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Jordanian Public  
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# *An Evaluation of Teaching Computer to Tenth Grade Students in Jordanian Public Schools*

**Dr. Akram A. Omari**

## *Abstract*

This study evaluated the status of computer education in the Jordanian public school system. It aimed at identifying the effectiveness of studying computer by tenth grade students as perceived by learners and the effectiveness of teaching computer to tenth grade students as perceived by the teachers of computer and the principals of those public schools who teach computer.

All Jordanian public schools that taught computer in the academic year 1995-1996 to tenth grade students (511 males' and females' schools) with a population of 60259 tenth grade students, 226 teachers of computer and 511 principals were subjected for this study. Of those potential subjects, 3365 tenth grade students (1565 male and 1800 female), 74 teachers of computer (35 male and 39 female) and 94 principals (44 male and 50 female) were randomly chosen as a sample to participate in this study.

This study investigated several questions concerning the status of teaching computer: 6 questions related to tenth grade students perceptions, 4 questions related to teachers' perceptions, 3 questions related to the principals of those schools and 4 questions related to students', teachers' and principals' attitudes.

For the purpose of the study, special questionnaires to measure the subjects perceptions and attitudes were designed, developed and validated with acceptable reliability coefficients. The final forms consisted of 63 items for students' perceptions, 48 for teachers' perceptions, 29 for principals' perceptions and 18 items for students', teachers' and principals' attitudes.

♦ Data collected were analyzed and the results indicated the following:

First: Results related to tenth grade students' perceptions.

1. The theoretical and practical aspects of the text book were slightly adequate.
2. Computer laboratories were fairly suitable especially the number of computers available to be used.
3. Competency of computer teachers were very adequate.
4. 66.4% of the students perceived that they very well benefited from studying computer, while 8,2% indicated that they benefited with lesser extent.

Second: Results related to the teachers' perceptions.

1. Students' text book was very suitable in terms of the language used, materials, objectives and the practical part whereas as the rest of the statement on this subscale were slightly adequate.
2. Teachers' guide was Fairly adequate in terms of sequence and clarity of procedures for carrying out the lessons, well defined goals and well stated objective and their relations to materials used in the text book. The rest of the statements on teachers' guide subscale were very adequate.

3. Teachers' in-service training program was suitable for teachers' ability in teaching, but in terms of using computer applications was not suitable. However, the rest of the statements on the teachers' in-service training subscale were fairly suitable.
4. Obstacles that teachers perceived to hinder the teaching of computer were no personal maintenance available in schools delay in maintenance when computer stops working, the availability of computer softwares in schools, computers most of the time are out of order, difficulties in computer use. While the adequacy of teaching computer, suitability of computer labs and difficulty of using computer softwares were less important obstacles. The obstacles of the cooperation between computer teachers and school administration and persuading students with the importance of teaching computer were perceived to be less sharp than other obstacles.

**Third:** Results related to the principals' perceptions.

1. Lab preparation such as lights, vandilation, Location and equipment were perceived to be very adequate. The number of computers available to meet students numbers demand was fairly adequate, but the rest of the statement on the Lab preparation subscale were adequate.
2. The advisory system for teaching computer was not competent in the coordination among teaching advisors, follow up of principals, using traditional methods of advising and class visitation while the rest of the statement on the advisory system subscale were perceived to be more competent.
3. The coordination between computer teachers and their school administration, availability of computer teachers, softwares and suitability of computer labs were perceived to be un sharp obstacles whereas the rest of the obstacles on the subscales were perceived to be very sharp obstacles.

**Fourth:** Results related to students', teachers' and principals' attitudes indicate that:

1. Students' attitudes toward studying computer were positive.
2. There was a significant difference at ( $p < 0,001$ ) in students' attitudes related to students' geographical areas (south, middle, north). Those who were studying computer in the two geographical areas (middle and south) showed more positive attitudes than those who were studying in the north area.
3. Teachers' attitudes toward teaching computer were positive.
4. Principals' attitudes toward teaching computer were positive.
5. There was a significant difference at ( $p < 0,001$ ) between teachers' and principles attitudes. Teachers' had more positive attitudes that principals.

In the light of this study, the most important recommendations were:

- 1- The Theoretical part of the textbook needs to be redesigned with reconsideration of students' characteristics and aptitude.
- 2- There is a need to train the already teachers in the field educationally.
- 3- School library should have special section for all the computer resources needed for the teaching of computer, such as literature software, books ... etc.
- 4- To increase teaching advisors' visits to the teachers of computer in schools.
- 5- To generalize computer education to include those schools which they do not teach computer.

# *Chapter One*

## **Introduction**

Computer is one of the main characteristics of our life. Its advent has important implications in many different dimensions. Perhaps, the most striking feature of computer is the shifting from labor intensity information to information intensity. Moreover, and because of the rapid development of this technology, it becomes widely spread through the most aspects of life.

Since the middle of the 20th century, we have increasingly used the power of computer to create discourse. Indeed, the computer presents us with new ways to formulate our individual insight and new visions of collective knowledge. At the same time, and as a medium for exercising the working of the world, computers present us with new rules of well-formedness that change what we are collectively and individually.

Beginning in the 1950s, educational computing experienced a series of promising beginnings followed by disappointing results. It began as a tool for research and administration on college campuses. Later on, innovative educators perceived its potential as instructional tools (Aklabi & Mousa, 1996; Gandla, 1981; Niemies & Walberg, 1985; Habeeb, 1987; Manai, 1991; Abu-Hatab; 1984; Mansour, 1987; Titi, 1988). Consequently the starting place for Educational computing in education was offered by math

departments (Cole, 1971), where some instructors attempted to use the computer as a large teaching machine for programmed instruction. Others developed computer technology courses for selected students to learn programming.

Fulfilling the promise of individualized learning became the goal of early computer-Assisted Instruction (CAI), which provided mainly low-level teaching of facts and skills with uninspired drill and practice sessions. Such instruction forces rigid control of students and permits only inflexible responses.

During the 1970s, the focus was changed from searching for ways of computers to carry out tasks done quite well by faculty, to finding ways in which students could use computers to discover principles, to inquire into the nature of academic disciplines, to develop high level research skills and to discover how to learn (Kulik & Jaska, 1977).

A closer look at the many forms created by computers may elaborate on the potentials which these forms have offered for those using computer. It is often too difficult to draw lines of distinction between the narrative and the expository discourse. Computer narratives call on the computer user to step back at certain points, to analyze, to deduce and to extrapolate. Having done so, computer forms of exposition call on the user to abandon certitude in right and wrong answers, to see worlds of probability and to experiment with a variety of possible scenarios or stories (Abu-Hatab, 1984).

The Computer Aided Instruction (CAI) form, when incorporated into the teaching of the disciplines, can offer education many Forms of organizational patterns for engaging students with knowledge:

Simulation for instant, focuses attention on the structural elements which shape human experience beyond textbook descriptions of particular outcomes (Aklabi & Mousa; 1996, Titi, 1988), traditionally studied within the content oriented curriculum (Hassan, 1987).

Drill and practice courseware remain the most common type of (CAI). It allows students to overcome deficiencies in basic skills (Abu-Hatab, 1984).

Tutorial systems provide an interactive dialogue for students; the computer assumes the actual role of the instructor at this level. Data bases engage students in searching, sorting, creating and reporting with diverse and wide-ranging information resources.

Hyper- text (Hypermedia systems) encourage students to present their knowledge using multiple symbolic forms while connecting information in terms of relationships and patterns as opposed to more traditionally linear sequences. Interactive fiction allows students to experiment with consequences of their knowledge within the frame of the conduct of life. Finally, teaching computer as a science in which students learn to know computer; how it works and how to program it (Al-Mansour, 1987).

Other advantage is the Computer-Managed Instruction (CMI) where computer promised to guide instruction at fine-grained level

of decision-making during instruction, tailoring the experience to the momentary needs of the learner and his/ her chaining response. Then the vision is used to convert new comers to the notion of computerized instruction (Thomson, 1985). In spite of the fact that this system tests students, diagnoses their weaknesses, and prescribes remediation (Hashisho, 1987; Baker, 1978); it requires much time and effort to prepare and monitor such system (Rugsdale, 1986).

The development of the Micro-Computer adds the final necessary ingredient of accessibility (Precivl & Ellington, 1984), and releases the previously unrealized potentials of computers.

Psychologists such as Pyaget, Browner, Skinner and others emphasized the importance of instruction. Using computer as a media of instruction can provide better organization, management recalling and listing of new information with prior knowledge (Willson & Fitzgibbon, 1970). Yet, the teacher's role will remain an important part of the instruction.

However, recent work in cognitive science has stressed the need for media instruction as a main factor to provide interaction (Precival & Ellington, 1984). Abu-Hatab (1984) noted that the teacher's role would not vanish. In essence, teachers must keep demonstrating the initiation and self motivation to become literate to have a flexible and adjustable roles according to present and future technology (Bahow, 1986).

Yet, why does education seem to lag behind other aspects of society? When educational opportunities are not equally available to

all, it is quite natural to judge that education may never achieve the computer revolution as originally conceived. Educators are continuing to recognize the ever-growing use of computers in society (Kamal, Nofel, 1991) and the associated needs of students to understand and to apply them.

No one can deny the computer role in education. Several recent empirical studies have found that computer as a media of instruction results in better learning and increases the level of recalling to almost 80% (Barth, 1990; Cuban, 1981; Goodlad, 1984).

It also helps enhancing the creative ability (Barbara, 1988). Several researches agreed on this issue and provided evidences to suggest that using computer in instruction enhances the creative thinking (Bennett, 1987; Qaud, & Jawarneh, 1995) especially in problem solving (Martin, 1993; Charlene, 1993; Beverly, 1993; Lengel, 1987). Some other studies indicated that the creative thinking is enhanced when new and modern teaching methods using the computer systems are used (Maria, 1981; Eugene, 1972; Zegan, 1994).

Other advantages using Computers in learning help in saving time and increasing the given information (Roozer & Northup, 1989). Perelman (1990) claimed that, using computers increases learning to 30% and saves about 40% of learning time that is when compared with other traditional methods. Kulik (1983) analyzed fifty modern studies dealt with computer in learning. Results indicated that more than 80% of these studies showed the benefit of computer and the enhancement of student's achievement (Lober, 1970). In addition to that it showed that computers were able to save almost 30-90% of time used for teaching students.

In the field of using computers in teaching subject matters, computer increases student's abilities in less time than that used in teaching using the traditional methods (Hamshari, 1993; March, 1985; White, 1986; Baily, 1987). Trueman (1981) conducted a study on two groups; one was taught by a teacher and the other by the computer. His study indicated that the achievement of the group which was taught by the teacher was better than the group used the computer with a difference of about 12%.

Many other studies have been done in the field of computer education. For more details refer to:

- Moskowitz & Birman(1985); Richarad(1984); Easa (1988) and Homaisat(1988) in the field of teaching computer in schools.
- Sales(1985)In the field of computer facilities.
- Burghes(1984) and Cheng (1985) in the field of the computer textbooks.
- Moskavitz (1985) in the field of the objectives and the plans of applying computers .
- Ellingham (1982), and bliss & Cox (1986) in the field of the factors that influence using the computer.
- Nishinosono (1984), Camer (1985), Weaver & Shuker (1986) in the field of teachers training.
- Lets, p (1986) in the field of the problems of teaching the computer
- Percival(1984); Thanson(1982), Isenberg(1986), Smith(1986), Loyd et al. (1987), Martin(1991), Wiener(1993) and Al-Akalbi and Mousa(1996) in the field of the attitudes towards computer.

## Teaching Computer In Jordanian Public Schools

Beginning with the computer revolution, educational computing has been receiving a great deal of attention from the Jordanian Ministry of Education. It was until the mid 80s, when the Ministry of Education decided to include teaching computer in the public school system. The experiment started in two schools in Amman in the academic year of 1984/1985. This experiment was done on the tenth grade students and only for two sessions per week. These two schools were chosen as one for males and one for females. By the school year of 1985/1986, six more schools were added, each was provided with (11) computers terminals

In the school year of 1986/1987 a protocol was signed by the government of Jordan and the government of the United Kingdom to enhance teaching computer in the public schools of Jordan. Increasingly, advocates called for computer knowledge and experiences for all students. In response to this call, the number of schools that was teaching computer for the tenth-grade students was increased in the academic year of 1993/1994 to 321 schools.

According to the 1996 Statistics of the Ministry of Education in Jordan, there is (511) schools spread all over the country. These schools enroll about (60259) tenth grade students and contains about (4794) computers.

The following are the main objectives of teaching computer in the Jordanian school system:

1. To train students to live in a technological environment where the computer and the information system are the key components.
2. To enhance students' intellectual skills, such as problem solving, creativity, understanding, organizing and analyzing data. Also to learn using computer as a media of instruction.
3. To promote students' abilities to work in groups.
4. To enhance students' abilities to use the computer.
5. To enhance students' abilities to understand and discriminate between problems that can or can't be solved using the computer.
6. To improve student's skills and their proficiency in programming.
7. To enhance students' thinking ability through using computer in solving problems.
8. To enhance students' abilities to use the computer for accomplishing educational and career tasks.

