



The Effectiveness of Edmodo Educational Platform in Developing Achievement and Attitude towards Science Subject among Ninth-Grade Students in Jordan

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Abstract: *The current study aimed to reveal the effectiveness of the educational platform Edmodo in developing achievement and developing the trend toward science among ninth-grade students in Jordan. The study was applied during the second semester of the academic year 2021-2022. The researcher used the experimental method, where she prepared an achievement test to measure the extent to which students attain the topics of a proposed unit in science at the levels of remembering, understanding, application, and higher levels (analysis and synthesis), and a measure of attitudes towards sciences was used. The study sample consisted of (40) female students from Al-Mazar Secondary School for Girls. The results of the research revealed that there were statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the Edmodo educational platform in developing science achievement among ninth-grade students in favor of the post application. In addition, there were statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the Edmodo educational platform in developing the attitude towards science among ninth-grade students in favor of the post application. In light of the findings of the study, the researcher recommends; Training teachers to use Edmodo e-learning platforms, benefiting from the experiences of developed countries in the field of interactive curricula programming.*

Keywords: *Edmodo platform; achievement; attitudes; sciences; nine-grade*

I. Introduction

Technological and informational developments have imposed themselves on all aspects of life, making the world a small village. These developments have dominated the educational reality of the world by exploiting modern designs to facilitate the educational process through the use of these designs in teaching. Over the past decades, many educational software and environments have been used in teaching, from computers with simple software to electronic learning, integrated education, virtual classrooms, and various interactive environments, most of which have proved effective in education.

E-learning platforms are at the forefront of web 2nd generation technologies that are increasingly being employed by faculty; This is due to the vitality and fun it brings to the teaching and learning processes; This forces the learner to interact with the content presented through them, as well as with his peers and teacher, in addition to being involved in a number of tasks that develop his skills (Tomassini, 2013; Al-Khataybeh, 2006).

Edmodo is one of the most important social learning networks, launched in 2008 to bridge the gap between what students learn in school and what they live in their lives, and

created to provide learning in the 21st-century environment, a Facebook-like environment; It is called Educational Facebook and represents a safe and user-friendly learning environment for teachers, students, and parents, is available free of charge, and facilitates communication between teachers and students worldwide (Edmodo, 2019). Executive Director of Edmodo Nick Borg reports that there are a number of new attitudes that have emerged in the educational process right now that educators need to recognize and take great advantage of, such as collaborative learning or collaborative learning, smart digital devices, and then save data through cloud storage.

Edmodo is distinguished from other social networking sites as it is for teachers, students, and parents to exchange information, ideas, opinions, files, and scientific updates; Teachers can send data, identify and give grades, receive assignments through the network, transfer files, e-mail, learn remotely, provide parents and interested students with degrees (Janpho et al, 2015).

The researcher adds to the above that the educational platforms Edmodo facilitate learning and cooperation between students in the classroom and the possibility for teachers to communicate with other educators to learn more about topics of common interest. It also allows educators to create learning environments whose teaching extends beyond the classroom, in addition to the ease with which the parents of students can follow such platforms, thus contributing to the learning process by them.

Educational attainment is the common measure by which we infer the intelligence and mental abilities of the individual, and the interest in educational attainment provides those responsible for education with indicators of educational goals, which in turn reflects society's aspirations for development and progress (Mokhtar, 2018). Academic achievement plays a major role in shaping and defining the learning process, but is not the only variable in the learning process. The objective of this process is influenced by various factors and forces, some of which relate to the learner, his abilities, preparations and moods, and health, and some of which are related to the learning experience, the way it is learned, and the possibilities surrounding the individual (Saez Lopez et al, 2014; Batsila et al., 2014).

In the light of the foregoing, the researcher points out that academic achievement is one of the most important educational outcomes that learners seek, providing students with knowledge and sciences that develop their perceptions and allow their personalities to develop correctly and instill positive values in them.

Attitudes play a major role in human behavior in different areas of life, regulating cognitive and emotional processes to crystallize certain behaviors in a given situation, and thus are good predictors of human behavior. Attitudes toward school curricula are emotional goals to be achieved in the field of education (Maazi& Janfeshan, 2018).

The researcher thinks that the development of scientific attitudes, from the behavioral directions, that the teacher performs, to the orientation of the learner to develop his scientific skills and build a scientific personality of which he is proud in situations that require him to answer scientific questions within the specialization from which he will graduate.

The objective of science is not only to provide students with scientific knowledge but also to translate knowledge into useful practice, action, and behavior. This requires preparation and motivation to learn science and acquire knowledge. This can only be achieved

by providing scientific material to students in an interesting and enjoyable way. Modern technologies are provided by responding to the scientific-technological revolution and by employing the computer and its software in education, based on the characteristics and advantages that characterize it, which contributes to the presentation of the scientific material in various forms and ways that can help achieve the goals of the educational process with a high degree of efficiency (AL-Khataybeh& AL-Awasa, 2016; Hilal, 2015).

The study of science gives students a positive attitude towards science if the teaching method used is appropriate and achieves it. The psychological and physical climate in the classroom affects the student's attitudes towards the educational subject he is studying (Capuano et al, 2018).

The researcher concludes from the foregoing that science education develops student thinking through the success of the teacher in arousing students' interest in various teaching methods that inspire students and increase their tendency towards studying science.

