ATTITUDES TOWARD COMPUTER USE AND GENDER DIFFERENCES AMONG KUWAITI SIXTH-GRADE STUDENTS

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Because computer use become more and more important in the educational environment, the attitudes of students toward computer may play an important role in their learning success. This study investigated the attitudes toward computers and gender differences of sixth-grade Kuwaiti students and examined the relationships between students' attitudes toward computers and school, motivation/persistence, study habits, empathy, creative tendencies, and achievement in the Informatics field.

The Computer Attitude Questionnaire (CAQ), translated from the English into Arabic Language for this study, was originally developed by Knezek and Miyashita for the Texas Center for Educational Technology (University of North Texas). The CAQ was administered to a random cluster sample of 10 public middle schools: (5 boys' and 5 girls' schools), with a total of 562 students, (265 boys and 297 girls), in the State of Kuwait during the academic year 1999-2000. The pilot test was conducted to calculate the reliability with Cronbach's alpha = .87 for the CAQ Arabic version.

This study found positive attitudes toward computer use (mean = 3.31 on 4-point likert-scale); however, girls had significantly more positive attitudes toward computers (mean = 3.36) than did boys (mean = 3.26). It also found statistically significant correlations between attitudes toward computers and school (r. = .149), motivation/persistence (r. = .459), study habits (r. = .371), empathy (r. = .308), creative tendencies (r. = .530), and achievement in the Informatics field (r. = .201).

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CHAPTER I

INTRODUCTION

Computer technology has become an important tool in the teaching process and in students' learning as well as students' attitudes and achievements in schools today. Lockard, Abrams, and Many (1997) "believe the computer is an inescapable component of changes now facing education in the United States, indeed throughout the world" (p. 4). Furthermore, Bright (1987) believes that teaching and learning are difficult goals to achieve and that the computer opens new ways for working toward these goals. It is an excellent tool that provides an educational environment with virtual situations that students can apply to real life.

In the past few years, the educational use of computers has shown a remarkable increase in many countries (Collis & Sakamoto, 1996). The International Association for the Evaluation of Educational Achievement conducted an international comparative survey of computer use (Collis et al., 1996). The survey of schools was performed from 1987 until 1994 in 19 nations at all levels of education. Between the1989 survey and the 1992 survey, a significant increase in computer use within and among these countries was found. In U.S. public schools, for instance, the number of students per computer rose from 125 students per computer in the 1983-84 school year to 9 students per computer in the 1995-96 school year (Quality of Education Data [QED], 1995).

Despite the increase in the use of computers, important questions remain. What can educators do with computers to integrate the curriculum or extend instruction methods? "The question is not whether to use computers, but rather how best to use them" (Lockard et al., 1997, p. 3). What can schools do with computers so that they can improve students' outcomes? What can children learn from using computers in their schools?

Computer Use

Many possibilities exist for the use of computers at all levels of education with different subject areas (see Figure 1).

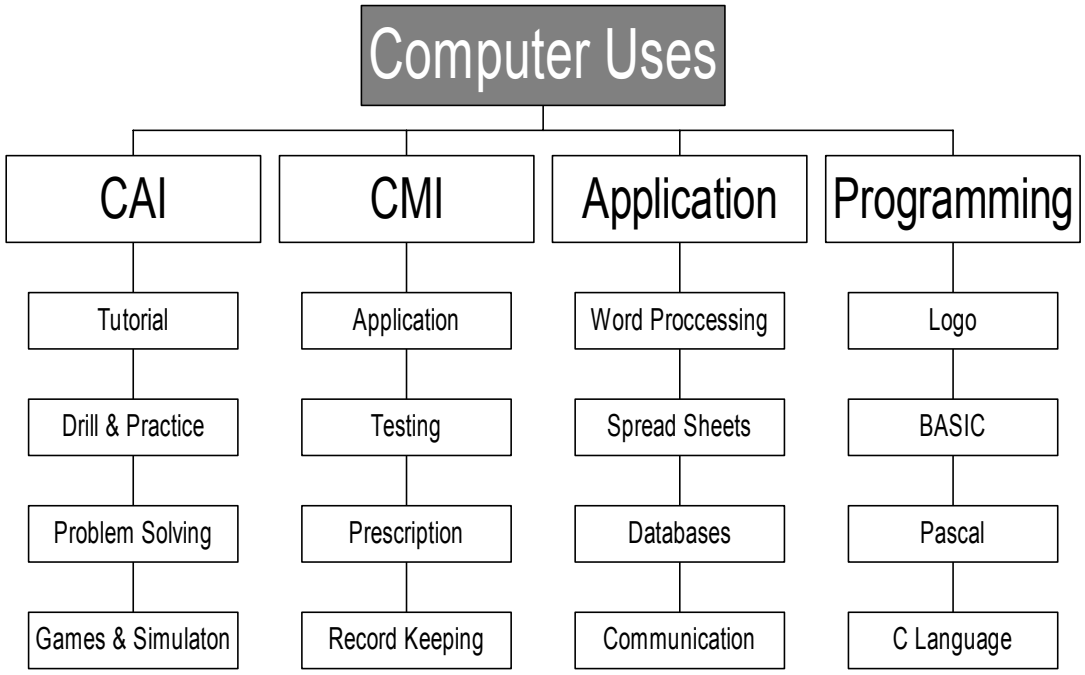


Figure1. Educational computer uses domains.

Computer education may be divided into two main categories: Computer-Assisted Instruction (CAI) and Computer-Managed Instruction (CMI) (Azarmsa, 1991; Toomey & Ketterer, 1995). According to Toomey and Ketterer (1995), CAI and CMI control both the information given to learners and the way the information is presented.

CAI

Computer-Assisted Instruction adapts to various models of instruction to present the content to the students in five commonly available strategies according to Azarmsa (1991); Heinich, Molenda, Russell, and Smaldino (1999); Kaiser (1985); and Knezek, Rachlin, and Scannell (1988).

Tutorial The computer acts as the teacher. "Information is presented in small units or modules followed by a question" (Azarmsa, 1991, p. 30). The computer analyzes the student's response and gives appropriate feedback.

Drill and Practice Drill and practice programs basically lead the students through a series of examples to increase dexterity and fluency in a skill. These programs provide a variety of questions with varied formats (Heinich et al., 1999). "The student is usually allowed several tries before the computer presents the correct answer. Several levels of difficulty can be available with the same program" (Azarmsa, 1991, p. 32).

Discovery and Problem Solving "Discovery is a general term to describe activities using an inductive approach to learning requiring problem solving. In this model, the computer presents problems which the student solves, after trial and error" (Azarmsa, 1991, p. 32). In discovery, the role of the student is to make hypotheses, test guesses, develop principles, and draw conclusions. In problem solving, the role of the student is to

define the problem, set up the solution, manipulate variables, and conduct trial and error (Heinich et al 1999). In addition, the most instructive and important development in educational computing is instructional software that enhances problem-solving skills. Collis and Lai (1996) noted, "The computer lessons provided students with the means to try out alternative approaches to the problems they are supposed to solve" (p. 62). Problem-solving software presents situations on the computers that are solved through a process of logical deduction, synthesis, and implementation. Stimulating analytical thinking is one of the primary characteristics of problem-solving software (Norton & Wiburg, 1998). Problem-solving software encourages students to be critical thinkers, problem solvers, and decision makers, and also to be creative.

Games and Simulation

> Games provide the opportunity for students to receive instruction in a motivating format. [Using Games in the computer] increase students' motivation, enthusiasm, and attention. . . . Simulation, on the other hand, is a dynamic representation of a real object, situation or environment. . . . Computer simulations focus on cognitive strategies, put the students in an active role, process input, make decisions, monitor progress, and coordinate efforts to reach a goal. (Azarmsa, 1991, p. 33)

Simulation is also useful in determining the end results of some dangerous experiments and expensive activities (Kaiser, 1985). A student with tutorial, drill, and practice models is a passive learner, but a student with problem-solving, games, and simulation models is a more active learner.

CMI

Computer-Managed Instruction (CMI) is another method of using the computer in education. "CMI refers to the use of a computer system to manage information about

learner performance and use of tools such as word processors, databases, spreadsheets, etc., to manage instruction" (Azarmsa, 1991, p. 35). According to Azarmsa (1991) CMI also helps teachers to manage the classroom in testing, prescription, and record keeping.

Application

Although Azarmsa (1991) included the tool use of computers in CMI, Bork (1985), Bright (1987), Knezek et al. (1998), Mitra (1998), and Toomey and Ketterer (1995) all saw this as a separate category of technology. They consider them as the specific software and applications being used. These applications have become important tools in the teaching process and in students' learning in today's schools. Word processors, spreadsheets, and database systems are applications that students should learn to use in the classroom and in real life. According to Bright (1987), the use of word-processing programs during class time or during the students' free time improves their imaginations by having them engage in creative writing activities. Bork (1985) emphasized the importance of spreadsheets as well as word-processing technology in teaching and learning. "Spreadsheets are another computer application becoming more and more common at present" (Bork, 1985, p. 36). Personal data systems help students develop good study habits by using this application to store personal note taking and information (Bork, 1985).

One unique computer educational application that has been developed recently is computer-mediated communication through the Internet and Electronic E-mail System. Azarmsa (1993) encouraged the applications of computer-mediated communications in promoting students' learning and in the professional development of teachers.

In today's teaching and learning, this system allows teachers to overcome the barriers of time and distance to share ideas and lesson plans, not only within the school, but also with teachers all over the world. This system allows students also to exchange information over distance or time with their classmates and with other students everywhere. As a matter of fact, many educators believe that, if this interactive system is used properly, it will be a helpful tool in enhancing teachers' professional development and in building students' knowledge.

Programming

The fourth category in the educational use of computers is programming. A number of programming languages have been taught in schools, such as BASIC, Pascal, C Language, FRTRAN, and COBOL (Lockard et al., 1997). Logo, however, is one that "is a unique blend of a programming language, learning theory, and educational philosophy" (Lockard et al., 1997, p. 322). It is popular in computer use in schools. Designed as a learning environment, Logo is a sophisticated computer program language that students learn in school. It gives children the opportunity "to develop 'powerful ideas' and, in doing so, begin to develop a sense of mastery over their learning environment" (Heinich et al., 1999, p. 206). Logo may be used in many ways. It can be used as a computer language and as an educational environment.

> As a programming language, Logo has the capability to be manipulated through words and expressions people use in the their natural language. . . . As an educational environment, Logo is both a mathematics-rich and language-rich medium. (Bu-Zebar, 1988, p. 15-16)

Logo programming helps students to think and solve problems. They can learn to break a problem into a sub problem, than further divide the problem into smaller units or parts until they arrive at a level at which the problem can be easily solved.

No evidence supports the assumption that mere exposure of students to computer technology can improve their attitudes and achievements. Technology alone does not affect teaching and learning. To choose what to do with technology is the crucial issue (Proctor & Burnett, 1996; Barron & Orwig, 1997). McKinnon, Nolan, and Sinclair (2000) cautioned,

> A key message for educators is that even though modern computer technology may be both fascinating and compelling to teachers and students alike, it is the quality of the curriculum programs in which the technology is used that makes the real differences to students' attitudes, motivation, and performance (p. 326).

Thus, the important question is How do educators employ technology and suitable educational applications by integrating them into the curriculum in an effective way to enhance teaching and learning? How can computers become a tool for teaching and learning, not only for presenting information to learners? There is already a good deal of interest in using this sophisticated technology to improve teaching and learning. Therefore, decision makers and educators must think and plan effective and appropriate ways of integrating computers into their curriculum that enhance the needs of their students to become active learners.

Information Technology in Kuwait Education

The State of Kuwait is a modern country, and computers are currently used in most aspects of life. Computers are used in homes, offices, hospitals, banks, and shopping centers. Al-Sadoun and Haj-Issa (1993) pointed out that since the 1980s, decision makers in the Ministry of Education have realized the importance of computer use in education. The Ministry of Education in Kuwait (MEK) examined the experiments of other countries on the use of computers in their schools. They adopted from those nations what is appropriate for Kuwait's environment and what is suitable to improve students' outcomes. Thus, computer technology was first implemented in four secondary schools in the school year 1985/86 to teach computer literacy courses. Currently, computer literacy courses are implemented in all Kuwaiti secondary schools (Al-Kbaz, 1992).

The Kuwait Intermediate School Information Technology Project (KISITP) is a new project that was launched in September 1994 by the MEK. The project is to be fully implemented and disseminated in all the intermediate Kuwaiti schools within the period 1994-2003. The general aim of KISITP is to introduce Information Technology (IT) for intermediate Kuwaiti schools Grades 5-8 (10-14 year olds) (Al-Furaih, Al-Sadoun, & Ebeid, 1997).

The IT curriculum addresses most of the categories of using computer technology: Computer-Assisted Instruction, Computer-Managed Instruction, applications, and Logo programming. In addition, the IT curriculum is integrated into other subject areas by the projects students apply at the end of each unit. Table 1 shows the philosophy

and goals of KISITP, and Table 2 shows the IT curriculum, which is taught across different grades (Al-Furiah et al., 1997).

Table 1

The Philosophy and Goals of KISITP

The philosophy of the program is based on the following: Empowering each student to fulfill his or her own potential by initiating computer skills at an early stage. Preparing students to meet the demands of a rapidly changing society and preventing alienation to modern technology. Reinforcing active learning through using the computer as well as other high-tech equipment as a tool to develop Higher-Order Thinking Skills (HOTS) such as problem solving, decision making, and reasoning. Integrating learning experiences through linking IT skills with other subject areas within the curriculum. Cultivating positive attitudes among students toward computer-oriented education. Encouraging cooperative learning through group work involving gathering, analyzing, and managing information. By the end of the intermediate stage, it is expected that the students will be able to fulfill the following: Use the computer as a general-purpose tool to support their learning through the use of word processing, database, spreadsheet, graphics, telecommunication, and other general-purpose application packages. Use the computer as a problem-solving tool through the use of Logo programming language or spreadsheet to develop their analytical skills. Use word processing technology, integrating with other appropriate computer application such as graphics in support of their work in different subject areas and self-created projects. Be exposed to the use of Computer-Assisted Instruction (CAI) to enhance their learning through the use of drill and practice, simulation, and tutorials. Be exposed to multimedia presentations in a variety of activities. Be acquainted with some innovations in computer such as E-mail and Internet culture.

Adapted from Al-Furaih et al., (1997).

Table 2

The IT Curriculum Across the Different Grades

Grade	First semester (30 Sessions)		Second semester (30 Sessions)		
FIFTH	Computer World (12 Sessions)	Graphics (18 Sessions)	Word Processor (16 Sessions)	Logo (14 Sessions)	
SIXTH	Graphics (14 Sessions)	Word Processor (16 Sessions)	Computer World (8 Sessions)	Logo (14 Sessions)	Project (8 Sessions)
SEVENTH	Word Processor (16 Sessions)	Spread Sheet (14 Sessions)	Computer World (10 Sessions)	Logo (14 Sessions)	Project (10 Sessions)
EIGHTH	Spread Sheet (20 Sessions)	Computer World (10 Sessions)	Computer World (10 Sessions)	Logo (14 Sessions)	Project (10 Sessions)

Adapted from Al-Furaih et al., (1997).

In the Teacher Book (Abou Zaid, Al-Ahmad, & Al-Rshad, 1997) of the IT curriculum, introduction goals outlined what students should learn after 1 and a half year's enrollment in the KISITP:

1. In the first unit, the fifth and sixth grades curriculum focuses in computer literacy, Computer World Unit, in which students learn how to turn on and off the computer, how to use the mouse, keyboard, and icons to execute orders that students have thought about it, and how to open and use the applications.
2. Let's Draw Unit, students learn to use graphics application in which students learn how to draw, design a variety of shapes and cards for different occasions, and then color them. After that the students learn how to add written text into what they have drawn and save the file to use it another time for editing or printing the work.

3. Word-processing, Let's Write Unit, is another application students learn to use in this curriculum. Students learn to type, correct, save, edit, and print what they wrote. Students learn to organize their essay and move their words, sentences, and paragraphs. Students learn development thinking skills and problem solving that are related with the writing process. In these units, students link what they learned to other subject areas to benefit from using the computer.
4. In the Logo unit, Let's Think with Logo, students learn to acquire thinking, problem solving, and creative skills through the use of Logo language as educational environment in the school sitting.

More than $24.1 million (US Dollars), according to Al-Furaih et al. (1997), have been spent on this project. The large amount of money is an investment so that students can get benefits from this innovation. Because the implementation of computer education program for intermediate stage students is just beginning, studies are needed to investigate how computer use influences students' attitudes in Kuwait. Policy makers in the Ministry of Education are seeking evidence on the results of the investment in information technology. They seek answers to many questions. Have students' attitudes improved as a result of using computers in the school? In what ways have students' achievement been impacted as a direct result of the information technology curriculum?

Purpose of the Study

The purpose of this study was to investigate the attitudes toward computers of sixth-grade Kuwaiti students who are learning computer applications and Logo language in a school setting and to investigate gender differences in attitudes toward computers. In addition, the study examined the relationships between students' attitudes toward computers and school, motivation/persistence, study habits, empathy, creative tendencies, and achievement in the Informatic field (see Figure 2).

