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PAPER

The Effect of Using Microsoft Teams on the Achievement and Self-Learning Skills among Undergraduate Students in the School of Educational Sciences at the University of Jordan

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ABSTRACT

The study aimed to investigate the effect of using Microsoft Teams on the achievement and self-learning skills among undergraduate students in the School of Educational Sciences at the University of Jordan. The study used the quasi-experimental approach, and the number of study members was (88) students of the Computerized Children's Programs course, who were divided into two groups. They were intentionally chosen and randomly distributed. The first one was the experimental group that underwent teaching using the Microsoft Teams application, with (46) students; the second one was the control group that underwent teaching using the traditional method, with (42) students, during the first semester of 2022/2023. An achievement test consisting of (25) questions was prepared, as well as a self-learning skills scale consisting of (30) items. Both study tools were applied to the sample and their validity and reliability were verified. The results showed that there were statistically significant differences between the average scores of students in the achievement test and the self-learning scale post measurement, which was attributed to the teaching method variable and in favor of the experimental group that used the Microsoft Teams application. The study recommended implementing teaching methods using the Microsoft Teams application in the event of remote learning and to employ in the rest of the other educational courses and at all levels, editing courses to fit with the use of the Microsoft Teams application.

KEYWORDS

Microsoft Teams, communication platform, academic achievement, self-learning skills, the University of Jordan

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1 INTRODUCTION

The huge growth of Information and Communication Technology (ICT) and the ubiquitous influx of digital technologies, such as smart phones and online games, characterize societies of the 21st century. There has been a broad call to provide today's learners with the essential skills that are expected to make them competitive in future jobs that cannot be precisely determined in an everlasting, evolving technological landscape. One of these skills is computational thinking. It is not limited to coding knowledge; rather, it seeks to make people think like computer scientists and engineers. It is not restricted to computerizing curricula or trying to attract students to computing topics, but rather to grafting subjects that students already have with the skills involved in analytical thought activities. Therefore, computational thinking is about formulating solutions to problems in diverse contexts of everyday life, even in the absence of computational devices. Embedding computational thinking in curricula is not straightforward; each discipline has its own outcomes, and those outcomes cross the boundaries between disciplines. Here rises the significance of the science, technology, engineering, arts and mathematics (STEAM) approach, which properly ties disciplines together technologically and provides a precious pool of current and future-oriented, socially and economically stimulating skills that lead to growth and innovation.

The world is currently experiencing many transformations and rapid progress in several areas, the most prominent of which is: Information and Communications Technology, which has greatly influenced many activities and services, including the educational process. What is known as: "e-Learning" has emerged, which relies on multimedia technology to provide educational content to the learner in an effective and enjoyable way [1].

In turn, the compelling circumstances that the world witnessed in recent years, including the spread of the Corona pandemic (COVID-19), forced educational institutions to resort to e-Learning through the use of several applications for visual communication, the most famous of which is the Microsoft Teams application as a suitable alternative to ensure the continuity of the educational learning process. This application is considered a platform for integrated communication, and it is one of the versions of Microsoft Office, through the ability to chat and hold class meetings via video technology [2].

On the other hand, the development of the educational process and the use of technology and modern educational devices represented by e-Learning comes from the interest in increasing the academic achievement of students and providing them with various knowledge with all available means, and therefore achieving the educational goals efficiently. This was confirmed by Al-Bitar [3] that the importance of using e-Learning comes from the goals it achieves, such as the interaction of the students and their teachers within the classroom environment and among the students themselves, the enhanced confidence of the students themselves, and the practice of self-learning without restrictions anywhere and anytime; all of which leads to raising their educational abilities and their academic achievement. Self-learning is a very important method of learning that allows the use of high effectiveness learning skills, which contributes to the development of the cognitive, behavioral, and conscience abilities of the student and provides him with information that enables him to comprehend modern data. In addition, it provides many advantages, including: creating positive learner's interaction, helping the learner in overcoming boring repetition that accompanies traditional education, and providing strong motivation for learners through diversity in educational materials, activities, and goals [4].

Based on the above, the researcher conducted this study to determine the effect of using the Microsoft Teams application on the achievement and self-learning skills among undergraduate students in the School of Educational Sciences at the University of Jordan.

2 THE STUDY PROBLEM AND QUESTIONS

The teaching/learning process in universities as educational institutions faces many challenges as a result of the global development and openness in the use of developed electronic educational systems associated with managing the educational process electronically. These systems include: remote learning and e-Learning through the use of educational platforms and applications such as the Microsoft Teams application, as well as other educational programs, multimedia integration, cooperation and interaction between educational institutions using Information and Communications Technology applications. These modern applications in e-Learning environments have played a clear role in developing students' self-learning skills and their academic achievement, as achievement and self-learning skills are clearly visible; however, there are some fears of losing some of these skills with remote learning. Since this application was used in most educational institutions in Jordan during the COVID-19 pandemic and beyond, the researcher wanted to investigate the effectiveness of its use and its impact on these two variables specifically due to their importance with regards to students.

