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The Effect of Teaching Using Artificial Intelligence Software's on the Academic Achievement of the 10th Grade Students in Computer Science Subject and Their Attitudes Towards It in Jordan

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Abstract
This study aims to identify the effect of the teaching method using educational software based on artificial intelligence in the academic achievement of 10th-grade students in computer science in Jordan and their attitudes towards it. To achieve the goal of this study, a computerized software was designed to be applied to a purposefully selected sample consisting of (50) 10th-grade students at The University of Jordan School. The study sample was randomly distributed into two groups: an experimental sample taught using the educational software, and a control sample taught in the traditional method, where the researcher prepared an achievement test to measure the academic achievement of the 10th-grade students in the Computer Science Subject, where the validity and reliability of the test has been validated, and the test-retest reliability coefficient was (0.86). A questionnaire was prepared for the attitudes, where their validity and reliability were validated. The reliability factor of the questionnaire based on Cronbach's alpha equation was (0.01). To analyze the results, an analysis of covariance (ANCOVA) was used, where the results of the study showed that there are statistically significant differences in favor of the experimental group taught using educational software based on artificial intelligence in learning computer science subject. The results also showed that there are medium positive attitudes of the experimental group towards educational software. The study recommended designing and developing computerized software in the field of teaching computer science subject s and training and encouraging teachers to use artificial intelligence-based learning in the field of basic education.
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1.1 Introduction

One of the most central challenges facing the educational process in our time is the ability to explore effective methods in education, and being able to design an interactive learning environment that meets the needs of learners, motivates them and stimulates their interest to integrate into the education process. With the availability of different modern technology means, teaching in the traditional method is no longer feasible, and the technology must be activated and used in the appropriate educational position to ensure the achievement of positive results. The aim is not only to use technology but rather to plan to select the appropriate educational method depending on the educational situation and the goal of the educational process.

When using the appropriate educational tool in the appropriate educational position depending on the target learners, we may add new value to the learning process; where we can achieve the goals that we strive to accomplish, as information and communication technology provides many means of high efficiency that exceed the limits of time and space. It also opens novel horizons for the learner to give him the responsibility and the largest role in the learning and interaction process through the services that this technology provides such as the Internet, e-mail, educational software, interactive whiteboards, visual media, audio-visual means, and ready-made educational packages (Bani Abdo, 2017).

As Zemam and Sulaimani (2013) pointed out that we must work on understanding and studying the importance and impact of these methods on the educational learning process, and identify their types to distinguish the most appropriate types based on the target audience or the appropriate educational position. We must in this context identify the effects of the use of a specific method in a specific educational situation, where the use of a method can lead to influence the target learners more than the use of another method in the same educational situation. Given the great development and the accelerated change in all aspects of life as a normal result of the expansion of knowledge and technological development in the means of communication, and with the availability of huge amounts of information in all sciences, it was necessary to develop the philosophy of education and change the role of the teacher by moving away from spoon-feeding traditional instruction and relying more on providing areas of expertise in front of the learner. For these reasons, it was essential to provide educational means that allow diversification of areas of expertise, which allow the learner to practice the learning process to gain new experiences that enable him to face the continuous changes in the requirements of life.

Although the teaching methods existed since ancient times, they were not used in the systematic manner

intended to achieve the goals of the teaching and learning process, except in the middle of the last century when some American universities and schools used several types of audio-visual teaching aids. After a short time, the importance of using these methods in education became prominent, as they became a major part of the curriculum in educational institutions (Layla, 2016). Andrew (2016) also stressed that the great progress in information and communication technology in our world at present and the emergence of cloud computing concepts and its many capabilities covered all areas of life, especially educational ones, which led individuals and institutions to benefit from this progress and achieve competitive advantages in various domains.

It was necessary to have teaching strategies that keep pace with the times, and teaching methods that develop students' confidence in their skills and abilities in learning various subjects, and trying to overcome the traditional methods to bridge the gap between the requirements of the times and the aspirations of students. Computer subjects are continuously changing topics that need modern methods to learn them to suit their changing and renewable nature (Azmi, 2014).