The Ministry of Education in Jordan acted upon the recommendations of the the Educational Development Conference which was held in 1987. The Ministry of Education required the following: computer laboratories to be built in each of the new schools; remolding the old Computer laboratories in the old schools, increasing the number of Computer and Computer supplies in each existing computer laboratories, developing new textbooks, teachers' guides and teacher in-service training programs (Easa, 1988: Sales, 1985).

But surprisingly the status of such computer education program remains largely unknown. What do we learn from these experiences is the Major Question that we want to investigate? Accordingly, the Jordanian Ministry of Education was concerned with such implementation and curricula modifications; focusing on those involved in the teaching of computer (principals, students, teachers) and the extent of available resources to meet the program demand (Titi, 1988; Homisat, 1988).

Our purpose is to evaluate the teaching of computer for the tenth grade students in the Jordanian public schools; focusing on perceptions and attitudes of students, teachers, and principals.

### **Problem Statement**

Educators continued to recognize the ever-growing use of computers in society (Kamal, Nofel, 1991) and the associated needs of students to understand and to apply them. Computer skills represent the most common school system definition of computer literacy; as such, the government of Jordan included computer skills as an integral part of its school plan of 1984/1985. The Ministry of Education required tenth-grade students to learn how to use computer and to be able to interact with it. Several studies confirmed the role of computer in gaining information from the world, presenting such information in forms that could be transformed as knowledge. Such knowledge then can be used to direct students' attention and behaviors.

Since the introduction of computer in the Jordanian schools, educators as well as the Ministry of Education have been focusing

on those involved in the teaching of computer (principals, students, teachers) and the extent of available resources to meet the program demand (Titi, 1988; Homisat, 1988).

This study is an another attempt in the field of computer evaluation. It examines the computing education for the tenth grade students in the Jordanian public school system; focusing on the perceptions and attitudes of the tenth grade students , teachers of computer and principals of those public shools who teach computer for the tenth-grade students.

### **Research Questions**

To examine the status of the computer education program employed by the public schools of Jordan, this study investigated the following research questions:

First: questions related to tenth-grade students' perceptions of the status of teaching computer in Jordanian public schools:

- 1 - To what extent do students perceive the theoretical part of their computer text book suitable for them?
- 2 - To what extent do students perceive the practical part of their text book suitable for them?
- 3 - To what extent do students perceive the computer lab preparation adequate to meet the objectives of the computer curricula?
- 4 - To what extent do students perceive their computer learning activities practiced inside the computer lab?

- 5 - To what extent do students perceive the competencies of their computer teachers ?
- 6 - To what extent do students benefit from studying computer in Jordanian public schools?

Second: questions related to computer teachers' perceptions of the status of teaching computer in Jordanian public schools:

- 1 - To what extent do teachers of computer perceive the students' text book suitable for them?
- 2 - To what extent do computer teachers perceive their teachers' guide suitable to teach the computer text book?
- 3 - To what extent do the teachers of computer perceive their in-service teacher training program effective?
- 4 - What are the obstacles that teachers perceive important to hinder the teaching of computer in Jordanian public schools?

Third: questions related to the school principals' perceptions of the status of teaching computer in Jordanian public schools:

- 1 - To what extent do principals perceive the preparations of the computer labs adequate to achieve the objectives of teaching computer in Jordanian public schools?
- 2 - To what extent do principals perceive the competencies of the system of advisory to teaching computer ?
- 3 - What obstacles do principals perceive to face the teaching of computer in Jordanian public schools?

Fourth: questions related to students', teachers' and principals' attitudes toward the teaching of computer:

- 1 - What are the students' attitudes toward teaching computer in Jordanian public schools?
- 2 - What are the influences of the geographical areas (South, North Middle) on students' attitude toward teaching computer?
- 3 - What are the teachers' attitudes toward teaching computer in Jordanian public schools?
- 4 - What are the principals' attitudes toward teaching computer?
- 5 - Is there statistical significant difference between teachers and principals' attitudes toward the teaching of computer to tenth grade students in Jordanian public schools?

## *Chapter Two*

### **Methodology**

#### **Subjects**

All Jordanian public schools (511 male's and female's schools) within the school system of the country of Jordan that teach computer to Tenth-grade students were subjected for the purpose of this evaluation. These schools have a population of (60259) tenth-grade students, (226) computer teachers and (511) principals. These public schools were divided into three geographical areas: North, Middle and South (see table 1).

Depending on the number of schools in each of the three mentioned areas, a sample of 94 schools was randomly chosen in the following manner: 39 schools from the North, 36 from the Middle and 19 from the South. Then, two classes were randomly chosen from each randomly chosen school. Except those schools where there was only one class available, the same class was used. All students in these classes, teachers of these classes and principals of the randomly chosen schools were the participants of this study (see Table 1).

**Table (1):** Population of the study.

Areas	Principals		Teachers		Students	
	Male	Female	Male	Female	Male	Female
North	82	89	52	41	9171	9668
Middle	103	130	46	55	17600	17688
South	51	56	21	11	3047	3085
Subtotal	236	275	119	107	29818	30441
<b>Total</b>	511		226		60259	

**The students' sample:** this sample consisted of (3365) students. Of those(1565) were males and (1800) were females (see table 2).

**Table (2):** Distribution of the samples according to geographical areas and sex.

Areas	schools Principals		Teachers		Students	
	Male	Female	Male	Female	Male	Female
North	18	21	12	14	401	521
Middle	17	19	18	19	809	986
South	9	10	5	6	355	293
subtotal	44	50	35	39	1565	1800
<b>Total</b>	94		74		3365	

This sample presents 5.5% of the students population. Such percentage is acceptable in educational research.

**The teachers sample:** table 2. presents the teachers' sample which consisted of 74 computer teachers. Of those 35 were

male teachers and 39 female teachers. It represents 18.5% of the teacher population and this percentage is acceptable in research.

**The principals' sample:** Principals in this sample were the principals of those randomly selected schools and were the participants. This sample consisted of 94, of those 44 were male principals and 50 female principals (See table 2). The sample presents 18.5% of the principals.

Data were collected from the participated students, teachers and principals during the second term of the school year of 1995/1996. Also, data were collected about computers laboratories and their equipment's, number of classes and number of students in each of these classes.

### **Definition of Terms**

This study used the following definition of terms:

- 1 - **Students:** those tenth-grade students who were studying computer in Jordanian public schools in the academic year of 1995/96.
- 2 - **Teachers:** those computer teachers who were teaching tenth grade computer textbook to tenth grade-students in those public schools that taught computer in the academic year of 1995/96.
- 3 - **Principals:** the principals of those schools where computer was taught in their schools for tenth-grade students in the academic year of 1995/96.
- 4 - **Attitudes:** students, teachers and principals' responses on the questionnaires that were developed by the researcher to

measure subjects' perceptions of the studying of computer in Jordanian public schools.

- 5 - **Computer Education:** the information technology program that was established by the Ministry of Education in Jordan in the academic of 1989-1990. However, anywhere the word computer education comes cross it means (information technology).
- 7 - **Tenth-grade:** the school level that comes at the end of the primary school in the school system of Jordan that continue for 10 years.
- 8 - **Median:** the median scale on the attitudes' questionnaires for students (3 sub-scales), teachers and principals (5 sub-scales) towards the teaching of computer. This scale consisted of (36) points to students and (54) points to teachers and principals.

### **Research Instruments**

After reviewing previous studies related to the teaching of computer in schools; the teaching of computer in the Ministry of Education in Jordan; the computer teacher's guide and the computer textbook that was used for teaching computer to the tenth grade students in the Jordanian public schools, the researcher developed six research instruments: two for students, two for computer teachers and two for the principals. All the instruments were written in Arabic because most of the population of this study do not speak English well.

## **I - The students' questionnaires: Perceptions and Attitudes.**

A. The questionnaire of the students' perceptions was an instrument designed to be used by students participants to obtain perceptual data. The original instrument consisted of 72 likert-type items contained 3 measurable levels of responses to assess the students' perceptions of the Theoretical part of the text book; the lab part of the Textbook, lab preparation, students' activities during the lab work and teachers' abilities of teaching computer.

The instrument was tested for reliability and content validity in the following manner: The instrument was presented to 20 jury from the members of the faculty of education at Yarmouk University; some teachers of computer and some school principals at the Ministry of Education in Jordan. The jury were asked to judge if the items included in the instrument could measure what they were supposed to measure. Based on their judgments, the instrument was modified to include 63 items.

A pilot study was done on the final instrument to determine if the instrument was able to gather the relevant data and discover ambiguities in the following manner: The instrument was administered to 50 students in computer classes. Minor modifications were made related to the language used in some of the items. The pilot study indicated that the instrument possessed stability, readability and was comprehensible by the students subjects. The major study yielded a coefficient alpha (Cronbach Alpha) of 0.94 for internal consistency. The reliability for the sub-

scales (categories) individually yielded a coefficient alpha ranged from 0.70 to 0.86 (see table 3 and appendix 1).

**Table (3)** Students', teachers', and principle's sub-scales and their reliability.

Instruments	No. of items	Sub-scales and their items	Reliability Cronbach alpha
Students' perceptual questionnaire	63	1. Theoretical part of the text book. 2. Practical part of the text book. 3. Lab preparation, 4. Practical activities 5. Teachers competencies 6. Computer use benefit.	Total instrument (0.94). Sub-scales 0.70 to 0.86
Students attitudes questionnaire	18	Attitudes toward teaching computer.	0.76
Teachers perceptual questionnaire	48	1. Textbook-theory and practice. 2. Teachers guide. 3. In-service training program 5. Obstacles of teaching computer	Total instrument 0.87 Sub-scales 0.73 to 0.82
Teachers attitudes questionnaire	18	attitudes toward teaching computer	0.84
Principals perceptual questionnaire	29	1. Lab preparation 2. advisory system 3. Obstacles of teaching computer	Total instrument 0.89 Sub-scales 0.71 to 0.85
Principles attitudes questionnaire	18	Attitudes toward teaching computer	0.73

B. The students' attitudes questionnaire was intended to measure respondents' attitudes toward teaching computers. It consisted of 25 items in its original form. The same procedures which were used in establishing the validity and reliability of the students' perceptual questionnaire (A) were also used in establishing the validity and reliability of questionnaire (B). The final script of this instrument was modified to include 18 items contained 3 measurable levels of responses (strongly agree, Agree, disagree). Of those 9 items were in the positive form that took the measurable values (3, 2, 1) respectively and (9) items in the negative form that took the order of (1, 2, 3) respectively. A test of criterion related validity using Cronbach alpha was used that yielded 0.76. This value was considered to be effective, reliable and acceptable for humanity research (see appendix 2, table 3)

## **II. The teachers' instruments: Perceptions and attitudes**

A. The instrument of the teachers' perceptions was a questionnaire that consisted of 54 items which were designed and developed to be used by the participated teachers to obtain perceptual data on the theoretical and practical part of the textbook, teacher's guide, teacher's in-service training and obstacles that face the teaching of computer. This instrument was tested for reliability and content validity in the same manner which was used of testing the students' instrument. Based on the results, this instrument was modified to include 48 items presented in a likert type scale format that contained 5 measurable levels of responses (strongly disagree, disagree, fairly agree, Agree strongly agree) with the values of (1, 2, 3, 4, 5) respectively. A Cronbach

alpha was used and yielded reliability coefficient of 0.87 (see appendix 3 and table 3).

B. The teachers' attitudes questionnaire.

This questionnaire consisted of 28 items in its original form. Validity and reliability were established in the same way was used for the students' instrument. The reliability was found to be 0.84. The final script consisted of 18 items of which nine were in the positive form (see table 3 and Appendix 4).

**III. The principals' Instruments: Perceptions and Attitudes.**

A- The principals' instrument of perceptions was questionnaire that consisted of 35 items in its first script. It was intended to measure the respondents' perceptions on the computer lab preparation and the obstacles that face teaching the computer in the Jordanian public schools. Validity and reliability were established in the same way was used for the students' perceptual questionnaire (A). Based on the results, this instrument was modified to include 29 items presented in a likert scale format. The instrument contained 5 measurable levels of responses (strongly disagree, disagree, fairly agree, Agree, Strongly agree) with the values of (1, 2, 3, 4, 5) respectively see (table 3 and Appendix 5)

B. The Principals attitudes questionnaire.

It was the same questionnaire used to measure the teachers' attitudes towards computers. Cronbach alpha was used to establish the reliability which was found to be 0.73.

All the instruments were supplied with a short message to all the participants (students, teachers and principals). This message contained the purpose of the study and explanation of how to respond to the instruments. All the participants were told that their responses would be confidential and would only be used for the purposes of this study. (see table 3 and Appendix 6).

### **Data Collection**

In order to help the researcher in distributing the instruments to all participants in Jordanian public schools, the researcher trained an assistant group of five members from the faculty of Education in the Yarmouk University . The researcher and his assistant group distributed the six scales to the tenth grade students who studied computer during the academic year 1995/1996 in the public schools in Jordan; the teachers of the computer of the tenth grade students and the principals of the public schools which taught the computer in the same academic year hand to hand. The researcher and his assistants explained the items of the scales to the participants; and they answered all the questions that were raised by the participants.

The researcher and his assistants distributed the instruments to the participants of this study during the period between 1/5-1/6 1996.