Additionally, technological progress has a major impact on the teaching/learning process, which has led to a change in teaching methods and the emergence of many e-Learning and remote learning strategies. This imposed some challenges and problems on educational institutions, including universities, the most prominent of which is how to implement electronic educational platforms, including the implementation of Microsoft Teams in teaching so that the student becomes a seeker of knowledge and acquires self-learning skills instead of traditional education, which in turn will make him interact with existing education that is based on e-Learning in a better way. Accordingly, this study investigated the impact of the use of the Microsoft Teams application in regards to achievement and developing self-learning skills among undergraduate students in the School of Educational Sciences at the University of Jordan in the Computerized Children's Programs course. This is in an attempt to answer the following questions:

1. What is the effect of using the Microsoft Teams application on academic achievement in the Computerized Children's Programs course among undergraduate students in the School of Educational Sciences at the University of Jordan?
2. What is the effect of the use of the Microsoft Teams application in developing self-learning skills in the Computerized Children's Programs course among undergraduate students in the School of Educational Sciences at the University of Jordan?

3 SIGNIFICANCE OF THE STUDY

The significance of this study comes from two aspects: the theoretical aspect and the practical aspect.

3.1 The theoretical aspect

Due to the recent heavy reliance on remote education during the COVID-19 pandemic and beyond, the shift in the educational process will result in changes in results and application, as well as a change in educational practices. This study provides a preliminary picture of these changes in theoretical terms. Also, identifying the impact of using the Microsoft Teams application on the achievement and development of self-learning skills among university students may help in providing an e-Learning environment in which learners are interactive and active, and that are compatible with their needs and individual differences when employing technology.

3.2 The practical aspect

The study seeks to provide a practical basis and preliminary results for education using modern technological applications. It will present the results of remote education on two dimensions: academic achievement and self-learning skills. The study also constitutes a reference for educational departments in universities to know the impact of these modern applications on academic achievement and how to modify them, if possible, to develop achievement effectively, and to develop the teaching/learning process when preparing academic courses. This may contribute to developing the capabilities of instructors and learners in Jordanian universities when using modern teaching methods.

4 THE THEORETICAL FRAMEWORK AND PREVIOUS RELEVANT STUDIES

This part of the study deals with the theoretical framework of the study topics, and reviews previous studies related to these topics.

4.1 The theoretical framework

This part of the study includes a presentation of the theoretical literature related to the subject of the study: The effect of using the Microsoft Teams application on the achievement and development of self-learning skills in the course of computerized children's programs among undergraduate students at the School of Educational Sciences at the University of Jordan. The following is a discussion of the themes of the study and its variables:

4.2 Microsoft teams application

The Microsoft Teams application is part of the Office 365 applications that extend the functionality of Microsoft SharePoint with a simple and easy-to-use user interface. It also provides the ability to make live voice calls, live video broadcasts, and interactive chats in which everyone can interact with each other. In addition, the user can download and run a Microsoft Teams application via (iOS) devices or install it on a computer running Windows or MAC. It can also be used in an Internet browser, and it is considered one of the applications included and authorized in the

educational license available in many schools and universities [5]. It is considered one of the most popular applications at the present time, as statistics indicate that in 2021, the number of daily active users worldwide reached more than (44) million [6].

Purba [7] defines the Microsoft Teams application as a virtual learning method for collaborative learning. Branscombe [8] sees it as a chat and collaboration platform designed to facilitate communication, messaging, and group chatting in small groups.

The Microsoft Teams application has provided an educational environment which implemented e-Learning (remotely) during the (COVID-19) pandemic that caused the closure of all schools and universities in the world, forcing millions of students to remain at home and all educational institutions and universities resort to remote education. As a result, the Microsoft Teams application has achieved great success in education [9]. It allows users to create a direct meeting room to hold meetings and class sessions using the direct video feature, the ability to record the meeting, and share files such as multimedia, e-books or training, as well as the ability to directly chat between instructors and students in the class meeting, and allows the teacher the advantage of creating tests and correcting them electronically [10].

Private channels in the Microsoft Teams application create dedicated spaces for work and collaboration in the private team, and allow the team owner or members to access the channel. Each channel has tabs, where two tabs are automatically created: files and posts. Private channels support links and new tabs of favorite applications and files available in the Microsoft Teams application library, at the top of the channel, including: (Excel, Word, Stream), and other applications that members can benefit from using them [11].

One of the additional advantages of the Microsoft Teams application is that it has communication and education tools, including: the ease of using the application interface, fully maintaining the safety of the user and his privacy, and free entry using his email address without restrictions. Moreover, it provides the use of several languages, including Arabic; also, educational tools such as content editing tools can be used, browsing content before publishing, and includes an automatic system, which helps the teacher monitor grades, exams, and assignments [12]. Almodaires, Almutairi, and Almsaud [13] believe that using the Microsoft Teams application achieved positive interaction in the learning process. This is due to its quality and the ease of using and benefiting from the available tools, as it enhanced effective participation between instructors and students, and the speed of its use in receiving and providing feedback.