For this reason, many computer applications based on artificial intelligence began to appear, as these applications were used to develop the educational learning process to improve the level of students and increase their efficiency in gaining experiences and optimally obtaining them. As new patterns were formed for applications of artificial intelligence that can be used in the educational learning process whether it is in the form of expert systems or smart learning systems that may be built to be an integrated system through which the entire educational process can be developed and updated to benefit from modern technologies included in applications based on artificial intelligence to increase the interaction between the students and the educational content learning; which may contribute to increasing the effectiveness of the process of teaching and learning (Karsenti, 2019; Sourani, 2018). The use of applications based on artificial intelligence in the educational learning process came through emphasizing modern educational attitudes calling for opportunities for students to gain their knowledge easily, which gives them positive directions towards these applications (Popenici and Kerr, 2017).

In addition to the pleasure provided by applications based on artificial intelligence while acquiring and building knowledge, it enhances the principle of providing learning opportunities commensurate with the capabilities and needs of the individual because applications based on artificial intelligence are provided with huge and integrated capabilities that combine many different learning techniques (Ismail, 2017). They are also provided with capabilities of programming educational content provided to students sequentially and logically so that they adapt to the educational content and the individual needs of learners. Besides, they enable students to interact and share according to specific fundamentals such as providing the required infrastructure for schools, including computer laboratories and devices, teacher training, and the development of electronic content for curricula and textbooks (Yazigi, 2019).

1.2 Problem of the Study

The problem of the study stems from the significance of achievement because it has an important role in determining the degree of students' understanding of the educational subject. However, the indicators do not reveal an acceptable level of appropriate academic achievement among students of the computer subject at various academic levels. In light of the increased interest for several years concerning the evaluation and achievement among students, educators have directed towards investigating the level of achievement of students in different stages of education. The problem of the study is also seen in the urgent need to improve the methods currently used in teaching computer subjects to raise the level of achievement among students (Baradei, 2017).

With that, the modern approach was to employ modern teaching methods in the educational learning process and invest them to develop higher scientific and intellectual skills among students and increase educational achievement such as the use of applications based on artificial intelligence, in addition to the need to prepare students with skills and experiences that enable them to deal with the data of the times and its challenges through adopting technological innovations and investing their capabilities in the field of education. This matter requires identifying the most important features of e-learning technology and the various programs it contains, as this technology is one of the modern applications of computers and internet networks that require identifying the possibility of using them in educational institutions to achieve the attitudes related to preparing individuals who can deal with the changes of this age (Anzi, 2013).

1.3 Questions of the Study

In light of the problem of the study, the following questions have been formatted.

1. Are there statistically significant differences at the level of significance ($\alpha = 0.05$) between the means of the degrees of the computer subject on the achievement test due to the teaching method (the traditional method, the educational software based on artificial intelligence)?

2) What are the students'attitudes towards using educational software based on artificial intelligence for learning?

1.4 Objectives of the Study

In light of the questions of the study, the following objectives have been formatted.

1. To identify the effect of teaching computer subjects using educational software based on artificial intelligence on the achievement of 10th-grade students at the University of Jordan School in Jordan and their attitudes towards the use of this software in learning.

1.5 Significance of the Study

This study is in line with the changes that technology has brought about in education, knowledge expansion, and focus that the learner is the center of the educational process, and directs education to build a knowledge society, so that the process of human industry, which is concerned with designing environments and conditions according to scientific knowledge about human behavior, aims to build a personality and its desirable social formation and to provide the learner with cognitive experiences (Khair,2014).

Therefore, the importance of studying is seen in introducing new methods that may contribute to sustainable development and continuous learning for students, trying to keep pace with contemporary global attitudes and in response to many recommendations of research and conferences from the need to employ technological innovations in the educational process to improve and develop the teaching and learning processes, dealing with one of the most important stages of education, which has the responsibility to prepare individuals who will lead the wheel of development in the field of the educational process so that the student becomes responsible for his learning, having diversity in teaching methods and using of modern technological technologies and information provided by the Internet, making the learning process a fun interactive process away from boredom and constant stress, and activating diversity of categories of beneficiaries from the results of this study according to the party interacting with the research topic.

1.6 Terms of the Study

Artificial intelligence Software: It is a term given to one of the types of computer applications, and aims to make computer simulate the processes of intelligence that take place within the human mind so that the computer can solve problems and make decisions in a logical manner and the same way the human mind thinks (Faqih, 2012).
It is procedurally defined as an electronic application based on artificial intelligence through the use of its capabilities to increase student achievement in computer science.