### **Data Analysis**

Using SPSS, means, standard deviations, t-tests, One way ANOVA and Newman Kuels test of post comparisons were used to analyze the students', teachers' and principals' responses.

## *Chapter Three*

### **Results and Discussion**

The focus of this study has been on the evaluation of teaching the computer to tenth-grade students in public schools in Jordan, included participants' perceptions of the status of the program and their attitudes towards the teaching of computer. It is important to note that the researcher has limited the scales of the results of data analysis for interpretation purposes. Accordingly, the researcher classified the items included in the instruments as follow:

- 1 - Students' instruments: all items that each has the mean value 2.5 to 3.0 were classified as strongly adequate; all items that each has the mean ranged from 1.5 to less than 2.5 were classified as adequate; all items that each has the mean value ( $<1.5$ ) were classified as slightly adequate.
- 2 - Teachers' and principals' instruments: all items that each has the mean 4.5 were classified as very strongly adequate; all items that each has the mean ranged from 3.5 to less than 4.5 were classified as strongly adequate; all items that each has the mean ranged from 2.5 to less than 3.5 were classified as adequate; all items that each has the mean  $<1.5$  were classified as poorly adequate.

To ease the presentation of the results', the results were divided as follow:

First: Results related to the tenth-grade students' perceptions of the status of teaching computer in Jordanian public schools.

Second: Results related to the teachers' perceptions of the status of teaching computer in Jordanian public schools.

Third: Results related to the principals' perception of the status of teaching computer in Jordanian public schools.

Fourth: Results related to students', teachers' and principals' attitudes toward teaching computer.

*First: Results related to students' perceptions of the statues of teaching computer in Jordanian public schools:*

*1 - Results related to the first research question of interest: To what extent do students perceive the theoretical part of their computer textbook suitable for them?*

To answer this question, the mean was calculated for the participants' responses on each of the items of the students' questionnaire that directly dealt with the theoretical part of the textbook sub-scale items. Then, the items were arranged in descending order according to their mean values, and presented in table 4 with their means and standard deviations.

**Table (4)** Means and Standard Deviations of students' responses on the theoretical part of their computer text book sub-scale items

Item number	Ranks	Items	Mean value	S. D value
2	1	The textbook familiarizes me with computer parts.	2.35	0.69
8	2	The textbook uses charts, pictures, and examples for clearness purpose	2.33	0.70
3	3	The textbook familiarizes me with steps of how to present data	2.29	0.69
4	4	The textbook contains the functions of computer part.	2.15	0.73
7	5	The textbook familiarizes me with the relationship between human mind and computer.	2.14	0.76
1	6	The theoretical part of the textbook suits my ability.	2.11	0.62
9	7	The outside of the textbook looks attractive to study.	2.03	0.77
5	8	The textbook familiarizes me with many programming languages.	1.92	0.75
6	9	The textbook shows how to use the computer in the society (such as design of buildings, weather, prediction....etc.).	1.79	0.80

Table 1 shows that all the means of the items in this sub-scale were ranged from 1.79 to 2.35 which means that the students perceived that the theoretical part of their computer textbook was slightly adequate. The reason for such perception could be that the tenth-grade students have been accustomed to certain method of instructional design. However, its will knowing that the design used in most textbooks concentrate on goals, educational objectives, methods of teaching, teaching strategies and methods of evaluation. Whereas the design of the tenth-grade students computer textbook came to differ in its' design from other textbooks. This is probably

the reason why they reacted to this part of the textbook as they did.

2 - *Results related to the second question of interest: To what extent do tenth-grade students perceive the practical part of their textbook suitable for them?*

To answer this question, the mean and standard deviation was calculated for participants' responses to each of the items on the students' questionnaire that directly dealt with the practical part of the textbook sub-scale item and presented in table 5 with their means and standard deviations.

**Table (5)** Means and standard Deviations of Students' responses on the practical part of the computer textbooks sub-scale items.

Item number	Ranks	Items	Mean value	S. D value
15	1	I can use the functions of keyboard	2.67	0.59
10	2	I can use the computer myself	2.64	0.63
13	3	I can switch from screen to another	2.37	0.72
12	4	I can work-out the textbook assignments.	2.25	0.70
20	5	I see the practical part of the textbook sequenced from the easy to the more difficult tasks.	2.20	0.73
16	6	I can search through information stored inside the computer.	2.18	0.70
11	7	I can print information that appear on the screen.	2.16	0.71
14	8	I am able to use logo and Frame work.	2.13	0.75
18	9	I can design and use data files	2.10	0.75
19	10	I acquire the skills provided in the practical part of the textbook easily.	2.07	0.70
17	11	I can use the computer to print documents.	2.02	0.85

Table 5 shows that items 15 and 10 were ranked as the first and the second in their fulfillment to the necessary qualities, because they had the two highest means which were 2.67 and 2.64 respectively.

Both of the two means were considered to be higher than the standard mean 2.5 which means that both of them were adequately fulfilled in the practical part of the textbook. Whereas the rest of the items from 13 to 17 were fairly fulfilled in their textbook. Their means were ranged from 2.02 to 2.37.

The question of why students perceived the practical part of their textbook as they did is well notable. Notice the first two skills which students have indicated, that they were well mastered, both of them are necessary to perform other skills in this sub-scale. Further, the other skills in this sub-scale are higher order skills in using computer which they require more aptitudes from learners. This explains why students reacted as they did. Surprisingly, their ranks of order of fulfillment corresponds with their order of difficulties.

3: *Results related to the third research question of interest: To what extent do tenth-grade students perceive the computer lab preparation as adequate to meet the computer curricula objectives?*

Table (6) presents the items of the third sub-scale of the students' perceptual questionnaire (computer lab preparation). The mean and standard deviation were calculated for participants'

responses to each of the items and presented in this table with their means and standard deviations.

**Table (6)** Means and standard deviation of students' responses on the computer lab preparations sub-scale items.

Item number	Ranks	Items	Mean value	S. D value
25	1	Computer lab is equipped with the necessary teaching aids.	2.33	0.76
23	2	The color of the computer screen is healthy	2.29	0.73
21	8	Computer lab is fixed to suite teaching computer.	2.28	0.77
27	4	Lights in computer lab is suitable to work with computer.	2.26	0.74
30	5	The location of computer lab in school building is suitable.	2.22	0.76
22	6	Sitting with the computer makes me comfortable	2.18	0.81
28	7	Vindilation in computer lab is suitable to work with computer.	2.08	0.80
31	8	Instructions to use the computer are available inside the computer lab.	1.94	0.75
26	9	The computer lab space suits the number of students in each computer session.	1.93	0.79
29	10	The heating in computer lab is suitable.	1.81	0.67
24	11	The number of computer terminals suits the number of students in each computer session.	1.50	0.71

Notice that all items presented in table 6 show mean values fall within the range of (1.50 to 2.23). According to the standard scale of (1.5 to 2.50), the items are considered to be slightly fulfilled the necessary qualities of the computer Laboratory. These results indicated that the computer laboratories are fairly suitable to practice the use of computer. The reason for such finding could

be most of the schools that teach computer to tenth grade students are old in their buildings. Surely, when the Ministry of Education started teaching computer in the late 80s; the schools have not had special rooms designed for computer laboratories. So what the ministry of education did, was to vacant rooms for this purpose. Consequently, these rooms would not meet the standards of computer lab specifications. It should be noted, that this assertion is based on the finding of an earlier study by sales (1985) which indicated that computer laboratories should have certain specifications that differ from other facilities in schools.

It was further noticed that the availability of computer terminals was not adequate for the number of students in each session since the ratio was four students to each computer terminal. This is not acceptable internationally. According to Easa (1988) the ratio should be one or two students for each computer terminal.

4. *Table 7 presents the results of this study related to the fourth research question of interest: To what extent do tenth-grade students perceive their computer learning activities practiced inside the computer lab?*

The mean and standard deviation were calculated for the participants' responses on each of the items located on the (computer practical activities) sub-scale of the students' perceptual questionnaire and presented in table 7 with their means and standard deviations.

**Table (7) Means and Standard Deviations of Students' Responses on the Practical Activities Sub-scale Items**

Item number	Ranks	Items	Mean value	S. D value
36	1	I follow teacher's instructions carefully.	2.66	0.61
32	2	I interact with my group during working with computer assignments.	2.47	0.71
35	3	Whenever faced with learning problems, I can discuss them with my group members.	2.46	0.69
38	4	I follow the instructions listed in the textbook to work on computer activities.	2.35	0.70
41	4	The teacher of computer makes discussion after each computer activity performed.	2.35	0.74
40	6	Computer usage develops my ability in understanding, problem solving, Data analysis...etc.	2.34	0.71
37	7	I use what is learned in preceding lessons to understand incoming lessons.	2.31	0.67
42	8	I try to solve problems that face me during computer activities.	2.28	0.68
34	9	I use the keyboard to print out information appeared on the screen	2.27	0.73
33	10	I write the instructions for doing the activities in my notebook inside the lab.	2.23	0.76
39	11	I can design computer activities similar to the textbook ones.	1.89	0.75

Table 7 shows that item 36 was ranked the first among the items on this sub-scale. It has the highest mean value of 2.66. This is considered higher than the standards mean of 2.50 which indicates that students follow their teachers' instruction properly when doing their practical activities. However, the rest of the items

appeared on this table have the values ranged from 1.89 to 2.47. These items were slightly perceived by students.

These findings can be justified easily since students do not have previous computer experiences, nor have they studied computers in pervious computer classes. Therefore, students should follow their teachers' instructions in order to do their practical work successfully.

However, for the other items that were perceived by students to be fairly practiced, could be reasoned by the methods of teaching computers in the Jordanian tenth-grade computer classes. The cooperative method allows students to interact within groups equally. At the same time students did not have pervious computer experience. As such, it might affect their perceptions.

5. *Table 8 shows the results related to the fifth research question of interest: To what extent do students perceive the competencies of their computer teachers adequate?*

Table 8 presents the items on competency of the teachers of computer sub-scale of the students' perceptual instrument. The mean and standard deviation were calculated for the participants' responses on each of the items in this sub-scale and presented in table 8 with their means and standard deviations.

**Table (8) Means, and Standard Deviations of Students Responses on the teachers' Competencies Sub-scale Items**

Item number	Ranks	Items	Mean value	S. D value
59	1	The teacher stays with students in the computer lab during the practical activities lesson.	2.65	0.64
52	2	The teacher responds to his students questions.	2.62	0.63
48	3	The teacher confirms obeying the rules and assures quietness during the lessons.	2.61	0.65
45	4	The teacher watches students actions during the practical activities.	2.57	0.66
44	5	The teacher does well in teaching the practical part of the textbook.	2.50	0.70
43	6	The teacher does well in teaching the theoretical part of the textbook.	2.41	0.74
58	6	The teacher helps solving problems during lessons.	2.41	0.70
46	8	The teacher makes sure that mistakes are corrected individually during practical activities.	2.40	0.73
61	9	My grades in computer is subjected to teachers temperament.	2.36	0.76
49	10	The teacher follows up solving the textbook assignments.	2.34	0.33
47	11	The teacher introduces directions of safety rules inside the computer lab.	2.30	0.76
55	12	The teacher provides opportunities to ask questions.	2.29	0.72
56	13	The teacher introduces what is expected from the students to do during lessons	2.28	0.80
60	13	Students' distribution on computers' consoles is subjected to the teacher's temperament	2.28	0.75
53	15	The teacher does carefully distribute the computer usage time among students.	2.21	0.72
62	16	The teacher makes comparative among the final students' projects	2.20	0.77
51	17	The teacher allows enough time to practice using computer.	2.18	0.75
57	18	The teacher considers individual differences among students during lessons	2.04	0.77
63	19	The teacher exposes students to what is new in computers field	1.98	0.79
54	20	The teacher assigns an extra work to whom finishes his/her work before other colleagues	1.97	0.76
50	21	Reinforcement and punishment techniques are used by our teacher formative to time.	1.92	0.76

Table 8 indicates that items 59, 52, 48, 45 and 4 were ranked as 1, 2, 3, 4, 5 because they have the following mean values 2.65, 2.62, 2.61, 2.57 and 2.5 respectively. These findings indicate that these items were extremely practiced by the teachers of computer. Namely, the Ministry of Education in Jordan emphasizes the teachers' discipline and therefore, these items were considered to be very important disciplines.

Students also, perceived the rest of the items as fairly practiced by their teachers of computer since they had mean values ranged between 1.92 and 2.41. This might be explained by the fact that all these items require the teachers to be educationally qualified. According to the data presented in table 8, 84% of the computer teachers in Jordanian public schools are not so because they have only the B. S. in computer since this degree will not qualify a person to be a successful teachers. thereby, it might be reflected on their teaching skills.

6. *Results related to the sixth research question of interest: To what extent do tenth-grade students benefit from studying computer in Jordanian public schools?*

To provide data to answer this research question, an open question was added at the end of the students' perceptual instrument that asked respondents about the benefit they have received from studying computer during their school year. Respondents were asked to respond on a likert scale of (excellent, very good, good, fair, poor) with values of (5, 4, 3, 2,1) respectively. Responses on this sub-scale are presented in table (9).

