The Effect of Using Google Classroom Application on Tenth-Grade Students' Achievement in the Computer Subject in Jordan

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Abstract

This study aimed to identify The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject in Jordan. In order to achieve this goal, the quasi-experimental method was used. The study individuals consisted of (52) male and female students of the tenth-grade who were intentionally selected from the University of Jordan School; they were distributed randomly so that one section of the tenth-graders was selected to be a control group and consisted of (25) male and female students, and another section of the same school was selected to be an experiment set and consisted of (27) male and female students. To achieve the objectives of the study, an achievement test which consisted of (20) questions was developed. The results showed that there was a statistically significant effect in the telemetry of using the Google Classroom application on the achievement of the tenth-grade students in the Computer subject. Based on the results of the study, the researchers recommend to put into practice teaching using the Google Classroom application in the field of distance learning and employing it in the rest of the other educational subjects and all classes, preparing the study materials to be compatible with the use of the Google Classroom application, developing and providing the necessary requirements for teaching using the Google Classroom application in schools and universities, and holding training subjects for teachers to guide them on how to use it.

1. Introduction

The world is facing scientific problems and revolutions, technological development, and a wide range of knowledge, as the accumulation of discoveries, theories, and their cognitive and technological implementations increase with unprecedented degrees. Countries are more interested in adding various technological technologies to the educational system within educational institutions due to their importance in developing different aspects of life regardless of their various negative and positive aspects.

Throughout different ages, education has been constantly evolving with knowledge and communication tools, as it aims to bring about different developments in ways and methods to challenge the accelerating and escalating changes. Modern technologies have greatly influenced the development of new ways of learning since their emergence, which helped solve most of the challenges faced by educational systems and led to presenting several proposals regarding the reform of the educational system with all its inputs, processes, and outputs.

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Education was not limited to providing the student with various facts and information, but rather it gave the student a space to rely on himself and develop his skills and abilities with the aim of adapting with the changes of the times, and thus becoming able to create a new life. (Schorm, 2019)

Recent technological trends have introduced new educational systems, such as what is known as: "E-learning", which relies on the use of computers, the Internet, and various interaction techniques in the education process (Al-Khalifa, 2010).

E-learning in particular has been adopted by educational institutions around the world and has been used as part of blended learning, where it is integrated into systems in conjunction with regular classroom learning.

Nowadays, it has become even more important because of the Covid-19 pandemic that the world faced during the last period (Vasanth & Sumathi, 2020). Google technologies are among the interactive educational technologies that provide teachers and students with many educational tools - regardless of whether they are technical or administrative. It is known that Google products that cover the needs of the world are spreading widely. It was expected that they would be implemented in the world of education, and they share in the educational fields have now increased impressively (Kakah, 2018).

Google offers a set of productivity applications that are provided free of charge to educational institutions; these applications include: G-mail, Google Calendar, Google Drive, Google Docs, Google Sites, Google Classroom, and other services (Al-Amour and Al-Olaimat, 2016).

Google Classroom applications have several characteristics over other companies, which made many educational institutions choose collaborative solutions for Google Classroom applications to become integrated in the technological world. One of the most important benefits of the Google Classroom application in educational institutions is that it allows the user to access specific files via Google Drive without the need for a specific application to be available on the user's device, and thus reduces security risks and required hardware resources (Sukmawati & Nensia, 2019).

Al-Dalaan (2018) confirmed that educational institutions can benefit from the great services provided by Google, such as: conducting complex operations, providing applications needed by the learner and teacher, the ease of sending exercises, assignments, and projects to students, and helping to teach students in new ways. Also, they help them to manage their projects and duties, obtain different opinions between students and teachers, and to make communication between the students themselves easier.

The subject of academic achievement is among the important topics in learning that many scholars of educational psychology have researched, as it describes what is required of the student to achieve at the end of the academic unit. Therefore, researchers in the fields of educational sciences and psychology have paid attention to academic achievement because of its effective impact on the different academic stages of students, as it is the result of what is applied in the educational institution in terms of different learning processes for many skills, knowledge, and sciences that indicate cognitive and mental activity (Khawalda, 2015). Learning through Google technologies is directly related to academic achievement, helping the learner to adapt to life and face its problems by using his knowledge to think and make current and future decisions (Al-Khafaji, 2011).

The Ministry of Education in the Hashemite Kingdom of Jordan has worked to keep pace with modern computerized technologies by continuing to use some applications, such as: (Google Classroom) in the course of learning, and working to spread the culture of e-learning among teachers and students. Google Classroom applications are a big leap towards developing educational processes, and it is an effective tool in using technology to present scientific content to students in a fun, interesting, and effective way.

Given the importance of using distance e-learning applications in the educational learning process, especially during the Corona-virus pandemic. This study came to determine the impact of using the (Google Classroom) application on the achievement of tenth-grade students in the (Computer) subject in Jordan.

1.1. Study Problem and Questions

Scientific and technological progress at the beginning of the 21st century played an important role in the development of human life in all fields, especially in general education, which led to a change in: its objectives, methods, teaching methods, and curricula, so the use of learning management systems became more prominent in the fields of education. Countries and nations are competing with each other in adopting these systems in their various educational institutions in: schools, institutes, and universities, which has led to a quantum leap in the teaching and learning process.

The use of technologies known to the world is an important pillar of public education policy in the Hashemite Kingdom of Jordan. Educators have paid attention to learning management systems and their various forms, including Google Classroom applications, which is a challenge for educational institutions. It is noted that the great progress in terms of quantity in the field of technology has not been matched in terms of quality in the abilities of teachers and students to use modern technology, as learning management systems are still in their early infancy. The observer of the reality of educational technology in educational institutions notes that this field is in great need of efforts to work on its development after recent experiences using Google Classroom applications, especially during the Corona-virus pandemic (Vasanth & Sumathi, 2020).