Academic Achievement: The learner acquires various skills, knowledge, and sciences as a result of various and multiple learning processes, indicating his cognitive mental activity, and is measured by the degree that he achieves in a structured test he takes when he is required to do so (Jalali, 2011).

It is procedurally defined as the amount of experience, knowledge, information, and concepts that the learner acquires about the content of the scientific subject and is measured by the final result that students obtain in a test prepared to measure their performance in programming in computer science for the 10th grade.

Student attitudes: they are defined by Shdifat (2016) as a fairly stable tendency to respond consistently to some things, situations, individuals, or a specific group of individuals. Attitudes include a set of feelings and emotions directed at specific goals.

It is procedurally defined as the final result that students obtain after using software based on artificial intelligence, which can be measured through a questionnaire designed to measure students' attitudes toward using the software.

1.7 Limits of the Study

The study limits are as follows:

- Objective Limits: the application of the study is limited to using software based on artificial intelligence to teach the first unit (Algorithms and Programming) from the computer textbook for the 10th-grade in Jordan.
- Human Limits: this study is limited to 10th-grade students at the University of Jordan School in Jordan.
- Spatial Limits: the study is applied in the Learning Resources Room of a private school in Amman, the capital of Jordan.
- Time Limits: The study is conducted during the first semester of the academic year 2019/2020, and the duration of the experiment was 8 weeks, which lasted (40) minutes per day.

1.8 Previous Studies

Few studies have been written on teaching using artificial intelligence software on academic achievement. In his 2015 study, Ibrahim aimed at measuring the impact of an electronic computerized expert system on developing problem-solving skills and decision-making ability among student, where the study was conducted on a sample of (25) students from field training students for scientific education subject at the Faculty of Education at the University of the Suez Canal in Egypt. The study adopted the quasi-experimental approach to attain the results of finding the effect of the electronic expert system on developing problem-solving skills and decision-making ability

among field training students .

Also, in their 2016 study, Awamleh, Hamdi, and Surur investigated the impact of the Right Intelligent System of Knowledge (RISK) program on developing creative thinking and critical thinking skills among a sample of upper basic stage students in Jordan, where the study sample consisted of (53) students from the tenth-grade students. The study instruments included the Torrance test for creative thinking, the verbal image, Cornell scale for critical thinking (X) as pre and post-measurement tools, and the Right Intelligent System of Knowledge (RISK). The results of the study indicated that there are differences between the members of the experimental and control groups on the dimensions of fluency and flexibility and the total score on the Torrance test for creative thinking in favor of the experimental group due to the program. The results also showed that there were no differences between the performance of the members of the experimental and control groups on the originality dimension. The results also indicated the presence of differences between the performance of members of the experimental and control groups on the Cornell scale of critical thinking in favor of the experimental group are attributable to the program .

Besides, the 2017 study of Bedou aimed to identify the effect of using the educational robot to teach the topics of communication on a period, communication at a point, and the relationship of communication to derivation in the development of achievement in mathematics for the scientific steam of the twelfth grade at the main directorate of Amman, Jordan. The researcher used the semi-experimental approach, and the study sample consisted of (60) female students from the twelfth grade at Arjan Secondary School for Girls and Jabal Al-Hussein School for Girls in the first semester of the 2015/2016 academic year. The study sample was divided into two sections: the first section is the experimental group who studied the educational subject using the educational robot, and the second section is the control group who studied in the traditional method. The results of the study indicated the effect of teacher teaching based on the educational robot in academic achievement, and the study also emphasized the positive impact of teaching mathematics using the educational robot. In his 2018 study, Siau attempted to identify the impact of artificial intelligence on higher education, especially the change that artificial intelligence brings to higher education, as well as the role of higher education in developing artificial intelligence. The research used a qualitative approach through action research and provided solutions to problems. The research concluded that artificial intelligence contributed to supporting higher education and solving its problems.