**Table (9)** Degrees of benefits from studying computer

Scale of	Repetition	Percent age %
excellent	754	22.0
very good	1450	43.9
good	884	26.2
fair	158	4.7
poor	119	3.5

Table (9) shows that 66.4% of the tenth grade students were very satisfied with their study of computer. Whereas only 8.2% were either fairly or unsatisfied. It is clear that students benefited from their study of computer and this might be due to the fact that those students never studied computer before tenth-grade level, and thus most of the computer skills were new for them. Since the practical work in using computer saves opportunities for students to interact directly with things which is considered as enjoyable matters (this has been observed during data collection), so students may feel that they would benefit from this experience. By that mean they perceived satisfaction while studying computer.

Second: Results related to the teachers' perceptions of the status of teaching computer in Jordanian public schools.

1: *Results related to the research question: To what extent do teachers of computer perceive the tenth grade students' textbook suitable for them?*

To provide data to support the answering of this research question, the researcher calculated the mean and standard deviation for participants' responses on each of the items in the teachers instrument that dealt with the textbook sub-scale. Table 10 presents these items with their mean values and standard deviation.

**Table (10)** Means and standard Deviations of teachers' Response on the text book sub-scale items.

Item number	Ranks	Items	Mean value	S D. value
1	1	The language of the textbook is easy.	4	0.64
2	2	The material in the textbook is clear.	3.85	0.75
3	3	The practical assignments in the textbook are clear and understandable.	3.70	0.84
11	4	The objectives of the textbook are clear and specific.	3.54	0.92
8	5	The practical part of the textbook concentrates on research and practice.	3.49	0.91
4	6	The scientific expressions of the textbook suite students' abilities.	3.45	0.74
7	7	The subjects of the textbook are clearly sequenced	3.35	0.77
10	8	The textbook contains questions and exercises at the end of each subject.	3.32	1.09
9	9	The textbook contains enough instructions to interact with the computer system.	3.14	1.00
6	10	The textbook contains proper figures, charts and pictures to facilitate learning.	3.09	0.88
5	11	The textbook includes enough examples on each subject.	3.07	0.91

Table 10 shows that items (1, 2, 3, 11) have the mean values of 4, 3.85, 3.70, 3.54 respectively. These values fall within the range of (3.50 to 4.50) which indicates that these items are well covered in the students' textbook.

At the same time, items (4, 7, 10, 9, 6, 5) were considered to be fairly covered in the textbook because their mean values fall within the range of (3.07 to 3.49). This could be reasoned by the instructional design of their computer textbook. A closer look at the design of this book would show how this book was prepared. Surely, it was not prepared as a text book rather it was prepared as a note book with the terminology of computer science which might be easily understood by teachers and not by students. Further, as a result of the continuous interaction between the teachers of

computer and the students' textbook, and as a result of teaching this book for many years, the book became easy and simple to be used by the teacher.

However, the other items on this sub-scale were perceived as slightly covered in the textbook. Their mean values ranged between 3.07 and 3.49. This result could be justified by the fact that the preparation of this textbook did not account for the main educational principles that should be in the preparation of the textbooks such as enough examples, charts and ways of dealing with computer. Or may be the scientific terms used in the textbooks were not suitable for the students' aptitudes. Also, it could be that the textbook wasn't concerned with the scientific method of research. This is might be why teachers have perceived this part as they did.

2. *Results related to the research question of interest: To what extent do the teachers of computer perceive their teacher's guide as suitable to teach the computer textbook?*

To provide data in support of answering the above research question, the researcher calculated the mean and the standard deviation for participants responses to each of the items in the teachers' instrument that dealt directly with the teachers' guide sub-scale. Table 11 presents these items with their means and standard deviations.

**Table (11) Means and Standard Deviations of Teachers' Responses on the Teachers' guide Sub-scale Items.**

Item number	Ranks	Items	Mean value	S D. value
15	1	Procedures for carrying out the lessons in teachers' guide are sequenced and clear.	3.86	.78
13	2	Teacher's guide provides a well defined statement of goal.	3.84	.81
12	3	Teacher's guide provides a well stated educational objectives.	3.81	.89
16	3	Goals and objectives in teachers' guide and relates to the materials in the students textbook.	3.81	.70
14	5	The items of objectives are derived from the items of goals in teachers guide.	3.73	.85
21	6	Instructions that are carried out during the lessons are related to the objective items.	3.53	.86
20	7	The duration of the session is enough to carryout the lesson.	3.51	1.08
19	8	The teacher's guide covers the different levels of educational objectives.	3.34	.93
18	9	The teachers' guide concentrates on the three levels of educational objectives (cognitive, Effective and psychomotor).	3.16	.86
17	10	The teachers' guide uses a variety of teaching methods.	3.15	.86

Table 11 shows that items 15, 13, 12, 16, 14, 21, and 20 were ranked 1, 2, 3, 4, 5, 6, 7 respectively. Since their mean values ranged between 3.51 and 3.86. These values indicated that these items were strongly fulfilled in the necessary qualities of the teacher's guide, whereas items 19, 18 and 17 were ranked 8, 9 and 10 respectively. Their mean values fall within the range of 3.15 to

3.34 which means that these items were slightly fulfilled in the teacher's guide. The reason why teachers have perceived their guide as they did, could be because, the teachers' guide concentrated on the cognitive objectives at the expense of the other two dimensions of objectives ( effective and psychomotor) because of the difficulty of preparing such objectives. Or may be because, the teacher's guide focuses on using the cooperative method of teaching which gives an equal opportunity for all students to learn.

3. *Results related to the research question of Interest: To what extent do the teachers of computer perceive their in-service teachers' training program effective?*

To answer the above question, the researcher calculated the mean and standard deviation for participants' responses to each of the items that dealt with (teachers' training) sub-scale (Table 12).

**Table (12)** Means and Standard Deviations of Teachers responses on the In-service teachers' training program sub-scale items.

Item number	Ranks	Items	Mean value	S D. value
23	1	There is always advantages to hold a training programs in computer.	3.91	1.35
32	2	The training programs are necessary to develop my teaching skills.	3.64	1.18
22	3	The teaching aids that we used for training are adequate.	3.24	1.28
31	3	The duration of the training programs is suitable.	3.24	1.17
28	5	The computer trainers seem to have an adequate qualifications to train others.	3.19	1.07
30	6	Training materials are related to the textbook materials.	2.93	1.02
36	6	Trainers familiarize us with modern methods of teaching computer.	2.93	1.35
24	8	The number of training programs are adequate.	2.89	1.21
29	8	The places of the training programs are suitable.	2.89	1.33
34	10	The training programs cover training teachers on how to use computer in teaching other subjects.	2.86	1.22
27	1	The training programs covers both he theoretical and practical parts equally.	2.84	1.25
26	12	The trainers provide enough information to cover the practical and theoretical parts.	2.66	1.14
25	13	The timing of the training programs is suitable to us.	2.58	1.07
33	14	The training programs cover the technical training of computer.	2.50	1.27
35	15	The training programs cover how to use different programming languages.	2.42	1.28

Notice that items 23 and 32 have the highest means with values of 3.91 and 3.64 respectively. Since these values fall within the range of 3.50 to 4.50, both of the two items were considered to be well covered in the teachers' in-service training program. Whereas, the rest of the items shown in this table were perceived as slightly covered except for item 35.

Because of the values of the means that fall within the range of 2.50 to 3.59, this item was poorly covered. It has the mean of 2.42 which is less than the standard mean of 2.50. This is a natural thing because training is usually useful for teachers. Especially, the in-service training which always improves the teachers' teaching skills. But, the reason why item 35 was perceived as poorly covered in the in-service computer training programs for teachers, could be because of the fact that the in-service training does not usually cover all the available computer languages. However, this finding agrees with Esa's finding (1988) in which he mentioned that teachers were not satisfied with the in-service training programs which the Ministry of Education in Kuwait used to hold.

The other items in this sub-scale were perceived only fairly covered. Their mean values ranged between 2.50 and 3.24. This means that both the materials used in training and the duration of training were not suitable. This might refer to the fact that both the training hours and the training materials were not adequate. However the teachers claimed that the places of training were not suitable for them. The few available computer teachers made it difficult for the Ministry of Education to hold in service training program in different places. And so, it used to hold such training

programs in places which many of the teachers found them difficult to reach. At the same time, the time of the training programs was not suitable since they were held in the summer vacations which teachers need to have a rest. Even Carrier & Glim & Sales (1985) have emphasized that the place, time, objectives and the content of the training programs should be chosen carefully to suite teachers.

4. *The results of this study that are related to the research question of interest: What are the obstacles that do teachers perceive important to hinder the teaching of computer in Jordanian public schools?*

To answer the above question, the mean and standard deviation were calculated for participants' response to each of the items in the teachers' instrument that dealt with (obstacles hinder teaching computer). Then, the items were arranged in descending order according to the mean values, and presented in table 13.

**Table (13)** Means and standard deviations of teachers' response on the obstacles of the teaching computer sub-scale items

Item number	Ranks	Items	Mean value	S D. value
45	1	There is no cooperation between computer teachers and school administration.	3.50	1.34
37	2	It is difficult to persuade students with the importance of teaching computer.	3.45	1.02
41	3	computer soft ware are difficult to use	3.45	1.37
44	4	Computer labs are unhealthy to suite working with computer.	2.82	1.40
43	5	Preparation for teaching computer is inadequate.	2.57	1.21
42	6	Students have poor computer experiences.	2.43	1.11
38	7	Little of computers are available in computer lab	2.42	1.32
46	8	Most of the time computers are out of working order.	2.32	1.30
48	9	Computers in computer lab are old ones.	2.26	1.49
40	10	There are no computer software available in schools.	2.20	1.15
47	11	There is always delay in maintenance when computers stop working.	1.95	1.30
39	12	There is no personal maintenance available in schools to maintain computers.	1.59	.98

Table 13 shows the items that assimilate the perceived obstacles faced the teaching of computer. Notice the mean values, item 45 was not perceived to form an obstacle which means that there is a great cooperation between teachers and their school administration. Of course, the school administration usually provides the necessary materials required for training and teaching of the textbook, and this item indicates that the school administration does provide such service.

Whereas items 37, 41, 44 and 43 represent obstacles that were perceived to be fairly existed. This means that the teachers were trying to link computer experiences with social needs of the students. Such link might have created a motivational urge for learning of how to use computer. But in regard to the items that dealt with the computers laboratories, they were perceived to be fairly important. It could be because teachers do not know exactly how computer lab should be prepared, and this is why they did not form a sharp obstacles.

Yet, with regard to the rest of the items on this sub-scale, they were perceived to be very sharp obstacles. Teachers indicated that some computers are old which causes them to stop working more often. Also, the lack of technical maintenance, the shortage of computer terminals and the working condition of computers were perceived to be very serious problems. These findings are similar to Jaradat's and et al (1991) findings. Which pointed the problems facing the teaching of computer.

Third: Results related to the principals' perceptions of the status of teaching computer in Jordanian public schools:

1. *Results related to the research question: To what extent do principals perceive the preparations of computer labs adequate to achieve the objectives of teaching computer in Jordanian public schools?*

To provide data to answer the above question, the mean and standard deviation were calculated for each of the items in the

principals' questionnaire that dealt directly with computer lab equipment. Items are presented in table 14 with their means and standard deviations.

**Table (14)** Means and Standard Deviations of Principals' responses on the adequacy of computer lab supplies sub-scale items

Item number	Ranks	Items	Mean value	S D. value
2	1	Lights in computer lab is adequate.	4.26	0.80
8	2	The school administration provides the requirements of using computer available.	3.99	0.84
9	3	The location of computer lab in the school building is suitable.	3.87	0.96
4	4	Vindilation inside computer lab is adequate.	3.83	0.99
1	5	Computer lab is equipped with proper teaching aids.	3.77	0.89
10	5	The school administration try to have personal maintenance personal available in the school.	3.77	0.99
11	7	the environment of the computer is adequate for teaching computer.	3.72	0.93
3	8	The computer lab have an adequate space.	3.47	1.22
12	9	There is a flexibility in the arrangement of the computer lab according to the teaching requirements.	3.15	1.13
7	10	The students move around inside the computer lab freely.	2.96	1.19
5	11	The heating in the computer lab is adequate.	3.85	1.11
6	12	The number of computer terminals suit the number of students in each session.	2.49	1.13

Table 14 shows the items which dealt with principals perceptions of the adequacy of computer laboratories. Items 2, 8, 9, 4 1, 10 and 11 indicate that the part of the computer lab supplies

that dealt with these items was perceived strongly fulfilled the necessary qualities. The mean values of these items were ranged from 3.72 to 4.26 and this range of values falls within the standard mean range of 3.50 to 4.50.

But items 3,12,7 and 5 indicate that this part of the computer lab which dealt with these items was perceived by participants as slightly fulfilled, because these items have a mean values fall within the standard mean range of (2.50 to 3.50). The last item on this sub-scale that dealt with the suitability of the number of students in class to the number of terminals was perceived by participants to be unsuitable since the mean value of this item was less than the standard mean of 2.50.

