

The Effect Of Teaching Biology Through Science Activities and Computer Simulation In Motivation Towards Learning Biology And among the Ninth Grade Students In Amman In Jordan.

Dr. Rana kamel Al-Tabbaa
Jordan - Amman

Abstract

This study aimed to investigate the effect of teaching Biology using science activities and computer simulation in motivation towards learning Biology among the ninth grade students in Jordan. The members of the study consisted of (66) female students from the ninth primary – grade. They were distributed into two experimental groups, one of them studied by scientific activities, and the other studied by computer simulation.

A scale of motivation towards learning Biology was built which consists of four dimensions (self efficiency, active Biology, Biology learning attention, achievement goal) (45) items. Validity of the instruments was insured through experts, while reliability was verified through Cronbach – α coefficient which ranged from (0.87) to (0.95).

The results of the study indicates there is a statistically significant at the significance level ($\alpha = 0.05$) between mean scores difference the two experimental groups for the motivation towards learning Biology for the benefit of the experimental group that studied with scientific activities, that means scientific activity is more preferable than computer simulation in improving motivation towards learning Biology

Key Words:

(Scientific Activities, Simulation, Science learning Strategies, motivation towards learning Biology.)

Introduction

In the last period the knowledge resources have diversified as the cognitive explosion, especially the teaching of science. It has been associated with technology with both knowledge and practical sides. Through integration of technology with integrated science student's growth to become a meaningful education, it facilitates the learning of many scientific phenomena that can't be studied in practice due to their danger, cost, and lack of time to do the experiments.

And Majority of science teachers in Jordan used about more than 75% of lessons time, which leaves students very few opportunities to ask questions, so urges science teachers education scientists and encourage them to use methods and strategies that will contribute to give students scientific concepts, therefore, the formation of scientific concepts of students requires an appropriate teaching method that ensures the integrity of its composition and retention, In Bruner theory, he emphasizes that any concept can be taught to any learner if it is presented in a manner appropriate to its abilities and aptitudes, depending on the educational situation and the nature of the educational material on the one hand, and nurturing individual differences on the other hand, whereas there is no effective teaching method in teaching all subjects; and achieving all the objectives of teaching science (Zaitoun, 2004).

That the practical laboratory is the most important way to acquire the skills of practical sensory experiences and opportunities for self-learning and the application of the investigation method in scientific knowledge and problem solving, and taking into account the difficulty of teaching biology in a practical way; for the need for special techniques, it was necessary to find ways to facilitate the teaching, As students in various elementary, preparatory and secondary education stages are constantly declining; especially in the higher education level or in the educational stage - in terms of practical activities hands-on activities (Direct sensory experiences). As that some shortcomings in achieving the objectives of teaching science - especially among students in the preparatory stage - may in part be due to the weak use of laboratory work and its practical activities effectively (Zaitoun, 2004).

Scientific activities may contribute to the consolidation of biological information in the minds of students and the development of their motivation towards biology, which is one of the important things in the basic stages, which will result in a lot of benefits related to their studies in the future, in particular that biology within most of the scientific colleges vocabulary; which may specialize by students after their transition to university education, as well as providing them with information and capabilities to interpret natural phenomena surrounding them, while the computer simulations can prepare a way out the teacher may turns to it, when practical activities are not possible, in the absence of materials and tools in the laboratory.

Computer simulations are one of the most common and used. Students find it very difficult to deal with subjects that require a great deal of imagination or facts that make it difficult for students to be in their real environment, such as human body systems or deep sea. The simulation also places the learner in some scientific problems and then asks him to provide appropriate solutions. As that the role of the program is to interact with the learner's responses, which are often numerical (from the keyboard) and indicate the response that the learner sees. Simulations are the most widely used in science classes, due to their dynamic nature and their ability to represent the reality of many scientific phenomena (1990, Bradford).

And motivation is an important factor that interacts with the student's determinants to influence the student's performance behavior in class, and represents the force that motivates and motivates the student to do the schoolwork. This is reflected in the student's intensity of effort or the desire to do lesson assignments, and this strength is reflected in the intensity of the student's effort, and in the degree of perseverance and its continued performance and in offering the best abilities and skills in the lesson (Kelvin-Seifert, 2014).