1.1 The Statement of Problem

E-learning enjoys continuous support from the Jordanian Ministry of Education. It encourages taking advantage of the availability of electronic educational environments in light of the technological revolution. Therefore, the researcher chose to use educational platforms to teach a unit in science, especially since there is a dearth of using such platforms in science teaching, according to the specific knowledge of the researcher. Hence, the researcher proposes the problem of the study in the following questions:

1. What is the effectiveness of Edmodo's platform in developing Science subject achievement among ninth-grade students in Jordan?
2. What is the effectiveness of Edmodo's platform in developing the Attitudes toward Science among ninth-grade students in Jordan?

1.2 Study Hypotheses

1. There are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the educational platform Edmodo in developing achievement in Science subject for ninth-grade students in Jordan in favor of the post application.
2. There are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the educational platform Edmodo in developing the attitude towards science among ninth-grade students in Jordan in favor of the post application.

Significance of the Study

1.3 The Significance of the Study is as Follows:

1. The present study may open the way for researchers to conduct further research into the use of the Edmodo platform in other educational stages and to conduct research on the effectiveness of the use of the Edmodo platform in developing skills in all teaching materials.
2. The study may contribute to the creation of a supportive learning environment for the classroom environment, which will facilitate the follow-up of parents with their children during the learning process.
3. Curriculum developers in various educational materials may be useful to use the Edmodo educational platforms in the education process as an intermediary between parents and their children for further assessment of their children.

1.4 Limitations of the Study

1. Time limit: The application of the study in the second semester of the academic year 2021\ 2022.
2. Spatial limit: This study was limited to Al-Mazar Secondary School for Girls through the study instruments of achievement testing and attitude measurement.
3. Objective limit: The study was limited to learning about the effectiveness of the Edmodo educational platform in the development of achievement and attitudes towards science.
4. Human Limit: The study was applied to a sample of ninth-grade students at Al-Mazar Secondary School for Girls.

1.5 Study Terminology

1. 1-Edmodo: Educational websites through which educational content in all its forms can be made available and some educational activities can be conducted. They allow students and teachers to share interests, activities, and opinions by adding personal issues, sharing photos and videos, adding posts and communicating with peers, as well as creating personal collections. The researcher defines Edmodo as a social educational network that seeks to communicate between teachers and students in a virtual learning environment far from the traditional one. Parents can follow the educational level of their students through this network.
2. Academic achievement: An educational achievement or achievement of a subject which means attaining a certain level of proficiency in the study, defined by codified tests or teachers' reports. The researcher defines academic achievement as the degree to which students at the higher basic stage of science will receive.
3. Attitude: A state of mental preparation that produces a vital influence on the individual's response and helps the individual to make decisions regarding situations and problems, whether they are met with rejection or affirmative (Hilal, 2015). The researcher defines the attitude as the sum of the responses of each individual sample to science education, which is an indication of acceptance or rejection of the material and is expressed in the degree to which the student obtains his response to the attitude gage items.

II. Review of Literature

2.1 First: Edmodo

The most recent social network was created with the aim of stimulating and strengthening interaction between students and teachers and facilitating learning.

Educational platforms (Edmodo) feature:

- Combining e-content management systems with a free social education network for teachers, students, and schools; changes the way students teach in class and makes it a 21st -century classroom that relies on digital, interactive courses, social communication, and increased interaction between students and the use of smart devices.
- Technical features such as a dedicated education network such as a grading system, a message archive and retention, and the use of various applications, educational programs, and websites.
- Easy to use because the interface is like Facebook, so it's easy and familiar for students.
- Teachers can create virtual classes for students. A new virtual classroom requires only seconds, no special information during registration, and no student email.
- Group discussions, messaging, and file sharing between teachers and students.

- Create multiple groups on the platform.
- Provides a digital library containing learning resources for scientific content and content sharing in the form of files or links; so it's easy to access scientific material.
- Helps create electronic tests easily.
- A teacher can send a text message (SMS) of alerts and messages that are attached to a file or link and store and share the content as a file or link.
- Provide feedback to students by responding to students and also by monitoring and discussing grades for the whole group, small group, or individual students.
- Download on smartphones and tablets.
- Ease of communication between teachers and parents, and informing parents of their children's results.
- Helps teachers track their students' performance for some skills, their progress, their responsiveness, and sending them important tests and homework.
- The communication between teachers in a given country or in many countries, sharing ideas and participating in educational discussions.
- Solve your private tutoring problem by finding unconventional solutions to traditional teaching methods problems (Taylor, 2015; Boyd& Ellison, 2007).

The researcher points out that the previous features show that there is quick and immediate access to homework, school notifications, and homework. There is also an interaction in the communication of students and their contact with each other to solve problems. The educational platform Edmodo helps students complete their homework, especially absent students. It also helps them with the calendar, which helps organize important ideas and dates, as students contact their teachers and all students in the classroom, and cannot enter into bilateral talks.

2.2 Student Benefits of Edmodo

The advantage of the Edmodo platform for students is that it is (Joko & Septia, 2018; Fryer, 2016):

- Prompt access to homework, school notifications, homework views on the homepage and teacher comments on the work so they are accessible to students.
- The homepage of the learning platform is an available tool to assist students in conducting their studies.
- It helps students complete their homework, especially absent students, where it's on the stage, as well as the calendar, which helps organize important thoughts and appointments.
- There is also a schedule of dates that the student can view at will to find out important dates: Assignments, exams, future milestones, and any other content-relevant information.
- Students were able to review the grades with their teachers.
- Every student calls his or her teachers and all students in the classroom and cannot enter into bilateral conversations.
- Give shy students a chance to share their opinions and publish them.
- Enlarging the circle of learners easily, communicating with teachers, and increasing students' interaction, communication, and communication to solve problems.
- Expanding students' knowledge of the latest developments in their field of study, increases motivation and desire to study through the Edmodo platform.