These results indicated that the principals rated that part of the computer lab under their immediate observation as being strongly fulfilled the necessary qualities. But those which they were not immediately under their observation were rated slightly fulfilled. The reason for such perception could probably be due to the fact that most of the public school buildings are old, and have computer laboratories in rooms which were not originally designed for computer labs. But those responsible for computer lab preparation in the ministry of education have provided all the necessary arrangements to have these rooms adequate to suite the needs for teaching computer. At the same time, principals are the ones who are usually in contact with the ministry of Education. Therefore, it could be possible that the principals saw such arrangements as the best that could be, especially those principals who have never been exposed to well designed computer

laboratories. Another consideration might be the fact that most of the principals were not computer users and therefore, they might perceived any preparation as adequate and suitable for this technology. Especially where this technology is new in the Jordanian schools, and therefore. It would be perceived adequate. On other hand, the principals have rated items 3, 12, 7 and 5 as being slightly fulfilled. The reason could be that those items have dealt more with teachers' than the principals' observation and this might be why they have rated them as less adequate.

But, in regard to the last item which dealt with the suitability of the number of students to the number of computer available in the computer lab in each session, the results indicate that was perceived it as inadequate . This result agrees with the students' and teachers' perception. The reason why, the principals perceived it this way could be because all complains goes back to the principals, which means that there was a complains about the shortage of computer terminals.

The above findings imply that there is a strong indication that the number of computers available in computer Laboratories are not suitable to the number of students. Previous research about computers in schools supports this finding (Bliss, Chandra & Cox, 1986; Moskowitz & Birman, 1985). Results showed that the ratio is almost (4:1) which means four students to one computer in each single session. Also, this ratio is high if we consider the time of the session to be 45 minutes and the number of the sessions per week is 2.

2. *Results related to the research question of interest: To what extent do principals perceive the competencies of the system of advisory to teaching computer?*

To provide information to answer the above question, the mean and standard deviation were calculated for participants' response to each of the items in the principals' instrument that dealt directly with the competencies of the advisory system sub-scale. Table 15 presents these items with their means and standard deviations.

**Table (15)** Means and standard deviations of principals' responses on the competency of the advisory system for teaching computer sub-scale items

Item number	Ranks	Items	Mean value	S D. value
18	1	Poor coordination among teaching advisors.	4.12	1.11
19	2	Principals do not follow up on providing the schools with in school advisors for teaching computer.	3.98	1.12
14	3	The schools use a traditional method when advising the teaching of computer.	3.10	1.50
27	4	The advisor of teaching computer makes a low number of visitation to the class	3.0	1.32
17	5	The system of advising is not capable of following up the teaching of computer.	2.91	1.30
29	6	There is a low number of qualified advisors available for teaching computer.	2.74	1.43

The means of Items 18 and 19 indicate that this part of the advisory system that dealt with these items was perceived to present real problems. Both items (18 and 19) were ranked as the

first and second by the principals since they took the highest two mean values in this sub-scale which were 4,12 and 3,98 respectively. This indicates that they existed in a high degree and shows the weak cooperation between the supervisors and the school principals with regard to carrying out the syllabuses of computer. The reason might be due to the nature of supervision visits. It is known that these visits are planned weekly in each directorate of education without any cooperation with schools or their principals. So supervisors mostly visit the teachers of the computer textbook occasionally to write evaluative reports about each of them because of the inadequate number of supervisors of computer since there is usually only one supervisor of the computer subject in every one or two directorates of education. This forces the supervisors to visit each teacher only one or two visits which are not enough to discuss with the teachers nor with the principals any of the difficulties they face. Additionally, the statistics of the Ministry of Education show that most of the principals do not have qualifications in the computer science to help them to follow up the teachers of computer or to cooperate with the supervisors in this field.

The other items were perceived as only existed since their mean values ranged between (2.74 and 3.10). This means that the supervision in the computer field still faces difficulties such as the shortage of qualified supervisors, the inadequate number of supervision visits and the use of conventional methods of supervision. This may be due to the number of supervisors of teaching computer (one supervisor for every one or two directorates of education) which increases their duties and decreases their abilities to follow the computer teachers performance.

3. *Results of this study related to the research question of interest: what obstacles do principals perceive to face the teaching of computer in Jordanian public schools?*

To determine these obstacles, the mean and standard deviation were calculated for participants' responses to each of the items in the principals' instrument that dealt directly with the obstacles that face the teaching of computer to tenth grade students in Jordanian public schools. Table 16 shows these items with their mean values and standard deviations.

**Table (16)** Means and standard deviations of principals responses on the obstacles of teaching computer sub-scale items

Item number	Ranks	Items	Mean value	S. D. value
24	1	Their is a poor coordination between computer teachers and their school administration.	3.91	1.20
13	2	There is a shortage on qualified computer teachers.	3.74	1.31
23	3	The Ministry of Education does not provide schools with instructional software's for teaching computer.	3.51	1.32
20	4	Computer labs are not suitable to teach computer.	3.32	1.20
15	5	In-service teachers' training programs are not adequate to train computer teacher.	3.16	1.25
25	6	The courses that are available to teach computer are not enough.	3.14	1.30
28	7	The methods and tools used in students' evaluation are weak.	3.06	1.06
16	8	There is no library available in schools that contain computer software's for teaching computer.	2.84	1.45
23	9	The ministry of education does not provide schools with computer software.	2.77	1.37
21	10	There is financial problems concern buying and maintaining computer.	2.68	1.45
22	11	The cost of buying computer software is getting high.	2.52	1.34

Notice the means of the items shown in table 16. The first three means that are concerned with items 24, 13 and 23 are ranged from 2.50 to 4.50 which indicates that these items on this part of the computer obstacles sub-scale were not perceived by participants as sharp obstacles for teaching computer. Whereas the rest of the items in this sub-scale were perceived by participants as sharp obstacles.

It is generally recognized that cooperation between the school principals and teachers makes teaching very effective. This agrees with the results of this study since principals indicated that they work together with computer teachers and hereby this cooperation did not present an obstacle for teaching computer. But, in respect to the availability of trained computer teachers, the results indicated that they were strongly available. Results showed that 90% of teachers of computer have BS in Computer science.

The results also indicted that the Ministry of Education provides all necessary software to schools. But in respect to the suitability of computer labs to the teaching of computer, the findings of this study indicated that the computer labs were suitable to the teaching of computer.

However, items 20, 15, 25, 28, 16, 26, 21 & 22 were considered by school principals as serious obstacles. It could be so because of the inadequacy of the in-service training programs.

Also, the school principals perceive the number of computer sessions per week as insufficient. It could be because the computer is taught in one session per week with twice the time available for other classes. Further, the school principals perceive that the evaluation methods used in schools were unsuitable, specially when

evaluators depend on project turned by students at the end of school year.

In addition, the schools should have special library available for computer software, books and literature that relates to the teaching of computer. However the results indicated that the most important obstacles that face the teaching of computer are those problem that dealt with the financial allocations. Since school budget depends on students donation which is not enough to buy and maintain computers.

Fourth: Results related to the research questions concerning the students' attitudes toward computer learning; teachers' and principals' attitudes toward teaching computer:

1. *what are the students attitudes toward learning computer in Jordanian public schools?.*

In order to investigate tenth grade student's attitudes toward learning computer. A t-test showed significance at ( $p < 0.001$ ) when responses on the students' attitudinal questionnaire were compared to the median (Table, 17).

Results in table17 indicate that tenth grade students' attitudes toward the learning computer were positive. These results might be supported by Jaradat et al, (1991). He pointed to the importance of the interaction with computer during practical work. Another consideration might be the fact that those students never had previous computer experiences, and therefore these newness experiences might stimulate them, this finding is consistent with previous research findings (Layd & Gressad, 1987; 1984) or might

be an indication that some psychological factors have motivated them to have positive attitudes. This finding, although not a new one, is significant because it reinforces the notion that sufficient opportunity to use computers leads to positive attitudes toward computers, which decreases anxiety or worry about future computer use.

**Table (17)** T-test. Students attitudes compared to median.

No Valid cases	Mean	S. D	T value	D.F	Prob.
3365	42.1	6.78	51.99	3364	0.000
	36				

2. *The second question of interest: what are the influences of the geographical areas (south, middle and north) on students' attitude toward teaching computer.*

One way analysis of variance (ANOVA) was applied on the attitudes dependent variable and the independent variable with three levels (south, middle, north). It showed significant differences among the (south, middle and north) areas (Table 8).

**Table (18)** Analysis of variance (one way ANOVA) attitudes by geographic areas

	Sum of square	D.F	Mean square	F	Sig. of F
Between groups	1071.05	2	508.5	*11.2	0.000
Within groups	153623.5	3362	45.7		
Total	154640.5	3364			

Then, Newman- Kuels test of differences among the areas (south, middle, north) was used with significant difference among the geographical areas (table 19).

**Table (19)** Newman-Kuels test of differences- students attitudes by geographic areas

Region	Mean	North	Middle	South
North	41.2	41.2	1.2*	
Middle	42.4			
South	42.5	1.3*		

The results of these analysis indicated that the tenth-grade students who were studying computer in the both two geographical areas (middle and south) showed more positive attitudes toward teaching computer than those students who were studying in the North area.

The question of why students in the Middle and South areas showed more positive attitudes than those in the North area did remain important. The answer might be due to the fact that the number of students in classes in the South area were less than those in Both north and middle areas. If this was the case, then it might provide more time for students to interact with computer and thus, this would provide less number of students to have work with single computer. It seems that students in the south area saw the new technology as a gift to them. So they reacted more positively than those in the other two areas. According to Cheng & Steven (1985) belief in computer technology potential is an important determinant in affect.

Contrary to that, those students in the middle area had different characteristics than those in the South and the North areas. Data showed that most of those students in the middle area had computers at home. In addition, most of them they lived in the capital city of Amman where several intellectual establishments were presented. Most of those students had better socioeconomic status than those in that other two areas which might make it easy for them to enroll in establishments that have computers. Beside that some of those students could be offered special teachers which might have been reflected their attitudes toward computer. This finding supports previous research that suggests computer literacy achievement's are improved through better socioeconomic status (Martin, 1991), and Positive attitude toward computer (wiener, 1993).

3- *The Third question of interest: what are the computer teachers' attitudes toward teaching computer?*

The third question of interest that asked the teachers of computer about their attitudes toward the teaching of computer in Jordanian schools was investigated. A T-test showed significance at ( $p > .001$ ) when responses on the teachers' attitudinal questionnaire were compared to the median score (table 20).

**Table (20)** Teachers' attitudes to median

No. valid cases	Mean	S.D	t , value	DF	Prob.
74	75.7 54.1	10.2	18.41	73	.001*

results in table 20 indicated that the teachers of computer showed positive attitudes toward the teaching of computer in Jordanian schools. These results can be attributed to the fact that 80% of the teachers of computer who teach computer to 10th grade students in Jordanian public schools hold B. S. computer science degree. And since those people specialized in computer science then their behavior might be affected by this factor

4- *The fourth question of interest: What are the principals' attitudes toward teaching computer?*

T-test was used to analyze the principals attitudes toward teaching computer in their schools. It showed significance at ( $p < 0.001$ ) When responses on the principals attitudinal questionnaire were compared to the median score (table 21).

**Table (21)** Principals' attitudes to the median

No. of cases	Mean	SD	t value	DF	Prob.
94	71.7	7.7	22.29	73	.001*
	54				

Results in table 21 indicated that the principals showed positive attitudes toward the teaching of computer to the tenth grade students in Jordanian public schools. Interestingly, these results imply that principals perceive computer as an important media in the development of our social system, and a essential knowledge to achieve a variety of personal, academic and professional goals. It is also a very important media for every one

to function more effectively as a citizen in a modern society such as Jordan.

Furthermore, the principals might also realized that the children of to day are those the producers of tomorrow. Students of today soon become the producers of tomorrow and will work to achieve better developed society. More interestingly, those principals who had computer taught in their schools might have felt that they were distinguished among other schools. So, there responses on the questionnaire might be affected as such.

5. *The fifth question of interest that asked if there is a statistical significant differences between teachers and principals attitudes toward the teaching of computer to tenth grade students in Jordan.*

To answer this question a t-test was used which showed significance at  $p < .001$  when responses on both principals and teachers on the attitudinal questionnaires were compared (table 22).

**Table (22)** T-test principal's attitudes to teachers' attitude

Variables	No valid cases	Mean	S D	T value	D.F	Prob.
Teachers	74	75.8	10.2	2.85		.001*
Principals	94	71.7	7.1			

Despite the fact that both groups had positive attitudes, this analysis showed that the teachers had more positive attitudes toward teaching computer than the principals.

The results of this study implied that both of the teachers and principals perceived the teaching of computer as important. But the reason why teachers had more positive attitudes than the principals remains important. This may be because teachers are responsible for providing the knowledge and skills of computer to students and because they are the ones who are responsible for stimulating students to interact with computer due to its' newness and characteristic's as a technology that would provide sounds and pictures.

## Recommendations

Based on the inferences developed from the findings of this evaluation, the following recommendations are specifically concern with students:

- 1 - The Theoretical part of the textbook needs to be redesigned with reconsideration of students' characteristics and aptitude.
- 2 - The practical part of the textbook needs additional examples to correspond with the types of skills included in the text book.
- 3 - There is a need for additional computers to reduce the number of students using one computer.
- 4 - The technical and environmental conditions of the computer laboratories need to be updated to suite the teaching of computer.
- 5 - Student's text book should cover suitable scientific concepts, research and practice, and systematically present information with appropriate examples and assignments at the end of each unit of information.