The Microsoft Teams application is one of the effective e-Learning platforms, and is important for online learning, specifically in preparing classrooms, helping instructors accomplish their educational tasks, and communicating more effectively with students [14]. It can be said that what distinguishes the Microsoft Teams application is that it is easy to download on the computer and the mobile phone for free, it provides features available to all individuals without temporal or spatial restrictions, and also provides many different applications that were merged into one program without the need to open many applications separately [15]. Wichanpricha [16] believes that the Microsoft Teams application led to motivating students to learn, and achieved interaction and educational goals.

4.3 Academic achievement

Academic achievement is a student's cognitive mental activity; it is represented by the extent to which students comprehend what they have studied in the

academic courses. It is measured by standardized tests prepared for this purpose. It measures the student's ability to understand the educational material that has been studied and apply the knowledge that has been acquired through the means of measurement that the school applies through oral and written examinations during the semesters of the academic year. Achievement occurs when the student masters the knowledge and skills he learned after gaining educational experience in one course or a group of courses [17].

The importance of achievement lies in the fact that it has a positive impact on the student through his feeling of success and accomplishment in reaching the desired goal, enhances confidence in himself and his mental abilities, develops his scientific culture, accepts the opinions of others with open arms, and possesses positive energy in facing the difficulties and challenges in his academic career. This will make him always aspire to the top and become an effective individual in his society, proud of himself and his successes. He will have sufficient knowledge and experience in the future to face the problems related to the scientific aspect, and not be affected by them, which some countries suffer from due to the low level of education and achievement and the spread of the phenomenon of school dropouts and fake certificates [18].

Achievement aims to measure the mental abilities possessed by the student and his rate of comprehension, acquisition of knowledge, and knowledge of the specialization that suits him later, as well as the link between his transition from one stage to another after determining the final result [19].

The level of academic achievement is based on the elements of the student's personality, such as the level of intelligence and his ability to comprehend, to express in a correct manner, and the strength of his memory, senses, and response, in addition to the positive motivations in the learning process. The family also has a major role in influencing children and shaping their personalities, as it builds their values and behavior. It issues statements that they believe in and apply in their academic and practical lives, such as the importance of education and culture that build society and influence individuals [20].

4.4 Self-learning skills

Self-learning skills are the processes that depend on the mental performance of the learner, relying on his own speed in collecting the content that he wants to study, understanding it in depth, classifying it, and evaluating the extent of his growth and progress in each part [21]. Al-Zaboun and Hamdi [22] defined it as the educational activity carried out by the student through his own desire and conviction with the aim of developing his aptitudes, potentials, and abilities in response to: his needs, interests, and inclinations in a way that achieves the development of his personality, its integration, interaction, and contribution with his society by relying on himself and being confident of his abilities.

The Information and Communications Technology revolution and the trend towards the knowledge economy have led to increased interest in self-learning, since it makes learners positive participants and helps in achieving educational goals, based on a set of philosophical, psychological, educational, and social foundations that ensure its effectiveness and the achievement of its goals [23]. There are several methods for self-learning, including: educational television, educational portfolios, remote learning, open learning, educational programs directed to the individual, and e-Learning [24].

The importance of learning self-learning skills is to raise the level of the learner's performance in accomplishing what is required of him with ease, developing positive trends, and evoking his motivation and tendency towards science and learning, as well as making the learner able to keep pace with scientific and technological developments. In addition, the expanding knowledge, training to solve problems, stimulating the learner's ability to innovate, all note an increase in interest in self-learning. This is due to the increase in the demand for education, the increase in the numbers of students, and the confrontation of individual differences between the students as well. As such, self-learning at this time is one of the basic pillars around which the teaching technology and its applications, as well as modern education in general, are centered on [25].

4.5 Previous studies

The researcher referred to many studies related to the course of the current study, and this is a presentation of these studies according to its temporal sequence, which is as follows:

Al-Juhni [21] conducted a study that aimed to reveal the perceptions of students at Taif University in Saudi Arabia about the impact of self-learning on the effectiveness of remote education in light of the COVID-19 pandemic from their point of view. The study sample consisted of (234) male and female students. The results of the study concluded that the level of self-learning and remote education among Taif University students was high, and there were also statistically significant differences attributed to the effect of gender on self-learning and remote education, which were in favor of females. The study recommended giving remote education more attention after the end of the COVID-19 pandemic by reconciling it with face-to-face education.

Al-Nassar [26] conducted a study aimed at identifying the obstacles to using e-Learning via the Microsoft Teams platform during the Corona (COVID-19) pandemic in the State of Kuwait. The results showed that the majority of learners do not suffer from difficulties in e-Learning as a method of learning and teaching, but one of the obstacles is the lack of technological resources and Internet speed within homes, as well as prior training on using Microsoft Teams platform tools.

Mahdi [6] conducted a study that aimed to determine the trend towards remote learning via the Microsoft Teams platform and its relationship to self-regulation skills among a sample of Al-Azhar University students. The study sample consisted of (605) male and female students, and the results showed positive trends among the sample members of Al-Azhar university students, and there was a positive relationship between the trend towards remote learning via the Microsoft Teams platform and self-regulation skills among Al-Azhar University students.