Hence, interest in Google Classroom applications and multimedia has increased locally and globally to contribute to the development of the educational process and to the continuation of the educational process during the Corona-virus pandemic that affected the whole world and beyond, due to the flexibility and interactivity of Google Classroom applications.

It is noted through the results of educational studies - such as the study of Musalami (2014) - that there are obstacles facing e-learning, including: creating a document in which two or more users cooperate, where students face a problem that a lot of time and effort is spent on resolving issues related to applications.

Through the experience of the researchers and their direct observation of the reality of using Google Classroom applications in public education; based on the foregoing and the lack of topics related to Google Classroom applications and their use in the local educational field - as far as the researchers are aware - and the inability of students to join their classes at schools during the Corona-virus pandemic. Also, due to the lack of Arabic studies in this field, this study was presented as an attempt to discover The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject in Jordan.

The study also attempted to answer the following main question: What is The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject?

1.2. Study Importance

The importance of the current study lies in the need to know The outcome of utilizing the Google Classroom application on achievement, motivation, interest in developing methods of teaching methods, integrating modern technology into the educational process, and its impact on achieving effective teaching in the educational field. Therefore, the importance of the current study appears in the following aspects:

1.2.1. First: Theoretical Aspect

The results of the study contributed to the following:

(1)   Focusing on the impact of using the Google Classroom application on the achievement of tenth-grade students in the Computer subject in Jordan. The Ministry of Education can take steps and recommendations to achieve the positive effects and reduce the negative effects of using Google Classroom applications in light of the results of this study.

(2)   It may be useful in supporting and developing the teaching-learning process by using advanced and modern technological means associated with the use of e-learning platforms and employing them in education fully or complementary to regular education.

(3)   It may pave the way for many researchers to conduct future studies on the use of the Google Classroom application.

1.2.2. Second: The practical aspect

The results of the study contributed to the following:

(1)   Identifying The outcome of utilizing the Google Classroom application on students' achievement.

(2)   It helped provide and develop an e-learning environment full of the interaction and activity of learners, and is compatible with their needs and individual differences when employing modern technology.

(3)   This study had important and fundamental effects that contribute to the development of the teaching-learning process, the preparation of academic subjects, and the development of the capacities of teachers and learners in schools using modern teaching methods.

1.3. Study Terminology

Some procedural terms were used in the research, which are known as follows:

●   Google Classroom application: Hussein (2014) defined it as: a group of programs and cloud storage media over the Internet that can be run and viewed via a web browser without the need for users to purchase or install software; they can directly use the service and access their files and processing tools. The researchers define it procedurally as: one of Google's educational application programs through which the teacher can build an electronic classroom that complements regular education, and through which educational materials, homework, and projects are all published.

●   Academic achievement: Al-Jalali (2011) defined it as: achieving the learning outcomes intended to be acquired for students, represented by: facts, information, skills, values, and attitudes. The researchers define it procedurally as: what the learner acquires from: knowledge, experience, information, and terminology about the subject of (Using Computers in Education), and it will be measured by the total scores obtained by the student in the (Computer) subject in the first semester of the academic year (2021/2022) based on the achievement test that was prepared for the purposes of the study.

1.4. Study Delimitations

The research is limited to the following limits:

(1)   Human and spatial delimitations: The study included only tenth-grade students at the University of Jordan School in Amman, Jordan. The study individuals consisted of (52) male and female students of the tenth-grade who were intentionally selected from the University of Jordan School; they were distributed randomly so that one section of the tenth-graders was selected to be a control group and consisted of (25) male and female

students, and another section of the same school was selected to be an experiment set and consisted of (27) male and female students.

(2) Temporal delimitations: The study was applied during the first semester of the academic year (2021/2022).

(3) Objective delimitations: This study dealt with the issue of The outcome of utilizing the Google Classroom application on the achievement towards computer learning among tenth-grade students in the Computer subject in Jordan only; the study was applied using the second academic unit (Small Basic software) in the Computer subject for the tenth-grade.

(4) Objective parameters: The objective parameters were determined by the nature of the procedures in terms of the way the study tools were prepared and their psychometric characteristics; moreover, the possibility of generalizing the results of the study to the community from which the sample was taken was determined.

2. Theoretical Framework and Previous Studies

This section of the study presents a review of the study literature on research topics and reviews studies related to the research; it offers a description that represents a review of the previous educational literature. It consisted of a theoretical framework that includes an overview of Google classroom applications and achievement, and it also included a review of some of the previous Arabic and foreign studies related to the topic.

2.1. Theoretical Framework

This part of the study deals with two main aspects as follows:

2.1.1 Google Classroom Application

Google introduced the (Google Suite) application for education in May of 2014 which helps institutions and individuals to join a group of applications in one interface, and it helps them to compile a group of applications in one interface. It can be called an (educational platform), which is suitable for educational institutions of all kinds; it provides the possibility of educational management and provision of registration services for classes and permitting educational materials, as well as providing operations related to the follow-up of classes and all learners. Also, it helps the teacher to use the system independently, where the teacher presents the scientific subject, conducts short tests, communicates with students directly, and allows learners to enter their classes independently, take their exams, and facilitate communication between them and their teachers or colleagues collectively or individually, and all of this is done via the Internet.

Initially, the company was thought to require users to create an account and sign up for the Google Suite. However, when the demand for the application increased, anyone with a Google email account was allowed to use it in March 2017 to achieve the company's goals (Google, 2017).

Google has provided a set of free applications that help in interaction between students, their teachers, and the students themselves, including the Google Chrome browser to search for knowledge easily and at high speed, Google Docs editor to create texts, format them, and convert Word files into documents that can be formatted, edited, exchanged and accessed regardless of time and place. Furthermore, there is group video chat for video conferencing, virtual meetings, YouTube for downloading and uploading videos, email service which allows electronic messages to be exchanged between students and teachers and stored in order to share information, Google Translation which translates words, sentences, texts, Google Scholar for scientific research published for researchers and academics, and Google Drive for storing and sharing individual files. The best one of

these applications feature-wise is Google Virtual Classrooms regarding learning management (Al-Najjar, 2019).