The following recommendations are specifically concern with teachers:

- 1 - Teachers must follow up students' progress during instruction.
- 2 - There is a need to train the in-service teachers educationally.
- 3 - Teacher's guide must include variety of the levels of educational objectives within the domains of cognitive, affective and psychomotor.

4 - The in-service training program for computer teachers needs to be updating to include:

- I. Increase the number of training sessions,
- II. Consider teachers' needs and special circumstances,
- III. The possibility of on job training using special training software and /or using video taps.....etc..
- V. The use of different computer programming languages.

The following recommendations are specifically concern with principals and school administration:

- 1 - Provide maintenance group available to take care of all computers that would stop working.
- 2 - School library should have special section for all the computer resources needed for the teaching of computer, such as literature software, books.....etc.
- 3 - Updating the advisory system so that one advisor should be available in each educational area to help in computer use.
- 4 - To train the school principals to be computer literate, so that they can practice their duty as resident advisors.
- 5 - Updating the coordination between advisors and the school principals in the domain of the advisory system.
- 6 - To increase teaching advisors' visitations to the teachers of computer in schools.
- 7 - Because of the positive attitudes we must generalize computer education to include those schools which they do not teach computer.

The following recommendations are general ones:

- 1 - Employment of computer teachers should request those having BS. in computer science to have teachers' certificate or develop an in-service training program that will provide them with what should be included in teachers' certificate.
- 2 - Colleges and universities need to consider and invent computer education programs to train college students on how to become teachers of computer.
- 3 - The Ministry of Education needs to form a committee that consists of educators from computer science, curriculum and instruction, educational psychology and measurement and evaluation to supervise the design and development of computer textbooks.
- 4 - To increase the intellectual establishment of computer to cover those areas that have less chances.
- 5 - More attention and researches are needed to discover reasons caused students', teachers' and principles' attitudes to be positive. For example, are the attitudes, as defined in this evaluation really antecedents to effective computer use, i.e., do positive attitudes result in successful computer use? Are there individual differences other than the ones studied that are more relevant to attitudes to teaching computer?

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## *Appendix 1*

### **The teaching of Computer to tenth grade students in Jordanian public schools**

Dear Students:

Below is a list of items regarding the teaching of computer in your school. Please indicate by marking (X) to the right of each item and under the item that most closely represent your opinion. Your responses will be confidential and used for the purpose of this study.

**Sex:**                      G    Male            G    Female

**School Location:**    G    South            G    Middle            G    North

No.	Item	Strongly adequate	Adequate	Slightly Adequate
1	The theoretical part of the textbook suits my ability.			
2	The textbook familiarizes me with computer parts.			
3	The textbook familiarizes me with steps of how to present data			
4	The textbook contains the functions of computer part.			
5	The textbook familiarizes me with many programming languages.			
6	The textbook shows how to use the computer in the society (such as design of buildings, weather, prediction....etc.).			
7	The textbook familiarizes me with the relationship between human mind and computer.			
8	The textbook uses charts, pictures, and examples for clearness purpose			
9	The outside of the textbook looks attractive to study.			
10	I can use the computer myself			
11	I can print information that appear on the screen.			
12	I can work-out the textbook assignments.			
13	I can switch from screen to another			

No.	Item	Strongly adequate	adequate	slightly adequate
14	I am able to use logo and Frame work.			
15	I can use the functions of keyboard			
16	I can search through information stored inside the computer.			
17	I can use the computer to print documents.			
18	I can design and use data files			
19	I acquire the skills provided in the practical part of the textbook easily.			
20	I see the practical part of the textbook sequenced from the easy to the more difficult tasks.			
21	Computer lab is fixed to suite teaching computer.			
22	Sitting with the computer makes me comfortable			
24	The number of computer terminals suits the number of students in each computer session.			
25	Computer lab is equipped with the necessary teaching aids.			
26	The computer lab space suits the number of students in each computer session.			
27	Lights in computer lab is suitable to work with computer.			
28	The color of the computer screen is healthy			
28	Vandilation in computer lab is suitable to work with computer.			
29	The heating in computer lab is suitable.			
30	The location of computer lab in school building is suitable.			
31	Instructions to use the computer are available inside the computer lab.			
32	I interact with my group during working with computer assignments.			
33	I write the instructions for doing the activities in my notebook inside the lab.			
34	I use the keyboard to print out information appeared on the screen			
35	Whenever faced with learning problems, I can discuss them with my group members.			
36	I follow teacher's instructions carefully.			
37	I use what is learned in preceding lessons to understand incoming lessons.			
38	I follow the instructions listed in the textbook to work on computer activities.			

No.	Items	Strongly adequate	Adequate	Slightly adequate
39	I can design computer activities similar to the textbook ones.			
40	Computer usage develops my ability in understanding, problem solving, Data analysis...etc.			
41	The teacher of computer makes discussion after each computer activity performed.			
42	I try to solve problems that face me during computer activities.			
43	The teacher does well in teaching the theoretical part of the textbook.			
44	The teacher does well in teaching the practical part of the textbook.			
45	The teacher watches students actions during the practical activities.			
46	The teacher makes sure that mistakes are corrected individually during practical activities.			
47	The teacher introduces directions of safety rules inside the computer lab.			
48	The teacher confirms obeying the rules and assures quietness during the lessons.			
49	The teacher follows up solving the textbook assignments.			
50	Reinforcement and punishment techniques are used by our teacher formative to time.			
51	The teacher allows enough time to practice using computer.			
52	The teacher responds to his students questions.			
53	The teacher does carefully distribute the computer usage time among students.			
54	The teacher assigns an extra work to whom finishes his/her work before other colleagues			
55	The teacher provides opportunities to ask questions.			
56	The teacher introduces what is expected from the students to do during lessons			
57	The teacher considers individual differences among students during lessons			
58	The teacher helps solving problems during lessons.			
59	The teacher stays with students in the computer lab during the practical activities lesson.			
60	Students' distribution on computers' consoles is subjected to the teacher's temperament			

No.	Items	Strongly adequate	Adequate	Slightly adequate
61	My grades in computer is subjected to teachers temperament.			
62	The teacher makes comparative among the final students' projects			
63	The teacher exposes students to what is new in computers field			

## Appendix 2

### Tenth grade students' attitudes towards studying computer in Jordanian public schools

No	Items	Agree	Do not know	Disagree
1.	I believe studying computer is a waste of time.			
2.	I think working with computers would be enjoyable and stimulating.			
3.	Studying computer would increases my ability to think.			
4.	It would be really nice if teaching computer goes beyond tenth-grade level.			
5.	I would feel bored in a computer class.			
6.	Studying computer would Make me self-absorbed person.			
7.	It would make me happy if my computer teacher will not show up to class.			
8.	Teaching computer sounds like decreasing Interaction between teachers and students.			
9.	I hope studying computer would be elective.			
10.	Studying computer would help me learn more in less time.			
11.	Studying computer would be necessary in dealing.			
12.	Studying computer would strength my self confidence.			
13.	It would be great to use computer in studying all school curricular.			
14.	I would feel using computer in learning helps me to recall.			
15.	Studying computer decreases my ability to write.			
16.	I wish to discuss computer with others.			
17.	Studying computer would scare me.			

### Appendix 3

## The teaching of computer to tenth grade students in Jordanian public schools

Dear teachers:

Below is a list of items regarding the teaching of computer in your school. Please indicate by marking (X) to the right of each item and under the item that most closely represent your opinion. Your responses will be confidential and used for the purpose of this study.

**Sex:**                      G    Male            G    Female

**School Location:**    G    South            G    Middle            G    North

**Specialization:**        G    Computer science    G    Others

**Qualifications:**        G    BS.                                      G    Bs + Specialist        G    MS

**Number of in-service teachers' training have been attended:** .....

No	Items	Very strongly adequate	Strongly adequate	Adequate	Slightly adequate	Very slightly adequate
1	The language of the textbook is easy.					
2	The material in the textbook is clear.					
3	The practical assignments in the textbook are clear and understandable.					
4	The scientific expressions of the textbook suite students' abilities.					
5	The textbook includes enough examples on each subject.					
6	The textbook contains proper figures, charts and pictures to facilitate learning.					
7	The subjects of the textbook are clearly sequenced					
8	The practical part of the textbook concentrates on research and practice.					

No	Items	Very strongly adequate	Strongly adequate	Adequate	Slightly adequate	Very slightly adequate
9	The textbook contains enough instructions to interact with the computer system.					
10	The textbook contains questions and exercises at the end of each subject.					
11	The objectives of the textbook are clear and specific.					
12	Teacher's guide provides a well stated educational objectives.					
13	Teacher's guide provides a well defined statement of goal.					
14	The items of objectives are derived from the items of goals in teachers guide.					
15	Procedures for carrying out the lessons in teachers' guide are sequenced and clear.					
16	Goals and objectives in teachers' guide are related to the materials in the students textbook.					
17	The teachers' guide uses a variety of teaching methods.					
18	The teachers' guide concentrates on the three levels of educational objectives (cognitive, Effective and psychomotor).					
19	The teacher's guide covers the different levels of educational objectives.					
20	The duration of the session is enough to carryout the lesson.					
21	Instructions that are carried out during the lessons are related to the objective items.					
22	The teaching aids that we used for training are adequate.					
23	There is always advantages to hold a training programs in computer.					
24	The number of training programs are adequate.					
25	The timing of the training programs is suitable to us.					

No	Items	Very strongly adequate	Strongly adequate	Adequate	Slightly adequate	Very slightly adequate
26	The trainers provide enough information to cover the practical and theoretical parts.					
27	The training programs covers both the theoretical and practical parts equally.					
28	The computer trainers seem to have an adequate qualifications to train others.					
29	The places of the training programs are suitable.					
30	Training materials are related to the textbook materials.					
31	The duration of the training programs is suitable.					
32	The training programs are necessary to develop my teaching skills.					
33	The training programs cover the technical training of computer.					
34	The training programs cover training teachers on how to use computer in teaching other subjects.					
35	The training programs cover how to use different programming languages.					
36	Trainers familiarize us with modern methods of teaching computer.					
37	It is difficult to persuade students with the importance of teaching computer.					
38	Little neck of computers are available in computer lab					
39	There is no personal maintenance available in schools to maintain computers.					
40	There are no computer software available in schools.					
41	computer soft ware are difficult to use					
42	Students have poor computer experiences.					
43	Preparation for teaching computer is inadequate.					

No	Items	Very strongly adequate	Strongly adequate	Adequate	Slightly adequate	Very slightly adequate
44	Computer labs are unhealthy to suite working with computer.					
45	There is no cooperation between computer teachers and school administration.					
46	Most of the time computers are out of working order.					
47	There is always delay in maintenance when computers stop working.					
48	Computers in computer lab are old ones.					

## Appendix 4

### Tenth grade Computer teachers' attitudes towards teaching computer in Jordanian public schools

No	Items	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
1.	Teaching Computer is a waste of time.					
2.	Teaching Computer in my school would make me very nervous.					
3.	I think teaching Computer would be enjoyable and stimulating.					
4.	I feel that Computer use would decrease students thinking ability.					
5.	Generally, It would feel ok trying to teach computer to 11 and 12 grade.					
6.	Teaching Computer makes learners unsociable.					
7.	Teaching Computer would decrease the interaction among students, teachers and principals.					
8.	I think teaching Computer would be very easy for me.					
9.	I have a lot of self Confidence when it comes to working with Computers.					
10.	Teaching Computer decreases my self confidence.					
11.	I feel uneasy and confused when Computer is taught in my school.					
12.	I do not think that teaching Computer would help using Computer in teaching subject matters.					
13.	I think that teaching Computer would increase students' ability to recall.					
14.	I see students studying Computer once they start to work with the Computer, they would find it easy to stop.					
15.	I see the challenge of solving problems with Computer appeals to students studying Computer.					

No	Items	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
16.	I see students studying Computer always enjoying talking with others about Computers.					
17.	I do not feel aggressive and hostile toward teaching Computers in my school.					
18.	Students studying Computer always enjoy working with Computers.					

## Appendix 5

### The teaching of computer to tenth grade students in Jordanian public schools

Dear Principal:

Below is a list of items regarding the teaching of computer in your school. Please indicate by marking (X) to the right of each item and under the item that most closely represent your opinion. Your responses will be confidential and used for the purpose of this study.

**Sex:**                      G   Male            G   Female

**School Location:**    G   South            G   Middle            G   North

**Number of computer teachers in your school:** .....

**Number of computers in computer lab in your school:** .....

No	Items	Very strongly adequate	Strongly adequate	Adequate	Slightly adequate	Very slightly adequate
1	Computer lab is equipped with proper teaching aids.					
2	Lights in computer lab is adequate.					
3	The computer lab have an adequate space.					
4	Vandilation inside computer lab is adequate.					
5	The heating in the computer lab is adequate.					
6	The number of computer terminals suit the number of students in each session.					
7	The students move around inside the computer lab freely.					
8	The school administration provides the requirements of using computer available.					
9	The location of computer lab in the school building is suitable.					
10	The school administration try to have personal maintenance personal available in the school.					
11	the environment of the computer is adequate for teaching computer.					