Wijayanto et al. [27] conducted a study aimed at knowing the impact of using (Microsoft Teams 365), as an alternative to remote learning media during the COVID-19 pandemic for learning the Indonesian language. The results showed that the Microsoft Teams application achieved positive results by facilitating the learning and teaching process not only in learning the Indonesian language, but also in all educational fields.

Wea and Kuki [28] conducted a study aimed at identifying students 'online learning perceptions using the Microsoft Teams application at the University of Nusa Niba (UNIPA) during the COVID-19 pandemic, and the study sample consisted of (176) students of the School of Teachers and Education (FKIP). The results showed that students

have a good perception of using the Microsoft Teams application, and that students can experience the online learning process, such as the live learning process as usual.

Mustafa [29] conducted a study that aimed to determine the effectiveness of hybrid education using the Microsoft Teams program to improve the level of cognitive achievement among students. The study sample consisted of (120) female students, and to achieve the objectives of the study, a cognitive test was prepared. The most important results were that the proposed program using the hybrid teaching method has had a positive impact on the level of cognitive achievement of female students.

Ismail and Ismail [10] conducted a study that aimed to know the impact of the teaching approach using the Microsoft Teams application versus the obstacles in the online learning environment. The study followed the quantitative approach, and the study sample consisted of (154) university students registered for software engineering treatment at the Malaysian Private University. The results showed that most of the students did not face any difficulty in using the Microsoft Teams application, in terms of time management, nor did they face any difficulty in navigation, and they also felt comfortable and satisfied when using it.

Alameri et al. [30] conducted a study that aimed to know students' perceptions about e-Learning platforms (Microsoft Teams, Moodle, and Zoom platforms) at the University of Jordan and their relationship to self-study and academic achievement during the COVID-19 pandemic. This study examined students' perceptions regarding e-Learning using digital learning platforms (Microsoft Teams, Moodle, Zoom) at the University of Jordan. It also addresses students' knowledge about how these platforms contribute to self-learning and academic performance. The sample consisted of (450) male and female students. The students' perceptions about the method of implementing e-Learning at the university were monitored, and their opinions were also surveyed about the difficulties facing the application of e-Learning using these digital platforms. The results showed that students have a positive perception of the e-Learning applications used at the university, and that their academic performance has been greatly affected as a result of using these electronic platforms during the COVID-19 pandemic.

Al-Rashidi [31] conducted a study aimed at identifying the impact of e-Learning in improving the self-learning skills of students in the Education and Communication Technologies course at the University of Hael in Saudi Arabia. The study sample consisted of (60) male and female students, and to achieve the objectives of the study, a questionnaire that aimed to measure self-learning skills was built. This questionnaire consisted of (45) items distributed over four areas. The study found a statistically significant effect of teaching using e-Learning on improving the level of self-learning skills in favor of the experimental group. The study reached a set of recommendations, the most important of which are: Activating the use of the e-Learning system in the teaching/learning process.

5 RESEARCH METHODOLOGY

The study adopted the quasi-experimental approach and followed the design method of the two groups (control and experimental); the experimental group to which the teaching method was applied using the Microsoft Teams application, and the control group to which the traditional teaching method was applied. This was done to reveal the effect of using the Microsoft Teams application on the achievement and development of self-learning skills in the course of Computerized Children's

Programs among undergraduate students in the School of Educational Sciences at the University of Jordan.

5.1 Participants

The sample used in this study consisted of (88) undergraduate male and female students in the School of Educational Sciences at the University of Jordan, who were distributed into two sessions of the Computerized Children's Programs, and they were intentionally chosen and randomly distributed. The first was the experimental group that underwent teaching using the Microsoft Teams application, which consisted of (46) male and female students, while the second group formed the control group that was taught in the traditional way, and consisted of (42) male and female students, during the first semester 2022/2023.

5.2 Research instruments

In this study, two measurement tools were designed and developed by the researcher, namely: the achievement test and the self-learning scale.

5.3 The achievement test

To achieve the objectives of the study, an academic achievement test was built, consisting of (25) objective multiple-choice questions, prepared according to the specifications table for the unit (Classification of Computerized Children's Programs) of the Computerized Children's Programs course prescribed for teaching undergraduate students in the School of Educational Sciences at the University of Jordan. The student chooses the only correct answer to the question from four alternatives. The test has (25) items allocated, and each item is allocated one mark.

To verify the validity of the test, it was presented in its initial form to a group of (8) arbitrators with expertise in: curriculum and instruction, educational technology, measurement and evaluation, from faculty members in the School of Educational Sciences at the University of Jordan. The arbitrators' opinions and observations were taken into account, and suggested amendments were made to present the tool in its final form. To verify the reliability of the achievement test, the reliability of the internal consistency of the test was used by calculating the Pearson correlation coefficient between the items and the total degree of the test. The results showed that there is a positive and statistically indicative correlation at the level of significance ($\alpha = 0.05$) between each item with the total degree of the achievement test. All the values came high, as they ranged between (0.392–0.737), which expresses the reliability of the achievement test [32].