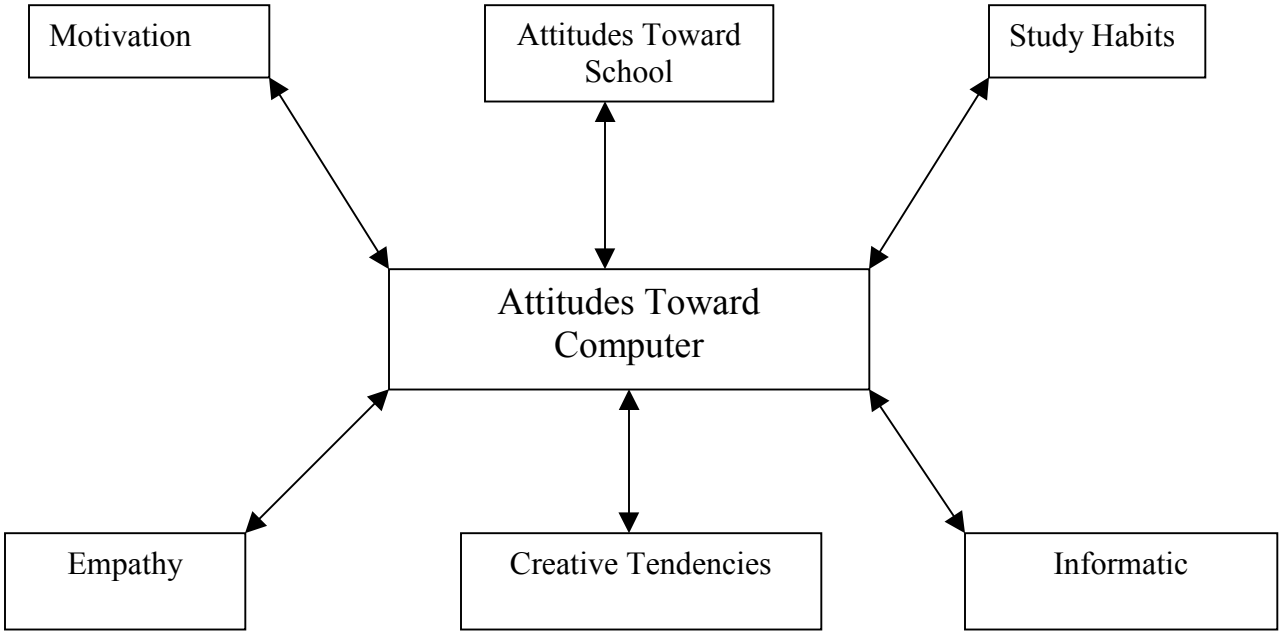


Figure 2. Multidimensional analyses of attitudes

Research Questions

1. What are students 'attitudes toward computers after 1 and a half years' enrollments in the KISITP? Are they generally positive or negative? Are the attitudes toward computers of boys and girls the same?
2. Is there a relationship between students' attitudes toward computers and attitudes toward school? Is the relationship the same for boys and girls?
3. Is there a relationship between students' attitudes toward computers and motivation/persistence? Is the relationship the same for boys and girls?
4. Is there a relationship between students' attitudes toward computers and study habits? Is the relationship the same for boys and girls?
5. Is there a relationship between students' attitudes toward computers and empathy? Is the relationship the same for boys and girls?
6. Is there a relationship between students' attitudes toward computers and creative tendencies? Is the relationship the same for boys and girls?
7. Is there a relationship between students' attitudes toward computers and achievement in the Informatic field? Is the relationship the same for boys and girls?
8. Do students who have access to computers at home display similar attitudes toward computers as students without computers at home?

Summary of Research Procedures

To answer the research questions, a Computer Attitude Questionnaire (CAQ) was administered to a random cluster sample of five boys' and five middle schools in the State of Kuwait during the academic year 1999-2000. CAQ was used to gather data about

the students' attitudes toward computers and school, motivation/persistence, study habits, empathy, creative tendencies, and whether or not students use computers at home.

Significance of the Study

The purpose of this study was to investigate whether or not the use of computer technology positively impacts the attitudes of sixth-grade students. Therefore, based upon these findings, the Ministry of Education will be in a better position to make informed decisions about the investment of monies in the area of computer technology for use in the intermediate schools in the State of Kuwait. This study adds to the limited research on the use of computers to enhance attitudes, motivation, study habits, and creativity. It contributes to knowledge on the appropriate way to use technology in teaching and the learning process.

Limitations of the Study

This study was limited by the characteristics of the population. It may be generalized only to State of Kuwait students who are enrolled in the KISITP.

Definition of Terms

Many of the terms that appear in this study have been used in the instrument for the study, and it is therefore important to define them based on their use in the present study.

Attitude is "defined as the thoughts, feelings, and behaviors of person toward a category, class, set of phenomena, or cognitive objects (Kerlinger, 1986)" (Miyashita, 1991, p. 15).

The following terms, as defined by Knezek, Christensen, and Miyashita (1998), are related to attitude variables measured by the Computer Attitude Questionnaire.

Attitudes Toward Computer: includes three kinds:

Computer Importance: perceived value or significance of knowing how to use computers.

Computer Enjoyment: amount of pleasure derived from using computers.

Anxiety: fear of failing to use a computer.

Attitudes Toward School: perceived value or significance of school.

Motivation/Persistence: unceasing effort; perseverance; never giving up.

Study Habits: mode of pursuing academic exercises within and outside class.

Creative Tendencies: inclinations toward exploring the unknown, taking individual initiative, finding unique solutions.

Empathy: a caring identification with the thoughts or feelings of others. (Knezek, et al., Glossary, 1998)

Summary

This chapter has served as an introduction to the problem of whether students' attitudes toward computers in the school setting are generally positive or negative. The second chapter is a discussion of attitude theories and a review of current literature in similar studies and related areas. Chapter 3 is a description of the research methodology and design of this study, and chapter 4 presents an analysis of the data. Chapter 5 provides a summary, conclusions, and recommendations.

CHAPTER II

REVIEW OF LITERATURE

Because computer technology has become an important tool in the teaching and learning process in the schools today, it is crucial to learn how students feel about computer use in their classrooms. This research has focused on the students' perspectives concerning computer use. The purpose of this study was to investigate students' attitudes toward computer use in the school setting. A review of the literature on students' attitudes toward computers provides an understanding of the importance of the problem being studied. This chapter consists of a synthesis of the research on (a) attitude theories, (b) attitude measurement, (c) attitudes toward computers, and (d) factors related to attitudes toward computers.

Attitude Theories

Attitudes are an important element in a wide variety of interpersonal behaviors and in almost every field that involves human beings (Fishbein, 1967; Fishbein & Ajzen, 1975). In the educational field, teachers need to understand students' attitudes in order to influence them toward learning (Mager, 1984). Collis and Sakamoto (1996), for example, emphasized that students' attitudes must receive attention from school staff. Fishbein and Ajzen (1975) defined "attitude as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object" (p. 10). Based on Fishbein and Ajzen's definition, attitude is either a favorable or unfavorable

evaluation of an object, idea, or thing, and therefore, students should like, or be positively disposed to, the subject or the activities in the classroom in order to learn.

Thorndike's Law of Effect holds that behavior with a pleasant consequence is more likely to be repeated and thus "learned." Hergenhahn and Olson (1997) wrote that, if "a response is followed by a satisfying state of affairs, the strength of connection is increased. If a response is followed by an annoying state of affairs, the strength of connection is decreased" (p. 61). Skinner's theory of operant behavior states that organisms tend to repeat those responses that are followed by favorable consequences. The operant conditioning theory under Thorndike and Skinner also emphasizes that the organism has to be rewarded in order to reinforce the elicited response and to enhance the chances of similar behavior occurring in the future (Kaiser, 1985). Fishbein and Ajzen (1975) and Mager (1984) pointed out that learners should consider positive or favorable attitudes toward the subject matter they study. Considering unpleasant or unfavorable attitudes causes negative attitudes toward learning. Skinner (1968) stated that interesting subjects could strengthen positive attitudes toward school.

Boser, Daugherty, and Palmer (1996) stated "this position is supported also by Popham (1994) who suggested that students who exhibit a positive attitude toward a subject are more likely to actively engage in learning during and after instruction" (p. 3). Therefore, based on the literature suggestions concerning the importance of development positive attitudes toward school subjects, according to Boser et al. (1996),

"it could be assumed that if students have a tendency to act positively toward a subject, e.g. technology, then, students will have more of an interest in that subject (Krathwohl)" (p. 3).

Cognitive theory looks at the learning process from different angles. It holds that "learning takes place due to the cognitive processes that occur inside the organism. The learner interacts with the environment, processes the information, and elicits the response" (Kaiser, 1985, p. 9). According to theory learning results from interactions with the environment. According to Hergenhahn and Olson (1997), Kurt Lewin who developed a theory of human motivation that said that a psychological fact is anything of which a person is conscious and that all psychological facts make up the person's life space. As stated by Hill (1977), the life space is the environment as it affects an individual's behavior or attitude. It contains the person himself or herself, the positive goals that he/she is seeking, the negative goals that he/she is trying to avoid, the barriers that restrict his/her movements, and the paths that he/she must follow to obtain the desired results. Some of these factors might exert a positive or negative influence on the person's attitude.

Therefore, a sophisticated environment of learning can positively develop students' attitudes toward learning. According to Fishben & Ajzen (1975), attitudes are not innate--they are learned. Therefore, students' attitudes can be changed. Triandis (1971) described attitude as "an idea charged with emotion which predisposes a class of actions to a particular class situations" (p. 2). Attitudes are developed, and they are "organized through experience" (Fishbein, 1967, p. 8).

The theoretical foundation supporting this investigation based upon the behavioral and cognitive theories. These theories express an individual's desire and attitude to learn and implement actions to attain designated outcomes, so the effects of educational computer use on students will depend specifically on the computer curricula contexts in which computers are used.

Attitude Measurement

Fishbein (1967) believed that attitudes can be measured. Information about attitudes can be gathered, according to Dwyer (1993), in two basic ways: (a) through observing the subjects' behaviors, or (b) through asking the subjects what they believe, as Anderson (1981) and Dwyer (1993) call "self-report methods." Measuring attitude through observation is not as accurate as self-report because "attitude is not directly observable. It is an inferred entity, something which is not measured directly but rather deduced from other observable data" (Halloran, 1967, p. 15). In addition, McHaney (1998) cautioned that

> the complexity of human behavior creates at least three major problem with obtaining information about attitudes on observations of overt behaviors: (1) difficulty in determining which behaviors to observe and how to accurately record them, (2) inaccurately inferring affective characteristics from the behaviors, (3) misinterpreting the behaviors observed. (p. 21)

Self-report methods also have certain problems. Mitra (1998) believes that "measurement of attitudes toward computer has also posed some methodological challenges" (p. 284). Anderson (1981) described the major problem as being that the subjects may provide misinformation because of social desirability and acquiescence.

> Social desirability means that people respond to a question/statement/adjective in ways that they believe to be socially acceptable (or, at least, acceptable to the person administering the self-report measure) rather than in a way consistent with their true beliefs and feelings… Acquiescence refers to the tendency of a person to agree with a statement (or answer yes to a question) when he or she is unsure or ambivalent. (p. 65)

Thurstone and Chave (1929) (as cited in Dwyer, 1993) considered the issue of misinformation and suggested the following:

> All that we can do with an attitude scale is to measure the attitude expressed with the full realization that the subject may be consciously hiding his true attitude or that the social pressure of the situation made him really believe what he expresses. . . . All we can do is minimize as far as possible the conditions that prevent our subjects from telling the truth, or else to adjust our interpretation accordingly. (p. 10)

Regarding the social desirability issue, the items in the questionnaire used in this study do not ask subjects to answer personal questions, to make decisions, or to differ widely in their tendency to respond in a socially desirable manner, as Anderson (1981) believed that these factors should be taken into account. This questionnaire gathers information in items that avoid the obvious problems of the social desirability and acquiescence issue.

For the present study, a Likert-type scale "self-report" was used to measure students' attitudes toward computers. According to Mitra (1998), attitudes toward computers have been measured with Likert-type scales. The questionnaire used in this study is the Computer Attitude Questionnaire, which measures attitudes (feelings toward a person or thing) and prevailing attitudes (dispositions). The CAQ was developed by Knezek and Miyashita (1994) of the Texas Center for Educational Technology (University of North Texas). According to Knezek and Miyashita, the CAQ "is based

upon the Young Children's Computer Inventory (YCCI). . . . which was developed and refined during 1990-93 for use in a multinational study of psychological impact of computer use on young children" (p. 125). The CAQ is designed to survey students in middle school (Grades 6-8) (Kneznk & Miyashita, 1994).

The Computer Attitude Questionnaire measures students' psychological dispositions in six areas: (a) attitudes toward computer: computer importance, computer enjoyment, computer anxiety/seclusion; (b) motivation/persistence; (c) study habits; (d) empathy; (e) creative tendencies; and (f) attitudes toward school.

Those areas were studied by Knezek and Miyashita (1993) to discover primary students' attitudes toward computer and school. In addition, Knezek et al. (1994) used these areas to compare data from computer-using students in Japan to data from students not using computers in Japan, while using data from students in the United States and Mexico as time-synchronized controls.

Regarding the validity of CAQ, Knezek and Miyashita (1993) stated in the Handbook for the Young Children's Computer Inventory three common traits:

1. Involves judgments by experts as to whether an item measures the construct in question.
2. Involves using a multivariate data analysis technique called factor analysis, to determine how well unspecified set of predictors (called factors) can be found to account for the variance in the data.
3. Criterion-related validity, which is the ability of a measurement instrument to distinguish between groups with genuine differences on the constructs under examination. (p. 2)

The reliability Cronhach's alpha was calculated using seventh and eight-grade data from 1995 (N=588) (Knezek & Christensen, 1996). The values indicate the internal

consistency of the instrument and are all within the "very good" range. The CAQ has been administered to students in Japan, Mexico, Korea, and United States.

Attitudes Toward Computers

Pelgrum and Plomp (1996) stated, “Student’s attitudes toward computers are considered to be very important indicators of students’ inclination to adopt this new technology in their lifelong learning” (p. 38). Christensen (1998) wrote:

> A review of the literature on attitudes computer by Lawton and Gerschner (1982) showed that children found computers to have infinite patience, never to get tired, never to forget to correct or praise, to be impartial to ethnicity and gender, and to great motivators. In the same review, it was shown that students liked computer because they were self-paced, gave immediate feedback, and did not embarrass when they made mistakes. (chap. 2, p. 6)

Further, Computer-Assisted Instruction plays a considerable role in the students’ attitudes toward learning. Bender and Bender (1996) believe that “efficient CAI use can improve a student’s attitude toward learning” (p. 10). According to Kulik (as cited in Lindia, 1992), “Research demonstrates that computer-based instruction has a positive effect upon students attitudes toward computer use” (p. 39). The majority of the research literature in the area of students’ attitudes toward computers strongly suggested that computers positively affect the students’ attitudes (Boser et al., 1996; Brosnan, 1998; King, 1994-95; Sacks, Bellisimo, & Mergendoller, 1993-93). Students’ attitudes toward computers is such a critical issue that Zhang and Espinoza (1998) claimed that attitudes should continually be monitored if the computer is used as a teaching and learning tool.

Attitudes toward computers have been documented at almost every level of education (pre-university and university level), and these studies involved different populations from different countries. It is useful to look at the previous evidence about

students' attitudes toward computers. Different instruments were used in these studies to collect data regarding students' attitudes toward computers at various levels of education. In addition, these studies examined gender differences in attitudes toward computers.

Evidence on Attitudes Toward Computers

King (1994-95) examined seventh-grade students' attitudes toward computers and school in Australia. Using the computer was a government-sponsored electronic-learning project. Two instruments were used in the study. The first was a computer-anxiety index consisting of 26 positively or negatively worded Likert-type items. The second instrument was used to measure the students' perceptions of the quality of their school life. It was a 40-item Quality of School Life Questionnaire. King found that the computers positively increased the students' attitudes. However, no identifiable effect of the presence of the computer on the quality of school life was found.

Orabuchi (1992) did a 4-month experimental study designed to determine the effectiveness of CAI. The researcher found that CAI students' scores were significantly higher than non-CAI group in inferences, generalizations, and math problem solving. The results showed also that the CAI group was higher in self-concept, attitude toward school, attitude toward computers, and tasks they could do with computers.

Wodarz (1994) conducted an experimental study in Phoenix, Arizona, to investigate the effects of computer usage on elementary students' attitudes, motivation, and achievement in mathematics. The Iowa Test of Basic Skills was used for students' achievement, and a survey was used to measure attitudes and motivation. The items to measure attitudes and motivation "were written using Miyashita and Knezek's attitude

survey as a guide" (p. 64). Experimental group scores were significantly higher than the control group in mathematics achievement, but no significant difference existed in attitudes and motivation.

McKinnon, Sinclair, and Nolan (1997) studied the impact of the integrated curriculum, which included extensive use of computers in New Zealand (Grades 8-10). Researchers used a variety of methods to collect data on 415 students. They employed "Education questionnaire (Nicholls, Patashniick & Nolen, 1985) . . . to monitor the development of students attitudes and motivation" (p.7). They also developed the Computer Attitudes Questionnaire to monitor students' attitudes towards learning with and about computers. The study found that students in the integrated program had significantly more positive attitudes towards computer use than did students in the traditional program.

Attitudes Toward Computer and Gender Differences

Sacks et al. (1993-94) studied the attitudes toward computer and computer use by Grade 10-12 students in a small urban school district in Northern California. Researchers examined gender differences in computer use and attitudes toward computers. They used a 30-item questionnaire concerning students' attitudes toward computer use. The questionnaire was a Likert-type instrument yielding three subscale scores (computer anxiety, computer confidence, computer liking) and a summary score. Researchers found that (a) girls' attitudes toward computers improved while boys' attitudes did not; (b) boys' attitudes toward computers and actual computer use were relatively unrelated, while girls' attitudes toward computers and actual computer use converged; and

(c) boys' attitudes and behaviors toward computers were relatively stable, while girls' attitudes and behaviors were not stable.

Brosnan (1998) examined the role of psychological gender in children's computer-related attitudes and attainments by 48 primary (6-11 year-olds) school-aged children in South London, UK. Research used the Children's Sex Role Inventory, which is based upon the Bem Sex Role Inventory. The instrument was a 10-item questionnaire upon a 4-point scale from not at all true to very true. The findings show that boys hold more favorable attitudes towards computers than girls and that boys hold more positive attitudes and achieve higher levels of computer-related attainment than girls.