No	Item	Very strongly adequate	Strongly adequate	Adequate	slightly adequate	Very slightly adequate
12	There is a flexibility in the arrangement of the computer lab according to the teaching requirements.					
13	There is a shortage on qualified computer teachers.					
14	The schools use a traditional method when advising the teaching of computer.					
15	In-service teachers' training programs are not adequate to train computer teacher.					
16	There is no library available in schools that contain computer software's for teaching computer.					
17	The system of advising is not capable of following up the teaching of computer.					
18	Poor coordination among teaching advisors.					
19	Principals do not follow up on providing the schools with in school advisors for teaching computer.					
20	Computer labs are not suitable to teach computer.					
21	There is financial problems concern buying and maintaining computer.					
22	The cost of buying computer software is getting high.					
23	The Ministry of Education does not provide schools with instructional software's for teaching computer.					
23	The ministry of education does not provide schools with computer software.					
24	Their is a poor coordination between computer teachers and their school administration.					
25	The courses that are available to teach computer are not enough.					
27	The advisor of teaching computer makes a low number of visitation to the class					

No	Items	Very strongly adequate	Strongly adequate	Adequate	Slightly adequate	Very slightly adequate
28	The methods and tools used in students' evaluation are weak.					
29	There is a low number of qualified advisors available for teaching computer.					

## Appendix 6

### Principals' attitudes towards teaching computer in Jordanian public schools

No	Items	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
1.	Teaching Computer is a waste of time.					
2.	Teaching Computer in my school would make me very nervous.					
3.	I think teaching Computer would be enjoyable and stimulating.					
4.	I feel that Computer use would decrease students thinking ability.					
5.	Generally, It would feel ok trying to teach computer to 11 and 12 grade.					
6.	Teaching Computer makes learners unsociable.					
7.	Teaching Computer would decrease the interaction among students, teachers and principals.					
8.	I think teaching Computer would be very easy for me.					
9.	I have a lot of self Confidence when it comes to working with Computers.					
10.	Teaching Computer decreases my self confidence.					
11.	I feel uneasy and confused when Computer is taught in my school.					
12.	I do not think that teaching Computer would help using Computer in teaching subject matters.					
13.	I think that teaching Computer would increase students' ability to recall.					
14.	I see students studying Computer once they start to work with the Computer, they would find it easy to stop.					
15.	I see the challenge of solving problems with Computer appeals to students studying Computer.					

No	Items	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
16.	I see students studying Computer always enjoying talking with others about Computers.					
17.	I do not feel aggressive and hostile toward teaching Computers in my school.					
18.	Students studying Computer always enjoy working with Computers.					

# *An Evaluation of Teaching Computer to Tenth Grade Students in Jordanian Public Schools*

**Dr. Akram A. Omari**

## *Summary*

This study evaluated the status of computer education in the Jordanian public school system. It aimed at identifying the effectiveness of studying computer by tenth grade students as perceived by those students and the effectiveness of teaching computer to tenth grade students as they are perceived by the teachers of computer and the principals of those public schools who teach computer.

All Jordanian public schools that taught computer in the academic year 1995-1996 to tenth grade students (511 males' and females' school) with a population of 60259 tenth grade students, 226 teachers of computer and 511 principals were subjected for this study. Of those potential subjects, 3365 tenth grade students (1565 male and 1800 female), 74 teachers of computer (35 male and 39 female) and 94 principals (44 male and 50 female) were randomly chosen as a sample to participate in this study.

Special questionnaires were developed by the researcher to measure the participants perceptions and attitudes. All questionnaires were tested for reliability and content validity using (cornbach alpha):

1. The students' perceptual questionnaire (63) items in its final form with a reliability coefficient of 0,94.
2. The teachers' perceptual questionnaire (48) items in its final form with a reliability coefficient of 0,87.
3. The principals' questionnaire (29) items in its final form with a reliability coefficient of 0,89.
4. The students', teachers' and principals' attitudinal questionnaires each consisted of 18 statements in their final form. For each questionnaire, half of the statements were in the positive form and the other half was in the negative form. These instruments were validated

with a reliability coefficient (using cronbach alpha of 0,76, 0,84, 0,73 respectively).

All questionnaires were administered to the participants in the spring of the school year of 1995/1996. Responses were collected and analyzed using SPSS system. The means, standard deviations, t-tests, One way ANOVA and Newman kuels test of post comparisons were used in the analyses to investigate the following research questions:

**First:** questions related to tenth-grade students' perceptions of the status of teaching computer in Jordanian public schools:

- 1- To what extent do students perceive the theoretical part of their computer text book suitable for them?
- 2- To what extent do students perceive the practical part of their text book suitable for them?
- 3- To what extent do students perceive the computer lab preparation adequate to meet the objectives of the computer curricula?
- 4- To what extent do students perceive their computer learning activities practiced inside the computer lab?
- 5- To what extent do students perceive the competencies of their computer teachers adequate?
- 6- To what extent do students benefit from studying computer in Jordanian public schools?

**Second:** questions related to computer teachers' perceptions of the status of teaching computer in Jordanian public schools:

- 1- To what extent do teachers of computer perceive the students' text book suitable for the students?
- 2- To what extent do computer teachers perceive their teachers' guide suitable to teach the computer text book?
- 3- To what extent do the teachers of computer perceive their in-service teacher training program effective?
- 4- What are the obstacles that teachers perceive important to hinder the teaching of computer in Jordanian public schools?

**Third:** questions related to the school principles' perceptions of the status of teaching computer in Jordanian public schools:

- 1- To what extent do principals perceive the preparations of the computer labs adequate to achieve the objectives of teaching computer in Jordanian public schools?
- 2- To what extent do principals perceive the competencies of the system of advisory to teaching computer adequate?
- 3- What obstacles do principals perceive to face the teaching of computer in Jordanian public schools?

**Fourth:** questions related to students', teachers' and principals' attitudes toward the teaching of computer:

- 1- What are the students' attitudes toward teaching computer in Jordanian public schools?
- 2- What is the influence of the geographical areas (South, North Middle) on students' attitudes toward teaching computer?
- 3- What are the teachers' attitudes toward teaching computer in Jordanian public schools?
- 4- Are there statistical significant differences between teachers and principals attitudes toward the teaching of computer to tenth grade students in Jordanian public schools?

For the purpose of the interpretation of this study the following classifications on the result of the data analysis were used:

- 1- **Students' instruments:** All items that each has the mean value 2.5 to 3.0 were classified as strongly adequate, All items that each has the mean ranged from 1.5 to less than 2.5 were classified as adequate and all items that each has the mean value  $< 1.5$  were classified as slightly adequate.
- 2- **Teachers' and principals' instruments:** All items that each has the mean 4.5 were classified as very strongly adequate, all items that each has the mean ranged from 3.5 to less than 4.5 were classified as strongly adequate; all items that each has the mean ranged from 2.5

to less than 3.5 were classified as adequate; All items that each has the mean ranged from 1.5 to less than 2.5 were classified as fairly adequate and all items that each has the mean  $< 1.5$  were classified as poorly adequate.

Results related to students' perceptions of the status of teaching computer indicate that:

- a- The theoretical part of the computer text book was slightly adequate.
- b- The practical part of the computer text book was slightly adequate to practice the practical work using computer laboratories.
- c- Computer laboratories were fairly suitable to practice using computer to do students practical work especially the number of computers available to students.
- e- Competency of computer teachers were very adequate in regard to follow students in computer lab during the practical activities, responding to students' questions, obeying the rules and assures quietness during the lessons, watching students' actions during practical work and teaching the practical and theoretical part of the text book. Where as the rest of the statements on the teachers' competencies subscale were adequate.
- f- 66.4% of the students perceived that they very well benefited from studying computer, while 8,2% indicated that they benefited with lesser extent.

Results related to the teachers' perceptions of the status of teaching computer indicate that:

- a. Students' text book was very suitable in terms of the language used, materials, objectives and the practical part whereas as the rest of the statement on this subscale were slightly adequate.
- b. Teachers' guide was Fairly adequate in terms of sequence and clarity of procedures for carrying out the lessons, well defined goals and well stated objective and their relations to materials used in the text book. The rest of the statements on teachers' guide subscale were very adequate.

- c. Teachers' in-service training program was suitable for teachers' ability in teaching, but in terms of using computer applications was not suitable. However, the rest of the statements on the teachers' in-service training subscale were fairly suitable.
- d. Obstacles that teachers perceived to hinder the teaching of computer were no personal maintenance available in schools delay in maintenance when computer stops working, the availability of computer softwares in schools, computers most of the time are out of order, difficulties in computer use. While the adequacy of teaching computer, suitability of computer labs and difficulty of using computer softwares were less important obstacles. The obstacles of the cooperation between computer teachers and school administration and persuading students with the importance of teaching computer were perceived to be less sharp than other obstacles.

Results related to the principals' perceptions of teaching computer were as follow indicate that:

- a. Lab preparation such as lights, vandilatation, Location and equipment were perceived to be very adequate. The number of computers available to meet students numbers demand was fairly adequate, but the rest of the statement on the Lab preparation subscale were adequate.
- b. The advisory system for teaching computer was not competent in the coordination among teaching advisors, follow up of principals, using traditional methods of advising and class visits while the rest of the statement on the advisory system subscale were perceived to be more competent.
- c. The coordination between computer teachers and their school administration, availability of computer teachers, softwares and suitability of computer labs were perceived to be un sharp obstacles whereas the rest of the obstacles on the subscals were perceived to be very sharp obstacles.

Results related to students', teachers' and principles' attitudes indicate that:

- a. Students' attitudes toward studying computer were positive.
- b. There was a significant difference at ( $p < 0,001$ ) in students' attitudes related to students' geographical areas (south, middle, north). Those who were studying computer in the two geographical areas (middle and south) showed more positive attitudes than those who were studying in the north area.
- c. Teachers' attitudes toward teaching computer were positive.
- d. Principals' attitudes toward teaching computer were positive.
- e. There was a significant difference at ( $p < 0,001$ ) between teachers' and principles attitudes. Teachers' had more positive attitudes that principals.

In the light of this study, the most recommendations were:

- 1- The Theoretical part of the textbook needs to be redesigned with reconsideration of students' of students' characteristics and aptitude.
- 2- The practical part of the textbook needs additional examples to correspond with students' environment, pervious computer experiences and students' aptitude.
- 3- There is a need for additional computers to allow one terminal for each student.
- 4- There is a need to train the already teachers in the field educationally.
- 5- School library should have special section for all the computer resources needed for the teaching of computer, such as literature software, books ... etc.
- 6- Updating the advisory system so that one advisor should be available in each school to help in computer use.
- 7- To train the school principals to be computer literate, so that they can practice their duty as resident advisors.
- 8- Updating the coordination between advisor and the school principals in the domain of the advisory system.
- 9- To increase teaching advisors' visitations to the teachers of computer in schools.

## تقييم تدريس الحاسوب في الصف العاشر في

### المدارس الحكومية الأردنية

و. أكرم العمري

جامعة اليرموك - الأردن

#### ملخص

هدفت هذه الدراسة الى تقييم تدريس مقرر الحاسوب في الصف العاشر في الأردن، من وجهة نظر مديري المدارس، ومعلمي الحاسوب، وطلبة الصف العاشر، تكونت عينة الطلبة من (٣٣٦٥) طالباً وطالبة من طلبة الصف العاشر الذين يدرسون مقرر الحاسوب منهم (١٥٦٥) طالباً و (١٨٠٠) طالبة، فيما تكونت عينة المعلمين من (٧٤) معلماً ومعلمة منهم (٣٥) معلماً و (٣٩) معلمة، وتكونت عينة المديرين من (٩٤) مديراً ومديرة، منهم (٤٤) مديراً و (٥٠) مديرة، تم اختيارهم بطريقة عشوائية طبقية من جميع المدارس التي يدرس بها مقرر الحاسوب في الأردن والبالغ عددها (٥١١) مدرسة.

ولتحقيق غرض الدراسة، فقد قام الباحث ببناء الأدوات التالية:

١. استبانة تقييم تدريس الحاسوب من وجهة نظر الطلبة، وقد تكونت في شكلها النهائي من (٦٣) فقرة موزعة على خمسة مجالات وقد تم تقدير معامل ثباتها بمعادلة كرونباخ الفا على عينة اثبات والبالغة (٥٠) طالباً وطالبة، فبلغ ثباتها (٩٤). اما بالنسبة لصدق الأداة فتم تقديره من خلال الصدق المنطقي (المحكمين).
٢. استبانة تقييم تدريس الحاسوب من وجهة نظر المعلمين، وتكونت من (٤٨) فقرة موزعة على (٤) مجالات، وتم تقدير ثباتها بواسطة معادلة كرونباخ الفا فبلغت قيمة الثبات (٠,٨٧)، أما بالنسبة لصدق الأداة فقد تم تقديره باستخدام الصدق المنطقي (المحكمين).
٣. استبانة تقييم تدريس الحاسوب من وجهة نظر مديري المدارس، وقد تكونت من (٢٩) فقرة، وزعت على ثلاثة مجالات، وقد تم تقدير صدق الأداة باستخدام الصدق المنطقي أما الثبات فبمعادلة كرونباخ الفا، وقد بلغ معامل الثبات (٠,٨٤).

