The Effect of Using Blended Learning in Teaching Geography on the Achievement of Basic Stage Students in the Koura District Education Directorate of Irbid Governorate

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Abstract
This study aimed to investigate the effect of using blended learning in teaching geography on the achievement of students in the Koura District Education Directorate of Irbid Governorate. This study was applied to the students of the basic stage, where the study sample was divided into two groups, experimental and control. The descriptive approach and the experimental approach were adopted, and in analyzing the results, the researcher relied on the (SPSS) program, in extracting means and standard deviations, in addition to analyzing the impact of blended learning on student achievement based on the Eta square ($\eta2$), calculating the adjusted earning percentage for Black to verify the effectiveness Blended learning in developing achievement. The results of the research showed that there is an impact of the use of blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate. And there is a statistically significant difference between the average scores of the experimental group and the control group students in the post-application of the achievement test in favor of the experimental group. In addition, there is a statistically significant difference between the mean scores of the experimental group students in the pre and post applications of the achievement test in favor of the post-application. The study recommends several proposals, the most important of which is training teachers in general and geography teachers in a way to adopt blended education in the educational process. And the adoption of blended learning for all educational levels, especially in geography.
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Chapter one
Research Introduction
As a result of significant advances in communication technology and cognitive development, a wealth of available information and a variety of learning objectives have emerged that go beyond simply imparting knowledge to students or teaching them some specific skills; The modern approach to teaching emphasizes whole person development to achieve desired educational outcomes for learners at different educational levels, and students must be able to engage in higher levels of thinking (Othman, 2021).

Scientists with experience in the field of education have agreed that the Internet is one of the most important technological developments because it enables people to communicate with each other at any time via a mobile device, facilitating access to information and keeping abreast of current affairs, and get updates on new developments in education, and researchers of information technology and educational technology have noticed that there was a convergence between the two fields, which opened new and broad horizons for education because it is now faster and simpler than it was in the past (Abu Samhadana, 2021).

Due to the advantages of modern technology in many areas of life and the need to provide a variety of resources to both students and teachers, it has become more and more difficult to dispose of them because the current era is characterized by technological progress and rapid progress in science and teaching techniques, which caused a change in the way new ideas appeared, which helped in modernizing the teaching profession, which required administrators and decision-makers to search for every opportunity to improve the educational system to keep pace with the requirements of the times and embrace the industry (Mahran and Mubarak, 2021).

The idea of   e-learning as it is currently understood and used was not created overnight; It has been in development since the early 1990s, the establishment of learning management systems in the mid-nineties provided a tactical approach to organizing and managing all areas of learning in the educational institution to achieve integrated education in all academic fields, which was necessary to move from the old method using the Internet to the new method (Al-Daihani, 2017); Which contributed to the creation of several educational assistance applications, such as WebCT, Moodle, Claroline, Blackboard, and the Jones e-learning system, the goal of e-learning was to take advantage of technology of all kinds to give student knowledge in the shortest period of while providing the greatest value Hence the term "distance education" emerged as a type of e-learning that enables a person to access knowledge at the most convenient time and place for him, and also provides the

student with possibilities to share knowledge with his peers (Al-Anzi, 2017).

Al-Ajmi (2018), sees it as a complete redesign of the educational process, a restructuring of the roles of the student and the teacher, and the educational environment as a whole; To provide knowledge faster than in the past, it has created a variety of cutting-edge technology tools. Where the so-called blended education is designed to maximize the advantages of traditional education and online learning while trying to address the disadvantages of both, no matter how important e-learning may be, it cannot replace traditional education, which still leaves the largest and most enduring mark (Al-Fuqaha, 2014).

Due to the features of a blended learning strategy that allows teachers to use their teaching talent effectively, it is a new type of training and learning program that appropriately blends classroom and online learning, depending on the needs of the educational situation, to improve and achieve educational goals at the lowest possible cost. The application of pedagogy in curricula and teaching methods; Therefore, this study appeared to investigate the impact of the use of blended learning in teaching geography on the achievement of primary school students, which was applied within the Koura District Education Directorate of Irbid Governorate.