These applications are characterized by being free and easy to access by registering with a Google account and using them via computers and smart phones. They save time and effort by sharing educational files, have high storage capacity, and a high level of protection. They also provide simultaneous and asynchronous communication that is suitable for all its users; these applications are known as: "cloud computing". (Shahin, 2004).

Bogdan, Andreea, and Camelia (2015) define Google Classroom as a learning management system that aims to simplify classroom creation, categorization, and content delivery for online learners. It is defined by Teodora and Ioana (2017) as an Internet-based computerized system based on the integration of (Google Suite) educational applications with all services and other applications of (Google Suite) and all Google applications, and allows its users to provide e-learning and manage its operations.

Al-Bawi and Ghazi (2019) defined Google Classrooms as an application that represents an interactive educational environment that employs web technology. Teachers use it to set: objectives, educational activities, and computerized lessons through multiple technologies; it allows the exchange of ideas between the teacher and his students to achieve high quality educational outcomes.

Google educational applications have advantages that are of great benefit to the educational process, as they provide exciting methods for learners to increase their motivation and enthusiasm within a flexible learning environment by relying on cloud computing technology. All of which develop self-learning skills and personal and social skills for students, and make them ready to compete in the global economy. These applications are characterized by providing collaborative and participatory learning collectively through peers to help them acquire self-evaluation skills, as well as acquiring research skills and facilitating the use of publishing tools of information and media on the web and sharing them when needed. The teacher follows up the students' progress and development since Google applications automatically record students' work on their databases; the teacher grades them, and feedback is provided by teachers (Al-Dalaan, 2017).

Google is characterized by providing a collaborative, interesting, and exciting learning environment that is characterized by activity and dynamism, in addition to excellence and effectiveness in teaching strategies, and diversity in teaching and learning methods to develop higher-order thinking skills. The computer organizes the learning process, enables teachers to teach and prepare tests in a fun way that makes students continue their learning, stores information in different ways and retrieves it easily, provides educational content in a sequential and elaborate manner, helps students learn different topics, and assists them in the education process. All of which help to foster a lasting positive impact in multiple educational situations (Abu Sarah, 2020).

The Google Classroom application is also free, enabling its users to access it directly from the Internet, and it is based on cloud computing, which helps in accessing files from anywhere and without special equipment or cost; it also supports all languages in the world, and it can be accessed from any browser and from any computer or smart phone with an easy-to-use control panel for the teacher and his students. It is a high-quality application regarding levels of authority available to users, and it can be linked with other devices in the educational institution; the educational content can be output in more than one format, for example outputting a subject as an Excel file or (pdf), and outputting reports for quick decision-making. It allows each student to access it individually and with the creation of their own profile and in more than one style in order for their class assignments to be viewed by their teacher. The teacher can arrange the classes according to priorities and academic loads and uploads the subject in various ways such as: printed

files, Word files, presentations, and video clips. It is also possible to link with YouTube directly, create advertisements, upload homework, and conduct necessary grading (Al-Samkari & Al-Jarrah, 2018).

The technical and technological development has become a feature of the twentieth century, which is in line with global trends towards educational quality standards in the use of modern technological technologies in the educational sector. Multiple Google applications have been relied upon to deliver educational content electronically, and to increase interaction between teachers and learners in a positive and easy way, while saving: time, effort, and flexibility in the teaching process due to the shift towards distance learning after the outbreak of the Corona-virus epidemic (Al-Khazaleh, 2020).

 Google educational applications are among the applications that are used in the educational sector to achieve effective communication between employees in educational institutions. They serve as an electronic medium within an integrated educational environment that enables the teacher to present the education process to the student in an interesting and attractive way to achieve positive results for the educational process.

2.1.2 Academic Achievement

It is the mastery of a number of knowledge and skills that a student can acquire after passing educational experiences in some specialized subjects or even one subject. The concept of achievement is defined as being able to measure the student's ability to understand the academic material, to what extent he is able to apply it through specific measurement parameters used by the school; this is done through oral and written tests that are held at different times as well as daily and quarterly exams (Rivkin, 2010).

Academic achievement is the first measure used by teachers to find out the extent to which students' educational goals are achieved, which is one of the important aspects of students' mental progress (Al-Jalali, 2011). Researchers in the field of education and psychology are interested in academic achievement, which is an important necessity in the students' academic life, because it is the result of different and multiple learning processes for different skills, knowledge, and sciences that illustrate cognitive mental activity. Achievement indicates that students achieve the highest level of science or knowledge for themselves in all the different stages of their lives, from their childhood until the advanced stages of their lives (Baqi'i, 2014).

Nasrallah (2004) defined achievement as: the general average that students obtain at the end of the academic year, which includes all marks achieved: daily, monthly, or quarterly, and at the end of the academic year, in each subject. It also specifies the level of the student for one subject in terms of his strengths and weaknesses, and the total average that the student reaches in all subjects through: oral or written learning, or daily or monthly learning that depends on conducting special tests and examinations.

Rivkin (2010) indicated that achievement is a student's ability to study after completing a specific curriculum. The concept of counting includes the quantity and knowledge that the student has achieved after graduation by studying the various subjects. Achievement: It is the student's mastery of the skills and abilities that he may possess after being exposed to educational experiences in a specific subject or group of subjects.

The computer programs aim raise the level of achievement based on training and practice, with the availability of good program specifications of: illustrations, sounds, and shapes. The computer provides the educational content and the students respond with: increased motivation, increased positive interaction, and increased active exchange with the computer in receiving computerized lessons without fear, while taking into account the individual differences between them and providing feedback when needed. All of which lead to an increase in their achievement and benefit from the multiple educational styles and increase their motivation due to the freedom they have in e-learning (Al-Shura, 2015).