The researcher concludes that this platform provides an integrated environment that responds to all the students' scholastic needs, increases their abilities and level of understanding, develops their performance, informs them of developments in their field of

study, increases their readiness to learn better, in addition to developing the skill of cooperation, interaction and sharing ideas and proposals.

2.3 Teachers Benefits of Edmodo

The Education Platform (Edmodo) teaches the teacher the following (Nasrullah et al, 2018; Lan& Sic, 2010):

- Contribute to the evaluation of the work of students and familiarize them with their duties and grades.
- Access of the teacher to students in the classroom and to students from other classrooms.
- The teacher engaged with the parents to see their children's status.
- Easy exchange of materials and ideas between teachers and classmates at school or with other local, Arab, or international schools.
- Invest time by putting specific topics on the stage for a discussion with students.

The researcher summarizes the foregoing, that the educational platform Edmodo assists the teacher in evaluating the students' work, knowing their duties and grades, facilitating the teacher's contact with the students' parents, informing the parents about the level of their children, communicating with the teacher's colleagues at the same school or outside the school to exchange materials and ideas, and shortening the time by putting a specific topic on the podium and then discussing it with the students.

2.4 Second: Academic Achievement

The level of performance achieved by the student in his study and measured by the total of all the prescribed subjects obtained by the student in the year-end exam (Bani Amer&Al-Khataybeh, 2021).

2.5 Types of Educational Achievement

Education divided academic achievement into three sections as follows (Al-Khataybeh, 2022; Khalaf -Allah, 2013):

1. Academic knowledge: The collection involving the mental processes of the learner at various levels, from merely retrieving the information he has read or heard to understanding and applying what it means or analyzing its interrelationships, and thus judging its content in terms of accuracy, objectivity, and novelty.
2. Skilled education: The academic achievement that represents the motor skills of the human body parts, such as the movement of the hands, feet, or whole body; it is essential that the criterion or test by which the performance of the skill is measured in time or in the percentage of the accuracy in performance.
3. Emotional education: An outcome that addresses emotional issues that arouse feelings and deals with the attitudes, feelings, feelings, and values that are in the heart and that affect the various aspects of its behavior and activities.

The researchers conclude that there is complementarity, interaction, and interdependence among the three types of achievement because they encompass all aspects of knowledge, skills, and values that underpin their development in the process of learning and learning through the formulation of objectives that include cognitive, emotional and skill goals, through activities and thorough evaluation.

2.6 Factors Affecting Academic Achievement

There are many factors that influence educational achievement, the most important of which is the following (Almatrody& Alhassan, 2017; Zhonggen& Guifang, 2016):

- Self-factors.
- Family environment.
- Economic, cultural and social.
- The competence of the teacher is scientific and professional.
- Level of education of parents.
- Physical school environment.
- Use of educational technology.
- Individual differences among learners.

The factors that influence the educational attainment of the above-mentioned are complementary to each other so we cannot speak of one factor unless the next is influential or has an income. Factors such as the family being the first home for the student, followed by the school, the second home where the student finds himself in a new family where the guardian is the teacher or the school, and the brothers are represented by classmates. These factors either positively or negatively affect the student's achievement, and this is in accordance with the method and method followed by the teacher and the type of companions he chooses.

2.7 Third: Attitudes towards Sciences

A relatively constant acquired emotional readiness, reflected in the individual's willingness to seek multiple sources of knowledge and a positive role in the teaching and learning processes (Seyal et al, 2010).

2.8 Characteristics of Attitudes in Science Subjects

Attitudes have a number of characteristics that distinguish them from others (Mohamed, 2017; Sawaftah, 2016; Sanders, 2012):

- Psychological attitudes are learned, not inherited.
- Attitudes do not consist in a vacuum but always involve a relationship between an individual and a subject matter of the environment.
- Attitudes vary and vary according to the effects associated with them, and have emotional properties.
- The psychological attitude is the consistency and agreement between individual responses to social stimuli, allowing us to predict individual responses to certain social stimuli.
- Direction may be definite or general, and subjectivity will overcome it more than objectivity in terms of content and knowledge content.

In light of the above, the researcher points out that the attitudes show that the students are prepared as a result of the interaction of their beliefs, feelings, and motives, which develop with the evolution of their stages of development and gain more experience in them.

2.9 Components of the Attitudes towards Science

The attitude consists of three main elements (Tarun, 2019; Almoqren, 2016):

- Knowledge Component: Includes objective information and facts available to the individual on the subject of direction.
- Emotional component: The emotional component refers to the feelings of love and hatred directed by the individual towards the object of the direction, and is related to his emotional formation. The individual may love one subject, be motivated by it, respond positively to it, and may hate another subject and be alienated from it, and respond negatively to it. The intensity of these feelings is known by identifying the individual between the two extremes of the direction, that is, between the complete

acceptance or absolute rejection of the subject of the direction.

- Behavioral component: The behavioral component of the attitude in the practical response to the attitude is shown in some way. Attitudes act as directions for human behavior, driving it to act negatively when it has negative attitudes towards the subject of the attitude or pushing it to act positively when it has positive attitudes towards the subject of the attitude.

In light of the above, the researcher has come to appreciate that the range of cognitive, emotional, and behavioral components expressing a relative sense of acceptance or rejection of the student's responses to the learned material, its nature, its enjoyment, its importance, and the students' exercise of the activities involved.