In their 2019 study, Fryer, Nakao, and Thomson also aimed at identifying conversation robots as an essential tool in language learning and working to develop conversation robots in the future. To achieve this goal, the study relied on the experimental approach to identify the effect of conversation robots on teaching students by doing a set of activities through the use of an audio-to-audio program, then providing feedback to students. The results of the study reached the effectiveness of conversation robots in education, especially in teaching languages, where they focus on students 'interests. At last, in his 2020 study, Mujahid examined the importance of making use of artificial intelligence applications to solve the problems of people with special needs for the deaf group. The study reviewed artificial intelligence processings and smart education programs that can be used to meet the needs of students with hearing disabilities and provide basic skills to it in a good and appropriate way through the use of methods and the strategies that attract them to the subject of the lesson and link them to their practical life and train them on lip reading and tongue training on pronunciation. People with hearing disabilities also need to be continuously strengthened in its various forms and provide feedback, in addition to focusing on the quality of the given educational experiences more than focusing on the amount of information and developing life skills and language communication skills that help in understanding the academic subjects.

Commenting on Previous Studies

After reviewing previous studies, it was found that there were studies that addressed the impact of artificial intelligence applications in developing student achievement as in the 2017 study of Bedou, and some studies focused on discovering the capabilities of artificial intelligence applications in developing creative thinking and critical thinking skills, as wll as develop problem-solving skills and develop decision-making ability, as in the 2015 study of Ibrahim the 2016 study of Awamleh, Hamdi, and Surour. However, the 2019 study of Fryer, Nakao, and Thompson identified the applications of artificial intelligence as a basic tool in language learning, the 2018 study of Siau on the impact of artificial intelligence applications in higher education, while the 2020 study of Mujahid measured the impact of artificial intelligence applications on solving the problems of people with special needs of the deaf group.

1.9 Study Samplre and Population

The study population consisted of students of the 10^{th} grade in Jordan for the academic year 2019/2020. The study sample was purposefully selected for the facilities available to the researcher, where the University of Jordan School was selected for the availability of laboratories and computers with internet access. Since the school contains two sections for the 10^{th} grade, where one of the sections was selected to study algorithms and programming using the educational software based on artificial intelligence in randomly and was called the experimental group, and the second section was taught using the traditional method and was called the control

group.

1.10 Methodology and Procedures of the Study

The study used the semi-experimental approach to identify the effect of teaching using educational software based on artificial intelligence on the achievement of students of the 10th grade for computer subjects, as this approach is the most appropriate to the goals and questions of the study. The following has been adopted as the study procedures:

- Access to Arab and foreign research, studies and the literature on distance learning and e-learning programs in order to identify concepts and principles that can be used to improve academic achievement and the attitudes towards their use.
- Formulate the algorithms and programming unit found in the curricula of the Ministry of Education based on the principles and models of teaching design and in a manner that is appropriate to the method of presentation in educational software in terms of the principles of distance learning, including within them all the objectives, content, activities and short tests.
- Present the program and study tools to a group of validators to express their opinion and remark.
- Preparing the final image of the content and tools of the study in light of the validators' opinions and observations.
- Ensure the suitability of the specified time for the application.
- Determine the most appropriate ways in which the teacher and students can interact.
- Verify the reliability of the study instruments on the exploratory sample.
- Conduct similarity between the two groups (experimental, and control) through the pre-test.
- Pre-measure the attitudes in the two groups (experimental and control).
- Apply the experiment by teaching the experimental group using educational software based on artificial intelligence, while the control group is taught in the traditional method.
- Post-apply the academic achievement test consisting of (20) items, and a questionnaire to measure students' attitudes towards using educational software as a role in distance learning.
- Analyze the results statistically, and interpret and discuss results.

2.0 Study Instrument:

2.1 First Instrument

It is an achievement test prepared according to the specifications table. The test included (20) items of multiple choice for the unit of algorithms and programming.

2.2 Study Validity

The achievement test was presented to a group of 10 validators with experience in the fields of measurement and evaluation, curricula and teaching, educational technology, Arabic language, and computer science. As they were asked to express their opinions on this test, they enriched this test with many valuable observations that benefited the study.

2.3 Study Reliability

The reliability of the achievement test was validated by using the re-test method, where the test was applied to an exploratory sample from outside the study sample that consisted of (55) students from the 10th-grade students who studied the algorithms and programming unit in a school in Salt City, and they share the same characteristics of the study sample as conditions, capabilities and given financial facilities. The same test was re-applied to that sample, then the researcher calculated the Pearson correlation coefficient between the results of the two applications, where the re-test reliability coefficient was (0.86), which reflects the stability of the scores obtained by individuals on the test at both times of application.