2.2. Previous Studies

The researchers reviewed many studies related to the subject of the current study, and the following is a presentation of those studies according to their chronological order from the newest to the oldest, as follows:

Al-Khazaleh (2020) conducted a study aimed at identifying the impact of using Google Classroom applications and multimedia to teach the "Using Computers in Education" subject on the achievement of Al-AlBayt University students, their acquisition of classroom interaction skills, and their motivation towards learning. The quasi-experimental approach was used with one group with pre and post measurement to achieve this, as the researcher selected a sample consisting of (69) male and female students from the subject of (Using Computers in Education) at Al-AlBayt University during the first semester of the academic year 2020/2021. An achievement test consisting of (30) questions, a measure of classroom interaction consisting of (25) items, and a measure of motivation towards learning consisting of (35) items were created to achieve the objectives of the study. The results showed that there is a statistically significant effect in the post-measurement of the use of (Google Classroom) applications and multimedia to teach the subject of (Using Computers in Education) regarding the achievement of Al-AlBayt University students, their acquisition of class interaction skills, and their motivation towards learning.

Al-Wasiti (2020) conducted a study aimed at identifying The outcome of utilizing the (Google Classroom) application on achievement in the physics subject for secondary school students in private schools in Madaba Governorate in Jordan; he used the quasi-experimental approach, and the study population consisted of all secondary school students in private schools in Madaba Governorate in the second semester 2019/2020. A purposive sample consisting of (53) male and female students was selected, and they were divided into two groups; the experimental group consisted of (28) students who were taught through the Google Classroom application. The control group consisted of (25) people who were taught in the usual way, and an achievement test was prepared as a study tool. The results of the study showed that there were statistically significant differences between the average scores of the students of the experimental group and the oversight group in favor of the experimental group.

Sukmawati and Nensia (2019) conducted a study aimed at examining the role of Google Classroom applications in teaching English. The study followed the quasi-experimental approach, and it was applied to a sample of (41) middle school students in the United States of America; they were distributed into two group, a control group and an experiment set, and a test was prepared in the English language subject. The results showed that there were statistically significant differences between the average scores of the experimental group and the oversight group on the test in the English language subject in favor of the experimental group.

Al-Samkari and Al-Jarrah (2018) conducted a study aimed at knowing The outcome of utilizing the (Google Classroom) application as an e-learning management system by applying it in (Introduction to Curricula) subject, and knowing the effect of this on developing scientific thinking skills among students of the Faculty of Educational Sciences at the University of Jordan. The study used the quasi-experimental approach, and the study sample consisted of (37) male and female students enrolled in the subject of (Introduction to Curricula) and they were counted in the experimental group, while the number of members of the control group was (40) male and female students. The scientific reasoning scale was used, and the results showed that the Google Classroom application had a statistically significant effect on the development of scientific thinking skills, in favor of the experimental group that studied the subject according to Google Classroom. The study recommended the need to use the Google classroom application in Jordanian universities.

Gupta & Pathania (2018) conducted a study aimed at examining the impact of using Google Classroom applications as an educational platform on improving teachers' learning levels. The study adopted the quasi-experimental approach; a test was prepared in the teachers' learning level for the purposes of achieving the objectives of the study, and the study consisted of (36) male and female teachers in the United States of America who were distributed into two groups, a control group and an experiment set. The results showed indicates there were statistically significant variations between the average scores of the experimental group and the oversight group on the test and in favor of the experimental group that used the Google Classroom platform.

Olaimat (2016) conducted a study aimed at revealing the effectiveness of Google educational applications in acquiring scientific terminology in the biology subject for tenth-grade students in the Negev district in Palestine, and the quasi-experimental approach was used. The study population included all tenth-grade students in the Negev district in Palestine, and a sample consisting of (133) males and females was chosen purposefully, and it was divided into two groups: The first group: represents the experimental group of (64) students who studied using the Google classroom. The second group: includes the control group of (69) students who studied in the traditional way. The results of the study concluded that there are statistically significant differences at the level of significance ($\alpha=0.05$) in the test of acquiring biological scientific terms in the (Blood) unit of the tenth-grade students due to the teaching method and in favor of the experimental group.

2.3. Commentary on Previous Studies

By reviewing the previous literature, the methodology, objectives, and results of these studies, the researchers discovered the following:

1.   The study agreed with the rest of the studies in relying on the quasi-experimental approach, such as: the study of Sukmawati and Nensia (2019), the study of Gupta and Pathania (2018), and the study of Al-Habib and Al-Jarrah (2018).

2.   Previous studies were beneficial through their theoretical literature and knowledge of the chronological development of the topic of the current study. Most studies agreed on the impact of the Google classroom, such as: the study of Olaimat (2016), the study of Al-Habib and Al-Jarrah (2018), the study of Al-Wasiti (2020), and the study of Gupta and Pathania (2018), and the study of Sukmawati and Nensia (2019).

3.   The current study is similar to previous studies in several matters, including: focusing on the topic of Google Classroom applications, but it differs from it in the following matters: It dealt with the use of the Google Classroom application in the achievement of tenth-grade students in the (Computer) subject and their motivation towards computer learning in Jordan.

4.   This study comes to confirm the results reached by some previous studies and complement them in terms of rapid developments. On the other hand, the current study is distinguished from others by being one of the first studies in the Arabic language - as far as the researchers know - and there is no study in Jordan that has dealt with this topic, which is The outcome of utilizing the (Google Classroom) application on the achievement of tenth-grade students in the (Computer) subject in Jordan, particularly during the Corona-virus pandemic.

3. Methods and Procedures

This part of the study deals with the study methodology, its population, tools, validity, stability, variables, application, and statistical processes that were used to answer the study questions.