Martin, Heller, and Mahmoud (1992) examined the attitudes of 8- to 12- year-old American and Soviet children toward computers. The researchers used picture data as indicators of children's attitudes to compare their responses to attitude statements and their drawings of computers

> The attitudes of the children from both countries were found to be very similar and mostly positive. . . . The most significant gender differences occurred in the drawings of computer users with most boys drawing males and most girls drawing females as computer users. (p. 155)

Lever, Sherrod, and Bransford (1989) conducted an experimental study "to determine whether computers can improve the attitudes of elementary students toward microcomputers and toward school in general" (p. 47). The Computer-School Questionnaire, which was developed by the researchers, was used to measure fifth-grade students' attitudes toward computers and school. The researchers reported that the computer helped students to improve attitudes toward school and computers.

An interesting finding was that females held more positive attitudes toward computers than did males.

Motivation, Study Habits, Empathy, Creativity, and Attitudes Toward Computers

Miyashita (1991) used the Young Children's Computer Inventory (YCCI) questionnaire for her dissertation to investigate the changes in attitudes of Japanese first- and second-grade children who were exposed to microcomputers in school. The study found that children who used computers had more positive attitudes toward computers than children who did not use computers. In addition, no significant differences were found between the two groups in the area of motivation to study, empathy, and creativity, as measured by the YCCI.

Knezek and Miyashita (1991) used the Young Children's Computer Inventory (YCCI) questionnaire to perform a cross-cultural study of students' attitudes toward the use of computers in instruction among three groups: "Japanese students in Tokyo, Japan; American students in Sanger, Texas; and Japanese in Dallas, Texas" (p. 1). The English-Language version of the YCCI was administered to American students, and the Japanese-Language version of the YCCI was administered to Japanese students in Tokyo and Dallas. The study found that Sanger students were more positive than Tokyo students in the areas of attitudes toward computers, less positive than the Tokyo students in empathy, and more positive than the Tokyo students in motivation to study. However, no significant differences were found in the area of creativity among the three cultural groups.

Knezek and Christensen (1995) used the Computer Attitude Questionnaire (CAQ) to compare two types of computing curricula at a junior high school in Leander, Texas. "The first program is a traditional computer literacy. . . . The second program, a pilot program, teaches the mandated computer literacy elements through the integration of computers within the existing 7th grade curriculum" (p. 1). The findings indicate that students in an integrated program enjoyed the computer more than students in a traditional computer literacy. In addition, integrated-program students "rated themselves as higher in creative tendencies than their peers enrolled in computer literacy" (p. 4). The most interesting finding was that females in the integrated group were significantly higher than males in the areas of study habits and empathy.

Knezek and Christensen (1997) used the Computer Attitude Questionnaire also to compare students' attitudes toward information technology at two parochial schools in North Texas. One school, located in Dallas, has all female students; the other, in Tyler, is coeducational. The researchers found similarities in students' attitudes toward information technology between the two schools. The Dallas school had higher empathy ratings than the Tyler school. No significant differences were found for the areas of student motivation to study, creative tendencies, or attitude toward school.

Knezek et al. (1998) reported a study conducted by a Mexican research team. The researchers administered the Computer Attitude Questionnaire to 590 ninth-grade Mexican students from different states in Mexico to measure their attitudes toward computers and electronic mail. The study found strong positive attitude toward electronic

mail, some differences between states on computer enjoyment, differences across states on frustration-anxiety. Girls tended to show more empathy than boys.

College Students' Attitudes Toward Computers

Over time, studies have been done to evaluate university students' attitudes toward technology in general and toward computer use in the college. Steffenson, Myers, and Edeburn (1982), for example, studied the attitudes of college students toward computer-managed instruction. The findings of this study indicate an overall positive attitude change. Ireson (1997) surveyed students' attitudes toward computer-aided instruction at a 2-year college. Students were surveyed using an instructor-developed instrument. Results indicated that students held positive attitudes toward using computers, felt that computer-aided instruction was helpful, and that computer skills were transferable to the workplace.

Liu (1996) examined the attitudes toward computers of Chinese students at American University. Researchers explored the possible effects of gender, age, and computer experience on these students' attitudes toward computers. The study found that Chinese students' attitudes were positive. Age and gender factors did not appear to make any difference among these students. However, significant differences in attitude were found among the groups of Chinese students who had more computer experience. Similarly, Luckett (1997) examined the relationship between gender and ethnicity and African American and Caucasian college student attitudes toward computers. Research found that all groups have positive attitudes toward computers. No significant difference was found between gender and ethnicity among the students.

Mitra (1998) surveyed undergraduate students at Wake Forest University regarding the categories of computer use and their relationship to attitudes toward computers. Higher use of computers among the students indicated more positive attitudes toward computers. "The results suggest that distinct categories of computer use exists and that significant relationships can be found between these categories and attitudes" (p. 291).

Summary

One of the underlying assumptions of computer education is its ability to improve the learners' attitudes. This appears from the review of literature on attitudes toward computers, which have been investigated at all levels of education in several nations. Researchers have found positive attitudes toward computers among students of different ages. However, the connection between attitudes toward computers and study habits, empathy, creative tendencies, and achievement in computer course has not been adequately investigated to find whether or not there are relationships between these variables. Miyashita (1991) investigated the changes in the motivation to study, empathy, and creativity, but she did not include achievement in computer field and attitudes toward school, and she did her investigation with Japanese first- and second-grade children who were exposed to microcomputers in school.

Because the computer has become increasingly important in all aspects of life in Kuwait, specifically in the educational environment, the present investigation studied whether attitudes of Kuwaiti students toward computers were positive after use in the school setting.

This study investigated whether relationships exist between (a) students' Attitudes Toward Computers and their Attitudes Toward School, (b) students' Attitudes Toward Computer and their Motivation/Persistence, (c) students' Attitudes Toward Computer and their Study Habits, (d) students' Attitudes Toward Computer and their attitudes toward other people (Empathy), (e) students' Attitudes Toward Computer and their Creative Tendencies, and (f) students Attitudes' Toward Computer and their grades in the Informatic field.

CHAPTER III

METHODOLOGY

The main purpose of this study was to investigate students' attitudes toward computer use in the school setting. This chapter includes sections describing (a) population and sample, (b) research design, (c) instrumentation, (d) procedures for data collection, and (e) procedures for data analysis.

Population and Sample

The target population for this study was 160 public middle schools in all districts under the Ministry of Education in the State of Kuwait during the academic year 1999-2000. These districts have integrated the Kuwait Intermediate School Information Technology Project (KISITP), in 77 boys' and 83 girls' schools. The sample of 10 middle schools was randomly chosen by cluster sampling, 5 boys' and 5 girls' schools. The sample was intended to be generalized to the middle-school students in the State of Kuwait. Two sixth-grade classes were selected by the schools' administration. The selection was according to the following criteria: (a) the time should be between 9-12 a.m, and (b) the students should already have eaten their breakfasts.

Ages of the sixth-grade Kuwaiti subjects in this study ranged from 11 to 13 years. The schools in Kuwait serve students from various socioeconomic backgrounds; including high level, middle-level, and low-level families. Some of the students come from other nationalities. All the participants had access to computers in the fifth grade.

They had similar keyboarding skills, previous computer experience, and writing ability. In the fifth grade, the participants studied four units: Computer Word, Graphics, Word Processor, and Logo. In the sixth grade, they study same units with more advanced skills required. In addition, they integrate projects to practice what they learn in each unit.

Research Design

This study was a single-group posttest only design. The treatment was already established: the Kuwait Intermediate School Information Technology Project (KISITP).

Instrumentation

The Computer Attitude Questionnaire (CAQ), used to gather data for this study, was translated from the English into the Arabic Language edition of a questionnaire originally developed by Knezek and Miyashita (1994) (see Appendix A) for the Texas Center for Educational Technology (University of North Texas). According to Knezek and Miyashita (1994), the CAQ "is based upon the Young Children's Computer Inventory (YCCI). . . . which was developed and refined during 1990-93 for use in a multinational study of psychological impact of computer use on young children" (p. 125).

The questionnaire consists of 62 Likert-type questions for six psychological dispositions. For each item, students respond by circling one of the number labeled Strongly Agree (SA), Agree (A), Disagree (D), or Strongly Disagree (SD). This instrument measures students' attitudes and dispositions toward computers on the following subscales: Computer Importance, Computer Enjoyment, Computer Anxiety, Computer Seclusion, Motivation/Persistence, Study Habits, Empathy, and Creative Tendencies. Eighteen paired-comparisons items in the instrument also assess students'

relative preferences for using a computer versus reading a book, writing, and watching television. In addition, four items measure students' attitudes toward school. These four items were added to the CAQ to compare whether attitudes toward school are influenced by computer use in the school. One question asked the students if they use a computer at home to see if the students had access to a computer at home.

The six subscales have been defined by Knezek and Miyashita (1993): computer importance: perceived value or significance of knowing how to use computers; computer enjoyment: amount of pleasure derived from using computers; study habits: mode of pursuing academic exercises within and outside class; empathy: a caring identification with the thoughts or feelings of others; motivation/persistence: unceasing effort; perseverance--never giving up; and creative tendencies: inclinations toward exploring the unknown, taking individual initiative, finding unique solutions.

The reliability Cronhach's alpha in Table 3 was calculated using seventh- and eighth-grade data from 1995 (N=588). The values indicate the internal consistency of the instrument and are all within the "very good" range. Table 3 contains the reliability for the CAQ as reported by Knezek and Christensen (1996). The CAQ has been administered to students in the United States and Mexico.

Table 3

Internal Consistency Reliability for the Computer Attitudes Questionnaire

Attitudes	No. of items	Reliability
Computer Importance	7	.82
Computer Enjoyment	9	.82
Computer Anxiety	8	.84
Computer Seclusion	13	.81
Motivation/Persistence	9	.80
Empathy	10	.87
Study Habits	10	.82
Creative Tendencies	13	.86
Overall	53	.94

The CAQ was translated into Arabic (see Appendix B), and its content validity was assessed by a panel of experts who compared the English and Arabic versions. Several modifications were made to some items so that they would be readable and understandable for 11-13- year-old Arabic readers. A professor at the College of Basic Education in the State of Kuwait also validated the instrument.

In addition, the CAQ back translated to English (see Appendix C) from the Arabic version to compare the original and the back translation, thus validating the translation.

A professional English teacher compared the original and the back translation and found that there were items in which specific words were not matched in the back-translated version (see Appendix D); however, these words do not affect the meaning of items. Therefore, the researcher made no further modifications.

Informatic Field

This study examined the relationship between students' attitudes toward computers and students' achievement in the information technology curriculum (Informatic Field). Teachers have instruction regarding how to evaluate students in the study field "Informatic" (see Appendix E). This instruction was obtained from the Ministry of Education in Kuwait (Information Center – Technical Department – Project of Computer Inclusion at Intermediate Stage) Also, the researcher asked the teachers of classes chosen to participate in the study to provide him with the grades of those classes in the Informatic field.

Pilot Study

The Arabic CAQ version reliability was estimated by employing the Cronbach's coefficient alpha in the pilot study. The CAQ data were analyzed using an analysis of variance. It was pilot tested with 174 sixth-grade students from four public middle schools in the State of Kuwait. Eighty-two boys and 91 girls participated in this pilot study, which the researcher administered in November 1999. The overall reliability of the CAQ Arabic version is .87, utilizing 62 of 81 items contained in the instrument. This reliability is considered very good, according to guidelines provided by DeVellis (1991). Subscales reliabilities, however, range from a low of .62 to a high of .75, as shown in Table 4.

Table 4

Internal Consistency Reliability for the Computer Attitudes Questionnaire, Arabic Version

Attitudes	No. of items	Reliability
Computer Importance	7	.74
Computer Enjoyment	9	.72
Computer Anxiety/Seclusion	9	.66
Motivation/Persistence	9	.73
Empathy	10	.75
Study Habits	10	.66
Creative Tendencies	13	.62
Attitudes Toward School	4	.64
Overall	62	.87

These can be evaluated according to the following guidelines regarding acceptable reliabilities for research instrument scales:

below .60	unacceptable
between .60 and .65	undesirable
between .65 and .70	minimally acceptable
between .70 and .80	respectable
between .80 and .90	very good
much above .90	consider shortening the scale.

(DeVellis, 1991, p.85)

According to these guidelines, current reliability estimates of the subscales can be considered encouraging especially since the overall reliability of the instrument is .87, a very good reliability. Creative tendencies and attitudes toward school appear to have undesirable reliability, but they do not fall in the unacceptable reliability according to the guidelines.

Procedures for Data Collection

The sample of this study consists of five boys' and five girls' middle school students. A letter was sent to the Ministry of Education (Deputy Undersecretary for Educational Research) (see Appendix F) in the State of Kuwait for approval to conduct this study in the Kuwaiti schools. The Ministry of Education sent letters to school principals, requesting that the researcher be allowed to conduct the study (See Appendix G). Because the State of Kuwait is not a large country, the researcher visited each school to meet with the principal to describe the purpose of the study, to schedule the administration of the Computer Attitudes Questionnaire to students, to explain the procedures for completing the questionnaire, and to provide the schools' administration with the Parents' Consent Form (see Appendix H) to be distributed to parents.

The instrument was intended for administration in the school environment, and the teachers and the researcher supervised the students in a classroom environment. Therefore, the researcher met the principal of each school and teachers of the classes chosen to participate in the study. Instruction on how to administer the questionnaire was provided for the principal and the teachers in this meeting.

In February 2000, the researcher and the teachers administrated the questionnaire to the students. The researcher distributed the Students' Consent Form (see Appendix I). The researcher explained the purpose of the study and why they had to sign the form. After all students signed the form and the teachers collected all the forms, the researcher

distributed questionnaires to all the students in the class, asking them to write their names in the blanks at the top. The researcher explained that it was not a test, that there were no right or wrong answers, and that the students should circle a response that showed how they felt about the item. In the case of students who had difficulty reading or understanding the item, the researcher read the item and explained the meaning of the item, rather than just have the student guess. Also, the teachers were instructed not to try to influence the response rating.

Procedures for Data Analysis

Data gathered through the CAQ were analyzed using analysis of variance statistical procedures in the Statistical Package for the Social Sciences (SPSS). This database was used to sum the numeric values of the responses. In addition, this database was used to run frequencies, percentages, means, and correlation between variables.

The mean score was used to judge whether the overall students' attitudes toward computers were positive or negative. The study employed the independent-samples t-test for the difference of means as an overall test for significant differences between boys' and girls' mean scores and between students who use computers at home and students who do not, as measured by the CAQ. The Pearson correlation was used to test for significant correlation between the subscales as dependent variables.

The CAQ includes eight subscales: Computer Importance, Computer Enjoyment, Computer Anxiety and Seclusion, Study Habits, Motivation/Persistence, Empathy, Creative Tendencies, and Attitudes Toward School. The items of the subscales are distributed among the parts of the CAQ, as shown in Table 5. For the main purpose of

this study, Computer Importance, Computer Enjoyment, Computer Anxiety and Seclusion were combined into one subscale called Attitudes Toward Computers (see Appendix J).

Table 5

The Items of the CAQ Subscales

Subscale	Part	Item numbers
Computer Importance	1	3, 6, 7, 8, 10, 11
Computer Enjoyment	1	1, 2, 4, 5, 9, 12, 13, 16, 19
Computer Anxiety/Seclusion	1	12, 13, 14, 15, 16, 17, 18, 19, 20
Study Habits	2	21, 24, 25, 26, 29, 30, 31, 32, 33, 34
Motivation/Persistence	2	21, 22, 23, 25, 27, 28, 29, 34, 35
Empathy	3	36, 37, 38, 39, 40, 41, 42, 43, 44, 45
Creative Tendencies	4	46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58
Attitudes Toward School	6	62, 63, 64, 65

Ten items on the CAQ have negative wording; therefore; these items were revised before adding them to the others. These are Items 2, 13, 14, 15, 16, 17, 18, 19, 20, 63, and 65. The researcher used a colored pen to circle the reflected values of the numbers marked by the students for these 10 items. If the student circled 1, it should be 4; if a student circled 3, it should be 2. For example, Item 2 (I am tired of using a computer), if circled (1) strongly disagree must be revised to (4) strongly agree.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

The purpose of this study was to investigate the attitudes toward computers of sixth-grade Kuwaiti students enrolled in the technology applications course and to investigate gender differences in attitudes toward computers. In addition, the study examined the relationships between students' attitudes toward computers and school, motivation/persistence, study habits, empathy, creative tendencies, and achievement in the Informatic field.

The CAQ of 65 items concerning the attitudes of students toward computer use in the school was administered to a random cluster sample of 10 public middle schools: 5 boys' and 5 girls' schools, 265 boys and 297 girls, in the State of Kuwait during the academic year 1999-2000. These schools have implemented the Kuwait Intermediate School Information Technology Project (KISITP). This chapter provides data regarding the respondents and an analysis of the responses to the questionnaire items in a narrative and tabular form.

The data presented pertain to students' psychological dispositions as measured by the CAQ in six areas: (a) Attitudes Toward Computer, (b) Motivation/Persistence, (c) Study Habits, (d) Empathy, (e) Creative Tendencies, and (f) Attitudes Toward School. Students' responses to the CAQ were analyzed to answer eight research questions:

1. What are students' attitudes toward computers after 1 and a half year's enrollment in the KISITP? Are they generally positive or negative? Are the attitudes toward computers of boys and girls the same?
2. Is there a relationship between students' attitudes toward computers and attitudes toward school? Is the relationship the same for boys and girls?
3. Is there a relationship between students' attitudes toward computers and motivation? Is the relationship the same for boys and girls?
4. Is there a relationship between students' attitudes toward computers and study habits? Is the relationship the same for boys and girls?
5. Is there a relationship between students' attitudes toward computers and empathy? Is the relationship the same for boys and girls?
6. Is there a relationship between students' attitudes toward computers and creative tendencies? Is the relationship the same for boys and girls?
7. Is there a relationship between students' attitudes toward computers and achievement in Informatics field? Is the relationship the same for boys and girls?
8. Do students who have access to computers at home display similar attitudes toward computers as students without computers at home?