The Problem Statement
It is known that the educational process now includes information technology, such as computers, the Internet, applications, and multimedia; To suit students' needs and interests, increase their motivation, and benefit from the learning process, these technologies are among the most effective ways to create an environment rich in educational materials, teaching, training, growth, and automated development; As a result, there is interest in the application of blended learning in the educational process, which calls for combining modern technologies with established teaching methods to give students a new type of education that better meets their requirements and helps them achieve their academic goals (Mutair, 2015).

As blended learning is technology-based, integrates online learning, divides teacher and student roles, and increases opportunities for student participation, blended learning is an important component of today's learning methodologies, which use electronic and modern technology resources such as electronic tools; To provide information to students with the least amount of effort and the highest possible value, we use computers, internet networks, etc.; To achieve the educational goal, blended learning should be used instead of e-learning, as e-learning did not show effective communication between students and teachers in the absence of direct group communication, it promotes participation and face-to-face interactions and is one of the essential elements of the educational process that focuses on aspects Human and social and takes into account the differences of the learner, and also enables people to take advantage of technological developments, increase their level of understanding, track the results of their work, and put the learner at the center of the learning process (Al-Juhani, 2011).

Based on the foregoing, this study emerged to examine the impact of the use of blended learning in teaching geography on the achievement of basic-stage students.

The study problem can be formulated through the following questions:
• What is the effect of using the blended learning strategy in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate?
• What is the effectiveness of using blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate?

The Research Significance
The importance of this study is determined on the theoretical and practical side, as it will contribute to the theoretical addition by clarifying the concept of blended education and its importance, as this will serve as a cornerstone for studies that intend to research the same subject,

As for the practical importance, this research will add the basis, which will be an aid in clarifying the reality of blended education and ways to develop it. It also shows the importance of the study through the following points:
1- The results of the research contribute to clarifying the impact of the use of blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate.
2- The results of the research contribute to clarifying the effectiveness of using blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate.
3- The research results contribute to the development of geography teaching methods.
4- The results of the research also contribute to the development and application of blended learning methods.

The Research Objectives
This study aims to achieve several goals, which we explain as follows:

1- Clarify the concept of blended learning and its related theoretical frameworks.
2- Clarifying the effect of using blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate.
3- Clarifying the effectiveness of using blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate.
4- Providing recommendations and suggestions that could be useful for future research.