3.1. Study Methodology

The researchers used the quasi-experimental approach due to its suitability for the purposes and nature of the current study and the achievement of its objectives, as the study individuals were chosen intentionally and distributed randomly. The study follows the method of designing two groups: the experimental group, to which the teaching method was applied using the (Google Classroom) application, and the oversight group, to which the teaching method was applied in the traditional way. This was done to know The outcome of utilizing the (Google Classroom) application on the achievement of the tenth-grade students in the (Computer) subject in Jordan, and the reality of this experience.

3.2. Participants

The study individuals (participants) consisted of (52) male and female students from the tenth-grade, who were deliberately chosen from the University of Jordan School, which includes more than one class for the tenth-grade; they were distributed randomly so that one of the tenth-grade classes was selected in it to be a control group, consisting of (25) male and female students, and another section was selected from the same school to be an experiment set, consisting of (27) male and female students.

It is important here to point out that because the quasi-experimental method was applied in the study, and since there were only four sections of the tenth-grade classes in the indicated school were chosen intentionally to participate in this study, two sections of them were selected randomly; one section as a control group where the other section as an experiment set.

3.3. Teaching Method

The following is an explanation of the method of teaching the students of the experimental group and the method of teaching the control group:

Firstly: The control group was taught using the traditional method (used in the University of Jordan School), as the second unit (Small Basic software) was taught to students of the control group during the first semester of the academic year 2021/2022 over the course of a full month, with (3) lessons per week, and the duration of each session was (40) minutes. The researchers first distributed the pre-achievement test on paper to the members of this group, and then started the process of teaching and providing information through the use of the proposed teaching strategies, such as: lecturing, critical thinking, and activities in the textbook. The facilities available in the university school were also used, such as: the computer lab and the projector; the objectives of the lesson were determined in each class by writing them on the board, making the appropriate preparation, and reviewing the previous information through the strategy of critical thinking, where the problem is presented to try to find suitable solutions for it. Explaining was done using the lecturing strategy to present the ideas and experiences contained in the subjects using the projector in the computer lab, identify the important points in the subject, and ask questions and discuss them with the students. The role of the students was limited to receiving information and limited participation in reading the book and answering the questions raised and discussing them under the supervision of the subject teacher; paper worksheets were distributed to the students at the end of each class, as each worksheet consisted of four questions to be answered by the students in the form of a homework, and then to be submitted at the beginning of the next class. After completing the teaching of the second unit, the post-achievement test was conducted on paper; the most important characteristic of this method used in teaching the students of the control group is that it did not use the (Google Classroom) application in teaching students.

Secondly: The experimental group was taught using the (Google Classroom) application, as the second unit was taught (Small Basic) software to the students of the experimental group during the first semester of the academic year 2021/2022 over the course of a full

month, at the rate of (3) lessons per week, and the duration of each session was (40) minutes. The researchers distributed the pre-achievement test in paper form to the members of this group, and then started holding the class meeting through the application using the live video feature, in which a review was done to what was previously studied in the last class meeting. Then, the content of the subject is presented explaining new topics, presenting an educational video regarding the lesson, presenting information, identifying important points in the subject, asking questions and discussing them with the students using the (Google Classroom) application. Questions were sent in the conversation for group discussion among students so that they can express their opinions regarding the topic of the lesson, which creates an interaction environment based on respecting the views of others during the time of the meeting, in addition to the homework given. Worksheets were created that included evaluation questions, and each worksheet included a number of questions, where students could answer them at the end of each session, after which the students' answers on the worksheet are re-sent electronically with the correct answer form in the form of a (Word) file, and the students were asked to commit to submitting the required worksheet on time. After completing the second unit, the post-achievement test was conducted, and then the researchers worked on the educational subject and produced it as required for the group under the supervision of the subject teacher.

3.4. Study Instrument

In this study, the researchers designed the following measurement tool to identify The outcome of utilizing the Google Classroom application on the tenth-grade students' achievement in the Computer subject in Jordan.

3.4.1. Achievement Test in the Computer Subject

To achieve the objectives of the study, an achievement test was designed and developed. It consisted of questions to measure the achievement of the (Computer) subject students at the University of Jordan enrolled in the first semester 2021/2022. The researchers prepared an achievement test for the purposes of this study, and then classified the objectives of the unit, which were later adopted according to Bloom's classification of levels of knowledge of: (remembering, understanding, and applying).

The process of creating the achievement test was carried out according to the following steps: Preparing the test items based on the behavioral goals specified in the teacher's guide in the Computer subject. The test in its final form consisted of (20) multiple-choice items, then one correct answer was approved from the four alternatives for each item; the highest score for the test was (20) and the lowest score was (0). In drafting the test items, the researchers took into account the clarity and simple language that suits the level of the tenth-grade students, and the connection of the content of the items with the content of the unit and its behavioral objectives. The researchers also took into account the clarity of the answers and that there were no answers that carry the same meaning.

3.4.2. Validity and Reliability of Study Instrument

The following steps were taken to ensure validity and reliability of the study instrument.

3.4.2.1. Validity of Study Instrument (Achievement Test)

To verify the apparent validity of the achievement test items, the researchers presented the study tool in its primary form to a group of (8) arbitrators with specialization in the field of: educational technology and curricula, teaching, measurement, and evaluation from faculty members in the Faculty of Educational Sciences at the University of Jordan.

The opinions of the arbitrators were taken into account in the clarity of the items, their linguistic and scientific integrity, their validity in terms of wording and content, the item's relation to the field in which it was prepared to be measured and its suitability for the dimensions in which it was included, the extent of its suitability for the purposes of the

study, the degree of their inclusion of the skills required of them, as well as the addition of any proposals to make appropriate amendments or modification to the items, whether in the form of addition or deletion.

Based on the opinions and suggestions presented to the arbitrators, the researchers took their observations and suggestions into consideration, and the amendments were made accordingly to present the instrument in its final form.