Reliability of internal consistency and items statistics: (KR-20) equation, as this equation is considered the most common in cases where one degree is given for the correct answer, and zero for the wrong answer. Where the reliability coefficient was (0.01), and this indicates that the test has an appropriate degree of reliability and consistency.

2.4 Second Instrument

It is the attitude questionnaire developed to measure students' attitudes towards learning and the use of educational software based on artificial intelligence. Through reviewing the theoretical literature and previous studies related to the subject of the study as a study (Baradei, 2018; Shdifat and Shdifat 2016; Omari, 2018; Mannai, 2018; Duraibi and Oquali, 2017), it has been found that these studies were helpful to develop the questionnaire. With that, the researcher developed an attitude questionnaire using the five-Likert scale as follows: strongly agree (5 degrees),

agree (4 degrees), neither agree nor disagree (3 degrees), disagree (2 degrees), and strongly disagree (1 degree). The questionnaire consisted of (20) items in order to identify the students 'attitudes towards using educational software based on artificial intelligence in learning computer subjects.

2.5 Study Validity

The questionnaire was presented to a group of 10 validators with experience in the fields of measurement and evaluation, curricula and teaching, educational technology, and the Arabic language. As they were asked to express their opinions on this questionnaire, the questionnaire was finalized based on their observations.

2.6 Study Reliability

Reliability of internal consistency and items statistics, as the Cronbach's Alpha Formula is most common in cases where the measuring instrument consists of items characterized as a continuous ladder, where the reliability coefficient based on the Cronbach's Alpha Formula was (0.01), and this indicates that the questionnaire has an appropriate degree of reliability and consistency.

2.7 Study Variables

The study included a number of variables, namely:
a- Independent variable: it includes the teaching method and has two levels:
Teaching by educational software based on artificial intelligence and the traditional method
b- Dependent variable: it is the means of students' achievement on the post-test.

2.8 Study Design

A: O1 O2 X O1 O2
B: O1 O1 .
Where:
A: an experimental group taught using educational software based on artificial intelligence.
B: a control group taught in the traditional method.
O1: an achievement test (pre and post).
O2: Questionnaire (pre and post).
X: Processing using educational software based on artificial intelligence.

2.9 Statistical Processing

To answer the study questions, the study adopted the appropriate statistical methods obtained from data analysis. The descriptive and inferential statistics methods from an arithmetic mean and a standard deviation and an analysis of covariance (ANCOVA) were used to control the pre differences from measuring study variables and to identify the difference between the means of the performance of experimental and control groups on the post-test for the academic achievement of the unit being taught.

3.0 Study Results

This study aimed to investigate the impact of teaching the Algorithms and Programming Unit in Basic Langauge using educational software based on artificial intelligence on the achievement of 10th-grade students at the University of Jordan School in Jordan and the students 'attitudes towards using the software in learning, where the study aimed to answer the following two questions:

1. Are there statistically significant differences at the level of significance ($\alpha = 0.05$) between the mean scores and the computer subject on the achievement test attributed to the teaching method educational software based on artificial intelligence, the usual method?
2. What are students' attitudes toward using educational software based on artificial intelligence for learning?

To answer this question, arithmetic means and standard deviations for the performance of the 10th-grade students on the pre and post-tests in the computer subject unit of algorithms and programming were calculated as shown in table (1):

Table 1: Arithmetic Means and Standard Deviations for the Performance of the Study Sample on the Pre and Post Tests in the Computer Subject Unit of Algorithms and Programming

Group	Number	Pre-test		Post-test	
		AM	SD	AM	SD
Experimental	25	6.52	1.98	14.84	2.10
Control	25	7.68	1.73	11.80	2.08
Sum	50	7.10	1.93	13.32	2.57

Table (1) shows a difference between the arithmetic means and the standard deviations of the performance of tenth-grade students on the computer subject according to the teaching method (the traditional method, the

educational software based on artificial intelligence), where the differences were in favor of the experimental group whose arithmetic mean was (14.84) compared to (11.80) for the control group. To test these differences statistically, the analysis of covariance (ANCOVA) was used to control the pre differences from measuring study variables and identify the difference between the mean of the performance of the experimental groups and the control on the post-test of the academic achievement of the unit studied. This has been conducted to explore the effect of teaching method (traditional method, educational software based on artificial intelligence) as shown in Table 2:

Table 2: Analysis of Covariance (ANCOVA) to Find the Significance of the Differences in the Performance of 10th Grade Students on the Achievement Test of the Unit of Algorithms and Programming.