Literature review
This chapter includes studies related to the subject of the study, which included the following:
Al-Thiabat study (2013), entitled "The Effectiveness of Programmed Education based on the Use of Blended Learning and the Traditional Method in the Achievement of Tafila Technical University Students in Teaching Methods for the First Grades and Their Attitudes towards it."
The study sought to determine the effectiveness of blended learning and traditional education in terms of student's academic performance in the first-grade teaching techniques course at Tafila Technical University, in addition to their views towards it. The teaching year at Tafila Technical University was from the 2010-2011 academic year, and the study sample consisted of fifty-eight male and female students.
They were divided into two groups: the first experimental group, consisting of thirty students, and the second control group, consisting of twenty-eight students who were randomly selected from the specialized children's education students, and the class teacher registered in the teaching methods of the first. The scores used in the study are traditional learning materials, blended learning materials, the achievement test, and the scale as a study tool for measuring attitudes toward blended learning. The results showed that there were statistically significant differences in favour of the experimental group that was taught by the method of teaching created at the expense of the traditional method of data collection and in the direction of integrated learning.
The Raba'a study (2019), entitled "The impact of the application of the blended education strategy on the academic achievement of the Arabic language curriculum for the seventh grade in the schools of the capital Amman."
The study aims to determine the impact of the blended learning method on academic achievement in the seventh-grade Arabic language curriculum on academic achievement in Amman schools. The total size of the study sample was (60) female students, they were divided into two equal parts (30) female students representing the experimental group, Division (A), and (30) female students representing the control group, Division (B), and an achievement test consisting of (40) items were used. Kind of multiple-choice. The results revealed that there were statistically significant differences in the achievement test of the Arabic language between the experimental group that studied using the blended learning method and the control group that studied the traditional way in favor of the experimental group.
Mahran and Ibrahim's study (2021), entitled "The Effectiveness of Blended Learning Using "Microsoft Teams" to Achieve Learning Outcomes of Model Design and Implementation of Children's Clothes"
The purpose of this study is to evaluate the effectiveness of blended learning using the Microsoft Teams application in developing cognitive achievement and acquiring skills for students in the second year of the Department of Apparel and Textiles by forming a team that includes knowledge and skills for the course content (model design and implementation of children's clothing) and the study sample included 83 students In the second year of the Department of Apparel and Textiles, the research used semi-experimental and descriptive methods due to their suitability to achieve the research. The results of the research revealed that there were statistically significant differences between the mean scores of students in the cognitive achievement test and skills performance before and after in favor of mail among the students of the experimental group who were taught using "blended learning". A statistically significant difference was found between the average scores of students on skill performance before and after a performance in favor of the preparatory stage. The research recommended the use of blended learning in the design and implementation of other courses that serve the field of clothing and textiles in home economics colleges and specialized colleges in light of the results of the current study in the published and published delayed cognitive achievement test in favor of the published delayed test, and the results showed the students' positive opinions about the application of blended learning using the Microsoft application. Teams for course content.
Kazu & Demirkol (2014) monograph " Effect of Blended Learning Environment Model on High School Students' Academic Achievement"
This study aimed to analyze the student's academic performance by comparing the blended learning environment with the traditional learning environment. It was noted whether there were statistically significant differences between the dispersion of academic achievement scores and the scores of male and female students. The study was conducted at Diyarbakir Anatolia High School in the 2010-2011 academic year, with biology courses in the first semester. Cluster analysis was performed to provide objectivity when forming the experimental and control groups.

The study was conducted on 54 participants, 19 males and 8 females for the experimental group and 18 males and 9 females for the control group. The experiment group continued their education in the blended learning environment and the control group continued their education in the traditional learning environment. The educational environments created focused on the topic of genetics for the biology course and lasted for 6 weeks. The preliminary test and the final test were used to analyze academic achievement. According to the results obtained at the end of the study, no significant difference was found between the two groups at the end of the preliminary test applied to the trial and control groups. In addition, according to the average final test scores, the experiment group was found to be more successful than the control group in both learning environments, and female students were found to be more successful than male students.

Kiviniemi Research (2014) entitled "Effects of a blended learning approach on student outcomes in a graduate-level public health course"

This study aims to investigate the effects of a blended learning approach on student outcomes in a public health course at the graduate level. The effect of a blended learning approach on student learning in a graduate-level public health course was examined using a quasi-experimental, non-equivalent control group design.

Exam scores and total course score data from the 'traditional' core semester (n = 28) were compared with that from the classroom using the blended learning approach (n = 38). In addition, student evaluations of the blended learning approach were evaluated. The results showed that there was a statistically significant increase in students' performance under the blended learning approach (final course score d = 0.57; average effect size), even after accounting for previous academic performance. Furthermore, student evaluations of the blended approach were very positive and the majority of students (83%) preferred the blended approach.

Zacharis Research (2015) titled "A multivariate approach to predicting student outcomes in web-enabled blended learning courses"

This study aimed to develop a working model for predicting students at risk of poor performance in blended learning courses. Previous research suggests that analyzing usage data stored in log files of modern learning management systems (LMSs) will allow educators to develop timely evidence-based interventions to support students at risk or in difficulty.

The analysis of student tracking data from a blended learning course powered by Moodle LMS was the focus of this research in an attempt to identify significant associations between different online activities and course scores. Of the 29 variables of LMS use, 14 were found to be significant and entered into a step-by-step multivariate regression which revealed that only four variables — message read and post, content creation contribution, testing efforts, and the number of files viewed — predicted 52% of the variance in the final score. for the student.

