

The paired correlation analysis (Table 3) shows that there is a significant relationship between S1TPre1 & S1TPost1 with correlation coefficient $r = 0.600$; S1TPre2 & S1TPost2 with correlation coefficient $r = 0.741$; S1WPre1 & S1WPost1 with correlation coefficient $r = 0.856$; S1WPre2 & S1WPost2 with correlation coefficient $r = 0.843$; S2TPre1 & S2TPost1 with correlation coefficient $r = 0.708$; S2TPre2 & S2TPost2 with correlation coefficient $r = 0.854$; S2WPre1 & S2WPost1 with correlation coefficient $r = 0.821$; S2WPre2 & S2WPost2 with correlation coefficient $r = 0.860$ at p -value < 0.05 . This means that both groups were tested on the same content or WebQuest skills. The independent t-test below will talk about the difference between WebQuest and traditional approaches.

Table 4: Paired t-test between different groups in two schools

		Mean	Std. De- viation	95% Confidence Inter- val of the Difference		t	df	Sig. (2- tailed)
				Lower	Upper			
Pair 1	S1TPre1 – S1TPost1	3.235	1.715	4.117	2.354	7.778	16	.000
Pair 2	S1TPre2 – S1TPost2	3.294	.985	3.801	2.788	13.786	16	.000
Pair 3	S1WPre1-S1WPost1	4.118	.857	4.559	3.677	19.799	16	.000
Pair 4	S1WPre2-S1WPost2	4.059	1.029	4.588	3.530	16.263	16	.000
Pair 5	S2TPre1 – S2TPost1	3.250	1.238	3.910	2.590	10.498	15	.000
Pair 6	S2TPre2 – S2TPost2	3.188	.911	3.673	2.702	14.002	15	.000
Pair 7	S2WPre1-S2WPost1	4.000	1.069	4.592	3.408	14.491	14	.000
Pair 8	S2WPre2-S2WPost2	3.933	1.163	4.577	3.289	13.100	14	.000

Where S=school; T=traditional approach; Pre=pre-test; Post=post-test; and W=WebQuest approach

These results indicate that the mean of S1TPre1 is significantly statistically different from the mean of S1TPost1 ($t = 7.778$, $p = 0.000$); the mean of S1TPre2 is significantly statistically different from the mean of S1TPost2 ($t = 13.786$, $p = 0.000$); the mean of S1WPre1 is significantly statistically different from the mean of S1WPost1 ($t = 19.799$, $p = 0.000$); the mean of S1WPre2 is significantly statistically different from the mean of S1WPost2 ($t = 16.263$, $p = 0.000$); S2TPre1 is significantly statistically different from the mean of S2TPost1 ($t = 10.498$, $p = 0.000$); the mean of S2TPre2 is significantly statistically different from the mean of S2TPost2 ($t = 14.002$, $p = 0.000$); the mean of S2WPre1 is significantly statistically different from the mean of S2WPost1 ($t = 14.491$, $p = 0.000$); the mean of S2WPre2 is significantly statistically different from the mean of S2WPost2 ($t = 13.100$, $p = 0.000$) at $p < 0.001$. This indicates that both the traditional approach and WebQuest teaching approach had a significant increase in the scores of the students in both schools. This was supported by Gulbahar, Madran, & Kalelioglu, (2010) who stated that WebQuest promotes student learning by ensuring that most or all of the information and data that students or learners interact with originates from internet sources.

Table 5: Independent-test between School 1 and School 2

School	Period	Group	N	Mean	Std. Deviation	Std. Error Mean	t-value	df	p-value
School 1	Pre-test1	Experimental group	17	3.2353	1.43742	.34863	.116	32	.908
		Control group	17	3.1765	1.50977	.36617			
	Post-test1	Experimental group	17	7.3529	1.65609	.40166	1.441	32	.159
		Control group	17	6.4118	2.12305	.51492			
	Pre-test2	Control group	17	3.0588	1.19742	.29042	.131	32	.897
		Experimental group	17	3.0000	1.41421	.34300			
	Post-test2	Control group	17	6.3529	1.45521	.35294	-1.222	32	.231
		Experimental group	17	7.0588	1.88648	.45754			
School 2	Pre-test1	Experimental group	15	3.2667	1.16292	.30026	.038	29	.970
		Control group	16	3.2500	1.29099	.32275			
	Post-test1	Experimental group	15	7.2667	1.79151	.46257	1.205	29	.238
		Control group	16	6.5000	1.75119	.43780			
	Pre-test2	Control group	16	3.1250	.95743	.23936	.158	29	.876
		Experimental group	15	3.0667	1.09978	.28396			
	Post-test2	Control group	16	6.3125	1.57982	.39496	1.077	29	.290
		Experimental group	15	7.0000	1.96396	.50709			

From the above analysis, it is evident that both schools saw an increases in scores, but there is no significant difference between the results of Schools 1 and 2 before and after the experiment with the $p > 0.05$. The above results indicate that there is no significant difference between the traditional approach and the WebQuest approach in both schools.