To verify the stability of the achievement test, it was applied to a group of students in the Computerized Children's Programs course outside the study sample, which included (30) male and female students. The application was repeated with a time interval of two weeks between both repetitions, and then the repetition stability coefficient was calculated using the Pearson correlation between both repetitions. The overall stability coefficient for the test was (0.876). Stability was calculated using the internal consistency method and applying the Cronbach Alpha equation. The stability coefficient was (0.795) using this method. Also, the internal consistency

method was implemented using the Kuder-Richardson formula (KR-20), and the stability coefficient was (0.83). These values are high and acceptable for scientific research purposes [33].

To ensure the equality of both groups on the pre-achievement test, the arithmetic means and standard deviations were extracted, and the independent samples t-test was applied to the pre-achievement test, as shown in Table 1.

Table 1. Arithmetic means and t-test for independent samples on the pre-achievement test

Group	No.	Arithmetic Mean	Standard Deviation	Calculated (T) Value	Significance Level
Experimental	46	13.17	3.43	–0.263	0.793
Control	42	13.40	4.74		

Table 1 indicates that the calculated (t) value for the total score on the pre-achievement test was (–0.263) with a significance level of (0.793), which means that there are no statistically significant differences at the significance level ($\alpha = 0.05$) between the experimental and control groups in the total score for the achievement test, which means that both groups were equal before starting the study.

5.4 Self-learning scale

A tool for measuring the extent of students of Computerized Children's Programs course has been developed for self-learning skills based on previous studies and literary references for the topic [19, 22]. The scale is of four areas: organizational skills, guidance and control skills, the skills of using learning sources, and the student's self-evaluation skills. Accordingly, the tool items were developed to serve the study objectives, and to answer the study questions and its assumptions, as the scale consisted in its final form of (30) items. The researcher also used a five-point scale: (always, often, sometimes, rarely, never). Three levels were adopted to evaluate the development of students' self-learning skills, as follows: Low level: If the arithmetic mean of the student's answers is within the category (1–2.33); Medium level: If the arithmetic mean of the student's answers is within the category (2.34–3.66); and High level: If the arithmetic mean of the student's answers is within the category (3.67–5.00).

To verify the validity of the self-learning skills scale, it was presented in its initial form to a group of (8) arbitrators with expertise in the fields of: educational technology, curricula and instruction, measurement and evaluation, and course instructors, so that they can give their opinion on it. The scale was modified according to what was agreed upon by the majority of arbitrators, with an agreement rate of (80%) in order for the tool to reach its final form.

To verify the construct validity of the self-learning skills scale, the internal consistency validity of the test was used by calculating the Pearson correlation coefficient between the items and the total score of the scale. The values of the correlation coefficients indicate the presence of a positive and statistically significant correlation at the significance level ($\alpha = 0.05$) between each item with the total score of the scale, which ranged between (0.254–0.738), which is considered high, and expresses the construct validity of the test [32].

To verify the stability of the self-learning scale, it was applied to a group of students in Computerized Children's Programs course and outside the study sample on

(30) male and female students. The application was repeated with a time interval of two weeks, and then the repetition stability coefficient was calculated using the Pearson correlation coefficient between both repetitions. The overall stability coefficient of the scale reached (0.777). Stability was calculated using the internal consistency method and by applying the Cronbach alpha equation. The stability coefficient in this method reached (0.851), and these values are considered high and acceptable for the purposes of scientific research [33].

To ensure the equality of both groups on the pre-test self-learning scale, the arithmetic means and standard deviations were extracted, and the independent samples t-test was applied to the pre-test of the self-learning scale. The results are shown in Table 2.

Table 2. Arithmetic means and t-test for independent samples on the pre-test of the self-learning scale

Group	No.	Arithmetic Mean	Standard Deviation	Calculated (T) Value	Significance Level
Experimental	46	102.59	15.46	–1.247	0.216
Control	42	106.33	12.39		

Table 2 indicates that the calculated (t) value for the total score on the pre-test self-learning scale was (–1.247) with a significance level of (0.216). This means that there are no statistically significant differences at the significance level ($\alpha = 0.05$) between the experimental and control groups in the total score for the self-learning scale, which means that both groups were equal before starting the study.

6 RESULTS AND DISCUSSION

The following are the findings of the study and discussions of the results.

6.1 Research results

First: The results related to the answer to the first study question, which stated: What is the effect of using the Microsoft Teams application on academic achievement in the Computerized Children's Programs course among undergraduate students in the School of Educational Sciences at the University of Jordan?

To answer the first question of the study, the arithmetic means and standard deviations were calculated for the performance of the study individuals in both groups in the pre-achievement and post-achievement tests, as shown in Table 3.

Table 3. Arithmetic means and standard deviations of the performance of the study individuals in both groups in the pre-achievement and post-achievement tests

Group	No.	The Maximum Value	Pre-Test		Post-Test	
			Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
Experimental	46	25	13.17	3.43	19.50	4.04
Control	42		13.40	4.74	15.10	5.21
Total	88		13.28	4.09	17.40	5.11

Table 3 indicates that there is an apparent difference between the mean of both study groups on the post-achievement test. The mean of the experimental group that used the Microsoft Teams application was (19.50), while the mean of the control group was lower, as it was (15.10). In order to verify that the difference between the means of both groups, which was (4.40), is statistically significant at the significance level ($\alpha = 0.05$), a One-Way ANCOVA analysis was conducted as shown in Table 4.