Description of Subjects

A total of 562 students, 265 boys and 297 girls, participated in this study. Subjects were sixth-grade students in 10 randomly chosen public middle schools in the State of Kuwait. Table 6 provides a frequency of gender in selected schools that participated in the study. Table 7 provides an overall frequency of gender. Table 8 shows the means and

standard deviation of overall students and the dependent variables of the study. Table 9 presents the means and standard deviation of gender and the dependent variables of the study.

Table 6

Frequency of Gender in Selected Schools

School code	Gender	Frequency	Percentage
101	Girls	72	12.8
102	Boys	42	7.5
103	Girls	51	9.1
104	Boys	62	11.0
105	Girls	58	10.3
106	Boys	59	10.5
107	Girls	55	9.8
108	Boys	50	8.9
109	Girls	61	10.9
110	Boys	52	9.3
Total		562	100%

Table 7

Overall Frequency of Gender

Gender	Frequency	Percentage
Boy	265	47.2
Girl	297	52.8
Total	562	100.0%

Table 8

Means and Standard Deviation of the Overall Students and the Dependent Variables

Variables	N	Mean	Std. deviation
Attitude Toward Computer	519	3.31	.39
Motivation/Persistence	535	3.35	.49
Study Habits	525	3.29	.49
Empathy	550	3.24	.63
Creative Tendencies	526	3.23	.46
Attitude Toward School	557	2.72	.93
Informatics	562	31.73	4.38

Table 9

Means and Standard Deviation of the Gender

Variables	Boys			Girls		
	N	Mean	Std. deviation	N	Mean	Std. deviation
Attitude Toward Computer	249	3.26	.40	270	3.36	.37
Motivation/Persistence	252	3.32	.55	283	3.38	.42
Study Habits	246	3.26	.56	279	3.33	.41
Empathy	260	3.12	.70	290	3.34	.53
Creative Tendencies	247	3.19	.46	279	3.27	.45
Attitude Toward School	263	2.55	.94	294	2.87	.90
Informatics	265	31.08	3.72	297	32.3	4.83

All subjects completed the questionnaires and were included in the analysis. A few failed to respond to some items. Appendix (K) provides item numbers, frequencies, and missing data as percentages of the total sample size. The largest percent of missing value occurred in Items 15, 25, and 26. These missing value items were included in the data analysis. Paired comparisons, which are a part of the CAQ, and all the subjects responded to this part, were not included in the analysis of the data in this study because they are beyond the scope of this analysis.

Results of the Research Questions

Research Question 1: What are students' attitudes towards computers after 1 and a half year's enrollment in the KISITP? Are they generally positive or negative? Are the attitudes towards computers of boys and girls the same?

To answer the first part of research question 1, the mean was used to judge whether the overall students' attitudes toward computers were positive or negative. The overall mean and standard deviation in students' attitudes toward computers are shown in Table 10.

Table 10

Attitude Toward Computers Score for the Students

	N	Mean	Std. deviation
Attitude Towards Computers	519	3.31	.39

For the purpose of interpreting the results, the middle of the scale is considered the cut-off point between the positive and negative valances of the scale, as shown in Figure 3. An example of using this method was indicted by Edwards (1957) in Techniques of Attitude Scale Construction. The questionnaire in this study is constructed as a Likert-type questionnaire. For each item, students respond by circling one of the numbers labeled: Strongly Agree (SA), which is scored 4; Agree (A), which is scored 3; Disagree (D), which is scored 2; or Strongly Disagree (SD), which is scored 1.

Figure 3 displays students' mean (3.31), which is located on the positive valence of the scale.

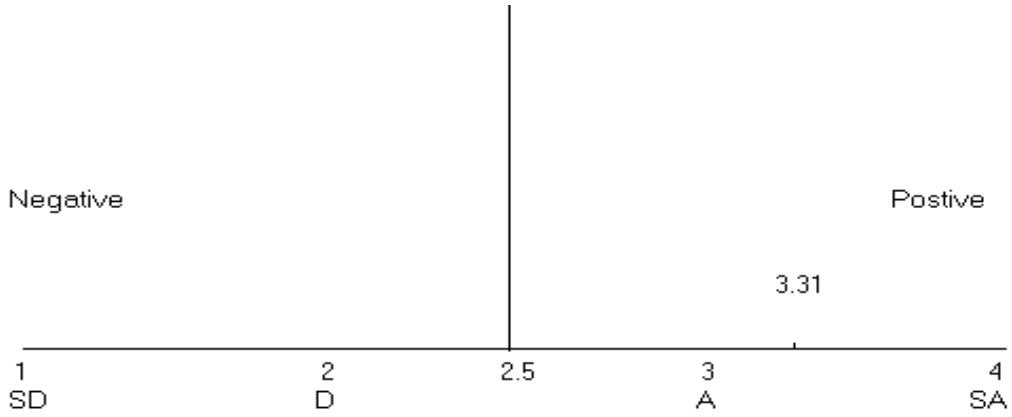


Figure 3: Positive and negative valances of scale.

Figure 4 displays the distributions of scores for students' attitudes toward computers. These scores are approximately normally distributed.

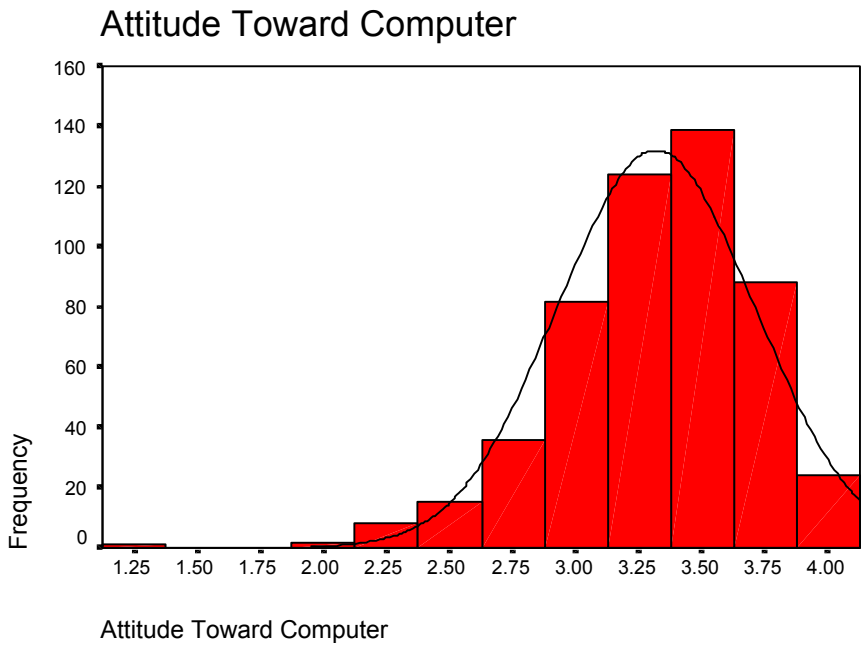


Figure 4: Distributions of score for attitudes toward computer.

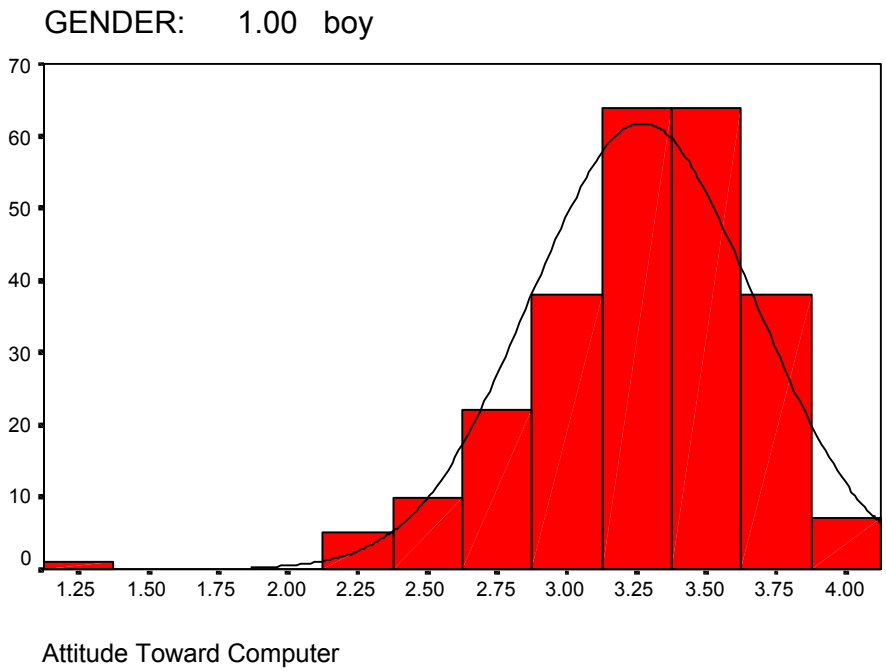


Figure 5: Distributions of boys' mean score for attitudes toward computer.

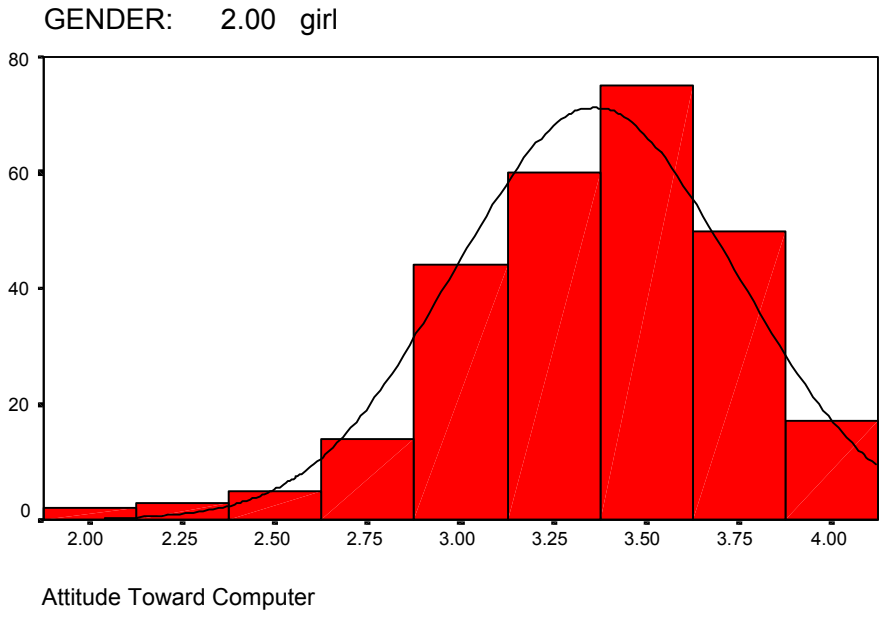


Figure 6: Distributions of girls' mean score for attitudes toward computer.

To answer the second part of research question 1, the attitudes toward computers of boys and girls were computed using the independent-samples t-test for the difference of means. The mean scores and standard deviation for attitudes toward computers of boys and girls are reported in Table 11, and the t-test results are presented in Table 12. These results indicate a statistically significant difference between boys and girls. Figure 5 displays the distributions of boys' scores for attitudes toward computers. And, Figure 6 displays the distributions of girls' scores for attitudes toward computers.

According to the APA guidelines (American Psychological Association, [APA], 1994, p. 18), the effect size should also be reported. The effect size reported Cohen's r (Cohen, 1992). Cohen (1992) defined the effect size (ES) as "the degree to which the *Ho* [results] is believed to be false" (p. 156). The effect size of .12 falls into the small effect size range. The following formula was used to calculate the effect size:

$$ES = \frac{X_{girls} - X_{boys}}{SD}$$

Where:

ES: The effect size

X girls: The mean scores on the attitudes toward computers of girls

X boys: The mean scores on the attitudes toward computers of boys

SD: The standard deviation of either boys or girls

Table 11

Mean Scores for Attitudes Toward Computers of Boys and Girls

Gender	N	Mean	Std. deviation
Boys	249	3.26	.40
Girls	270	3.36	.37

Table 12

Independent-sample t-test

		t-test for equality of means				
Attitude Toward Computers		t	df	Sig. (2-tailed)	Mean difference	Effect size
	Equal variances assumed	-2.659	517	.008	-9.0861E-02	.25
	Equal variances not assumed	-2.652	506.748	.008	-9.0861E-02	

Research Question 2: Is there a relationship between students' attitudes toward computers and attitudes toward school? Is the relationship the same for boys and girls? The correlation between students' attitudes toward computers and attitudes towards school was found to be .149 (p .001), which was a weak though statistically significant correlation. The correlation between students' attitudes toward computers and attitudes towards school is reported in Table 13.

Table 13

Correlation Size Between Attitudes Toward School and Attitudes Toward Computers

	N	Pearson correlation	Significant
Boys	247	r = .143*	p. 024
Girls	267	r = .114	p. 062
All students	514	r = .149**	p .001

The second part of question 2 asked whether the relationship were the same for boys and girls. Table 13 shows the correlation of r = .143 between boys' attitudes toward school and their attitudes toward computers and a correlation of r = .114 between girls' attitudes toward school and their attitudes toward computers. The formula that was used for the difference between the correlations in the independent samples was taken from Hays (William, 1988). The calculated t-value was (.35). Since the calculated t-value was less than critical z = 1.96, the difference in the sample correlations is not statistically significant in the population of girls and boys.

Research Question 3: Is there a relationship between students' attitudes toward computers and motivation/persistence? Is the relationship the same for boys and girls?

A statistically significant correlation of r = .459 (p = .000) between students' attitudes toward computers and motivation/persistence was found. The correlation between students' attitudes toward computers and motivation/persistence is reported in Table 14.

Table 14

Correlation Size Between Attitudes Toward Computers and Motivation/Persistence

	N	Pearson correlation	Significance
Boys	236	r = .425**	p. 000
Girls	257	r = .504**	p. 000
All students	493	r = .459**	p .000

The second part of question 3 asked whether the relationship were the same for boys and girls. Table 14 shows a correlation of r = .425 between boys' attitudes toward computers and motivation/persistence and a correlation of r = .504 between girls' attitudes toward computers and motivation/persistence. The formula that was used for the difference between the correlations in the independent samples was taken from Hays (William, 1988). The calculated t-value is (1.15). Because the calculated t-value was less than critical z = 1.96, the difference in the sample correlations is not statistically significant in the population of girls and boys.

Research Question 4: Is there a relationship between students' attitudes toward computers and study habits? Is the relationship the same for boys and girls? A statistically significant correlation of r = .371 (p = .000) between students' attitudes toward computers and their study habits was found. The correlation between the students' attitudes towards computers and their study habits is reported in Table 15.

Table 15

Correlation Size Between Attitudes Toward Computers and Study Habits

	N	Pearson correlation	Significance
Boys	232	r = .411**	p. 000
Girls	256	r = .309**	p. 000
All students	488	r = .371**	p .000

The second part of question 4 asked whether the relationship were the same for boys and girls. Table 15 shows a correlation of r = .411 between boys' attitudes toward computers and their study habits and a correlation of r = .309 between girls' attitudes towards computers and their study habits. The formula that was used for the difference between the correlations in the independent samples was taken from Hays (William, 1988). The calculated t-value is (1.18). Because the calculated t-value was less than critical z = 1.96, the difference in the sample correlation is not statistically significant in the population of girls and boys.

Research Question 5: Is there a relationship between students' attitudes toward computers and empathy? Is the relationship the same for boys and girls? A statistically significant correlation of r = .308 (p = .000) between students' attitudes towards computers and empathy was found. The correlation between students' attitudes towards computers and empathy is reported in Table 16.

Table 16

Correlation Size Between Attitudes Toward Computer and Empathy

	N	Pearson correlation	Significance
Boys	244	r = .215**	p. 001
Girls	263	r = .405**	p. 000
All students	507	r = .308**	p. 000

The second part of question 5 asked whether the relationship were the same for boys and girls. Table 16 shows the correlation of r = .215 between boys' attitudes toward computers and their empathy and a correlation of r = .405 between girls' attitudes toward computers and their empathy. The formula that was used for the difference between the

correlations in the independent samples was taken from Hays (William, 1988). The calculated t-value was (2.38). Because the calculated t-value was greater than critical z = 1.96, the difference in the sample correlations is statistically significant in the population of girls and boys.

Research Question 6: Is there a relationship between students' attitudes toward computers and creative tendencies? Is the relationship the same for boys and girls? A statistically significant correlation of r = .530 (p = .000) between students' attitudes towards computers and creative tendencies was found. The correlation between students' attitudes towards computers and attitudes toward school is reported in Table 17.

Table 17

Correlation Size Between Attitudes Toward Computers and Creative Tendencies

	N	Pearson correlation	Significance
Boys	232	r = .504**	p. 000
Girls	254	r = .547**	p. 000
All students	486	r = .530**	p .000

The second part of question 6 asked whether the relationship were the same for boys and girls. Table 17 shows the correlation of r = .504 between attitudes towards computers and the creative tendencies of boys only and correlation of r = .547 between attitudes towards computers and the creative tendencies of girls only. The formula that was used for the difference between the correlations in the independent samples was taken from Hays (William, 1988). The calculated t-value was (.62). Because the calculated t-value was less than critical z = 1.96, the difference in the sample correlation is not statistically significant in the population of girls and boys.

Research Question 7: Is there a relationship between students' attitudes toward computers and achievement in the Informatics field? Is the relationship the same for boys and girls? The Pearson correlation of .201 was weak, but there was a statistically significant correlation (p = .000) between students' attitudes toward computers and Informatics. The correlation between students' attitudes toward computers and achievement in the Informatic field is reported in Table 18.