Research Methodology
This research followed the descriptive approach in forming the theoretical framework by reviewing the literature and previous studies, in addition to the experimental method, which aims to test to test two experimental and control groups according to a pre and post-test for a group of basic stage students, where this research aims to study the impact of the use of blended learning. Teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate.

Research Hypotheses
This research seeks to test these hypotheses:
The first hypothesis:
There is no statistically significant difference at the level (0.05) between the mean scores of the experimental group and the control group in the post-application of the achievement test in favor of the experimental group.
The second hypothesis:
There are no statistically significant differences at the level (0.05) between the mean scores of the experimental group in the pre and post-applications of the achievement test in favor of the post-application.

Research Community
The research was applied to Umm Ma`bad Al-Khuza`iya Mixed Secondary School within the Koura District Education Directorate of Irbid Governorate, during the first semester of 2022/2023. The study population consisted of students from Umm Ma`bad Al-Khuza`iya Mixed Secondary School, where the sample consisted of 70 students from the basic stage.

Chapter II
Theoretical framework for the study
Introduction
The knowledge and capabilities required for university learning methods have undergone significant changes as

a result of rapid advances in information and communication technologies; As a result, education requirements have changed to develop traditional teaching strategies and introduce contemporary art styles to support and support its educational goals, including blended learning and e-learning, a tributary of blended learning that uses technologies, media and digital communications to support and enhance teaching, learning and assessment processes. Where many teaching techniques are incorporated to teach a specific subject in blended learning, examples of digital technologies include compressed video, audio, video conferencing, satellite education, and other tools.

Blended Learning Concept

Blended learning methods provide a wide range of teaching methods for the teacher and the learner that combine traditional methods and modern techniques in the learning process, take advantage of the advantages of face-to-face learning and e-learning technologies, and provide equal learning opportunities for all target groups, many researchers have defined it with different concepts. For example, Al-Bitar (2008) defines it as the use of e-learning along with direct education to teach educational courses while saving time, money, and effort in the name of blended learning, where it refers to the correct performance of teachers based on their understanding of these procedures. Text, moving and static images, and text can be used in asynchronous or asynchronous communications that are not limited to a specific place or time.

Blended learning also refers to an idea that primarily describes the integration of various teaching methods and educational curricula and has been characterized by many terms used to describe it, such as dual learning, blended learning, and blended learning is defined as combining traditional learning with online learning, and that this integration is achieved through the appropriate combination of traditional learning and online education based on the requirements of the educational environment; Due to the diversity of opinions about the nature and type of blended learning, it contains many concepts, but is defined as combining traditional learning with online learning (Abdel-Aty and Al-Makhini, 2010).

It also defines blended learning as training that combines elements of both traditional classroom instruction and online learning in a unified model while using the latest technology for both (Kaur, 2013).

Ismail (2009) defines it as the application of technological innovations that integrate learning objectives, content, learning resources, learning activities, and methods of communicating information through face-to-face online learning methods to enhance interaction between faculty members as a teacher and student guide.

Advantages of blended learning

Blended education is characterized by several advantages, which we mention as follows (Al-Dershawi, 2011):
• Significantly lower tuition costs compared to e-learning alone.
• Enable students to interact directly with their professors and fellow students.
• Improving social and human ties between students and teachers.
• Adapt teaching to students' diverse levels, ages, and learning styles.
• Benefit from technical developments in the application, implementation, and design.
• Raising the quality of the educational process, educational outcomes, and teacher effectiveness.
• Enrichment of human knowledge.
• Civilized interaction between many cultures.
• Take advantage of the latest developments in all sectors.
• Conduct training in the classroom or workplace.
• It takes the least amount of time and effort to achieve the highest results.
• The learner can acquire knowledge to the extent that he possesses the required skills.
• If a student is unable to attend class, they can still learn from what their peers have learned without stopping the class, which is beneficial for both fast learners and those with chronic illnesses.