Table 4. Results of the One-Way ANCOVA for the differences in the performance of the study members in both groups in the post-achievement test

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Sum of Squares	(F) Value	Significance Level	Eta Squared Value
Pre-Test	70.753	1	70.753	3.382	0.069	
Group	435.527	1	435.527	20.817	0.000	0.197
Error	1778.366	85	20.922			
Adjusted Total	2275.08	87				

Table 4 indicates that there is a statistically significant difference in the performance of the study individuals in both group's post-achievement test, based on the calculated (F) value, which was (20.817), and is significant at the level of (0.001). With this result, the first null hypothesis is rejected, which states: "There are no statistically significant differences at the significance level ($\alpha = 0.05$) between the means of the performance of the experimental and control groups in the level of academic achievement in the course of Computerized Children's Programs among undergraduate students in the School of Educational Sciences at the University of Jordan, which is attributed to the teaching method (Using the Microsoft Teams application and the traditional method)."

The two modified arithmetic means and their standard deviations were calculated for the performance of members of the study in both groups on the post-achievement test, as it was found in favor of the mean range of the experimental group that was (19.52), which is higher than the modified mean of the control group that was (15.07) with a difference of (4.45). This result confirms the effect of the use of the Microsoft Teams application in the academic achievement of the Computerized Children's Programs course among undergraduate students in the School of Educational Sciences at the University of Jordan.

The Eta squared value was extracted, which shows the size of the impact caused by the use of the Microsoft Teams application on academic achievement in the computerized children's program course, which is equal to (0.197). This value shows that (19.7%) of the variance in achievement is due to the use of the Microsoft Teams application, and the remaining percentage of variance in achievement (80.3%) may be due to other variables that were not investigated in the current study.

Second: Results related to the answer to the second study question, which stated: What is the impact of using the Microsoft Teams application on developing self-learning skills in the course of Computerized Children's Programs among undergraduate students in the School of Educational Sciences at the University of Jordan?

In order to answer the second question of the study, the arithmetic means and standard deviations were calculated for the performance of the study individuals in both groups on the scale of self-learning skills in the computerized children's program course in the pre-test and post-test (See Table 5).

Table 5. Arithmetic means and standard deviations of the performance of the study individuals in both groups on the self-learning skills scale in the Computerized Children's Programs course in the pre-test and post-test

Group	No.	The Maximum Value	Pre-Test		Post-Test	
			Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
Experimental	46	150	102.59	15.46	124.93	12.82
Control	42		106.33	12.39	111.07	12.13
Total	88		104.38	14.13	118.32	14.24

Table 5 indicates that there is an apparent difference between the means of both study groups on the post-test of the self-learning skills scale in the computerized children's program course. The mean of the experimental group that used the Microsoft Teams application reached a value of (124.93), while the mean of the control group was lower, as it reached (111.07). In order to verify that the difference between the means of both groups, which was (13.86) as statistically significant at the significance level ($\alpha = 0.05$), a one-way ANCOVA was conducted, the results are shown in Table 6.

Table 6. Results of the One-Way ANCOVA for the differences in the performance of members of the study in both groups on the self-learning skills scale in the course of children's computerized programs in the post-test

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Sum of Squares	(F) Value	Significance Level	Eta Squared Value
Pre-Test	79.978	1	79.978	0.509	0.477	
Group	4299.435	1	4299.435	27.375	0.000	0.244
Error	13349.612	85	157.054			
Adjusted Total	17649.091	87				

Table 6 indicates that there is a statistically significant difference in the performance of the study members in both groups on the scale of self-learning skills in the computerized children's program course in the post-test, based on the calculated (F) value, which was (27.375), and is significant at the (0.000) level. With this result, the second null hypothesis is rejected, which states: "There are no statistically significant differences at the level of significance ($\alpha = 0.05$) between the means of the performance of the experimental and control groups in developing self-learning skills in the course of Computerized Children's Programs among undergraduate students in the College of Educational Science at the University of Jordan that is attributed to the teaching method (using the Microsoft Teams application and the traditional method)."

In order to determine the source of the difference in favor of the mean of any of the two groups, the two adjusted arithmetic means and their standard deviations were calculated for the performance of the study individuals in both groups on the scale of self-learning skills in the computerized children's program course in the post-test. The results indicated the difference between the two adjusted arithmetic means for the performance of the individuals in both study groups on the scale of self-learning skills in the course of Computerized Children's Programs in the post-test, which was in favor of the adjusted arithmetic mean of the experimental group, which was (125.06), and is higher than the adjusted arithmetic mean of the control group, which was (110.94), with a difference equal to (14.12). This result confirms the existence of an impact of using the Microsoft Teams application in developing self-learning skills in the course of Computerized Children's Programs among students in the School of Educational Sciences at the University of Jordan.

The value of Eta squared was extracted that shows the size of the effect caused by the use of the Microsoft Teams application in developing self-learning skills in the Computerized Children's Programs course, which was (0.244), and this value shows that (24.4%) of the contrast in developing self-learning skills in the Computerized Children's Programs is due to the use of the Microsoft Teams application. As for the remaining percentage of the variance in self-learning skills (75.6%), it may be due to other variables that were not examined in the current study.