٤. مقياس اتجاهات الطلبة نحو دراسة مقرر الحاسوب: وقد تكون هذا المقياس من (١٨) فقرة نصفها ذو اتجاه ايجابي ونصفها الآخر ذو اتجاه سلبي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٧٦).
٥. مقياس اتجاهات المعلمين نحو تدريس مقرر الحاسوب، وتشمل هذا المقياس (١٨) فقرة نصفها ذو اتجاه سلبي، ونصفها الآخر ذو اتجاه ايجابي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٨٤).
٦. مقياس اتجاهات مديري المدارس نحو تدريس مقرر الحاسوب، وقد تكون هذا المقياس من (١٨) فقرة نصفها ذو اتجاه سلبي، ونصفها الآخر ذو اتجاه ايجابي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٧٣).

٤. مقياس اتجاهات الطلبة نحو دراسة مقرر الحاسوب: وقد تكون هذا المقياس من (١٨) فقرة نصفها ذو اتجاه ايجابي ونصفها الآخر ذو اتجاه سلبي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٧٦).

أولاً: الأسئلة المتعلقة بتقييم الطلبة لدراسة مقرر الحاسوب في الصف العاشر في الأردن، وتضم الأسئلة التالية: المعلمين نحو تدريس مقرر الحاسوب، وتشمل هذا المقياس (١٨) فقرة

١. ما مدى ملاءمة الجزء النظري من كتاب الطالب المقرر من وجهة نظر الطلبة؟

٢. ما مدى ملاءمة الجزء العملي من كتاب الطالب المقرر من وجهة نظر الطلبة؟

٣. ما مدى توافر التجهيزات المخبرية لتحقيق الأهداف التدريسية لمقرر الحاسوب من وجهة نظر الطلبة. (١٨) فقرة نصفها ذو اتجاه سلبي، ونصفها الآخر ذو اتجاه ايجابي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٧٦).

٤. ما مدى ممارسة الطلبة للأنشطة التعليمية التعلمية داخل مختبر الحاسوب؟

٥. ما كفايات مدرسي الحاسوب من وجهة نظر الطلبة؟

٦. ما مدى استفادة طلبة الصف العاشر في الأردن من مقرر الحاسوب؟

وقد حاولت الدراسة الإجابة عن الأسئلة التالية: اتجاه سلبي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٧٦).

ثانياً: الأسئلة المتعلقة بتقييم المعلمين لتدريس مقرر الحاسوب في الصف العاشر في الأردن، وتضم هذه المجموعة الأسئلة التالية:

١. ما مدى ملائمة الكتاب المدرسي للطلبة من وجهة نظر معلمي الحاسوب؟

٢. ما مدى مناسبة دليل المعلم لتدريس مقرر الحاسوب في الأردن؟

٣. ما مدى فعالية برامج تدريب المعلمين أثناء الخدمة من وجهة نظر المعلمين؟

٤. ما المعوقات التي تواجه تدريس مقرر الحاسوب في المدارس الأردنية؟

٥. ما مدى ممارسة الطلبة للأنشطة التعليمية التعلمية داخل مختبر الحاسوب؟

٦. ما كفايات مدرسي الحاسوب من وجهة نظر الطلبة؟

٧. ما مدى استفادة طلبة الصف العاشر في الأردن من مقرر الحاسوب؟

وقد حاولت الدراسة الإجابة عن الأسئلة التالية: اتجاه سلبي، وتم تقدير صدقه المنطقي من قبل المحكمين، أما ثباته فقد تم تقديره باستخدام معادلة كرونباخ الفا فبلغ (٠,٧٦).

ثانياً: الأسئلة المتعلقة بتقييم المعلمين لتدريس مقرر الحاسوب في الصف العاشر في الأردن، وتضم هذه المجموعة الأسئلة التالية:

ثالثاً: الأسئلة المتعلقة بتقييم مديري المدارس لتدريس مقرر الحاسوب في الصف العاشر في الأردن، وتضم الأسئلة التالية:

١. ما مدى توافر التجهيزات المخبرية لتحقيق الأهداف التدريسية لمقرر الحاسوب من وجهة نظر المديرين.
٢. ما مدى ملائمة الإشراف التربوي على تدريس الحاسوب من وجهة نظر مديري المدارس الأردنية؟
٣. ما المعوقات التي تواجه تدريس مقرر الحاسوب في المدارس الأردنية من وجهة نظر مديري المدارس؟

رابعاً: الأسئلة المتعلقة باتجاهات المعلمين والطلبة والمديرين نحو تدريس الحاسوب، وتضم الأسئلة التالية:

١. ما اتجاهات طلبة الصف العاشر في الأردن نحو دراسة مقرر الحاسوب؟
٢. ما اتجاهات معلمي الحاسوب في الأردن نحو تدريس مقرر الحاسوب في الصف العاشر؟
٣. ما اتجاهات مديري المدارس في الأردن نحو تدريس مقرر الحاسوب في الصف العاشر؟
٤. هل هناك فروق في اتجاهات الطلبة في المناطق التعليمية الثلاث نحو دراسة الحاسوب؟
٥. هل يوجد اختلاف في اتجاهات المعلمين والمديرين نحو تدريس الحاسوب في الصف العاشر؟

وقد عولجت البيانات المتجمعة لدى الباحث احصائياً، باستخدام الرزم الاحصائية المخصصة للأبحاث التربوية والنفسية (SPSS)، حيث تم استخدام المتوسطات الحسابية والانحرافات المعيارية، لترتيب الفقرات تنازلياً، كما استخدم اختبار (T-test)، وتحليل التباين الأحادي (One -Way -Anova) واختبار نيومان كولز للمقارنات البعدية (Newman - Kules).

كما اعتمدت معايير للإجابة لتصنيف الفقرات في ضوءها على النحو التالي:

- ١- استبانة الطلبة: حيث اعتبرت الفقرات ذات المتوسطات الحسابية ( $\leq 2,5$ ) متوفرة بشكل كبير أما الفقرات التي وصلت على متوسطات حسابية تراوحت بين ( $1,5$  - أقل من

(٢,٥) متوفرة بدرجة متوسطة، في حين كانت الفقرات التي حصلت على متوسط حسابي أقل من (١,٥) متوفرة بدرجة ضعيفة.

٢- استبانات المعلمين والمديرين: اعتبرت الفقرات ذات المتوسطات الحسابية ( $\leq ٤,٥$ ) متوفرة بدرجة كبيرة جداً، أما الفقرات التي حصلت على متوسطات حسابية تراوحت بين (٣,٥ - أقل من ٤,٥) متوفرة بدرجة كبيرة، في حين الفقرات التي حصلت على المتوسطات الحسابية (٢,٥ - أقل من ٣,٥) على التصنيف بدرجة متوسطة، أما الفقرات التي حصلت على متوسط حسابي أقل من (٢,٥) متوفرة بدرجة ضعيفة.

وقد خلصت الدراسة الى النتائج التالية:

أولاً: النتائج المتعلقة بتقييم الطلبة لدراسة الحاسوب في الصف العاشر في الأردن، وتضمنت ما يأتي:

- أ- الجزء النظري من الكتاب المدرسي المقرر مناسباً للتدريس بدرجة متوسطة.
- ب- الجزء العملي من الكتاب المدرسي المقرر مناسباً للتدريبات العملية بدرجة متوسطة.
- ج- التجهيزات المخبرية متوفرة بدرجة متوسطة.
- د- ممارسة الطلبة للأنشطة التعليمية التعليمية داخل مختبر الحاسوب مناسبة بدرجة متوسطة.
- هـ- كفايات مدرسي الحاسوب، فقد حصلت كل من الفقرات بقاء المعلم في المختبر أثناء الحصة، وإجابته عن أسئلة الطلبة، وتقيدته بالنظام والهدوء، ومراقبته أداء الطلبة أثناء العمل المخبري، وتدريسه للجزء العملي، على درجة كبيرة من حيث توافرها، أما باقي فقرات هذا المجال فقد توافرت بدرجة متوسطة.
- و- بلغت نسبة استفادة طلبة الصف العاشر من دراسة مقرر الحاسوب (٦٦,٤%) بتقدير جيد جداً فأكثر، في حين أن (٨,٢%) من الطلبة اعتبروا أن استفادتهم كانت بدرجة مقبولة أو أقل.

**ثانياً:** النتائج المتعلقة بتقييم المعلمين لتدريس الحاسوب في الصف العاشر في الأردن، وتضمنت:

- أ- مدى ملائمة الكتاب المدرسي للطلبة، فقد حصلت كل من الفقرات سهولة لغة الكتاب، ووضوح المادة التعليمية وأهدافه، والتطبيقات العملية فيه على درجة كبيرة، في حين توافرت باقي فقرات هذا المجال بدرجة متوسطة.
- ب- مدى مناسبة دليل المعلم لتدريس مقرر الحاسوب، فقد حصلت الفقرات التنوع في مستويات الأهداف وتوزيعها على مجالات النمو، والتنوع في أساليب التدريس على درجة متوسطة، أما باقي فقرات المجال فقد توافرت بدرجة كبيرة.
- ج- مدى فاعلية برامج تدريب المعلمين أثناء الخدمة، فقد حصلت كل من الفقرات فائدة الدورات التدريبية وأهميتها في تنمية مهارات التدريس على درجة كبيرة، أما اشتمال الدورات التدريبية على استخدام البرمجيات المختلفة فقد توافرت بدرجة ضعيفة، في حين توافرت باقي فقرات المجال بدرجة متوسطة.
- د- المعوقات التي تواجه تدريس مقرر الحاسوب، فقد توفرت الفقرة التي تشير الى تعاون الإدارة المدرسية مع المعلمين بدرجة كبيرة، أما فقرات اقناع الطلبة بأهمية الحاسوب، وسهولة تشغيل البرامج، وتوافر التجهيزات الكافية لتدريس الحاسوب فقد توافرت بدرجة متوسطة، في حين باقي فقرات المجال توافرت بدرجة ضعيفة أو قليلة.

**ثالثاً:** النتائج المتعلقة بتقييم المديرين لتدريس الحاسوب في الصف العاشر، وتضمنت ما يأتي:

- أ- توافر التجهيزات المخبرية في مختبر الحاسوب، فقد حصلت كل من الفقرات، اضاءة المختبر، وتهويته، وموقعه، وتوفير مستلزماته، وفني لصيانة الأجهزة على درجة كبيرة، أما مناسبة عدد الأجهزة لعدد الطلبة فقد توافرت بدرجة ضعيفة، في حين أن باقي فقرات المجال توافرت بدرجة متوسطة.
- ب- الاشراف التربوي، فقد توافرت كل من فقرات ضعف التنسيق بين المشرفين التربويين وإدارة المدرسة، وقلة متابعة مدير المدرسة الإشراف على تدريس الحاسوب على درجة كبيرة، أما باقي فقرات المجال فقد توافرت بدرجة متوسطة.
- ج- المعوقات التي تواجه تدريس مقرر الحاسوب، فقد توافرت كل من فقرات التعاون بين معلمي الحاسوب وإدارة المدرسة، وتوفير المعلمين المؤهلين لتدريس مقرر

الحاسوب، وتزويد المدرسة بالبرامج التعليمية، وملاءمة المختبرات لتدريس الحاسوب بدرجة كبيرة، أما باقي فقرات المقياس فقد توافرت بدرجة متوسطة.

رابعاً: النتائج المتعلقة باتجاهات الطلبة والمعلمين والمديرين نحو مقرر الحاسوب في الصف العاشر في الأردن، وتضمنت ما يأتي:

- أ- اتجاهات طلبة الصف العاشر نحو دراسة مقرر الحاسوب ايجابية.
- ب- يوجد فروق في اتجاهات الطلبة نحو دراسة مقرر الحاسوب تعزى للمنطقة التعليمية (شمال، وسط، جنوب) ولصالح الجنوب والوسط.
- ج- اتجاهات المعلمين نحو تدريس مقرر الحاسوب في الصف العاشر ايجابية.
- د- اتجاهات مديري المدارس نحو تدريس مقرر الحاسوب في الصف العاشر ايجابية.
- هـ- يوجد فرق في اتجاهات المعلمين والمدراء نحو تدريس مقرر الحاسوب في الصف العاشر، ولصالح اتجاهات المعلمين.

وفي ضوء النتائج التي توصلت اليها الدراسة، فإن أهم التوصيات هي:

- أ- إعادة النظر في صياغة محتوى الجزء النظري من الكتاب المقرر بما يتناسب وقدرات الطلبة.
- ب- تضمين الجزء العملي من الكتاب المقرر مزيداً من الأمثلة التي تناسب المهارات الواردة فيه.
- ج- توفير المزيد من أجهزة الحاسوب في المختبرات المدرسية بما يتناسب والقدرات المالية لوزارة التربية والتعليم.
- د- تأهيل المعلمين الذين يدرسون مقرر الحاسوب مسلكياً.
- هـ- توفير فرق صياغة كافية لإصلاح الأعطال المتكررة في أجهزة الحاسوب.
- و- توفير البرمجيات اللازمة والملائمة لمحتوى مقرر الحاسوب.
- ز- زيادة عدد المشرفين التربويين في الحاسوب التعليمي.
- ح- التنسيق بين المشرف التربوي وإدارة المدرسة في مجال الإشراف على تدريس مقرر الحاسوب.
- ط- تعميم تدريس الحاسوب ليشمل جميع المدارس التي لا يتوافر فيها تدريس هذه المقرر.