The importance of blended education

Due to its enormous potential in providing a more comprehensive, flexible, and effective education than the various forms of e-learning, where the teacher recognizes its important role in the process and demonstrates its importance and the huge potential it provides an opportunity to find a successful learning experience with a focus on children's emotional, cognitive and skills development (Amasha, 2008).

According to Ammar (2010), it allows students to express their ideas freely while giving them time to learn and participate, which prevents students from feeling inferior to their peers during class discussions, which negatively affects their learning and the requirements and characteristics of this stage of development.

As many types of research have shown the value of blended learning, some studies have shown that students who have participated in blended learning have a better sense of community than those who have just received a regular education or those who have participated in full e-learning (Billigmeier, 2011).

According to the results of a study conducted by (Akkoyunlu & Soylu, 2006) students enjoy participating in

the blended learning environment, their academic achievement levels have increased, and their view of the blended learning environment in the face of positive face-to-face interaction is evident; This underlines the importance of blended learning.

Al-Farsi (2021) believes that blended learning is important in increasing learning effectiveness and improving learning outcomes by providing a better link between student needs and the learning program, which includes a variety of educational resources that stimulate learning in new ways.

Chapter III
Research Methodology
Introduction
This chapter deals with a description of the approach followed and the study population, as well as the study tool used, the method of its preparation, how it was built and developed, and the extent of its validity and stability. In analyzing the data and drawing conclusions, the following is a description of these procedures.

Research Methodology
The experimental method was adopted to test two experimental and control groups according to a pre-and post-test for a group of primary school students within the Umm Ma`bad Al-Khuza`iya Mixed Secondary School within the Koura District Education Directorate of Irbid Governorate. To achieve the purposes of the research, the stages will be as follows:
First, answer the research questions that include the following:
• What is the effect of using the blended learning strategy in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate?
• What is the effectiveness of using blended learning in teaching geography on the achievement of primary school students in the Koura District Education Directorate of Irbid Governorate?
The researcher tested the hypotheses that include the following:
- There is no statistically significant difference at the level (0.05) between the average scores of the experimental group and the control group in the post-application of the achievement test in favor of the experimental group.
- There is no statistically significant difference at the level (0.05) between the mean scores of the experimental group in the pre and post-applications of the achievement test in favor of the post-application.
First hypothesis test
Table (1) below shows the "T" value that indicates the difference between the mean scores of the students of the experimental and control groups for the achievement test according to the six cognitive levels and the test as a whole.

Table No. (1)

Cognitive levels	groups	number	Arithmetic mean	standard deviation	T . value	degree of freedom	Significance at 0.05
memory	experimental	30	11.56	0.72	5.59	58	statistically significant
	officer	30	9.96	1.24			
understanding	experimental	30	12.36	0.86	5.58	58	statistically significant
	officer	30	10.48	1.44			
Application	experimental	30	7.08	0.99	5.02	58	statistically significant
	officer	30	5.44	1.31			
Analysis	experimental	30	6.65	1.07	4.88	58	statistically significant
	officer	30	4.72	1.59			
Composition	experimental	30	3.24	0.89	7.14	58	statistically significant
	officer	30	1.52	1.05			
Calendar	experimental	30	3.24	0.72	6.72	58	statistically significant
	officer	30	1.4	0.95			
The test as a whole	experimental	30	43.80	2.81	8.36	58	statistically significant
	officer	30	33.48	5.45			

The previous table clearly shows that the value of "T" is (5.59) at the significance level (0.05). The table also reveals that there are differences in the mean scores between the students of the experimental group (11.56) and the students of the control group (9.96) in the post-application of the achievement test at the level of remembering in favour of the experimental group.

In a comparison between the arithmetic averages of the student's scores at the level of understanding in favour of the experimental group, which amounted to (12.36), the value of "T" was 5.5 at the significance level (0.05) for the significance degree (0.05).