Table 18

Correlation Size Between Attitudes Toward Computers and Informatics

	N	Pearson correlation	Significance
Boys	249	r = .191**	p. 000
Girls	270	r = .188**	p. 002
All students	519	r = .201**	p .002

The second part of question 7 asked whether the relationship were the same for boys and girls. Table 18 shows the correlation of r = .191 between boys' attitudes toward computers and Informatics and the correlation of r = .188 between girls' attitudes toward computers and Informatics. The formula that was used for the difference between the correlations in the independent sample was taken from Hays (William, 1988). The calculated t-value is (.12). Because the calculated t-value was less than critical z = 1.96, the difference in the sample correlation is not statistically significant in the population of girls and boys.

Research question 8: Do students who have access to computers at home display similar attitudes toward computers as students without computers at home? To answer this question, the independent-sample t-test for the difference between means was used.

The mean scores for attitudes toward computers of students who use computers at home was (3.4) as reported in Table 19. Students who do not use computers at home had a mean score of (3.22) as reported in Table 19. T-test results presented in Table 20 indicate a statistically significant difference between students who use computers at home and those who do not have access to computers at home.

According to the APA guideline (APA, 1994, p. 18), the effect size should also be reported. The effect size reported Cohen's r (Cohen, 1992). Cohen (1992) defined the effect size (ES) as "the degree to which the *Ho* [results] is believed to be false" (p. 156). The effect size of .22 falls in the small/medium effect size range. The following formula was used to calculate the effect size:

$$ES = \frac{X_{yes} - X_{no}}{SD}$$

Where:

ES: The effect size

X yes: The mean scores on the attitudes toward computers of yes

X no: The mean scores on the attitudes toward computers of no

SD: The standard deviation of either yes or no

Table 19

Mean Scores and Standard Deviation of Attitudes Toward Computers of Students Who Use Computers at Home and Students Who Do Not Use Computers at Home

Do you use a computer at home?	N	Mean	Std. deviation
Yes	266	3.40	.35
No	252	3.22	.40
Total	518	3.31	.39

Table 20

Independent-sample t-test

		t-test for equality of means				
Attitude Toward Computers		t	df	Sig. (2-tailed)	Mean difference	Effect size
	Equal variances assumed	5.226	516	.000	.1754	.45
	Equal variances not assumed	5.206	496.650	.000	.1754	

Summary

The following are the summaries of the findings from this study:

1. After 1 and a half year's enrollment in the KSITP, a positive attitudes towards computers was found among sixth-grade Kuwaiti students as measured by the Computer Attitude Questionnaire. Table 21 shows the mean scores and the interpretation of the results.

Table 21

Mean Scores and Interpretation of the Results

	Mean	Interpretation
Boys	3.26	Positive
Girls	3.36*	Positive
All students	3.31	Positive

*Girls scores higher than boys.

2. A statistically significant difference was found between the group mean scores of boys and girls in the area of attitudes towards computers (see Table 20). Girls had more positive attitudes towards computers than boys.

Hinkle, Wiersma, and Jurs (1994) provided a "rule of thumb" that suggests that the correlations can be interpreted, as indicated in Table 31. The correlation between the dependent variables are interpreted according to Hinkle et al., (1994), as given in Table 22.

Table 22

Rule of Thumb for Interpreting the Size of a Correlation Coefficient

Size of correlation	Interpretation
.90 to 1.00 (-.90 to - 1.00)	Very high positive (negative) correlation
.70 to .90 (-.70 to - .90)	High positive (negative) correlation
.50 to .70 (-.50 to - .70)	Moderate positive (negative) correlation
.30 to .50 (-.30 to - .50)	Low positive (negative) correlation
.00 to .30 (-.00 to - .30)	Little if any correlation

3. A statistically significant correlation was found between students' attitudes toward school and attitudes towards computers. According to the "rule of thumb", these is little of any correlation between these variables. In other words, this is

very weak positive correlation. Table 23 shows the correlation between students' attitudes toward school and attitudes toward computers and the interpretation of this correlation.

Table 23

The Size of Correlation Between Students' Attitudes Towards School and Attitudes Towards Computers

	Pearson correlation	Interpretation
Boys	$r = .143$	Little if any correlation
Girls	$r = .114$	Little if any correlation
All students	$r = .149$	Little if any correlation

4. No statistically significant difference in the correlation was found between boys' and girls' attitudes toward school and their attitudes toward computers (see Table 23).
5. A statistically significant correlation was found between students' attitudes toward computers and motivation/persistence. According to the "rule of thumb," the correlation between these two variables is considered to be low positive. Table 24 shows the correlation between students' attitudes towards computers and motivation/persistence and the interpretation of this correlation.

Table 24

The Size of Correlation Between Students' Attitudes Towards Computers and Motivation/Persistence

	Pearson correlation	Interpretation
Boys	r = .425	Low positive correlation
Girls	r = .504	Moderate positive correlation
All students	r = .459	Low positive correlation

6. No statistically significant difference in the correlation was found between attitudes toward computers and the motivation/persistence of boys and girls (see Table 24).
7. A statistically significant correlation was found between students' attitudes toward computers and study habits. According to the "rule of thumb," the correlation between these two variables is considered to be low positive. Table 25 shows the correlation between students' attitudes toward computers and study habits and the interpretation of this correlation.

Table 25

The Size of Correlation Between Students' Attitudes Towards Computers and Study Habits

	Pearson correlation	Interpretation
Boys	r = .411	Low positive correlation
Girls	r = .309	Low positive correlation
All students	r = .371	Low positive correlation

8. No statistically significant difference in the correlation was found between attitudes toward computers and the study habits of boys and girls (see Table 25).
9. A statistically significant correlation was found between students' attitudes toward computers and empathy. According to the "rule of thumb," the correlation between these two variables is considered low positive. Table 26 the shows correlation between students' attitudes towards computers and empathy and the interpretation of this correlation.

Table 26

The Size of Correlation Between Students' Attitudes Towards Computers and Empathy

	Pearson correlation	Interpretation
Boys	$r = .215$	Little if any correlation
Girls	$r = .405$	Low positive correlation
All students	$r = .308$	Low positive correlation

10. A statistically significant difference in the correlation was found between attitudes towards computers and empathy of boys and girls (see Table 26). Girls were more than did boys.
11. A statistically significant correlation was found between students' attitudes toward computers and creative tendencies. According to the "rule of thumb," the correlation between these two variables is considered to be moderate positive. Table 27 shows the correlation between students' attitudes toward computers and creative tendencies and the interpretation of this correlation.

Table 27

The Size of Correlation Between Students' Attitudes Towards Computers and Creative Tendencies

	Pearson correlation	Interpretation
Boys	r = .504	Moderate positive correlation
Girls	r = .547	Moderate positive correlation
All students	r = .530	Moderate positive correlation

12. No statistically significant difference in the correlation was found between attitudes toward computers and the creative tendencies of boys and girls (see Table 27).
13. A statistically significant correlation was found between students' attitudes towards computers and achievement in the Informatics field. According to "thumb's rule", little of any, correlation exists between these two variables. In other words, this is a very weak positive correlation. Table 28 shows the correlation between students' attitudes toward computers and achievement in the Informatics field and the interpretation of this correlation.

Table 28

The Size of Correlation Between Students' Attitudes Towards Computers and achievement in the Informatics field

	Pearson correlation	Interpretation
Boys	r = .191	Little if any correlation
Girls	r = .188	Little if any correlation
All students	r = .201	Little if any correlation

14. No statistically significant difference in the correlation was found between boys' and girls' attitudes toward computers and achievement in the Informatics field (see Table 28).
15. A statistically significant difference was found between the group mean scores of students who use computers at home and students who do not. Students who have access to computers at home had more positive attitudes toward computers than did students who do not use computers at home.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study

The focus of this study was to investigate the attitudes toward computers of sixth-grade Kuwaiti students who are learning to use computers in (KISITP) in a school setting and to investigate gender differences in attitudes toward computers. In addition, the study examined the relationships between students' attitudes toward computers and school, motivation/persistence, study habits, empathy, creative tendencies, and achievement in the Informatic field.

The purpose of this chapter is to summarize the study's findings, present conclusions, practical recommendations, and recommendations for future research. The study was organized by eight research questions, which are as follows:

1. What are students' attitudes toward computers after 1 and a half year's enrollment in the KISITP? Are they generally positive or negative? Are the attitudes toward computers of boys and girls the same?
2. Is there a relationship between students' attitudes toward computers and attitudes toward school? Is the relationship the same for boys and girls?
3. Is there a relationship between students' attitudes toward computers and motivation? Is the relationship the same for boys and girls?
4. Is there a relationship between students' attitudes toward computers and study habits? Is the relationship the same for boys and girls?

5. Is there a relationship between students' attitudes toward computers and empathy? Is the relationship the same for boys and girls?
6. Is there a relationship between students' attitudes toward computers and creative tendencies? Is the relationship the same for boys and girls?
7. Is there a relationship between students' attitudes toward computers and achievement in the Informatics field? Is the relationship the same for boys and girls?
8. Do students who have access to computers at home display similar attitudes toward computers as students without computers at home?

To answer these questions, students from 10 public middle schools, 5 boys' and 5 girls' schools, in the State of Kuwait during the academic year 1999-2000 were randomly selected by cluster as a sample for this study. A total of 562 students, 265 boys and 297 girls, completed the questionnaire. A few students failed to respond to some items. The explanations for this might be that students did not understand those items, or they forgot to answer them.

The instrument used for this study was the Computer Attitude Questionnaire (CAQ) Arabic versions, which was translated from the English edition of a questionnaire originally developed by Knezek and Miyashita (1994) for the Texas Center for Educational Technology (University of North Texas). Panel experts who compared the English and Arabic versions validated this instrument. A professor at the College of Basic Education in the State of Kuwait also validated the instrument. The pilot test was conducted using sixth-grade Kuwaiti students to calculate the reliability of this instrument using Cronbach's coefficient alpha. The overall

reliability of the CAQ Arabic version is .87, which is considered very good according to guidelines provided by DeVellis (1991).

The Computer Attitude Questionnaire consisted of six subscales: (a) Attitudes Toward Computers, (b) Motivation/Persistence, (c) Study Habits, (d) Empathy, (e) Creative Tendencies, and (f) Attitudes Toward School.

The teachers and the researcher administered the questionnaire in the classroom environment at each school. The instruction regarding how to evaluate students in the study field Informatics was obtained from the Ministry of Education in Kuwait. The grades of the students in the Informatics field were obtained from each school participating in this study.

The mean score was used to judge whether the overall students' attitudes toward computers were positive or negative. The independent-samples t-test for the difference of means was employed as an overall test for significant differences between boys' and girls' mean scores and between students who use computers at home and students who do not, as measured by the Computer Attitude Questionnaire.

The Pearson correlation was used to test for significant correlation between attitudes toward school and attitudes toward computers, attitudes toward computers and motivation/persistence, attitudes toward computers and study habits, attitudes toward computers and empathy, attitudes toward computers and creative tendencies, and attitudes toward computers and achievement in Informatics field. The correlation size was calculated using a formula for the difference between the correlation in the independent samples to test for significant difference in the correlation between boys and girls.

Summary of the Findings

This study found that most students had high positive attitudes toward computer use; however, girls had more positive attitudes toward computers than did boys. The study found also that statistically significant correlations exist between attitudes toward computers and school, motivation/persistence, study habits, empathy, creative tendencies, and achievement in the Informatics field. The correlation between attitudes toward computers and creative tendencies is considered a moderate positive correlation. The correlations between attitudes toward computers and motivation/persistence, study habits, empathy are considered low positive. While the correlation between attitudes toward computer and school and the correlation between attitudes toward computer and achievement in the Informatics field were very weak, correlations below $\underline{r} = .3$, although statistically significant, are too low to interpret meaningfully.

Statistically significant difference in correlation was found between boys and girls in attitudes toward computers and empathy. Girls had more correlation than boys. Furthermore, this study found that students who use computers at their homes had more positive attitudes towards computers than students who do not use computers in their home.

Conclusions

The main conclusion to be drawn form the current study is that students like to use computers. In particularly, sixth-grade students have positive attitudes toward computers. Because this study is not an experimental study, the degree of influence of the KISITP cannot be determined. It might be that the influence in the students' attitudes came through visual or audible media, through computer clubs, or from the

use of computers at home. This study found that students who have access to computers at home have more positive attitudes than students who do not have home access to computers. The finding about students' positive attitudes toward computers was supported in previous studies conducted in the United States, Australia, and New Zealand, also with different levels of education (Ireson, 1997; King, 1994-95; McKinnon et al. 1997; Orabuchi, 1992). Further research is necessary to determine the way in which the practice can influence the attitudes of students. Students need to be pretested then exposed to the information technology curriculum, and then posttested to determine whether there are differences between their attitudes.

Based on the behavior and cognitive theories, students should like and favor the subject or the activities in the learning environment in order to develop positive attitudes toward learning. The results of the present study suggest that attitudes toward computers become more favorable among the students who use them so that educators should pay more attention to this characteristic to improve students' outcomes in the school.

The most interesting finding in this study was that girls had more positive attitudes toward computer than did boys. This study supported what Lever et al., (1989) found, that experimental girls held more positive attitudes toward computer than experimental boys. However, Brosnan (1998) found that boys hold more positive attitudes towards computers than girls. In addition, Martin et al., (1992) found no significant gender differences in attitudes toward computers for 8-12 –year-old children in the United States and the Soviet Union. This study found that girls not only had equal attitude to boys but statistically significant higher attitude with an effect size of .25 standard deviation. The unique of this study is that the educational

system in the State of Kuwait is single education. Boys' schools are separated than girls' schools. There is not a consistent finding in this matter so that this would be a good topic for further research.

The strong finding in this study was that a moderate positive correlation exists between students' attitudes toward computers and creative tendencies. However, according to a study by Miyashita (1991), computer experiences do not influence children's creativity. In this study, it might be that Logo, word processing, and graphics, which students learned in the KISITP, contributed to the creative tendencies of the students. Thus, Miyashita (1991) emphasized, "In order to assess students' creativity, it might be necessary to use instrument other than a self-report questionnaire" (p. 68). The current study agrees with Miyashita that the subjects' creativity needed to be measured by other instruments.

Students' motivation/persistence, study habits, and empathy were found to be low positive correlated with attitudes toward computers. Regarding the finding of the relationship between attitudes toward computers and motivation/persistence, Wodarz (1994) found that computer usage did not affect students' motivation. It was also found by Miyashita (1991) that computer experiences do not influence children's motivation to study. The relationship between attitudes toward computers and study habits was also found to have a low positive correlation in both boys and girls. However, according to a study by Knezak and Christensen (1995) females' scored higher than males in study habits. In order to document more evidence concerning motivation/persistence, study habits, and empathy, further research in necessary.

In this study, the correlation between girls' attitudes toward computers and empathy was significantly higher than that of boys. Moreover, there was a significant difference between girls' and boys' mean scores, as reported in Table 29.

Table 29

Mean Scores and Standard Deviation for Empathy of Boys and Boys

Gender	N	Mean	Std. deviation
Girls	290	3.34	.53
Boys	260	3.12	.71

Girls had higher mean scores than did boys. It is interesting that this evidence was documented in previous studies conducted in the United States, Japan, and Mexico (Knezek & Miyashita, 1993; Knezek et al., 1998). Girls in these nations and in Kuwait, as confirmed in the present study, tend to show more empathy than boys.

Perhaps the most noteworthy finding is that, although there was a statistically significant correlation between attitudes toward school and attitudes toward computers, this study confirmed no correlation between these dependent variables. The value of the relationship is only .149. Based on this value and consideration, it can be concluded that students like to use computers in school, but they do not like school.

An item in the CAQ measured students' attitudes about lessons on the computer. Forty-seven percent of the students strongly agreed, and 37% agreed that they enjoy lessons on the computer. Figure 7 displays the frequency of the student response to Item 9 in the CAQ.

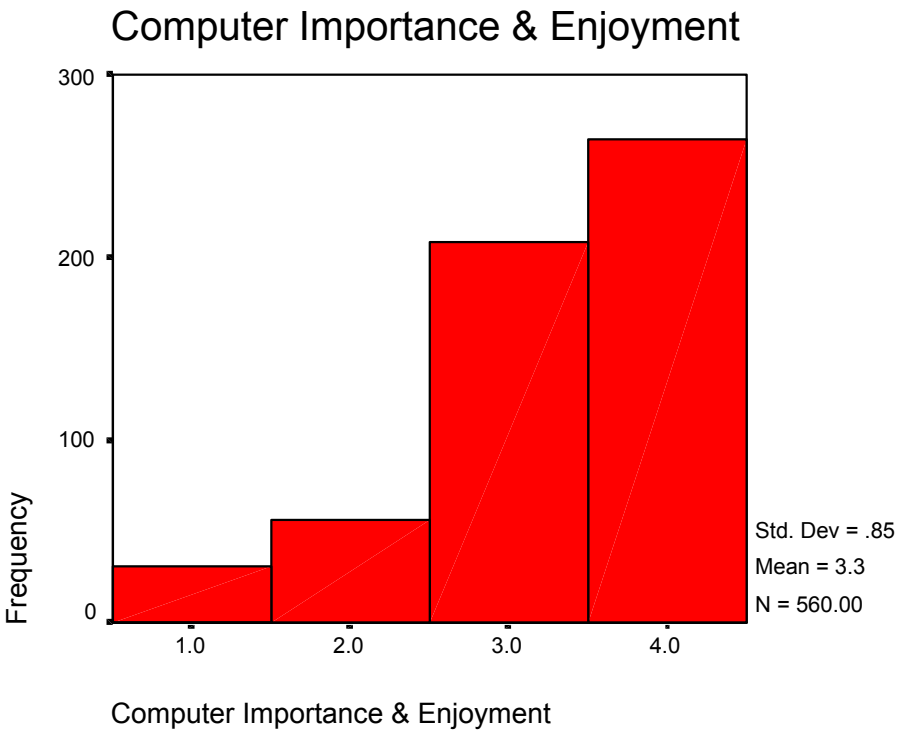


Figure 7: The frequency of student response to Item 9 in the CAQ.