Arithmetic means and standard deviations were also calculated for the performance of the study members in both groups on the four self-learning scale skills in the Computerized Children's Programs course in the pre-test and post-test. The results indicated that there was an apparent difference between the performance of the study courses in both groups on the four self-learning scale skills in the Computerized Children's Programs course in both post-tests. In order to verify that the differences between the means of both study groups are statistically significant at the level of significance ($\alpha = 0.05$), and in order to determine the skills in which the differences appeared, a multivariate dependent (MANCOVA) analysis of variance was applied, and the results of the analysis are shown in Table 7.

Table 7. Multivariate dependent (MANCOVA) analysis of variance for differences in the performance of study individuals in both groups on the four skills of the self-learning skills scale in the post-test

Source of Variance	Skills	Sum of Squares	Degrees of Freedom	Mean Sum of Squares	(F) Value	Significance Level	Eta Squared
Organizational Skills Pre-Test Hotelling = 1.383	Organizational Skills	61.708	1	61.708	4.199	0.044	
	Control and Direction Skills	0.060	1	0.060	0.004	0.950	
	Using Learning Sources Skills	13.620	1	13.620	1.666	0.200	
	Self-Evaluation Skills	7.441	1	7.441	1.666	0.200	
Control and Direction Skills Pre-Test Hotelling = 0.950	Organizational Skills	50.208	1	50.208	3.416	0.068	
	Control and Direction Skills	0.292	1	0.292	0.019	0.889	
	Using Learning Sources Skills	11.640	1	11.640	1.424	0.236	
	Self-Evaluation Skills	6.359	1	6.359	1.424	0.236	
Using Learning Sources Skills Pre-Test Hotelling = 1.185	Organizational Skills	56.612	1	56.612	3.852	0.053	
	Control and Direction Skills	0.237	1	0.237	0.016	0.900	
	Using Learning Sources Skills	13.050	1	13.050	1.597	0.210	
	Self-Evaluation Skills	7.129	1	7.129	1.597	0.210	
Self-Evaluation Skills Pre-Test Hotelling = 1.182	Organizational Skills	52.285	1	52.285	3.558	0.063	
	Control and Direction Skills	0.012	1	0.012	0.001	0.977	
	Using Learning Sources Skills	11.267	1	11.267	1.378	0.244	
	Self-Evaluation Skills	6.156	1	6.156	1.378	0.244	

(Continued)

Table 7. Multivariate dependent (MANCOVA) analysis of variance for differences in the performance of study individuals in both groups on the four skills of the self-learning skills scale in the post-test *(Continued)*

Source of Variance	Skills	Sum of Squares	Degrees of Freedom	Mean Sum of Squares	(F) Value	Significance Level	Eta Squared
Total Hotelling = 0.383	Organizational Skills	441.975	1	441.975	30.075	0.000	0.271
	Control and Direction Skills	412.500	1	412.500	27.568	0.000	0.254
	Using Learning Sources Skills	250.965	1	250.965	30.702	0.000	0.275
	Self-Evaluation Skills	137.106	1	137.106	30.702	0.000	0.275
Error	Organizational Skills	1190.364	81	14.696			
	Control and Direction Skills	1212.025	81	14.963			
	Using Learning Sources Skills	662.112	81	8.174			
	Self-Evaluation Skills	361.721	81	4.466			
Adjusted Total	Organizational Skills	1671.957	86				
	Control and Direction Skills	1646.198	86				
	Using Learning Sources Skills	921.081	86				
	Self-Evaluation Skills	503.199	86				

It is noted from Table 7 that there are statistically significant differences between the performance of both study groups on the four self-learning skills, based on the calculated (F) values of (27.568–30.702) with a significance level equal to (0.000). The adjusted arithmetic means and their standard deviations were extracted for the performance of both study groups on the four self-learning skills in Computerized Children's Programs course, and the results are shown in Table 8.

Table 8. Adjusted arithmetic means and their standard deviations for the performance of both study groups (Microsoft Teams and the control group) on the four self-learning skills in the course of Computerized Children's Programs

Skills	Group	Modified Arithmetic Mean	Standard Deviation
Organizational Skills	Experimental	38.02	0.58
	Control	33.32	0.60
Control and Direction Skills	Experimental	37.50	0.59
	Control	32.95	0.61
Using Learning Sources Skills	Experimental	28.97	0.44
	Control	25.42	0.45
Self-Evaluation Skills	Experimental	21.41	0.32
	Control	18.79	0.33

Table 8 indicates that the differences between the modified arithmetic mean of the performance of the study individuals in both groups on the four skills of the

self-learning skills scale in the post-test were in favor of the modified arithmetic mean of the experimental group. This result confirms the existence of an effect of using the Microsoft Teams application on the four skills of the self-learning skills scale among undergraduate students in the School of Educational Sciences at the University of Jordan. Eta squared values were extracted, which show the size of the impact caused by the use of the Microsoft Teams application in each of the four skills of the self-learning skills scale, and it was between (0.254–0.275). These values show the percentage of variation occurring in these four skills as a result of using the application.