In the post-application of the achievement test at the application level, there is a difference between the mean scores of students in favour of the experimental group (7.08) and the average scores of students in the control group (5.44). The calculated "T" value was (5.02) at the level of significance (0.05).

In the subsequent application of the achievement test at the level of analysis, there is a difference between the mean scores of the experimental group students (6.65) and the average scores of the control group students (4.72) in favor of the experimental, where the calculated "T" value reached (488) at the level of significance (0.05).

In the subsequent application of the achievement test at the synthesis level, there is a difference between the mean scores of the experimental group students (3.24) and the average scores of the control group students (1.52) in favor of the experimental group, where the calculated "T" value reached (1.14) at the significance level (0.05).

In the subsequent application of the achievement test at the assessment level, there is a difference between the mean scores of the experimental group students (3.24) and the average scores of the control group students (1.4), in favor of the experimental group, with the calculated "T" value reaching (6.72) at the level of significance.

Based on the above, the null hypothesis was rejected, which states that "there is no statistically significant difference at the level (0.05) between the average scores of the experimental group students and the control group students in the post application of the achievement test in favor of the experimental group." The alternative hypothesis was accepted, which includes the existence of a statistically significant difference at the level (0.05) between the mean scores of the experimental group students and the control group students in the post-application of the achievement test in favor of the experimental group.

The second hypothesis test

Table (1) below shows the "T" value that indicates the difference between the mean scores of the experimental group students in the pre and post-application of the achievement test according to the six cognitive levels and the test as a whole.

Table No. (2)

Cognitive levels	groups	number	Arithmetic mean	standard deviation	T . value	degree of freedom	Significance at 0.05
memory	pre-test	30	6.44	1.15	18.83	29	statistically
	post test	30	11.56	0.72			significant
understanding	pre-test	30	6.60	1.56	16.42	29	statistically
	post test	30	12.36	0.91			significant
Application	pre-test	30	2.56	1.61	12.08	29	statistically
	post test	30	7.08	0.99			significant
Analysis	pre-test	30	1.96	1.13	15.17	29	statistically
	post test	30	6.65	1.07			significant
Composition	pre-test	30	0.76	0.69	13.21	29	statistically
	post test	30	3.34	0.61			significant
Calendar	pre-test	30	0.68	0.55	12.88	29	statistically
	post test	30	3.24	0.66			significant
The test as a whole	pre-test	30	19.04	2.30	34.06	29	statistically
	post test	30	43.80	2.81			significant

The above table clearly shows that there are statistically significant differences at the significance level (0.05) between the average scores of the experimental group students in the pre and post-applications of the achievement test as a whole in favor of the post-application, where the calculated "T" value reached (34.06) at the level of significance (0.05).

The results revealed a difference in the mean scores of the experimental group students in the two applications, the pre, and post-applications, in favor of the post-application, and the estimated "T" value was (13.83) at the significance level (0.05).

At the level of understanding, the results of the analysis showed that there is a difference between the mean scores of the experimental group students in the two applications, the pre, and post-applications, in favor of the post-application, where the value of "T" was (16.45) at the significance level (0.05) for the degree of freedom (29).

In addition, there is a difference between the mean scores of the experimental group students in the application level in the pre and post-applications of the achievement test in favor of the post-application, where the calculated "T" value reached (12.08) at the significance level (0.05) for the degree of freedom (29).

There is a difference in the level of analysis between the mean scores of the experimental group students in the pre and post-applications of the achievement test in favor of the post-application, where the calculated T value was (3.17) at the significance level (0.05).

There is a difference in the level of composition between the mean scores of the experimental group

students in the pre and post-applications of the achievement test in favor of the post-application, where the calculated "T" value was (13.21) at the significance level (0.05).

There is a difference in the evaluation level between the mean scores of the experimental group students in the pre and post-applications of the achievement test in favor of the post-application, where the calculated T value was (12.88) at the significance level (0.05).

Based on the foregoing, the null hypothesis was rejected, which requires that "there is no statistically significant difference at the level (0.05) between the mean scores of the experimental group students in the pre and post-applications of the achievement test in favor of the post application".