3.4.2.2. Structural Validity of the Instrument (Achievement Test)

In order to verify the structural validity of the achievement test, the Pearson correlation coefficient was used to indicate the degree of correlation of the mean of each item in the test with the overall mean of the test; Table (1) shows these coefficients.

Table 1. The degree of correlation of the mean of each item in the test with the overall mean of the test

Item No.	Its Correlation Coefficient with the Total Score of the Test	Item No.	Its Correlation Coefficient with the Total Score of the Test
1	0.72 **	11	0.68 **
2	0.66**	12	0.79 **
3	0.72**	13	0.34 **
4	0.71**	14	0.35*
5	0.72**	15	0.35*
6	0.89**	16	0.31*
7	0.71**	17	0.35*
8	0.80 **	18	0.31*
9	0.65**	19	0.73 *
10	0.72 **	20	0.71**

** The correlation is statistically significant at the significance level (0.01).

The above table shows that the correlation coefficients of all items of the achievement test with the total score of the test were positive and statistically significant, as these coefficients ranged between (0.31-0.89), and these values indicate the existence of the structural validity of the test.

3.4.2.3. Difficulty and Discrimination Coefficients for the Instrument

The coefficient of difficulty and discrimination for each item was calculated after testing an exploratory sample consisting of (20) male and female students from outside the study sample. Table (2) shows the results.

Table 2. Difficulty and discrimination coefficients for the achievement test

Item No.	Difficulty Coefficient	Discrimination Coefficient
1	0.54	0.72
2	0.60	0.35
3	0.57	0.72
4	0.40	0.44

5	0.44	0.50
6	0.47	0.30
7	0.44	0.37
8	0.34	0.30
9	0.37	0.37
10	0.40	0.44
11	0.54	0.44
12	0.37	0.37
13	0.40	0.44
14	0.54	0.44
15	0.30	0.47
16	0.38	0.43
17	0.38	0.47
18	0.30	0.44
19	0.54	0.65
20	0.54	0.72

3.4.2.4. The Reliability of the Instrument (Achievement Test)

The internal consistency method was used on a survey sample consisting of (20) students from the study community and from outside the study sample with the aim of verifying the stability of the test; this is to identify the extent of internal consistency between the test items.

The stability coefficient (reliability) of achievement test was calculated using the Kuder-Richardson Formula (20), and the value of stability was (081). The appropriate method was used to test and re-test on an exploratory sample of (20) students from the study community and outside the sample of study individuals by applying the test twice on the survey sample, with a time difference of two weeks. By calculating the Pearson correlation coefficient between the two applications, it was found that the stability coefficient was (0.77), and these values are acceptable for the purposes of this study (Odeh, 2010).

3.5. Study Procedures

To reach the objectives of the study, the researchers proceeded according to the following procedures:

1.   Obtaining a letter of address to the concerned authorities from the University of Jordan to facilitate the task of researchers.

2.   Determining the study population and its sample, which are tenth-grade students.

3.   Distributing the students randomly into the experimental and control groups.

4.   Applying the achievement test on the students of the tenth-grade in the control and experimental groups beforehand, noting that the implementation of the two study tools from the experimental and control groups was done beforehand. The

implementation took place during the period from 3/11/2021-24/11/2021, with a total of (12) sessions, and the duration of each session was (40) minutes.

5.	Applying (Google Classroom) on the tenth-grade students in the experimental group and teaching the other group according to the usual method, that is: according to the teaching plans prepared by the researchers.

6.	Applying the achievement test after the fact on the tenth-grade students in the control and experimental groups.

7.	Providing data to the software to perform appropriate statistical analyses.

8.	Extracting results and making recommendations.

3.6. The Equivalence of Both Groups on the Pre-Achievement Test

To ensure the equality of the two groups in the pre-test, the arithmetic means and standard deviations were extracted, and the t-test was applied to the independent samples on the pre-application of the achievement test. The results are shown in Table (3).

Table 3. Arithmetic means, standard deviations, and t-test for independent samples on the pre-application of the achievement test

Group	Number	Arithmetic Mean	Standard Deviation	T-Value Calculated	Significance Level
Experimental	27	9.85	2.476	-0.819	0.417
Control	25	10.48	3.043		

Table (3) shows that the calculated t-value for the total scores in the pre-achievement test was (-0.819) at the level of significance of (0.417), which indicates that there are no statistically significant differences at the level of significance ($\alpha = 0.05$) between the experimental and control groups in the total score of the achievement test. Equivalent means were used for both groups before the start of the experiment.

3.7. Study Variables

The study included the following variables:

3.7.1. The Independent Variable

Teaching method with its dimensions:

•	Teaching using the Google Classroom application.

•	Teaching using the translational method.

3.7.2. The Dependent Variable

Academic achievement test in the Computer subject for tenth-grade students.

3.8. Statistical treatments

This study used descriptive and inferential statistical methods of arithmetic mean and standard deviation, Pearson's correlation coefficient, Cronbach's alpha equation, and Kuder-Richardson Formula (20) were used to verify the validity and reliability of the study instrument. One-Way ANCOVA was used to answer the main question of the study to reveal the significance of the differences in the arithmetic means of the students' scores in the post-application on the achievement test in the Computer subject, according to the teaching method variable. The researchers also used the eta square to discover the effect size of the teaching method variable.

4. Study Results

In this part of the study, the researchers review the results of the study that attempted to explore The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject in Jordan.

4.1 Main Study Question

Means and standard deviations were used to answer the study main question: What is The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject? Table (4) explains the results.