Source of Variance	Sum of Square	Degree of Freedom	Average of Squares	Value of F	Level of Sig	ETA squared
Achievement Test	.253	1	.253	.057	.812	.001
Teaching method	108.027	1	108.027	24.281	.000*	.341
Error	209.107	47	4.449			
Total Average	324.880	49				

*Statistical significance at the level of significance (0.05 =a)

It is noted from Table (2) that there are statistically significant differences at the level of significance (α = 0.05) in the performance of the tenth-grade students on the post-test achievement of the unit of algorithms and programming due to the method of teaching and in favor of the experimental group, where the calculated value of (F) was (24.281) with a statistical significance of (0.00). To find the size of the effect, the ETA square was calculated as it was (0.341), meaning that (34.1%) of the variance in the performance of the tenth-grade students on the post achievement test of the unit of algorithms and programming is attributed to the method of teaching, while the rest is due to other factors that are not controlled**.**

To find the difference in favor of either of the two groups, the modified arithmetic means for the performance of the two study groups (the experimental group and the control group) were calculated in the post achievement test in the computer science subject as shown in table (3).

Table 3: Modified Post Arithmetic Means and Standard Errors for the Performance of the Tenth Grade Students on the Achievement Test in the Computer Science Subject

Group	Modified Arithematic Means	Standard Error
Experimental	14.86	.43
Control	11.78	.43

It is noted from Table (3) that the modified post arithmetic means in the performance of the tenth-grade students on the achievement test in the computer subject for the experimental group has reached (14.86) which are higher than the arithmetic means of the control group that reached (11.78). This means that the difference in the performance of the tenth-grade students on the achievement test in the computer subject was in favor of the experimental group, which confirms the presence of a positive effect of educational software based on artificial intelligence on the academic achievement in the computer subject for the tenth-grade students.

3.1 Second Question

The second adopted question in this study is “What are students' attitudes toward using educational software based on artificial intelligence for learning?”

To answer this question, arithmetic means and standard deviations for students' abilities were calculated on the measure of students ’attitudes toward using educational software based on artificial intelligence in computer learning as shown in Table (4):

Table 4: Arithmetic Means and Standard Deviations of Students' Abilities on a Measure of Students 'Attitudes toward using Educational Software Based on Artificial Intelligence are in Descending Order.

Rank	Item	AM	SD	Degree
1	I feel that the e-course within the educational software based on artificial intelligence is being presented with a focus on the interaction	4.12	.93	High
2	I enjoy the direct help found in the educational software based on artificial intelligence	4.00	.91	High
3	I think educational software based on artificial intelligence makes it easier for me to take the exams	3.96	1.02	High
4	I think educational software based on artificial intelligence allows to discuss and share experiences with fellow students and teachers through discussion forums	3.88	1.01	High
5	I see that educational software based on artificial intelligence saves me financially	3.80	1.00	High
6	I believe that the educational software based on artificial intelligence helps me to download files and use them within the online curriculum	3.76	.83	High
7	I feel that the educational software based on artificial intelligence takes me from receiving knowledge only to participating in the educational process	3.72	.98	High
8	I feel that the educational software based on artificial intelligence provided me the opportunity to program and design algorithms directly without the need for physical communication	3.72	.94	High
9	I prefer to transfer all materials electronically	3.60	.91	Medium
10	I am satisfied with my use and effectiveness of educational software based on artificial intelligence e	3.60	1.15	Medium
11	I see that the educational software based on artificial intelligence enables me to easily recognize my notes	3.44	.82	Medium
12	I think the educational software based on artificial intelligence offers various facilities and methods that prevent boredom	3.32	.48	Medium
13	I see educational software based on artificial intelligence motivates me to actively participate	3.24	.72	Medium
14	I think the educational software based on artificial intelligence saves time and effort for students	3.20	.65	Medium
15	The best educational software based on artificial intelligence helps me to access electronic content 24 hours a day	2.96	.54	Medium
16	I feel that using the educational software based on artificial intelligence limits personal interaction among students	2.96	.20	Medium
17	I feel that the educational software based on artificial intelligence helps me submit assignments and receive feedback	2.92	.64	Medium
18	I feel the importance of stepping and self-learning in the educational software based on artificial intelligence	2.92	.57	Medium
19	I am having difficulty dealing with educational software based on artificial intelligence	2.84	.47	Medium
20	I feel that there are obstacles facing the use of educational software based on artificial intelligence	2.68	.48	Medium
Total Degree of the Measure		3.48	.25	Medium