Table 6: Independent t-test between experimental group in school 1 and 2

	Schools	N	Mean	Std. Deviation	Std. Error Mean	t-value	df	p-value
Pre-test	School 1	34	3.1176	1.40916	.24167	-.153	62	.879
	School 2	30	3.1667	1.11675	.20389			
Post-test	School 1	34	7.2059	1.75429	.30086	.161	62	.873
	School 2	30	7.1333	1.85199	.33813			

From the above analysis, it is evident that there is no significant difference between students in the experimental groups in Schools 1 and 2 before and after training with the $p > 0.05$.

Table 7: Independent t-test between control group in school 1 and 2

	Schools	N	Mean	Std. Devia- tion	Std. Error Mean	t-value	df	p-value
Pre-test	School 1	34	3.1176	1.34310	.23034	-.229	64	.820
	School 2	32	3.1875	1.11984	.19796			
Post-test	School 1	34	6.3824	1.79249	.30741	-.056	64	.955
	School 2	32	6.4063	1.64335	.29051			

From the above analysis, it is evident that there is no significant difference between students in the control groups in Schools 1 and 2 before and after with the $p > 0.05$. From the analysis, both control groups, in both schools, have the same averages on pre-tests and post-tests.

In conclusion, the study found that the mean scores of students increased after doing the post-tests when subjected to the traditional approach. The study also found that there is an increase in scores in computer science after the use of WebQuest. This is supported by Schutten and McFarland, (2009) who highlighted that the instructional goal of WebQuest is knowledge acquisition and integration of computer skills to all learners; helping learners to grab a significant amount of new information and make sense out of it (Miralles, Gómez, and Arias, 2013); helping to support learning through technology (Subramaniam, 2012); and availing learners of multiple kinds of information and choices in order to enable the learners to relate to real world complexities and realities where the information is applied (Barack, 2011). This helps learners to improve their scores at the end of the training.

Conclusion

This chapter presents the conclusion of the present study according to the literature

review, findings and results drawn from the study. This section also looks at the reliability and validity of the study. Additionally, the limitations and the implications of further research are also discussed in this chapter.

Discussion of The Findings

Even though the study did not confirm my hypothesis due to the time, the study found that there was an increase in the scores when using the traditional approach (control group) and WebQuest approach (experimental group) before and after the experiment. The increase of the WebQuest group was higher, demonstrating that the WebQuest approach is a good method and it is an alternative to the traditional approach, but its effectiveness is subject to future research. Although WebQuest is a new method in Saudi Arabia, the study found that there was an increase in the scores of both schools using the WebQuest approach. This is supported by the literature review where Gokalp, Manjula Sharma, Johnston and Mia Sharma, (2013) stated that WebQuest had a positive impact on the learning performance of students across various grades.

The above finding is also supported by Strickland (2005) who indicated that the use of WebQuests to teach students in seventh grade was more effective compared to traditional teaching instructions.

The study found that there was an increase in scores in computer science after the use of WebQuest. The above finding is supported by Schutten and McFarland, (2009) who highlighted that the instructional goal of WebQuest is knowledge acquisition and integration of computer skills for all learners; in order to improve learners' ability to grab a significant amount of new information and make sense out of it (Miralles, Gómez, & Arias, 2013); to enable them to analyze information in the decision making process (Polly & Ausband, 2009; Kurtulus and Ada, 2012); to generate interest and motivation in students, and helping to support learning through technology (Subramaniam, 2012); and to avail learners of multiple kinds of information and

choices in order to enable the learners to relate to real world complexities and realities where the information is applied (Barack, 2011).

The present study also found that there was an increase in the scores of both schools after using the WebQuest technology. This study is supported by Chang, Chen, & Hsu, (2011) who highlighted that WebQuest enables learners to be able to use what was learned in the classroom through critical thinking to solve problems.

The above finding is also supported by Abbitt and Ophus, (2008) who highlighted an increased level of subject understanding by students when taught using WebQuest as compared to when taught with traditional learning instructions of curriculum.

Relationship to Hypothesis

The research hypothesis was tested and accepted by the findings of the study. The study found that there was an increase in scores in computer science after the use of WebQuest. The finding of the study also answered the research question “how did the use of WebQuest impact first middle school Saudi students’ learning in computer science?”

Limitations

Even though the research has come up with certain results that meet the research objectives, the study encountered some limitations which are presented as below:

First, the study sample had a smaller size or group of participants which were not randomly selected. One of the reasons for the smaller sample size is that the WebQuest technology was a new technology in Saudi Arabia and most teachers in middle and high schools in Saudi Arabia had never been exposed to the WebQuest learning and teaching program before the beginning of 2013. Therefore, the study results were based only on a few respondents who understood it and have put it in practice. This is because the researcher had difficulty finding teachers who were interested in the study as well as had some knowledge about WebQuest.

Secondly, the study participants were boys from the first middle school, between 12 and 13 years of age. This was because, even though boys and girls undergo the same type of education in Saudi Arabia, they go to separate schools. Therefore, the study faces the issues of the generalisation and comparison since only boys participated in the study and hence generalization cannot be applied to the general population.