Table 4. Arithmetic means and standard deviations for each of the experimental and control groups on the achievement test in the post-test and their pre-test scores on the computer subject

Group	Number	Extreme End	Pre-Application		Post-Application	
			Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
Experimental	27		9.85	2.48	18.93	2.37
Control	25	20	10.48	3.04	13.24	4.99
Total	52		10.15	2.75	16.19	4.77

Table (4) revealed that the arithmetic mean of the students of the experimental group on the achievement test in the post-test was (18.93), which is higher than the arithmetic mean of the students of the control group, which amounted to (13.24), and the difference between the two means was (5.69). In order to ensure that the difference between the two means is statistically significant at the significance level ($\alpha = 0.05$), the one-way analysis of variance (ANCOVA) was performed. Here it is important to point out that the conditions for using ANCOVA were met as follows: Test of Normality and Test of Equality of Error Variance. Hence, the normal distribution for the dependent variable (achievement test) was implemented, the Kolmogorov-Smirnov statistic was used and the value is (.114) at the significance level ($\alpha = 0.05$) with a significance value of (.200), which is not statistically significant. Also, the homogeneity of variance was tested using Levene's Test of Equality of Error Variances statistical test with a value of ($F = .607$) at the significance level ($\alpha = 0.05$) with a significance value of (.442), which is not statistically significant.

However, the results of the one-way analysis of variance (ANCOVA) are shown in Table (5).

Table 5. Results of the one-way analysis of variance (ANCOVA) to verify the difference between the means of the experimental and control groups on the post achievement test

Source of Contrast	Sum of Squares	Degrees of Freedom	Sum of Squares Mean	F-Value	Significance Level	Eta Value
Pre-Test Application	8.566	1	8.566	0.572	0.453	
Group	400.514	1	400.514	26.743	0.000	0.353
Error	733.846	49	14.976			
Adjusted Total	1162.077	51				

Table (5) above shows that the value of (F) calculated for the difference between the means of the experimental and control groups in the post achievement test amounted to (26.743), with a significance level equal to (0.000); this value means that there are

statistically significant differences at the significance level ($\alpha = 0.05$) between the mean of the experimental group that used the application (Google Classroom) and the mean of the control group in the post achievement on the computer. With this result, the first zero hypothesis was rejected, which stipulated that there were no statistically significant differences at the significance level ($\alpha = 0.05$) between the average performance of the experimental and control groups at the level of academic achievement for tenth-grade students in the (Computer) subject. This was related to the method of teaching using the (Google Classroom) application and the traditional method.

In order to find out which of the group the difference belongs to, adjusted arithmetic expression and their standard errors were obtained for both groups; the results are shown in Table (6).

Table 6. Adjusted arithmetic means and standard errors for the performance of the experimental and control groups on the post achievement test

Group	Number	Extreme End	Adjusted Arithmetic Mean	Standard Error
Experimental	27	20	18.88	0.75
Control	25		13.29	0.78

Table (6) above shows that the adjusted arithmetic mean of the students of the experimental group on the post achievement test on the computer was (18.88), which is higher than the adjusted arithmetic mean of the students of the control group, which amounted to (13.29); the difference between the both means was (5.59), which means that the difference was in favor of the experimental group, because its adjusted arithmetic mean is higher than the adjusted arithmetic mean of the control group. This result shows that there is an effect of using the Google Classroom application on the achievement of tenth-grade students in the Computer subject; the value of Eta squared was calculated, which shows the size of The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject, which amounted to (0.353), which means that (35.3%) of the variation in the tenth-grade students' achievement in the Computer subject is due to the use of the Google Classroom application, while the remaining percentage, which is (64.7%), is due to variables not investigated in the current study.

5. Discussion

This section of the study deals with an explanation of the results of the study supported by the results of previous studies; what follows is a presentation of the discussion of the results of the study.

The results of the study's main question, which states: "What is The outcome of utilizing the Google Classroom application on the tenth-grade students' achievement in the Computer subject?" showed that there are statistically significant differences on the post achievement test due to the use of the Google Classroom application. They also showed that these differences were in favor of the experimental group that was taught using Google Classroom; this indicates that the use of the Google Classroom application is very effective in increasing achievement in the computer subject for tenth-grade students at the University of Jordan.

The researchers believe that the positive results are due to the fact that placing the students of the experimental group in an unusual educational situation led to attracting the students' attention to the new situation, created a high degree of readiness and acceptance for leveraging distant learning the Google Classroom application, and encouraged them to actively participate in the course of learning. All of which helped them outperform the control group in the Computer subject for the tenth-grade. Moreover, Google Classroom focuses on active learning that led to an increased comprehension of the subject for the

students; also, we see that the use of Google Classroom placed the students of the experimental group in an educational environment full of opportunities for immediate interaction with the educational content, the subject instructor, and their peers, as well as seeing and commenting on their peers' comments and inquiries, and taking them into account during their learning process. It is also noted that Google Classroom gave students of the experimental group the opportunity to express themselves and express their opinions through: open questions, comments, and interactive slides in the courses they received, which had a positive impact on their academic achievement.

The results of the study are also attributed to the fact that Google Classroom had an effective role in assisting the students of the experimental group in acquiring information and knowledge, and clarifying the concepts related to the educational unit in an easy and accessible way that helps them to retain and quickly retrieve them during the performance of the achievement test. Furthermore, the designed study materials using multimedia from: texts, images, kinetic effects, and interactive applications, made the students of the experimental group feel energetic and excited, and kept them away from the boredom of the educational meetings in the classrooms that they are accustomed to, which had a positive role in supporting the learning of the students of the experimental group and their superiority over the students of the control group.

The results of the study can also be attributed to the use of the Google Classroom application that has helped students draw their attention to educational activities and actively participate in them in a positive way, as the activities' questions are open-ended questions that give students enough space to ask their answers freely and without restriction. These reasons in turn helped the students of the experimental group to develop their academic achievement.