Table (4) indicates that the mathematical means of students 'abilities on the measure of students' attitudes toward using educational software based on artificial intelligence in computer learning were medium, with an arithmetic mean of (3.28) and a standard deviation of (0.21), while the arithmetic mean of the items ranged between (2.68) - 4.12), where the item of "I feel that the e-course within the educational software based on the artificial intelligence is being presented with a focus on interaction " ranked first with an arithmetic mean of (4.12) and with a high degree. However, the item of " I enjoy the direct help found in the educational software based on artificial intelligence" ranked second with an arithmetic mean of (4.00) and with a high degree, while the item of " I think educational software based on artificial intelligence makes it easier for me to take the exams" ranked third with an arithmetic mean of (3.96) and with a high degree.

Yet, the item of "I feel the importance of stepping and self-learning in the educational software based on artificial intelligence " ranked eighteenth with an arithmetic mean of (2.92) and with a medium degree. Also, the item of “I am having difficulty dealing with educational software based on artificial intelligence" ranked

Nineteenth with an arithmetic mean of (2.84) and with a medium degree. Moreover, the item of "I feel that obstacles are facing the use of educational software based on artificial intelligence" ranked twentieth and the last with an arithmetic mean of (2.68) with a medium degree .

With that, these results are consistent with the 2016 study of Awamleh, Hamdi, Surur, the 2017 study of Bedou, and the 2019 study of Fryer, Nakao, and Thomson, where these studies have demonstrated the effectiveness of using educational software based on artificial intelligence in improving the academic achievement and attitudes towards their use.

4.0 Discussion

The results in Table (2) and Table (3) indicated that there were statistically significant differences at the level of ($\alpha = 0.05$) between the arithmetic means of the performance of students who studied using the educational software based on artificial intelligence and who studied using the traditional method, where the differences were in favor of students who studied using educational software based on artificial intelligence. This is because the educational software based on artificial intelligence helped to attract the attention of students in the computer subject as a new method that they had not previously learned. Also, the lessons in the software were presented logically and sequentially appropriate to the capabilities of each student, where students can progress according to their speed and degree of mastery of the programming process, taking into account the individual differences among students, which reflected positively on the results of the students in the post-exam. The educational program also included various evaluation questions related to educational goals where students are provided with feedback on the extent of their progress to identify the student's strengths and weaknesses.

Importantly, the educational software based on artificial intelligence has handled the issue of teacher-student interaction, as it allowed exchanging information and questions and receiving feedback very quickly through the communication tools available in it such as direct chat and emails. With using educational software based on artificial intelligence, there is no longer boredom in learning the unit of algorithms and programming from computer subjects, as the capabilities of the software were used in adding the appropriate educational videos, along with the methods for handing in and receiving duties. As for the process of conducting short tests, it was done simply and easily to measure the skills and creativity of students in programming.

More importantly, the results related to the second question also showed that there is a medium positive attitude among students towards the use of educational software based on artificial intelligence to learn the unit of algorithms and programming, and this may be due to:

1. The students 'sense of responsibility towards their learning process using the educational software based on artificial intelligence, as the student becomes responsible for his learning process, and this would raise the level of self-confidence and achievement for students, which led to developing positive attitudes towards their use in learning.
2. Students' desire to fully interact all the time and overcome the obstacles of place and time by taking advantage of the experiences of other students and obtaining feedback from the educational software based on artificial intelligence, as this contributed to forming positive attitudes among students towards it.

As a final point, there is an important role in adopting educational software based on artificial intelligence in learning for the unit of algorithms and programming from computer subject because it makes the learning process a funny process for students and a continuous process throughout the life.

5.0 Recommendations

In light of the aforesaid results, the following has been recommended:

1. Encouraging students to use educational software based on artificial intelligence in learning computer science subjects.
2. Study the reality of using educational software based on artificial intelligence for learning in Jordan's schools.
3. Study the patterns of using educational software based on artificial intelligence in learning in Jordan's schools.

6.0 References

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