6.2 Discussion

The results showed that there was an effect on the achievement test in the course of Computerized Children's Programs among undergraduate students in the School of Educational Sciences at the University of Jordan, which was attributed to the teaching method variable in favor of the experimental group that studied using the Microsoft Teams application. The researcher attributes these results to the fact that the use of this application has contributed in raising the achievement level of students in the course of Computerized Children's Programs because of the tools it provides that excite students and increase their enthusiasm for learning using it. The multiplicity of educational activities, frameworks, and learning patterns provided by the Microsoft Teams application made the student more positive and curious for the information they learn, and raised their ability to face the problems they encounter, as well as they provided the content in accordance with the nature of the student. Furthermore, what distinguishes the Microsoft Teams application is that it is: interactive, adaptive, and flexibility, as it displays the content of the tendency in ways suitable for the user through the interface of the application that is easy to use, which makes each learner use the application and allocates it in the way that suits it, which takes into account and simulates individual differences.

The researcher also attributes this result to the method of learning through the Microsoft Teams application to what the Microsoft Teams application provides from its presentation of the educational material in a more interesting and more effective manner, as it consolidates the learning of the student, and helps the student to acquire information and knowledge and clarify the concepts related to the educational unit in an easy way that helps them to keep it and promotes its recollection in the way that is commensurate with: their capabilities, abilities, and skills. All of this has positive effects on the learner's achievement, so learning through the application of Microsoft Teams provides an interactive and attractive educational environment and encourages effective active participation in it, as activities' questions were the open answer questions that give students enough space to seek their answers freely and without restriction, and this would develop in the student the feeling of the importance of achievement through electronic learning.

This result is consistent with the study by Mustafa [29] and the study by Alameri et al. [30], where the Microsoft Teams application helps students increase their understanding and achievement, and provides easy and convenient access to information at any time. This result is also consistent with Al-Zaboun and Hamdi's study [22], the results of which showed that there was a statistically significant difference between the two research groups in cognitive achievement and attitude towards the course in favor of the experimental group that used the Microsoft Teams application.

The results also showed an impact on developing self-learning skills among the computerized children's program students, attributed to the method of teaching

in favor of the experimental group that was studied using the Microsoft Teams application. The researcher attributes this result to the teaching method using the Microsoft Teams application to the ease of using the application interface while maintaining complete security and user privacy, and the ease of downloading it that encourages students to interact inside and outside the classroom, and to receive new instant notifications related to homework or new notes.

The researcher attributes this result to the capabilities of the Microsoft Teams application in creating an interactive teaching and learning environment between students and their colleagues. Students can also talk and communicate with colleagues through the chat feature, or direct video and audio communication, which enhances their self-learning skills. Iin addition to that, self-learning develops the learner's ability to make decisions, and provides an enjoyable atmosphere for studying the course through modern technologies and what is appropriate for his abilities. Self-learning is also one of the most important learning methods for students that allows the use of learning skills with high effectiveness, and helps students in the process of remembering information faster and engaging in the learning process through the technical skills that have been acquired and employed in the learning process, and their reliance on themselves in learning.

This result may also be attributed to the various educational applications that were used by the teacher and students, which may contribute to developing the students' self-learning with their various skills. The multiple technical components included in the Microsoft Teams application have created advanced scientific and technical capabilities in the students, which may contribute to developing the learner's self-abilities and providing them with a set of basic skills for the educational course through students' participation, their search for information, increasing their motivation, and effective participation with the teacher and his colleagues. The use of the Microsoft Teams application, which is applied in Computerized Children's Programs course, has helped students master the skill of discovering knowledge and learning on their own, presenting distinctive scientific projects, increasing the connection of concepts to each other for them, and increasing students' self-confidence by presenting assignments and activities in the style that suits them.

This result is consistent with many previous studies that indicated the role of using technology and modern techniques such as: Microsoft Teams application and others in achieving and developing self-learning skills among students, such as: Abu Rumman and Hamdi's [25], Al-Zaboun and Hamdi's study [22], and the Al-Juhni's study [21], the results of which showed the effectiveness of teaching using electronic educational platforms and technological applications in developing learners' self-learning skills.

7 CONCLUSION AND RECOMMENDATIONS

This study revealed that there was a positive significant effect of using Microsoft Teams on the achievement and self-learning skills among undergraduate students in the School of Educational Sciences at the University of Jordan. As per the study results, the researcher presents a number of recommendations, which are as follows:

1. Activating teaching using the Microsoft Teams application in circumstances where it is needed (activating distance learning) and implementing it in all other educational courses and all scientific specializations, due to its clear impact on increasing students' achievement and developing their self-learning skills.

2. Conducting training courses for instructors on how to use the Microsoft Teams application to explain how to take advantage of the maximum capabilities of this application.
3. Encouraging instructors and course coordinators of the necessity of providing educational content and producing it in a way that is appropriate for e-Learning and interactive multimedia.
4. Conducting similar studies on other courses looking at the effect of the use of the Microsoft Teams application on other variables, such as: motivation, creative thinking, and social communication, due to its positive impact on the educational process in general.

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