Another item in the instrument measured students' beliefs that the more often teachers use the computer, the more the students will enjoy school. Forty percent of the students strongly agreed, and 36.5% agreed that they would enjoy school if the teachers used the computer more often. Figure 8 displays the frequency of the student response to Item 10 in the CAQ.

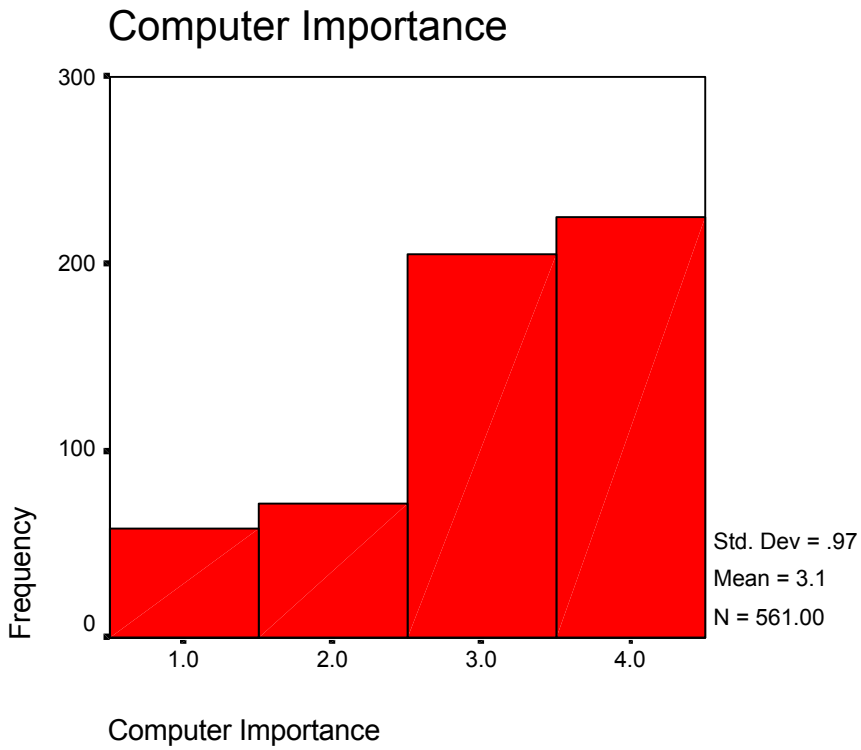


Figure 8: The frequency of the student response to Item 10 in the CAQ.

According to this finding of the students' beliefs, the decision makers at the Ministry of Education in Kuwait must introduce computers into the classrooms, and teachers use them in order to develop positive student attitudes toward school. Theories support the fact that students develop positive attitudes toward learning when they like the subject matter or the activities in the learning environment. Skinner (1968), in The Technology of Teaching, emphasized, " Attractive . . . things could be said to strengthen a positive attitudes toward school" (p. 105).

Concerning students' attitudes toward computers and achievement in the Informatics field, a statistically significant correlation between these dependent variables was found. Although this was a very weak correlation of only r = .201, the relationship between these dependent variables was not reported in previous studies.

This would be a good topic to investigate the relationship between attitudes and achievement in the informatics filed for further research.

One explanation of why the relationship between students' attitudes toward computers and their achievement in the Informatics field was weak might be that the students take the Informatics field less seriously because the grades in that field are not included in their grade average and not counted in determining of the students' standing in the school.

Students who use computers at home appear to have more positive attitudes toward computers than the students who do not use computers at home. Yaghi (1997) stressed that one of the factors, which affects students' attitudes toward computers, is home ownership of a computer, which is confirmed in this study.

Practical Recommendations

The following practical recommendations are based upon the findings and conclusions of this study:

1. It is recommended that the Ministry of Education in Kuwait develop national standards and selected standards in the use of technology in education.
2. It is recommended that the Ministry of Education in Kuwait introduce computer technology at the elementary level in order to develop positive attitudes toward computers.
3. It is recommended that computers be introduced to Kuwaiti students in the classroom environment in order to enhance student learning outcomes and to interest them in school.
4. It is recommended that the extensive use of computers be integrated into the curriculum to develop teaching and learning in Kuwait.

5. It is recommended that per-service teachers must be taught computer education courses on how to integrate computer technology into teaching and learning in the colleges of education.
6. It is recommended that in-service teachers be trained to integrate computer technology into daily classroom practice in order to enhance teaching and learning.
7. It is recommended that teachers in Kuwait use computers in different subject areas to help students develop learning skills in those subjects.

Recommendations for Future Research

The following recommendations for future research are based upon the findings and conclusions of this study:

1. It is recommended that pretest and posttest research be done to investigate the change in the attitudes toward computers of fifth-grade Kuwaiti students who will study in the Information Technology Curriculum in the KISITP.
2. It is recommended that a longitudinal study be done to investigate the change in the attitudes toward computers of Kuwaiti students from fifth-grade until eighth-grade as measured by Computer Attitude Questionnaire (CAQ).
3. It is recommended that a factor analysis study for the Arabic version of the CAQ be done to develop a suitable instrument for Arabic children.
4. It is recommended that some items in the Arabic CAQ be modified in order to be understandable to Arabic children.

5. It is recommended that the findings in this study be compared with other available data regarding different nations and cultural groups.
6. It is recommended that a replication of this study be done using subjects from different nations and cultural groups.

Finally, the researcher wishes to make clear that the first step in the educational system in schools today is to engage students in the learning environments that will enhance the quality of their education. Theories suggest that in order for students to be engaged in the learning process, they should like, or be positively disposed to, the subject or the activities in the classroom or the school building. The purpose of this study was to examine students' attitudes toward computer use in the school setting to learn whether they are generally positive or negative. The results indicate that students have positive attitudes toward computers. Based on the findings and theories, students would have favorable attitudes toward the subject matter when the computer is integrated into their learning environments and they have access to use the computer. However, educators believe that

> A key message for educators is that even though modern computer technology may be both fascinating and compelling to teachers and students alike, it is the quality of the curriculum programs in which the technology is used that makes the real differences to students' attitudes, motivation, and performance. (McKinnon et al., 2000, p. 326)

Students my like to learn because they have computers, but it is important for educators to understand that the quality of the curriculum program plays significant role in the student's learning. A well-designed computer curriculum affects the quality of students' education, performance, and outcomes, but also an excellent staff development program is essential in making effective use of educational technology. What the results may have been reported if all these strategies were implemented in a

country like the State of Kuwait? The answer could be found by conducting a pilot program in some schools, with other schools teaching the old system. Eventually, the evaluation would help the decision makers in the Ministry of Education to perceive practical results that provide a distinction between the adoption of the new method and the old methods.

APPENDIXS

APPENDIX A

COMPUTER ATTITUDE QUESTIONNAIRE
ENGLISH VERSION

Computer Attitude Questionnaire

Name: _____

This survey contains of 6 parts. Within each part, Read each statement and then circle the number which best shows <u>how you feel</u>.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

<u>Part 1</u>

		SD	D	A	SA
(1)	I enjoy doing things on a computer.	1.	2.	3.	4.
(2)	I am tired of using a computer.	1.	2.	3.	4.
(3)	I will be able to get a good job if I learn how to use a computer.	1.	2.	3.	4.
(4)	I concentrate on a computer when I use one.	1.	2.	3.	4.
(5)	I enjoy computer games very much.	1.	2.	3.	4.
(6)	I would work harder if I could use computers more often.	1.	2.	3.	4.
(7)	I know that computers give me opportunities to learn many new things.	1.	2.	3.	4.
(8)	I can learn many things when I use a computer.	1.	2.	3.	4.
(9)	I enjoy lessons on the computer.	1.	2.	3.	4.
(10)	I believe that the more often teachers use computers, the more I will enjoy school.	1.	2.	3.	4.
(11)	I believe that it is very important for me to learn how to use a computer.	1.	2.	3.	4.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

		SD	D	A	SA
(12)	I feel comfortable working with a computer	1.	2.	3.	4.
(13)	I get a sinking feeling when I think of trying to use a computer.	1.	2.	3.	4.
(14)	I think that it takes a long time to finish when I use a computer.	1.	2.	3.	4.
(15)	Computers don not scare me at all.	1.	2.	3.	4.
(16)	Working with a computer makes me nervous.	1.	2.	3.	4.
(17)	Using a computer is very frustrating.	1.	2.	3.	4.
(18)	I will do as little work with computers as possible	1.	2.	3.	4.
(19)	Computers are difficult to use.	1.	2.	3.	4.
(20)	I can learn more from books than from a computer.	1.	2.	3.	4.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

Part 2

		SD	D	A	SA
(21)	I study by myself without anyone forcing me to study.	1.	2.	3.	4.
(22)	If I do not understand something, I will not stop thinking about it.	1.	2.	3.	4.
(23)	When I don't understand a problem, I keep working until I find the answer.	1.	2.	3.	4.
(24)	I review my lessons every day.	1.	2.	3.	4.
(25)	I try to finish whatever I begin.	1.	2.	3.	4.
(26)	Sometimes, I change my way of studying.	1.	2.	3.	4.
(27)	I enjoy working on a difficult problem.	1.	2.	3.	4.
(28)	I think about many ways to solve a difficult problem.	1.	2.	3.	4.
(29)	I never forget to do my homework.	1.	2.	3.	4.
(30)	I like to work out problems which I can use in my life every day.	1.	2.	3.	4.
(31)	If I do not understand my teacher, I ask him/her questions.	1.	2.	3.	4.
(32)	I listen to my teacher carefully.	1.	2.	3.	4.
(33)	If I fail, I try to find out why.	1.	2.	3.	4.
(34)	I study hard.	1.	2.	3.	4.
(35)	When I do a job, I do it well.	1.	2.	3.	4.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

Part 3

		SD	D	A	SA
(36)	I feel sad when I see a child crying.	1.	2.	3.	4.
(37)	I sometimes cry when I see a sad play or movie.	1.	2.	3.	4.
(38)	I get angry when I see a friend who is treated badly.	1.	2.	3.	4.
(39)	I feel sad when I see old people alone.	1.	2.	3.	4.
(40)	I worry when I see a sad friend.	1.	2.	3.	4.
(41)	I feel very happy when I listen to a song I like.	1.	2.	3.	4.
(42)	I do not like to see a child play alone, without a friend.	1.	2.	3.	4.
(43)	I feel sad when I see an animal hurt.	1.	2.	3.	4.
(44)	I feel happy when I see a friend smiling.	1.	2.	3.	4.
(45)	I am glad to do work that helps others.	1.	2.	3.	4.

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

Part 4

		SD	D	A	SA
(46)	I examine unusual things.	1.	2.	3.	4.
(47)	I find new things to play with or to study, without any help.	1.	2.	3.	4.
(48)	When I think of a new thing, I apply what I have learned before.	1.	2.	3.	4.
(49)	I tend to consider various ways of thinking.	1.	2.	3.	4.
(50)	I create many unique things.	1.	2.	3.	4.
(51)	I do things by myself without depending upon others.	1.	2.	3.	4.
(42)	I find different kinds of materials when the ones I have do not work or are not enough.	1.	2.	3.	4.
(53)	I examine unknown issues to try to understand them.	1.	2.	3.	4.
(54)	I make a plan before I start to solve a problem.	1.	2.	3.	4.
(55)	I invent games and play them with friends.	1.	2.	3.	4.
(56)	I invent new methods when one way does not work.	1.	2.	3.	4.
(57)	I choose my own way without imitating methods of others.	1.	2.	3.	4.
(58)	I tend to think about the future.	1.	2.	3.	4.

Part 5

(59) Which would you rather do? (circle one of each pair):

(1) read a book or (2) write

(1) write or (2) watch television

(1) watch television or (2) use a computer

(1) use a computer or (2) read a book

(1) read a book or (2) watch television

(1) write or (2) use a computer

(60) Which would be more difficult for you (circle one of each pair):

(1) read a book or (2) write

(1) write or (2) watch television

(1) watch television or (2) use a computer

(1) use a computer or (2) read a book

(1) read a book or (2) watch television

(1) write or (2) use a computer

(61) Which would you learn more from (circle one of each pair):

(1) read a book or (2) write

(1) write or (2) watch television

(1) watch television or (2) use a computer

(1) use a computer or (2) read a book

(1) read a book or (2) watch television

(1) write or (2) use a computer

SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree

Part 6

		SD	D	A	SA
(62)	I really like school.	1.	2.	3.	4.
(63)	School is boring.	1.	2.	3.	4.
(64)	I would like to work in a school when I grow up.	1.	2.	3.	4.
(65)	When I grow up I would not like to work in a school.	1.	2.	3.	4.
(66)	Do you use a computer at home?	1 = yes		2 = no	

(End)

Thank you!

CAQ Ver 5.14 4/97

APPENDIX B

COMPUTER ATTITUDE QUESTIONNAIRE
ARABIC VERSION

أستبانة تتعلق بشعورالطالب أتجاه استعمال الحاسب الآلي (الكمبيوتر)

الاسم:_____

الأستبانة تشمل ستة (٦) اجزاء. يرجى قراءة اسئلة كل جزء ثم وضع دائرة حول الجواب الذي يعكس شعورك تجاه السؤال.

الجزء الاول

		اعارض بشدة SD	اعارض D	اوافق A	اوافق بشدة SA
١	انني أستمتع بالعمل على الكمبيوتر	١	٢	٣	٤
٢	لقد تعبت من استعمال الكمبيوتر	١	٢	٣	٤
٣	سأتمكن من الحصول على وظيفة جيدة إذا تعلمت كيفية العمل على الكمبيوتر	١	٢	٣	٤
٤	أركز تفكيرى على الكمبيوتر عند استعماله	١	٢	٣	٤
٥	أستمتع جداً بألعاب الكمبيوتر	١	٢	٣	٤
٦	سوف أعمل بجدية أكبر لو أتيح لي استعمال الكمبيوتر بشكل أكثر	١	٢	٣	٤
٧	انني أعلم بأن الكمبيوتر يعطيني الفرصة لتعلم أشياء جديدة	١	٢	٣	٤

		اعارض بشدة SD	اعارض D	اوافق A	اوافق بشدة SA
٨	باستطاعتي تعلم أشياء كثيرة عندما استعمال الكمبيوتر	١	٢	٣	٤
٩	استمتع بتلقي الدروس على الكمبيوتر	١	٢	٣	٤
١٠	سأستمتع بالمدرسة أكثر كلما أكثر المدرسين استعمال الكمبيوتر	١	٢	٣	٤
١١	مهم جداً لي بأن أتعلم استعمال الكمبيوتر	١	٢	٣	٤
١٢	بإمكاني استعمال الكمبيوتر بكل راحة وثقة	١	٢	٣	٤
١٣	أشعر بالضيق عندما أفكر باستعمال الكمبيوتر	١	٢	٣	٤
١٤	أحتاج وقت طويل لانهي عملي عندما استعمل الكمبيوتر	١	٢	٣	٤
١٥	انا لا أخاف من الكمبيوتر ابداً	١	٢	٣	٤
١٦	أشعر بالقلق عندما استعمل الكمبيوتر	١	٢	٣	٤
١٧	إنّ استعمال الكمبيوتر أمر مخيب	١	٢	٣	٤
١٨	سوف أنجز عملا قليلا مع الكمبيوتر	١	٢	٣	٤
١٩	إنّ الكمبيوتر صعب الاستعمال	١	٢	٣	٤
٢٠	بإمكاني التعلم من الكتب أكثر من الكمبيوتر	١	٢	٣	٤

الجزء الثاني:

		اعارض بشدة SD	اعارض D	اوافق A	اوافق بشدة SA
٢١	أدرس بنفسي بدون أن يأمرني أحد بذلك	١	٢	٣	٤
٢٢	اذا لم اتمكن من فهم شئ لا أتوقف عن التفكير به حتى أجد الحل	١	٢	٣	٤
٢٣	عندما لا افهم مسألة معينة اتابع العمل حتى اجد جوابا لها	١	٢	٣	٤
٢٤	أقوم بمذاكرة دروسي يوميا	١	٢	٣	٤
٢٥	أحاول إكمال أي شي بدأت به	١	٢	٣	٤
٢٦	أقوم بعض الاحيان بتغيير طريقة دراستي	١	٢	٣	٤
٢٧	استمتع بحل المسائل الصعبة	١	٢	٣	٤
٢٨	أفكر بطرق متعددة لحل أي مسالة صعبة	١	٢	٣	٤
٢٩	لا انسى القيام بواجباتي المدرسية في البيت	١	٢	٣	٤
٣٠	احب حل المسائل التي بامكاني استعمالها خلال حياتي اليومية	١	٢	٣	٤
٣١	اقوم بالاستفسار من استاذي عندما لا افهم بعض الاشياء	١	٢	٣	٤
٣٢	استمع باهتمام الى شرح اساتذي	١	٢	٣	٤
٣٣	عندما افشل بعمل ما احاول معرفة سبب الفشل	١	٢	٣	٤
٣٤	اذاكر بجدية	١	٢	٣	٤
٣٥	عندما أقوم بعمل، أنفذه جيدا	١	٢	٣	٤