2.10 Moving away from Science

One set of dimensions is summarized as follows (Porcel et al, 2018; PiriyaSilpa, 2010; Lazzari, 2009):

- Students' attitude towards the nature of science.
- The tendency of students to enjoy the subject of science.
- The attitude of students towards the importance of science in life.
- The attitude of students towards scientific activities.

2.11 Previous Studies

The study of Al-Enezi (2017): The use of educational platforms Edmodo for mathematics and computer students at the Faculty of Basic Education in Kuwait is effective. The study aimed to understand the effectiveness of the use of educational platforms Edmodo for students majoring in mathematics and computers at the College of Basic Education in Kuwait. The results showed the effectiveness of the use of educational platforms Edmodo for students majoring in mathematics and computers at the College of Basic Education.

Al-Juhani Study (2016): Investigate the behavioral intentions of post-graduate students to use the Edmodo platform in the future using the technology acceptance model. The study aimed to investigate the behavioral intentions of female postgraduate students towards the future use of the Edmodo learning platform. The results of the study showed a statistically significant relationship between the attitude of postgraduate students towards the use of the Edmodo learning platform and their behavioral intentions in its future use, as well as between perceived usefulness, perceived self-efficiency and the attitude toward the use of the Edmodo learning platform.

Qelja Study (2015): The effectiveness of Edmodo to improve the written performance of seventh-grade students and their attitudes toward writing. The study aimed to reveal the effectiveness of the use of Edmodo to improve the written performance in English among seventh-grade students and their attitudes toward writing. The results showed the effectiveness of the use of Edmodo to improve the written performance in English among seventh-grade students and their attitudes towards writing.

Al-Mutairi Study (2015): The effectiveness of the inverted classroom strategy using the Edmodo platform in developing self-learning skills and achievement in the biology curriculum. The study aimed to understand the effectiveness of the Inverted Classroom Strategy using the Edmodo platform in developing self-learning and achievement skills in the biology curriculum, and the results showed the effectiveness of the Inverted Classroom Strategy using the Edmodo platform in developing self-learning and achievement skills in the biology curriculum.

III. Research Methods

3.1 Study Instruments:

Theme 1: Preparation of Teaching Materials (proposed module using Edmodo):

1. General Objectives of the Module using Edmodo:
In developing the unit, the researcher took into account the following objectives.
 - Clarification of the meaning of renewable and non-renewable sources of energy.
 - To clarify the importance of solar energy for heating, heating, and electricity generation.
 - Appreciates the importance of the sun as an energy source.
 - Identification of biofuels.
 - Career development of practical skills, such as the use of tools and devices and the manufacture of extracts of materials available in a local environment, such as a solar cooker and a water fountain.
 - Identify thermal uses of the earth's energy.
 - Defining the concept of environmental pollution.
 - Identification of environmental pollutants.
 - Mention sources of environmental pollution.
 - Proposes appropriate ways to reduce environmental pollution.
 - Developing and maintaining positive attitudes towards the environment.
 - Develop faith in the importance of energy conservation.
 - Participation in methods of reducing greenhouse gases.
 - Participates in finding solutions and proposals to rationalize non-renewable energy consumption.
 - Writing a report on air pollution in Jordan.

(2) Identify the core topics of the module using Edmodo

To achieve the objectives of the Unit, the researcher reconstructed the content of the Renewable Energy Sources Unit and the Renewable Energy Sources Unit in the light of the list of environmental issues reached.

In preparing the proposed module, the researcher addressed the environmental issues involved in the developed approach, namely, solar energy, bioenergy, earth's thermal energy, wind energy, air, water, soil pollution, global warming, lack of non-renewable energy, and the rationalization of non-renewable energy consumption, which are of paramount importance in that they are:

- Topics that have prevailed in recent times and which need to be highlighted to give students of the higher basic level skills to solve.
- It is closely linked to the life of students in the upper basic stage.
- In preparing the scientific content of the topics, the researcher took into account a number of considerations:
- Confirmation of the linkage of environmental issues to the life of the student, which increases his\her drive towards the environment.
- Various activities in which students engage with the teacher and their group colleagues.

Teaching methods: The guide includes the use of educational platforms as illustrated in the accompanying images:

- Activities: The manual includes activities used to achieve learning outcomes.
- Calendar: actions a teacher takes to ensure lesson goals are met are described.
- General Directive for Instructor: The manual contains general directives that the teacher must take into account when teaching a unit.

Theme 2: Educational module benchmark using the platform.

When preparing them, the researcher followed the following steps:-

(1) Select the goal of the test:

The objective of the final test is to measure the achievement of the ninth-grade student, the basic subjects of the unit in science, "the unit of renewable energy sources," at the levels of remembrance, understanding, application, and highest skills. This includes (analysis and installation), of the educational platform Edmodo, in the development of achievement in science subject and attitudes in ninth-grade students in Jordan.

(2) Wording of test vocabulary: The test questions are modeled on the choice of multiple four alternatives for the following reasons:-

- These kinds of questions have high rates of honesty and consistency.
- Covers a large part of the content of the scientific material to be tested.
- Don't be influenced by self-correction.
- Easy to correct.
- Suitable for students in the upper basic stage.

In formulating the terms of the test, the researcher took into account the following:-

- Clarity of the question and ease of drafting.
- Only one answer is true.
- Test questions varied according to cognitive levels "Remember, understand, apply, highest Levels"
- Answers are as long as possible.
- Constant number of choices in the entire test (four tests)
- Avoid statements of negation.