The results of the study are also attributed to the fact that the Google Classroom application includes learning functions that support students' learning, which helped the students of the experimental group achieve higher academic achievement than the students of the control group who received their learning in a regular way without diversification or development. We also see that the use of Google Classroom allowed the students of the experimental group to watch the lessons several times by displaying them through presentation slides that contain: pictures, texts, movement, and illustrative examples, which facilitated the students' learning process and increased the effective response to the subject.

The researchers attribute this result to the fact that the use of the Google Classroom application provides an exciting learning environment that stimulates the student's thinking and increases his academic achievement, so that the learner becomes an effective, highly perceptive, and a person who thinks about any step he takes, as it allows him to express his understanding of the topics through his ability to apply the necessary steps, as well as the ability to interact with them freely through the computer screen.

The researchers also believe that the use of the Google Classroom application included the use of a curriculum with regular and gradual steps from the easiest to the most difficult, which helped the student to save sufficient time and to achieve progress in his learning to the extent commensurate with the capabilities of his mind and energy, in addition to his intuitive speed that helps him in reaching the knowledge himself. In addition, it facilitates his access to the desired goal that served to increase his desire to search for information related to the academic subject, and thus the improvement in his academic and achievement level.

The researchers also attribute that the use of the Google Classroom application has led to an increase in the interest and self-desire of the students to learn about the scientific subject and work on preparing for it in all its details before implementing the scientific steps required for its implementation, which helped in developing their understanding of theoretical subjects. With regard to terminology and related concepts, that is the student -

based on his capabilities - had the ability to control educational situations, which helped him by knowing the methods of choice and understanding the nature of work; this indicates the development of knowledge skills among students to be thinkers before they are educated, and therefore, he becomes able to: deduce, analyze, plan, monitor himself and his performance, and record notes. Moreover, he becomes able to summarize his understanding in more than one way; as long as he can do the above, he becomes more developed and aware; He becomes aware of how he thinks, and what he has to do while performing the activities involved.

The use of the Google Classroom application has made him aware of effective strategies for mastering educational and performance tasks, more understanding and self-confident, and more aware of his mistakes and how to amend them. Thus, he has the ability to judge himself, his performance, and his way of thinking, which increased his cognitive awareness processes and his mastery of them, and thus contributed to the development of his level of achievement.

The researchers also attribute this result to the nature of the design of the Computer subject that was taught according to the Google Classroom application, which was presented in a distinct way that is far from stereotyped, as it was transformed from its abstract form into an entertaining and enjoyable form, in a way that guides students and works to stimulate their intelligence and thinking, as well as the fact that it addresses the different senses of the students in a simplified manner. Also, the reason for that may also be due to the fact that it employs both the image and the text in the computer lessons, which made it easier for the students to understand and assimilate the subject better, and all of this was reflected in the performance of the experimental group members in the post-measurement, which improved students' performance and their academic achievement.

The reason for this may also be that the usual pattern followed in teaching methods, which is characterized by learner negativity, has placed some restrictions on students' thinking and achievement. However, the use of modern methods and models in teaching, such as the use of Google Classroom applications, helped break those restrictions, and gave the opportunity for tenth-grade Computer subject students to practice different learning processes. The use of Google Classroom applications in teaching gave students the opportunity to communicate and discuss with the teacher and with each other, and therefore, it was noted that there was a clear improvement in their achievement.

The researchers also conclude from this result that the use of the Google Classroom application contributed significantly to increasing the level of academic achievement among tenth-grade students at the University of Jordan School in the Computer subject. This can be clearly observed by looking at the value of Eta squared (0.353), as shown in Table 5, it shows the size of The outcome of utilizing the Google Classroom application on the achievement of tenth-grade students in the Computer subject; which indicated a large (strong) effect size (Cohen, 1988).

As a result, the results of the current study agree with the results of a number of different studies that proved that the use of Google Classroom had a positive effect on increasing the level of academic achievement when compared to the traditional method.

The results of this study agreed with the outputs of the Khazaleh study (2020), which showed that there was a statistically significant effect in the post-measurement of the use of Google Classroom and multimedia applications to teach the subject of (Using Computers in Education) in the achievement of Al-AlBayt University students. It also agreed with the results of the Al-Wasiti study (2020) which revealed the existence of statistically significant differences between the average scores of students in the experimental group and the oversight group in The outcome of utilizing the Google Classroom application on the achievement of the physics subject among secondary school

students in the private schools of Madaba Governorate in Jordan in favor of the experimental group.

It also agreed with the results of the study of Gupta and Pathania (2018), which dealt with The outcome of utilizing Google Classroom applications as an educational platform in improving teachers' learning levels; it showed showed statistically significant differences existed between the average scores of the two experimental groups and the oversight group on the test in favor of the experimental group that used the Google educational platform. Moreover, it agreed with the results of Musalami's study (2014), which dealt with measuring the effect of teaching via cloud computing technology (Google Drive) on academic achievement in the computer subject for second year secondary students in the Kingdom of Saudi Arabia, which showed that there were statistically significant differences between the average scores of the pre-test and post-test scores of achievement in the control and experimental groups in favor of the scores of the students of the experimental group.

6. Recommendations and Suggestions

In light of the results of the study, which found the positive effect of using the Google Classroom application on the achievement of tenth-grade students in the Computer subject in Jordan, the researchers recommend the following:

1.   Using Google Classroom application in teaching tenth-grade students in the light of positive learning outcomes related to achievement in the Computer subject.

2.   Encouraging the Department of Curricula and Textbooks in the Ministry of Education in Jordan to benefit from the findings of the study when developing computer curricula by the curricula developers.

3.   Providing teacher guides which include teaching strategies for applying Google Classroom.

4.   Holding training courses for teachers and students on the use of the Google Classroom application in line with the development in e-learning applications.

5.   Conducting more studies dealing with the impact of the Google Classroom application on other educational stages and new variables.

6.   Developing study materials and preparing them to be compatible with the use of the Google Classroom application by enriching them with various electronic learning resources and multimedia such as photos, videos, and others.

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