And accepting the alternative hypothesis, which includes "there is a statistically significant difference at the level (0.05) between the mean scores of the experimental group students in the pre and post-applications of the achievement test in favor of the post application".

Analysis of the effect of blended learning on student achievement based on eta square ($\eta2$).

Table 3 shows the eta-square value and effect size of the achievement test at the six levels and the test as a whole.

Table No. (3)

independent variable	dependent variable	Cognitive levels	T . value	value (η2)	d . value	Effect size
blended learning	achievement test	memory	18.83	0.92	3.3	big
		understanding	16.42	0.90	3.1	big
		Application	12.08	0.83	2.5	big
		analysis	15.17	0.88	2.9	big
		installation	13.21	0.85	2.7	big
		Evaluation	12.88	0.84	2.6	big
		test as a whole	34.06	0.96	5.7	big

It is clear from the above table the level of impact of the use of blended learning on the development of student's academic achievement, where the value of (d), (2.5, 5.7) came in each of the levels and the test as a whole;

This indicates that there is a statistically significant difference in academic achievement and its dimensions, between the mean scores of the two applications, the pre and post applications, in favor of the post-application, due to the effect of the blended learning strategy.

Calculation of Black's Adjusted Gain Ratio to verify the effectiveness of blended learning in developing achievement

Black's modified gain equation was used to measure the effectiveness of the use of blended learning in developing achievement in geography for students of the experimental group, and Table No. 4 shows the results that were reached.

Table No. (4)

Cognitive levels	The final grade	Tribal averages (x)	Dimensional Averages (r)	Blackjack Adjusted Gain Ratio (d)	Statistical significance
memory	12	6.44	11.56	1.35	Statistical significance
understanding	13	6.60	12.36	1.34	Statistical significance
Application	9	2.56	7.08	1.20	Statistical significance
analysis	8	1.96	6.65	1.35	Statistical significance
installation	4	0.76	3.34	1.44	Statistical significance
Evaluation	4	0.68	3.24	1.27	Statistical significance
test as a whole	50	19.4	44.08	1.30	Statistical significance

The average gain percentage for the performance of the experimental group students in the achievement test as a whole is (1.30), which is a statistically significant percentage because it exceeded the percentage that Black considered a minimum acceptance of effectiveness (1.2), which means that the use of the blended learning strategy in teaching achieved the maximum effectiveness in developing the achievement for the test as a whole and its six levels among the students of the experimental group.

As it is clear from the previous table that the average gain percentage for the performance of the

experimental group students ranged between (1.20 and 1.44), where the highest value was represented within the level of synthesis, and the lowest value for understanding was included within the application level, which is a statistically significant ratio, because it exceeded the percentage that Black considered a minimum acceptance of effectiveness, which is (1.2), and this means that the use of the blended learning strategy achieved the maximum effectiveness in developing achievement for all levels of the students of the experimental group.

Discussing findings and recommendations

1- It is possible to come up with the most important results included in the presence of the impact of the use of blended learning in teaching geography on the achievement of primary school students in the Directorate of Education in the Koura District of Irbid Governorate.
2- There are statistically significant differences between the mean scores of the experimental group students and the control group students in the post-application of the achievement test in favor of the experimental group.
3- There are statistically significant differences between the mean scores of the experimental group students in the pre and post-applications of the achievement test in favor of the post-application.
4- Blended learning contributes to encouraging students to study and learn with a positive and motivating desire, which leads to improved levels of achievement.
5- Blended learning provides immediate feedback that the student gets after each activity and after each self-assessment to reinforce the correct answer and correct the wrong answer.

In light of the previous results, the researcher recommends the following:
• Training teachers in general and geography teachers in a way to adopt blended education in the educational process.
• Adopting blended learning for all educational levels, especially in geography.
• The need to provide supportive technical cadres in addition to the necessary infrastructure for blended learning.
• Working on developing blended learning methods.

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