Final test draft: The final version of the test consisted of 50 paragraphs distributed among the main concepts, namely: 13 questions (Energy in our lives), 11 questions (Solar energy), 11 questions (Bioenergy), 6 questions (Earth's thermal energy) and 9 questions (Other renewable energy sources). The overall score for the test was set at 100 degrees, and the time needed to resolve the test was set at 60 minutes.

The emotional dimension is represented by the measurement of the attitudes towards the educational platform Edmodo.

(1) The goal of the scale: Measuring Students' Attitude toward Edmodo Platform Effectiveness.

(2) Select scale dimensions:

The dimensions of the measurement of the attitude towards the use of the educational platform were determined in the light of the literature on educational research on the formation and development of the attitude towards the environment and previous environmental studies and research in the field of environmental citizenship skills. The researcher has reached four main dimensions to measure the attitude toward the use of the educational platform:

- Usability attitude.
- Usability.
- Actual use.
- Impediments for using.

(3) Formulation of scale terms:

The scaling vocabulary is formulated in the estimation scale pattern; Students are given positive and negative statements on the topic of direction, and they must choose the category that shows their level of agreement regarding each item.

Table 1. Specification of the Attitudes in Platform Utilization

Weight	Items Numbers	Domain	No.
%27	14	Usability attitude	1
%27	14	Usability	2
%19	10	Actual use	3
%27	14	Impediments for using	4
%100	52	Total	

Theme 3: field testing procedure.

(1) Choosing Study group:

The Study group was selected from 40 students; the ninth- grade of Al-Mazar Secondary School for Girls for the scholastic year (2021/2022). There are three classes in the ninth grade, one of which was chosen at random.

(2) Pre-apply assessment instruments:

The achievement test and the measurement of the pre-attitudes to the education platform Edmodo were applied to the research group and the application of the assessment tools took two days.

(3) Prior to teaching in the Renewable Energy Unit:

1. Preparation of the Edmodo platform page which includes lessons for the module in question.
2. Processing of materials, tools, tools, and some learning resources for the Unit's lessons.
3. Meeting with the pilot group class instructor to clarify the purpose of the research and to clarify all aspects and requirements of the module's teaching using the Edmodo platform, accompanying activities, and evaluation techniques, as explained in the Module's teacher's manual, a copy of which was delivered to the instructor prior to teaching.
4. Giving students an introductory lesson to know what to do.

(4) Teaching of the Renewable Energy Unit:

The classroom teacher taught the module using Edmodo which was developed for the students of the pilot group.

The implementation of the five lessons of the module using Edmodo took from 6/3/2022 until 10/4/2022, including a final review session on the computerized module via the Edmodo platform.

III. Results and Discussion**First: The results of applying the cognitive achievement test:**

The first hypothesis: To test the validity of the first hypothesis of the research, which states: There are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the Edmodo educational platform in developing science achievement among ninth-grade students in Jordan in favor of the post application , where the researcher calculated the scores of the experimental group students in each of the pre/post application in the test as a whole and at each test level separately, and the researcher used the t-test for two related samples to reveal the significance of the differences before and after applying the unit using the educational platform Edmodo, as shown in table 2.

Table 2: The results of the two applications, pre/post, in the experimental group at each level of the cognitive achievement test

Sig. Level	Sig. Value	(T) Value	SD	Mean	No.	Experim ental group	Dimension
Statistically Significant at 0.01	0.000	18.141	1.983	5.306	16	Pre	Remembering
			2.261	12.833		Post	
	0.000	16.361	2.037	4.722	14	Pre	Understanding
			1.978	11.500		Post	
	0.000	12.107	1.251	1.750	7	Pre	Application
			1.386	5.278		Post	
	0.000	17.043	1.954	4.194	13	Pre	Higher Levels
			1.890	10.528		Post	
	0.000	21.740	4.687	15.972	50	Pre	Total
			5.900	40.139		Post	

* Tabular value of "T" at the degree of freedom (35) and at the level of significance ($0.05 \alpha \leq$) = 2.02

* Tabular "T" value at a degree of freedom (35) and at a significance level ($0.01 \alpha \leq$) = 2.70

This indicates that there are statistically significant differences at the significance level ($a < 0.05$) in the effectiveness of the Edmodo educational platform in developing achievement in science among ninth-grade students in Jordan.

This indicates that there are statistically significant differences at the significance level ($a < 0.05$) in the effectiveness of the Edmodo educational platform in developing achievement in science among ninth-grade students in Jordan.

Calculating the effect size:

To be more sure, the two researchers calculated the effect of the independent variable (educational using Edmodo) on the dependent variable (cognitive achievement test) by comparing the results of the calculated "T" values for the results of the experimental group students in the test. The effect size was calculated for the differences between the pre and post-application for the students of the experimental group to examine the cognitive achievement as a whole and each level separately for the test. Table (3) the effect size is indicated by "η²", "d".

Table 3: The effect size and significance of the cognitive achievement test

Effect Size	D Value	H ² Value	T Value	DF	Skill
Large	6.133	0.904	18.141	35	Remembering
Large	5.531	0.884	16.361		Understanding
Large	4.093	0.807	12.107		Application

Large	5.762	0.892	17.043		Highest Skills
Large	7.349	0.931	21.740	35	Total

Table (3) shows that (0.931) of the total variance of the dependent variable (cognitive achievement test) is due to the independent variable, and that (0.904), (0.884), (0.807), (0.892) of the total variance for all remembering, understanding, application, higher levels, respectively, is due to the independent variable.