Thirdly, the study period was only two weeks, due to the difference in the academic calendar between USA and Saudi Arabia. Time is an important aspect of research, and therefore, limited time affects the research in terms of the findings and results of the study.

Another limitation of the study was the sampling procedure employed. The study used the convenience sampling method where 65 students were selected. This affects the generalization of the results because students did not have an equal chance to participate in the study.

Lastly, the study was carried out specifically in two public schools in Hail city in Saudi Arabia. As WebQuest technology is a new technology in Saudi Arabia, it is being gradually introduced into selected schools. Consequently, many middle schools have not yet adapted the approach, making it hard for the study to use many schools to enhance the results and increase the generalization of the study.

Reliability and Validity of Results and Data

Reliability of the study can be described as the extent to which the finding of the present study can be replicated and used by other studies globally, applying the same research methods and approaches in a different area. The reliability of the study also depends on how the findings of the results are analyzed and interpreted, so that the results are meaningful and reflect the present study.

On the other hand, external validity of the results refers to the extent to which the results

obtained can be applied beyond the study, ultimately to organizations and educational institutions to improve performance using WebQuests.

The findings of the study were reliable because it produced results that supported and were supported by studies conducted in other areas and regions that used the same approach and method.

This study is one of the first of its kind in Saudi Arabia, which precludes any bias or influence from previous results, allowing this study to lay the foundation for future studies and further prove its reliability and relevance.

Implications for future research

To solve the above limitations, several implications were derived for future research that should be considered by other scholars.

First, the study focused on students' academic performance only, and did not take into consideration the factors that affect teachers and students when it comes to the use of WebQuest. Therefore, future studies should ensure that they determine the perception of both teachers and students on WebQuest since there is no precedent. Positive perception will help increased use of WebQuest and therefore increase academic performance of the students in computer science.

Secondly, the future study should use research methods that will help to make sure that the results and findings are reliable and valid. Therefore, the future study should use a random sampling method to ensure that participants have equal chances of taking part in the study.

Thirdly, the study focused on the education performance and the impact of the WebQuest technology on the performance in computer science. Future studies should concentrate not only on the impact of WebQuest on the performance of the students in computer science but also consider the impact of social, environmental and physical factors such as infrastructural facilities on the performance of the students.

Finally, the future study should involve participants of both genders and involve several schools as to provide a comparison of the results and findings from boys and girls, since schools only consist of one gender, in order to ensure that results are reliable and valid.

Contributions of The Study

First of all, the study has been able to contribute to the literature review on the effectiveness of using WebQuest to teach computer science among the first middle school students in Saudi Arabia. Deep and comprehensive knowledge of the concepts was presented via critically describing, analyzing, and discussing the WebQuest technology and its usage in teaching and the learning process in relation to views of other scholars. Due to this, other educational institutions can clearly understand the WebQuest design and usage and apply it to other schools in Saudi Arabia, as it is a new technology in the country.

Secondly, people who are interested in identifying the importance of the WebQuest usage in the teaching and learning processes may find it helpful to apply the method of this paper, which was successfully applied among the first middle school computer science students in Saudi Arabia, despite being a new technology. The research may be considered as a practical example for other educational institutions.

Finally, the research has a valuable practical contribution for improving the performance of students. The research findings found significant performance among computer science students when taught using WebQuest as compared to traditional teaching and yet it had never been applied in Saudi Arabia or any educational institution in the world.

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Appendices

Appendix A:

Pre/Posttest

school No.....

Your name:

Grade:.....

1-Sign mark (√) at the right of the sentence if it is true and mark (x) at the right of the sentence if it is not true. (4)

- A. One of the methods and programs drawing using a computer is drawing by hand.
- B. Apple Macintosh operating system works on all computers.
- C. Operating system helps the computer to shut down properly.
- D. One functions of the operating system is to discover the faults.

2: Choose the Right Answer For Each Question Below: (4)

- A. A set of programs that run on the computer and control its works carried out by:

Operating System.

Computer Peripherals.

User.

- B. Operating system that does not contain graphical interfaces is:

- 1. Windows.
- 2. Dos.
- 3. Linux.

- C. Are places To store data in the computer:

- 1. Files.
- 2. Folders.
- 3. Windows Explorer.

- D. Is a program used to write the text data and saved it quite simple:

- 1. Calculator.
- 2. Notepad.
- 3. Help and Support.

Write two points about the importance of computer drawing: (2)

1-.....

2-.....

Good luck,

Appendix B:

Data collection sheet 1 (blue)

No.	Name of the participant	Pretest scores	Posttest scores	Difference in scores (post-test-pretest)	Progress positive or negative
1.					
2.					
3.					
4.					
5.					
6.					

Data collection sheet 2 (Red)

No.	Name of the participant	Pretest scores	Posttest scores	Difference in scores (post-test-pretest)	Progress positive or negative
1.					
2.					
3.					
4.					
5.					
6.					