الجزء الثالث

		اعارض بشدة SD	اعارض D	اوافق A	اوافق بشدة SA
٣٦	اشعر بالحزن عندما ارى طفلاً يبكي	١	٢	٣	٤
٣٧	اقوم بالبكاء بعض الاحيان عندما احضر مسرحية او فيلم حزين	١	٢	٣	٤
٣٨	اشعر بالغضب عندما ارى احد زملائي يعامل معاملة سيئة	١	٢	٣	٤
٣٩	اشعر بالحزن عندما أرى كبار السن لوحدهم	١	٢	٣	٤
٤٠	اشعر بالقلق عندما ارى زميل حزين	١	٢	٣	٤
٤١	اشعر بسعادة كبيرة عندما اسمع اغنية احبها	١	٢	٣	٤
٤٢	لا احب مشاهدة طفل يلعب لوحده من دون اصدقاء	١	٢	٣	٤
٤٣	اشعر بالحزن عندما ارى حيوان يعامل بقسوة	١	٢	٣	٤
٤٤	اشعر بالسعادة عندما ارى ابتسامة صديق	١	٢	٣	٤
٤٥	انا سعيد لانني اقوم بعمل بهدف مساعدة الآخرين	١	٢	٣	٤

الجزء الرابع:

		اعارض بشدة SD	اعارض D	اوافق A	اوافق بشدة SA
٤٦	ادقق بالاشياء الغير عادية	١	٢	٣	٤
٤٧	ابحث دائما عن اشياء جديدة للعب بها واذا لم اجد اقوم بعمل واجبي المنزلي	١	٢	٣	٤
٤٨	عندما افكر بشى جديد اطبق ما تعلمته في السابق	١	٢	٣	٤
٤٩	أميل إلى اتباع طرق تفكير مختلفة	١	٢	٣	٤
٥٠	اخترع اشياء مميزة	١	٢	٣	٤
٥١	اعتمد على نفسي لقضاء حاجاتي	١	٢	٣	٤
٥٢	أبحث عن وسائل مختلفة عندما تكون الوسائل التي معي غير صالحة أو غير كافية	١	٢	٣	٤
٥٣	ادرس المسائل الغير معروفة لمحاولة فهمها	١	٢	٣	٤
٥٤	اقوم بوضع خطة قبل ان ابدا بحل أي مسالة	١	٢	٣	٤
٥٥	اخترع العاب واقوم باللعب بها مع الاصدقاء	١	٢	٣	٤
٥٦	اخترع وسائل جديدة عندما أجد الوسائل التي عندي لا تعمل	١	٢	٣	٤
٥٧	اختار طريقتي الخاصة دون تقليد طرق الآخرين	١	٢	٣	٤
٥٨	أميل للتفكير بالمستقبل	١	٢	٣	٤

الجزء الخامس:

٥٩- ما الذي تفضل عمله من الاشياء التالية؟ (ضع دائرة حول اختيارك)

١	قراءة كتاب	او	٢	الكتابة
١	الكتابة	او	٢	مشاهدة التلفزيون
١	مشاهدة التلفزيون	او	٢	استعمال الكمبيوتر
١	استعمال الكمبيوتر	او	٢	قراءة كتاب
١	قراءة كتاب	او	٢	مشاهدة التلفزيون
١	الكتابة	او	٢	استعمال الكمبيوتر

٦٠- ما هو الاصعب عليك من الامور التالية؟ (ضع دائرة حول اختيارك)

١	قراءة كتاب	او	٢	الكتابة
١	الكتابة	او	٢	مشاهدة التلفزيون
١	مشاهدة التلفزيون	او	٢	استعمال الكمبيوتر
١	استعمال الكمبيوتر	او	٢	قراءة كتاب
١	قراءة كتاب	او	٢	مشاهدة التلفزيون
١	الكتابة	او	٢	استعمال الكمبيوتر

٦١- ما الذي ستتعلم منه اكثر من الامور التالية؟ (ضع دائرة حول اختيارك)

١	قراءة كتاب	او	٢	الكتابة
١	الكتابة	او	٢	مشاهدة التلفزيون
١	مشاهدة التلفزيون	او	٢	استعمال الكمبيوتر
١	استعمال الكمبيوتر	او	٢	قراءة كتاب
١	قراءة كتاب	او	٢	مشاهدة التلفزيون
١	الكتابة	او	٢	استعمال الكمبيوتر

الجزء السادس:

		اعارض بشدة SD	اعارض D	اوافق A	اوافق بشدة SA
٦٢	انا احب المدرسة	١	٢	٣	٤
٦٣	ان المدرسة مملة	١	٢	٣	٤
٦٤	احب ان اعمل في المدرسة عندما اكبر	١	٢	٣	٤
٦٥	عندما اكبرلا احب العمل في المدرسة	١	٢	٣	٤

٦٦	هل تستعمل الكمبيوتر في المنزل؟	نعم = ١	لا = ٢
٦٧	هل درسة الكمبيوتر في الصف الأول متوسطة؟	نعم = ١	لا = ٢

(النهاية)

شكراً

APPENDIX C

BACK TRANSLATION OF COMPUTER ATTITUDE QUESTIONNAIRE

Computer Attitude Questionnaire

This questionaire consists of six parts. Please read each question and circle the answer that reflects your feelings.

		strongly disagree	disagree	agree	strongly agree
1	I enjoy working on computers	1	2	3	4
2	I am tired of using a computer	1	2	3	4
3	I would get a better job if I knew how to use computers	1	2	3	4
4	I can concentrate when I use a computer	1	2	3	4
5	I enjoy playing computer games	1	2	3	4
6	I would work more seriously if I was allowed to use a computer more	1	2	3	4
7	I know that computers can give me opportunities to learn many new things	1	2	3	4
8	I can learn many things when I use computers	1	2	3	4
9	I enjoy having lessons on a computer	1	2	3	4
10	I think that I would enjoy studying more if there was more computer use by my teacher	1	2	3	4
11	I think that it is important for me to learn how to use a computer	1	2	3	4
12	I can confidently and easily use a computer	1	2	3	4
13	I feel unease when I think about using a computer	1	2	3	4
14	I think that I need more time to finish my work when I use a computer	1	2	3	4
15	I never fear computers	1	2	3	4
16	I am shaken when I use a computer	1	2	3	4
17	It is depressing to use a computer	1	2	3	4
18	I will use a computer as little as possible	1	2	3	4
19	It is hard to use a computer	1	2	3	4
20	I can learn from books more than I can learn from a computer	1	2	3	4
21	I study without being told to by anyone	1	2	3	4
22	If I don't understand something, I don't stop thinking about it until I find out the answer	1	2	3	4

23	When I don't understand a problem, I continue working until I find I find an answer for it	1	2	3	4
24	I study daily	1	2	3	4
25	I try to complete anything I start	1	2	3	4
26	Sometimes I change the way I study	1	2	3	4
27	I enjoy working on hard problems	1	2	3	4
28	I think of several options to solve a difficult problem	1	2	3	4
29	I do not forget to do my homework at home	1	2	3	4
30	I like solving problems that I can use in my daily life	1	2	3	4
31	I ask my teacher when I don't understand something	1	2	3	4
32	I pay attention to my teacher's lectures	1	2	3	4
33	When I fail at something I try to learn why	1	2	3	4
34	I study hard	1	2	3	4
35	I perfect my work	1	2	3	4
36	I feel sad when I see a crying baby	1	2	3	4
37	I cry sometimes when I see a sad movie	1	2	3	4
38	I feel angry when I see one of my friends being treated badly	1	2	3	4
39	I feel sad when I see elderly people alone	1	2	3	4
40	I become worried when I see a sad friend	1	2	3	4
41	I feel happy when I listen to a song that I like	1	2	3	4
42	I don't like to see a child play alone without friends	1	2	3	4
43	I feel sad when I see an animal being treated badly	1	2	3	4
44	I feel happy when I see a smiling friend	1	2	3	4
45	I am happy to help others	1	2	3	4
46	I concentrate on unusual things	1	2	3	4
47	I always find new things to play with, or study without anybody's help	1	2	3	4
48	When I think about a new thing, I apply what I've learned in the past	1	2	3	4
49	I like to think differently	1	2	3	4
50	I invent new things	1	2	3	4

51	I depend on myself to get things done	1	2	3	4
52	I find new ways whenever my ways are not good or insufficient	1	2	3	4
53	I study extraordinary problems to try and understand them	1	2	3	4
54	I plan before I start solving a problem	1	2	3	4
55	I invent games, and I share them with friends	1	2	3	4
56	I invent new ways when one doesn't work	1	2	3	4
57	I choose my own way without copying others	1	2	3	4
58	I like to think about the future	1	2	3	4

APPENDIX D

MATCHING ITEMS

Comparing Between the Original CAQ English Version and
Back Translation Version

Items #	Original English Version	Back Translation English Version
1	Doing things	Working
4	Concentrate	Can concentrate
6	Harder	More seriously
7	Give	Can give
12	Comfortable	Confident, easily use
17	Frustrating	Depressing
24	Review	Study
35	Well	Perfect
36	Child	Baby
43	Hurt	Being treated badly
45	Do work	Help
46	Examine	Concentrate
49	Various ways of things	Think differently
52	Different kinds of materials	New ways
53	Unknown issues	Extraordinary problems
55	Play them	Share them
58	Tend	Like
59, 60, 61	Use computer	Working on computer
62	Really like	Love

APPENDIX E

INFORMATIC INSTRUCTIONS

Ministry of Education
Information Center - Technical Dept.
Project of Computer Inclusion at Intermediate Stage

Instructions Regarding
How to Evaluate Students at
The Study Field "Informatic"

- Two periods of free activity had been assigned for the study field "informatic" to be taught at experimental schools. By that, informatic field is within fields that are not involved within the total and not counted within percentage for the time being and till the generalization of teaching information is finished at all intermediate schools and at all their classes.
- According to the above paragraph, total of marks should be converted to a wording grade or evaluation at marks sheet and mark list of the end of the year in accordance with the under secretary circular number: ME/HA/1040 dated 7/5/1995 and be as follows:

Marks	Grade
From 36- 40	Excellent - A
From 32 - 35	Very good - B
From 31 - 28	Good - C
From 27 - and less	Satisfying - D

- Maximum marks which is (40) is distributed for different activities of the field according to the following table:

Complying to instructions of Lab utilizing	Interaction inside Class	Student productivity		Total	Wording grade
		Work papers	Written work		
5	10	15	10	40	

Where the following means:

- **Complying to instructions of lab utilizing**: Student respecting and complying to discipline, quietness, lab utilizing instructions, accompanied always with the school book, and complying to cooperative behavior with his colleagues and teacher.
- **Interaction inside class**: Student participation in different summer activities and debates.
- **Student productivity:**
  - **Work papers (15)**: Student carrying out steps of work papers included in the student book in a proper way, in an appropriate time, and recording inclusions and the required notes at their positions and the student following up and good utilizing of supporting cards.
  - **Written work (10)**: Student should have a book in which he carries out non-class applications and free activities relate to each unit of the curriculum.

- **The teacher when giving marks should consider the following**:

- To comply with evaluating the different field activities so evaluation shall not confine one side and ignoring other sides or any of them.
- Teacher when evaluating students should be able to differentiate between their different levels and considering the individual differences and he should be helping to show them.

- To rely on different means in evaluating students and to select the appropriate mean for each situation and aim, and for the time being should keep away from written exams and to focus on:
  (Behavior supervising- Debates- Oral questions - Free class activities Practical exercises - Collective projects - Non-class activities - …etc)
- After evaluating the student by different means, the teacher should analyze the student different results so being aware of their points of strength and weakness, and to know the material fields and subjects that is hard to student to understand or comprehend for explaining it to students.
- If student's marks came to be between tow grades, the teacher should raise to the upper one: foe example, if marks are 27.5 he raise to 28 so grading will be Good, if it is 35.5 the teacher raise to 36 to be graded as Excellent and so on.

- Consider to providing heritage activities for outstanding students so enhancing their skills and utilizing their efforts and developing their knowledge and skillfulness wealth in the field of Informatic
- Giving care for weak students and to develop their skills and to determine weak points of them to recover by means of recovery activities
- Be keen to have a magnetic disk for each student to record the student output of different units according to work papers related to each unit, and to keep these disks in a suitable place.
- The teacher should always be keen to keep all devices serviceability, reporting to technical support and the concerned engineer ion case of any defects and to keep number of the report and the name of the receiver, following up the matter with the concerned party so providing appropriate chance for each student to work at computer.
- The teacher should ask the technical director in charge of the school about what had not been mentioned at these instructions so he can be guided to the proper solution and to negotiate the issue with him.

APPENDIX F

LETTER TO MINISTRY OF EDUCATION IN KUWAIT

UNIVERSITY of NORTH TEXAS

College of Education
Department of Teacher Education and Administration

October 23, 1999

Shafi Almahboub
University of North Texas
324 Gabe Ct
Denton, TX 76207

Mr. Abdullah Alrjeyb
Deputy Undersecretary for Educational Research
Ministry of Education
State of Kuwait

Dear Sir:

I am a doctoral candidate in the Department of Teacher Education Curriculum & Instruction Program at the University of North Texas, Denton, Texas. My major professor is Dr. Steve Tipps who supervises my doctoral research. I am working on my dissertation proposal related to Kuwait Intermediate School Information Technology Project (KISITP). The purpose of my study is to investigate the Attitudes Toward Computer Use Among Kuwitit Sixth-Grade Students. The results of the study will be made available to you after the study is completed.

I am seeking your written approval of using the sixth grade students in Kuwait as target population for my research. 7-boys' and 7-girls' schools were randomly selected to participate in data collection.

Thank you for your cooperation. Please do not hesitate to contact me should you have any questions or concerns.

Dr. Steve Tipps may be reach at : Tel. # (940) 565-2920
Fax. # (940) 565-4952
E-mail tipps@coets.coe.unt.edu
I may be reached at : Tel. # (940) 484-8295
Fax. # (940) 484-0145
E-mail Shafi2000@hotmail.com

Sincerely,

Dr. Steve Tipps
Major Professor

Shafi Almahboub
Doctoral Candidate

P.O. Box 311337 • Denton, Texas 76203-1337 • (940) 565-2920 • Fax (940) 565-4952
TDD (800) 735-2989 • www.unt.edu

APPENDIX G

LETTERS TO TEN SCHOOLS

وزارة التربية
الادارة العامة لمنطقة حولي التعليمية
مكتب المدير العام

التاريخ: ٢٧/١٠/١٩٩١

الرقم:

السيده المحترمه / ناظـــرة مدرسة حمه الحنيف المتوسطة بنات
تحيه طيبه وبعد ،

بالاشارة الى كتاب مركز البحوث التربوية والمناهج رقم (وت/ح/١/٢٧) بتـــاريخ ١٩٩٩/١٠/٢٦م ، بشان تسهيل مهمة الطالب / شافي فهد شافي – الموفد من جامعـــة شمال تكساس للحصول على درجتي الماجستير والدكتوراه فى تخصص المناهج وطـوق التدريس .

لذا يرجى تسهيل مهمة المذكور فى مدرستكم .

مع خالص التحيه ...

مدير عام
منطقة حولي التعليمية

سالم محمد الصقر

نسخة / للسيد مدير الشئون التعليمية
نسخه / لمركز البحوث التربوية
نسخة / للملف

وزارة التربية
منطقة حولي التعليمية
إدارة الأنشطة التربوية

وزارة التربية
الادارة العامة لمنطقة حولي التعليمية
مكتب المدير العام

التاريخ: ١٩٩٩/١٢/٧

الرقم:

السيد المحترم / ناظـــر مدرسة المغيره بن شوقل المتوسطة بنين
تحيه طيبه وبعد ،

بالاشارة الى كتاب مركز البحوث التربوية والمناهج رقم (وت/ح/٢٧/١) بتـــاريخ ١٩٩٩/١٠/٢٦م ، بشان تسهيل مهمة الطالب / شافي فهد شافي – الموفد من جامعـــة شمال تكساس للحصول على درجتي الماجستير والدكتوراه فى تخصص المناهج وطـرق التدريس .

لذا يرجى تسهيل مهمة المذكور في مدرستكم .

مع خالص التحيه ،،

مدير عام
منطقة حولي التعليمية

وزارة التربية
منطقة حولي التعليمية
إدارة الأنشطة التربوية

نسخة / للسيد مدير الشئون التعليمية
نسخه / لمركز البحوث التربوية
نسخة / للملف

السيد المحترم / ناظر · الفردوس المتوسطة بنين

بعد التحية ،،،

بالإشارة إلى كتاب مدير إدارة البحوث التربوية رقم وت/ح/1/27 المؤرخ في 99/10/26 ·
بناء عليه يرجى تسهيل مهمة الطالب / شافي فهد الشافي المحبوب الموفد من جامعة شمال تكساس للحصول على درجتي الماجستير والدكتوراه في تخصص المناهج وطرق التدريس ·

مع خالص التحية

مدير عام
منطقة الفروانية التعليمية
بدر يوسف الشمروخ
مدير عام
منطقة الفروانية التعليمية

وزارة التربية
منطقة الفروانية التعليمية

نسخة/مدير إدارة البحوث التربوية
نسخة/مدير عام المنطقة التعليمية
نسخة/مدير دارة الشئون التعليمية
نسخة/مراقبة التعليم المتوسط
نسخة/الملف
ن/ع

MINISTRY OF EDUCATION
FARWANIA EDUCATIONAL AREA

وزارة التربية
منطقة الفروانية التعليمية
المدير العام

السيدة المحترمة / ناظرة الشيماء بنت الحارث المتوسطة بنات

بعد التحية ،،،

بالإشارة إلى كتاب مدير إدارة البحوث التربوية رقم وت/ح1/27 المؤرخ في 99/10/26 .
بناء عليه يرجى تسهيل مهمة الطالب / شافي فهد الشافي المحبوب الموفد من جامعة شمال تكساس للحصول على درجتي الماجستير والدكتوراه في تخصص المناهج وطرق التدريس .