The size of the effect of the independent variable on the development of remembering, understanding, application, and higher levels as a whole among the students of the experimental group is very large, as it reached (6.133), (5.531), (4.093) and (5.762), respectively, and all of these values are greater than (0.8), and this indicates, However, the Renewable Energy Sources unit affected the students' achievement very significantly, and thus achieved the validity of the first hypothesis which states: "There is a statistically significant difference between the mean scores of the experimental group students in the two applications, pre, and post, of the cognitive achievement test in favor of the post application.

The second hypothesis: To test the validity of the second hypothesis of the research: there are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of Edmodo educational platform in developing the attitude towards science among ninth-grade students in Jordan. The researcher compared the mean scores of the students of the experimental group in each of the two applications, pre/post, in the scale as a whole, and in each of the dimensions of the scale separately. The researcher used the t-test for two related samples to reveal the significance of the differences before and after applying the unit of renewable energy sources as shown in Table (4).

Table 4: The results of pre / post applications in the experimental group in each dimension of the scale of attitude towards using the educational platform in science.

Sig. Level	Sig. Value	(T) Value	Standard Deviation	Mean	No .	Experiment al Group	Dimension
Statistica lly Significa nt at 0.01	0.000	9.804	5.495	44.528	14	Pre	Attitude to Use
			7.397	55.972		Post	
	0.000	8.050	7.262	47.056	14	Pre	Usability
			7.238	59.111		Post	
	0.000	10.290	5.747	32.944	10	Pre	Actual Use
			6.090	42.944		Post	
	0.000	9.291	6.990	43.778	14	Pre	Impediments for using
				9.307	56.000		
	0.000	11.922	18.297	168.306	52	Pre	

			25.163	214.028		Post	Total
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* Tabular value of "T" at the degree of freedom (35) and at the level of significance ($0.05 \alpha \leq$) = 2.02

* Tabular "T" value at a degree of freedom (35) and at a significance level ($0.01 \alpha \leq$) = 2.70

This indicates that there are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the Edmodo educational platform in developing the attitude towards science among ninth-grade students in Jordan.

Calculating effect size:

To be more sure, the researcher calculated the effect of the independent variable (the developed unit) on the dependent variable (the cognitive achievement test) by comparing the results of the calculated "T" values for the results of the experimental group in the scale.

Calculating the size of the effect for the differences between the pre and post-applications of the experimental group students of the scale of the attitude towards the environment as a whole and each dimension separately; Where the two researchers used eta square " η^2 ", "d" to determine the effect of the renewable energy sources unit on the dimensional application of the scale. Table (5) shows the size of the effect by " η^2 ", "d".

Table 5: The size of the effect and significance in the pre\post applications of the experimental group in the measure of the attitude towards using the educational platform to teach a unit in science.

Effect Size	D Value	H ² Value	T Value	DF	The Dimension
Large	3.314	0.733	9.804	35	Attitude to Use
Large	2.721	0.649	8.050		Usability
Large	3.479	0.752	10.290		Actual Use
Large	3.141	0.712	9.291		Impediments for using
Large	4.030	0.802	11.922	35	Total

Table (5) shows that (0.802) of the total variance of the dependent variable (a measure of the attitude towards using the educational platform Edmodo) is due to the independent variable (the unit of renewable energy sources using Edmodo), and that (0.733), (0.649), (0.752), (0.712), of the variance the totality of each of the four dimensions, is due to the independent variable.

The size of the effect of the independent variable as a whole among the students of the experimental group in the dimensional application is very large, as it reached (3.314), (2.721), (3.479), (3.141), respectively, and all of these values are greater than (0.8), and this indicates that the teaching of the unit in Science subject using the educational platform influenced the students' attitude very much; Thus, the validity of the second hypothesis which states that: There are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the Edmodo educational platform in developing the attitude towards science among ninth-grade students in Jordan in favor of the dimensional application.

(1) The results of applying the cognitive achievement test.

The results of the study indicated that the students of the experimental group excelled in the cognitive achievement test as a whole and at each of its levels, after teaching the experimental unit in favor of the post application, as:

- The order of the percentage of the average levels of the cognitive achievement test in terms of their availability among the experimental group students in the tribal application is as follows: the first level (understanding) by (34%), then the level (remembering) by (33%), then the (higher) levels by (32%), and finally the level (application) by (25%), respectively.
- The order of the percentage of the average levels of the cognitive achievement test in terms of their availability among the experimental group students in the dimensional application was as follows: the first level (understanding) with a percentage of (82%), then the levels (higher) with a percentage of (81%), then the level (remembering) by (80%), and finally the level (application) by (76%), respectively.

The level of memory came at the forefront of the levels that achieved the growth of measurement because the number of questions that measured this level was (16) out of a total of (50) questions where the questions were formulated in the light of multiple choice. While the level of application is at the end of the levels that achieved growth because the number of questions that measured this level amounted to (7) out of a total of (50) questions, all of which are of the type of multiple choice.

These results may be due to the following:

- 1- Students' study of the content of the Renewable Energy Sources Unit in the light of contemporary environmental issues contributed to linking the science curriculum with the reality in which students live with their environment, which is the field of their daily lives and the focus of their feelings, and this provides them with an element of excitement and suspense and develops their desire and motivation to study, which led to raising Their level of achievement, especially that the students of the upper basic stage were able to use the educational platform Edmodo because it is similar to using Facebook.
 - 2- Organizing the content of the science curriculum in the light of contemporary environmental issues helped students to understand and assimilate scientific concepts, in proportion to their abilities and helps to raise their level of achievement.
 - 3- Diversity in the ways of presenting scientific knowledge to students through the use of new educational means represented by the use of the educational platform in addition to the fact that they watched many videos and photos contributed to enhancing the learning motivation of the students of the experimental group, and the result was positive for them.
1. The results of the current research are in agreement with the results of some previous studies such as Al-Anezi (2017), Suleiman (2016), Kalja (2015), Al-Mutairi (2015), and the sample agreed with the study of Suleiman (2016), and differed with the results of the study of Al-Juhani (2016).

(2) The results of applying the measure of attitude towards the use of the educational platform Edmodo.

- The results of applying the measure of the attitude towards using the educational platform Edmodo in its four dimensions tribally indicated the low level of ninth-grade students in terms of their attitudes towards using Edmodo, and this was indicated by the decrease in the average scores of the tribal application, but after applying the unit

of renewable energy sources the rate of Edmodo attitude increased as a result of skills The results that were gained by students while using the platform.

- The order of the dimensions averages in terms of their availability among the students of the experimental group in the dimensional application was as follows: The first axis was the attitude toward using the educational platform with an average of (59.111), the second after the actual use of the educational platform with an average of (56,000), the third after the ability to use with an average of 55,972.

Based on the foregoing, the following becomes clear:

There are statistically significant differences at the significance level ($\alpha < 0.05$) in the effectiveness of the Edmodo educational platform in developing the attitude towards science among ninth-grade students in Jordan.

IV. Conclusion

The researcher investigates the effectiveness of Edmodo as an educational platform for developing achievement and promoting science among ninth-graders in Jordan. The study was conducted during the second semester of the academic year 2021-2022. Using the empirical method, the researcher prepared an achievement test to assess student attainment of a proposed science unit at the levels of remembering, understanding, application, and higher levels (analysis and synthesis), as well as attitudes towards science. A sample of (40) female students from Al-Mazar Secondary School for Girls participated in the study. The study found statistically significant differences between the Edmodo educational platform and the post application when it came to the effectiveness of the Edmodo educational platform in developing science achievement among ninth-grade students. As well, the Edmodo educational platform was statistically significantly different from the post application in developing a positive attitude towards science among ninth-grade students at the significance level ($\alpha 0.05$). According to the researcher, the study recommends that teachers be trained to use Edmodo e-learning platforms, benefitting from the experiences of developed countries.

Recommendations

In light of the results of the study, the researchers recommend the following:

- 1- Training teachers to use Edmodo E-learning platforms.
- 2- Preparing guidelines by educational technology departments in colleges of education, and e-learning deanships in universities about e-learning platforms, including Edmodo, for students and faculty members, to benefit from.
- 3- Include in educational curricula in the educational technology departments in the colleges of education detailed topics about electronic learning platforms, including the Edmodo platform, and train students to use it so that they can benefit from it during practical education, and when they are assigned to schools.
- 4- Establishing a center for programming the curriculum and benefiting from specialists in the field of educational technologies.
- 5- Benefiting from the experiences of developed countries in the field of interactive curricula programming, and adopting what is appropriate for the educational systems in the Arab society.

References

Al-Enezi, Yousef. (2017). The Effectiveness of Using Edmodo Educational Platforms for Students Majoring in Mathematics and Computer at the College of Basic Education in the State of Kuwait, *Scientific Journal*, 33(6) ,193-241.

- Al-Juhani, Lily (2016): Investigating the intentions of behavioral graduate students to use the Edmodo educational platform in the future using the technology acceptance model, *Journal of the College of Basic Education for Educational and Human Sciences*, 28(3), 68-90.
- Al-Khataybeh, M. M. (2006). The effect of using SMS on the development of the vocabularies of English language students in Jordan. *Editorial Advisory Board*, 1, 59.
- Al-Khataybeh, M. M. (2022). A study of the Jordanian postgraduate students' perceptions on research writing through online learning. *Journal of Language and Linguistic Studies*, 18.
- AL-Khataybeh, M., & AL-Awasa, A. (2016). The Effect of Using Web Quests on Improving Seventh Grade Female Students' Writing Skills in Southern AL-Mazar Directorate of Education. *Journal of Education & Social Policy*, 3(1), 1-112.
- Almatrody, A. & Alhassan, R. (2017). The effect of teaching using cooperative learning through educational social network Edmodo on the academic achievement in a computer course. *International Journal for Research in Education*, 41(4), 115-148.
- Almoqren, N. (2016). Impact of e-learning using learning management system (Edmodo) on the achievement of the second secondary grade students in biology. *International Interdisciplinary Journal of Education*, 5(8), 217-246.
- Al-Mutairi, Sarah. (2015). The effectiveness of the Flipped Classroom strategy using the Edmodo educational platform in developing self-learning skills and academic achievement in the biology course, unpublished master's thesis, Imam Muhammad bin Saud Islamic University, Saudi Arabia.
- Bani Amer, Mohammad & AlKhataybeh, Majid. (2021). The Achievement Of English Language Curricula For Secondary Stage From The Perspectives Of Efl Teachers And Supervisors In Jordan, *International Journal, Language Literacy:Journal of Linguistics , Literature , and Teaching* ,5(1): 36-47. DOI: <https://doi.org/10.30743/ll.v5i1.3643>
- Batsila, M., Tsihouridis, C., & Vavougiou, D. (2014). Entering the Web-2 Edmodo World to Support Learning: Tracing Teachers' Opinion After Using it in their Classes. *International Journal of Emerging Technologies in Learning*, 9(1), 53-60. doi:10.3991/ijet.v9i1.3018.
- Boyd, D., & Ellison, N. (2007). Social network sites: Definition, history and scholarship. *Journal of Computer-mediated Communication*, 13(1), 210-230. <https://doi.org/10.1111/j.1083-6101.2007.00393.x>
- Capuano, N., Chiclana, F., Fujita, H., Herrera-Viedma, E., & Loia, V. (2018). Fuzzy group decision making with incomplete information guided by social influence. *IEEE Transactions on Fuzzy Systems*. 26 (3), 1704–1718. <https://doi.org/10.1109/tfuzz.2017.2744605>
- Edmodo. (2019). About Edmodo. Retrieved April 10, 2022, from <https://www.edmodo.com/about>
- Fryer, L. (2016). Collaborative learning through Edmodo. *Teaching Geography*, 41(3), 118-119.
- Hilal, Heba. (2015). The effect of using a computerized educational kit on academic achievement and attitudes towards science for fourth graders of basic education, unpublished master's thesis, University of Aleppo.Syria.
- Janpho, J., Chaaturat, C., & Multa, D. (2015). Enhancing English writing skill by using online social network Edmodo. *Journal of Education, Mahasarakham University*, 3(4), 707–712.
- Joko, & Septia, W, G. (2018). The development of learning management system using Edmodo. *IOP Conference Series: Materials Science and Engineering*, 336, pp. 12046. <https://doi.org/10.1088/1757-899x/336/1/012046>
- Khalaf -Allah, Marwa. (2013). The Effectiveness of Employing Mathematics Laboratory in