مع خالص التحية

مدير عام
منطقة الفروانية التعليمية

بدر يوسف الشمروخ
مدير عام
منطقة الفروانية التعليمية

وزارة التربية
منطقة الفروانية التعليمية

نسخة/مدير إدارة البحوث التربوية
نسخة/مدير عام المنطقة التعليمية
نسخة/مدير دائرة الشئون التعليمية
نسخة/مراقبة التعليم المتوسط
نسخة/الملف
ن/ع

وزارة التربية
الإدارة العامة لمنطقة الأحمدي التعليمية
مكتب المدير العام

التـــاريخ:
المـوافـق: ٩٩/٤/٢٤
رقم الاشارة:

السادة والسيدات / نظار وناظرات المدارس التالية :-
١-مدرسة بدر المتوسطة بنات
٢-مدرسة الرقة المتوسطة بنين
بعد التحية ،،،،،،

يرجى التكرم بتسهيل مهمة الطالب / شافي فهد شافي المحبوب الموفد من جامعة شمال تكساس للحصول علـــى درجتـــي الماجســـتير والدكتوراة في تخصص المناهج مطرق التدريس .

مع خالص التحية

مدير عام منطقة الاحمدي التعليمية

وزارة التربية
منطقة الأحمدي التعليمية
وحدة التخطيط والمعلومات

نسخة لكل من :-
السيد/المدير العام
السيد/مدير الشئون التعليمية
السيدة/ رئيسة وحدة التخطيط
الملف

بسم الله الرحمن الرحيم

وزارة التربية
منطقة الجهراء التعليمية
إدارة الشئون التعليمية
الرقم : و ت /ط ج ل٤/

التاريخ : ٢١/ ٧ /١٤٢٠ هـ
الموافق :٣١ /١٠ /١٩٩٩م

****

السيدة المحترمة / ناظرة مدرسة الصليبية المتوسطة بنات

السلام عليكم ورحمة الله وبركاته وبعد :

أرجو تسهيل مهمة الطالب /شافي فهد شافي المحبوب

الموفد من جامعة شمال تكساس للحصول علي درجتي الماجستير والدكتوراه في تخصص المنـــاهج وطرق التدريس .

آملا تقديم كل معاونة ممكنة إليه .
مع خالص التحية والتقدير ،،،

مدير عام منطقة الجهراء التعليمية

وزارة التربية
منطقة الجهراء التعليمية
وحدة التخطيط والمعلومات

نسخة : لإدارة الشئون التعليمية .
نسخة : مراقبة التعليم المتوسط .

وزارة التربية
منطقة العاصمة التعليمية
وحدة التخطيط والمعلومات

التاريخ : ١٩٩٩/١٠/٢٧م

حضرة المحترم / ناظر مدرسة الفيحاء المتوسطة بنين .

تحية طيبة وبعد ،،،،

يرجى تسهيل مهمة الطالب/شافى فهد شافى المحبوب الموفد من جامعة شمال تكساس للحصول على الماجستير والدكتوراه في تخصص المناهج وطرق التدريس .

شاكرين لكم حسن تعاونكم .

مدير
إدارة الشئون التعليمية

حمود راشد الهندي
مدير إدارة الشئون التعليمية
منطقة العاصمة التعليمية

وزارة التربية
منطقة العاصمة التعليمية
إدارة الشئون التعليمية

نسخه لكل من :
-مدير إدارة الشئون التعليمية
-وحدة التخطيط

وزارة التربية
منطقة العاصمة التعليمية
وحدة التخطيط والمعلومات

التاريخ : ١٩٩٩/١٠/٢٧م

حضرة المحترم / ناظر مدرسة الخليل بن أحمد المتوسطة بنين .

تحية طيبة وبعد ،،،،

يرجى تسهيل مهمة الطالب/شافي فهد شافي المحبوب الموفد من جامعة شمال تكساس للحصول على الماجستير والدكتوراه في تخصص المناهج وطرق التدريس .

شاكرين لكم حسن تعاونكم .

مدير
إدارة الشئون التعليمية

محمود راشد الهيدي
مدير إدارة الشئون التعليمية
منطقة العاصمة التعليمية

وزارة التربية
منطقة العاصمة التعليمية
إدارة الشؤون التعليمية

نسخه لكل من :
-مدير إدارة الشئون التعليمية
-وحدة التخطيط

وزارة التربية
منطقة العاصمة التعليمية
وحدة التخطيط والمعلومات

التاريخ : ١٩٩٩/١٠/٢٧م

حضرة المحترم / ناظر مدرسة قتيبة المتوسطة بنين .

تحية طيبة وبعد ،،،،

يرجى تسهيل مهمة الطالب/شافى فهد شافى المحبوب الموفد من جامعة شمال تكساس للحصول على الماجستير والدكتوراه في تخصص المناهج وطرق التدريس .

شاكرين لكم حسن تعاونكم .

مدير
إدارة الشئون التعليمية
حمود راشد الهندي
مدير إدارة الشئون التعليمية
منطقة العاصمة التعليمية

وزارة التربية
منطقة العاصمة التعليمية
إدارة الشئون التعليمية

نسخه لكل من :
-مدير إدارة الشئون التعليمية
-وحدة التخطيط

وزارة التربية
منطقة العاصمة التعليمية
وحدة التخطيط والمعلومات

التاريخ : ١٩٩٩/١٠/٢٧م

حضرة المحترمة / ناظرة مدرسة النـــزهة المتوسطة بنات .

تحية طيبة وبعد ،،،،

يرجى تسهيل مهمة الطالب/شافى فهد شافى المحبوب الموفد من جامعة شمال تكساس للحصول على الماجستير والدكتوراه في تخصص المناهج وطرق التدريس .

شاكرين لكم حسن تعاونكم .

مدير
إدارة الشئون التعليمية

حمود راشد الهنيدي
مدير إدارة الشئون التعليمية
منطقة العاصمة التعليمية

وزارة التربية
منطقة العاصمة التعليمية
إدارة الشئون التعليمية

نسخه لكل من :
-مدير إدارة الشئون التعليمية
-وحدة التخطيط

APPENDIX H

PARENTS CONSENT FORM

Letter to Parents

Dear Parents/Guardians:

As a Ph. D. candidate student at the University of North Texas (UNT) in the United States, I'm conducting a study that investigates the attitudes of sixth-grade Kuwaiti student toward computer use in the school setting. I will survey the students in their classroom. The administration of the survey will take 15-30 minutes. I request permission for your child to participate.

The goal of the study is to investigate if the use of computer technology positively impacts the attitudes of the sixth-grade students. This study will add to the limited research on the use of computer to enhance attitudes, motivation, study habits, and creativity. It will also contribute to knowledge on the appropriate way to use technology in teaching and learning process.

Your child will participate 15-30 minutes in his or her classroom; he or she will not be asked to go outside of the school. To preserve confidentiality, only first names will be used to identify children. This project has been reviewed and approved by the UNT Committee for Protection of Human Subjects (Tel 940-565-3940).

Your decision whether or not to allow your child to participate will in no way affect your child's standing in his or her class/school. Should you have any questions or desire further information, please call me at 9044055. Thank you in advance for your cooperation and support.

Sincerely,

Shafi Almahboub
Ph.D. Student at University of North Texas
College of Education
Shafi@unt.edu

Please indicate whether you wish to have your child participate in this project, by checking a statement below and returning this letter to your child's teacher as quickly as possible.

I do grant permission for my child, ---------- to participate in this project.

Parent/Guardian's signature

Date

السيد المحترم / ولي الأمر

السلام عليكم ورحمة الله وبركاته...

أنا طالب دكتوراه في جامعة شمال تكساس بالولايات المتحدة الأمريكية أقوم بدراسة مسح لسلوك الطلاب والطلبات اتجاه استخدام الحاسوب في مرحلة المتوسط لأتمام رسالة الدكتوراه.
الهدف من هذه الدراسة هو معرفة إذا كان الحاسوب له تأثير أجابي أو سلبي على سلوك الطالب أو الطالبة في المدرسة. هذه الدراسة سوف تضاف إلى البحوث التربوية التي تقترح بأن الحاسوب له تأثير على سلوك و الحوافز المعنوية نحو التعليم و العادات الدراسية و الإبداع عند الطالب أو الطالبة . هذه الدراسة أيضا سوف تساهم في معرفة الطرق الصحيحة في استخدام التكنولوجيا في عملية التدريس و التعليم.
سوف يقوم الطالب بالإجابة على استبيان الذي يستغرق من ١٥ ألي ٣٠ دقيقه. لن يطلب من التلميذ مغادرة الفصل أو المدرسة لأجابه على الاستبيان ولكن سوف تكون المشاركة في الفصل. للمحافضه على سرية المعلومات، الاسم الأول فقط سوف يستخدم لتعرف على الطالب. هذه الدراسة موافق عليها من قبل لجنة حماية حقوق الإنسان في جامعة شمال تكساس تلفون :(٩٤٠-٥٦٥-٣٩٤٠).
أن الموافقة على المشاركة من عدمه ليس لها تأثير على موقف الطالب الدراسي في المدرسة. يرجي مراجعة مدرس الحاسوب إذا كان لديكم أي سؤال أو استفسار عن الدراسة.

شكرا لكم مقدما على تعاونكم و دعمكم لهذا المشروع

شافي فهد المحبوب
طالب دكتوراه

يرجي كتابة اسم الطالب مع التوقيع على موافقتكم على المشاركة و ثم أعاده الرسالة مع الطالب ألي مدرس الحاسوب في المدرسة بأسرع وقت ممكن.

أوافق على مشاركة الطالب/..... في الدراسة
التوقيع/.....
التاريخ/.....

APPENDIX I

STUDENTS CONSENT FORM

Assessment of Students Survey

I, _____ (name) understand that Shafi Almahboub Ph. D. candidate student at the University of North Texas (UNT) in the United States is conducting a study that investigates the attitudes of sixth-grade Kuwaiti student toward computer use in the school setting. I realize that there will be no negative impact from not participating or withdrawing from the study.

I understand that information obtained from my responses on the survey will be used for the study only. I understand that my participation on the survey will take 15-30 minutes. I understand that my response will be confidential. This means that any information about me will be assigned a code number and will not include my name or other identifying information.

I understand that I can request further information about this consent form and the study from Shafi Almahboub. I understand that this project has been reviewed and approved by the UNT Committee for Protection of Human Subjects (Tel 940-565-3940).

_____ _____

Student's Signature Date

_____ _____

Teacher's Signature Date

أنا الموقع أدناه_____ قد فهمت أن شافي المحبوب طالب دكتوراه في جامعة شمال تكساس بالولايات المتحدة الأمريكية يقوم بدراسة مسح لسلوك الطلاب والطلبات اتجاه استخدام الحاسوب في مرحلة المتوسط لرسالة الدكتوراه. لقد أدركت أنه لن يكون هناك أي تأثير سلبي لعدم المشاركة أو الانسحاب من المشاركة من الدراسة.

لقد فهمت أن إجاباتي على الاستبيان سوف تكون سرية وهذه المعلومات تستخدم لدراسة فقط و أن وقت المشاركة يستغرق من ١٥ ألي ٣٠ دقيقه. لقد فهمت أن اسمي سوف يرمز له برمز أو رقم لتعرف على المعلومات.

أنا فهمت أنني أستطيع أن أطلب أي معلومات عن هذا الإقرار أو عن الدراسة في المستقبل من شافي المحبوب و أن هذه الدراسة موافق عليها من قبل لجنة حماية حقوق الإنسان في جامعة شمال تكساس تلفون :(٩٤٠-٥٦٥-٣٩٤٠).

توقيع الطالب/_____ التاريخ /_____

توقيع المدرس /_____ التاريخ /_____

APPENDIX J

COMPUTER ATTITUDE QUESTIONNAIRE SUBSCALES

CAQ Subscales

Attitudes Toward Computer

1) I enjoy doing things on a computer.
2) I am tired of using a computer.
3) I will be able to get a good job if I learn how to use a computer.
4) I concentrate on a computer when I use one.
5) I enjoy computer games very much.
6) I would work harder if I could use computers more often.
7) I know that computers give me opportunities to learn many new things.
8) I can learn many things when I use a computer.
9) I enjoy lessons on the computer.
10) I believe that the more often teachers use computers, the more I will enjoy school.
11) I believe that it is very important for me to learn how to use a computer.
12) I feel comfortable working with a computer.
13) I get a sinking feeling when I think of trying to use a computer.
14) I think that it takes a long time to finish when I use a computer.
15) Computers don not scare me at all.
16) Working with a computer makes me nervous.
17) Using a computer is very frustrating.
18) I will do as little work with computers as possible.
19) Computers are difficult to use.
20) I can learn more from books than from a computer.

Motivation/Persistence

21) I study by myself without anyone forcing me to study.
22) If I do not understand something, I will not stop thinking about it.
23) When I don't understand a problem, I keep working until I find the answer.
25) I try to finish whatever I begin.
27) I enjoy working on a difficult problem.
28) I think about many ways to solve a difficult problem.
29) I never forget to do my homework.
34) I study hard.
35) When I do a job, I do it well.

Study Habits

21) I study by myself without anyone forcing me to study.
24) I review my lessons every day.
25) I try to finish whatever I begin.

26) Sometimes, I change my way of studying.
29) I never forget to do my homework.
30) I like to work out problems which I can use in my life every day.
31) If I do not understand my teacher, I ask him/her questions.
32) I listen to my teacher carefully.
33) If I fail, I try to find out why.
34) I study hard.

Empathy

36) I feel sad when I see a child crying.
37) I sometimes cry when I see a sad play or movie.
38) I get angry when I see a friend who is treated badly.
39) I feel sad when I see old people alone.
40) I worry when I see a sad friend.
41) I feel very happy when I listen to a song I like.
42) I do not like to see a child play alone, without a friend.
43) I feel sad when I see an animal hurt.
44) I feel happy when I see a friend smiling.
45) I am glad to do work that helps others.

Creative Tendencies

46) I examine unusual things.
47) I find new things to play with or to study, without any help.
48) When I think of a new thing, I apply what I have learned before.
49) I tend to consider various ways of thinking.
50) I create many unique things.
51) I do things by myself without depending upon others.
52) I find different kinds of materials when the ones I have do not work or are not enough.
53) I examine unknown issues to try to understand them.
54) I make a plan before I start to solve a problem.
55) I invent games and play them with friends.
56) I invent new methods when one way dose not work.
57) I choose my own way without imitating methods of others.
58) I tend to think about the future.

Attitudes Toward School

62) I really like school.
63) School is boring.
64) I would like to work in a school when I grow up.
65) When I grow up I would not like to work in a school.

APPENDIX K

TABLE OF MISSING VALUE

Items Numbers, Frequencies, and Missing Data as Percentages of the Total Sample Size

Items #	Frequencies	Percentages	Items #	Frequencies	Percentages
2	1	.2	41	2	.4
4	2	.4	42	1	.2
5	3	.5	43	1	.2
6	6	1.1	45	1	.2
9	2	.4	46	7	1.2
10	1	.2	47	5	.9
12	2	.4	48	3	.5
13	4	.7	49	3	.5
14	3	.5	50	5	.9
*15	9	1.6	51	2	.4
16	4	.7	52	2	.4
17	6	1.1	53	4	.7
18	3	.5	54	7	1.2
19	6	1.1	55	7	1.2
20	1	.2	56	2	.4
22	2	.4	57	2	.4
23	1	.2	58	3	.5
24	1	.2	62	1	.2
*25	15	2.7	63	1	.2
*26	12	2.1	64	3	.5
27	5	.9	65	3	.5
28	3	.5			
29	1	.2			
30	1	.2			
31	4	.7			
32	4	.7			
33	3	.5			
35	1	.2			
36	1	.2			
38	3	.5			
39	3	.5			
40	1	.2			

- The largest percent of missing value occurred in items 15, 25, and 26.

APPENDIX L

PERMISSION TO USE
COMPUTER ATTITUDE QUESTIONNAIRE

October 28, 1999

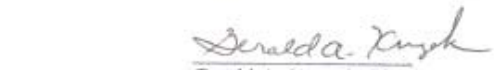
Shafi Almahboub
324 Gabe Ct
Denton, TX 76207

Dear Shafi,

Thank you for your interest in our survey instrument, Computer Attitudes Questionnaire (CAQ). I understand that you will be using this instrument to gather data for your dissertation research. I am pleased to give you permission to use the instrument for this purpose.

I would be very interested in hearing about your results and perhaps sharing your findings on our website.

Sincerely,



Gerald A. Knezek, Ph.D.
E-mail: gknezek@tenet.edu

University of North Texas
PO. Box 311337
Denton, TX 76203
Tel # (940) 565-4195

APPENDIX M

LETTER OF APPROVAL

University of North Texas
Research Services

November 29, 1999

Shafi Fahad Almahboub
324 Gabe Ct.
Denton, TX 76207

RE: Human Subjects Application No. 99-191

Dear Mr. Almahboub,

On October 29, 1999, the University of North Texas Institutional Review Board conducted a full review of your proposed project titled "Attitudes Toward Computer Use Among Kuwaiti Sixth-Grade Students." The Board found that the risks inherent in this research are minimal and the potential benefits to the subjects outweigh those risks. The submitted protocol is hereby approved for the use of human subjects on this project.

U.S. Department of Health and Human Services regulations require that you submit annual and terminal progress reports to the UNT Institutional Review Board. Further, the UNT IRB must re-review this project annually and/or prior to any modifications you make in the approved project. Please contact me if you wish to make such changes or need additional information.

Sincerely,

Reata Busby
Chair, Institutional Review Board

RB:sb

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A statistically significant gender difference was found in the correlations between attitudes toward computers and empathy. Girls had a stronger correlation (r. = .405) than boys (r. = .215). This study also found that students who use computers at home (mean = 3.40) have more positive attitudes toward computers than did students who do not (mean = 3.22).

The main conclusion of the current study is that students like to use computers, therefore, the researcher suggests that computer should be introduced for the students in the classrooms environment and to be integrated into the curriculum of all subject areas.