- Developing Geometric Thinking Skills and Achievement for Seventh Grade Students in Rafah Governorate, unpublished master's thesis, Islamic University, Gaza. Palestine.
- Lan, Y-F., & Sie, Y-S. (2010). Using RSS to support mobile learning based on media richness theory. *Computers & Education Journal*, 2(55), 723-732. <https://doi.org/10.1016/j.compedu.2010.03.005>
- Lazzari, M. (2009). Creative use of podcasting in higher education and its effect on competitive agency. *Computers & Education Journal*, 1(52), 27-34. <https://doi.org/10.1016/j.compedu.2008.06.002>
- Maazi, H., & Janfeshan, K. (2018). The effect of Edmodo social learning network on Iranian EFL learners writing skill. *Cogent Education Journal*, 5(1), 1-17. <https://doi.org/10.1080/2331186x.2018.1536312>
- Mohamed, H. (2017). Using the Edmodo platform for developing self-regulated learning skills and attitude towards employing it in teaching social studies for general diploma students at the Faculty of Education. *Journal of Educational Association of Social Studies*, 99, 90-139.
- Mokhtar, F. A. (2018). Breaking barriers through Edmodo: A qualitative approach on the perceptions of University of Malaya undergraduates. *Online Learning*, 22(1), 61-80. <https://doi.org/10.24059/olj.v22i1.1026>
- Nasrullah, A., Marlina, M., & DwiYanti, W. (2018) Development of student worksheet-based college e-learning through Edmodo to maximize the results of learning and motivation in economic mathematics learning. *International Journal of Emerging Technologies in Learning (IJET)*, 13(12), 211-229. <https://doi.org/10.3991/ijet.v13i12.8636>
- Piriyasilpa, Y. (2010). See you in Facebook: The effects of incorporating online social networking in the language classroom. *Journal of Global Management Research*, 2(3), 15–27.
- Porcel, C., Ching-López, A., Lefranc, G., Loia, V., & Herrera-Viedma, E. (2018). Sharing notes: An academic social network based on a personalized fuzzy linguistic recommender system. *Engineering Applications of Artificial Intelligence*, 75, 1-10. <https://doi.org/10.1016/j.engappai.2018.07.007>
- Qelja, May (2015). The effectiveness of using Edmodo educational platforms on improving the written performance in English of seventh grade students and their attitudes towards writing, unpublished master's thesis, the Islamic University, Gaza. Palestine.
- SáEZ LÓPEZ, J. M., DOMÍNGUEZ GARRIDO, C., RUIZ RUIZ, J. M., & BELANDO MONTORO, M. (2014). Análisis del uso de los Sistemas de Gestión de Aprendizaje en el Desarrollo Profesional Docente Desde una Perspectiva Práctica en la Escuela Complutense. (Spanish). *Bordón*, 66(3), 133. doi:10.13042/Bordon.2014.66309
- Sanders, K. (2012). An examination of the academia networking site Edmodo on student engagement and responsible learning. (Ph.D. dissertation). University of South Carolina, South Carolina, USA.
- Sawaftah, A. (2016). Effectiveness of blended learning based on the learning management system Blackboard in developing attitudes toward physics for health colleges students at King Saud University. *The Educational Journal*, 30(119), 295-345.
- Seyal, A., Ali, S., Awg, H., Yussof, H., Mohamad, H., Mohd, N.Rahman, M. (2010). Understanding students' attitudes toward e- learning: evidence from Bruneian vocational and technical education. Faculty of Business and Information Technology, Brunei.
- Tarun, I. M. (2019). The effectiveness of a customized online collaboration tool for teaching and learning. *Journal of Information Technology Education: Research*, 18, 275-292. <https://doi.org/10.28945/4367>
- Taylor, M. (2015). Edmodo: A collective case study of english as the second language (ESL) of latino/latina students. Doctoral Dissertations and Projects. Liberty University,

Lynchburg,VA.

Tomassini, J. (2013). Edmodo now closer to social network. *Australian Educational Computing*, 7.

Zhonggen, Y. & Guifang, W. (2016). Academic achievements and satisfaction of the clicker-aided flipped business English writing class. *Educational Technology & Society*, (19)2, 298-312.