Psychologists have divided the motivation in terms of its connection with the elements of the environment and the learner and their influence in the process of education to:

Internal motivation: It is the arousal that exists within the activity, the work or the subject, which attracts the learner towards it and stresses it to the desire to perform the work or preoccupation with the subject.

External stimuli: excitement that is outside the work, activity or subject and has nothing to do except in terms of purpose, organization or method, and is taken by the teacher in the form of reinforcements, awards or grades, material or moral (Kelvin-Seifert, 2014).

It is worth mentioning how motivation influences learning as it directs behavior toward specific goals. Students make goals for themselves, guide their behavior to achieve these goals, and increase the effort to achieve the goals. It determines the extent to which the student follows a task or work with enthusiasm and passion or shivering and laziness, and working to increase the initiative to start and do certain activities, and perseverance in their performance, students are

more likely to start a task they really want to do, and the probability of continuing to perform this task will continue to be completed even if they encounter obstacles (Rimawi, 2004).

Study problem and question

The problem of the study as a whole idea is need to improve the way of conducting the activities used in the teaching the concepts in biology, and employing all available strategies with the aim of achieving integration between the two aspects of science: knowledge and method, based on the reference of the studies to weakness of students in Jordan levels of learning scientific knowledge; in generally attributable to the fact that the methods of science education followed are still mostly conventional and focuses on student retention and concepts, and the results of several studies have indicated the positive impact of the use of laboratory and the scientific activities and their importance in the achievement of Students and the ability to provide the skills of science operation represented by teaching science curricula in general and science labs in particular such as a study cheating study(2009), and Abdul-Rahman study(2010). The importance of this study from the lack of research and studies that dealt with computer simulations as modern technique in the learning process at the local level, which highlighted the need for this study, which attempts to identify the impact of scientific activities and computer simulations in motivation development for learning biology among ninth grade students in Jordan, which may encourage other researchers to conduct a similar study in order to promote the reality of teaching science and prepare generation of students equipped with scientific competence required and from all the idea of this study come out to determine the effect of biology teaching with scientific activities and computer simulations in the development of motivation among ninth grade students in Jordan

Study Questions; The study problem was identified by the following question:

Is there a difference in the effect between biology teaching with scientific activities strategy and the computer simulation strategy on the development of motivation to learn biology among the ninth grade students in Jordan? Is there an impact of biology teaching with scientific activities strategy on the development of motivation to learn biology among the ninth grade students in Jordan?

- 1) Is there a positive effect of biology teaching with computer simulation strategy on the development of motivation to learn biology among the ninth grade students in Jordan?**
- 2) Is there are statistically significant differences at the level of significance ($\alpha=0.05$) in the development of motivation to learn biology among the ninth grade students attributed to the strategy of teaching? (Implementation of scientific activities compared to computer simulation.)**

The hypotheses of the study; To answer this question, the following hypothesis was formulated:

There were no statistically significant differences ($\alpha=0.05$) in the development of motivation to learn biology among the ninth grade students that attributed to the strategy of teaching (implementation of scientific activities in compare with computer simulation).

Purpose of the study:

- 1) Exploring the positive effect of teaching biology by the computer simulation strategy on the development of motivation to learn biology among the ninth grade students in Jordan?**

2) Exploring the effect of biology teaching on the strategy of scientific activities on the development of motivation to learn biology among the ninth grade students in Jordan.

The importance of the study

The importance of the study is:

- 1) It is a semi-empirical study intended to improve and develop methods of teaching biology. It examines the use of scientific activities based on sensory experience, which require a variety of teaching methods that stimulate and develop motivation towards biology learning process, and the computer comes as an aid in the learning process.
- 2) This study may encourage teachers of science in general and teachers of biology in particular to move away from the usual method that is interested in filling and indoctrination information, in which the role of the student is listening and watching, which makes students feel bored and lose motivation to learn. The interest in practical activities that help students to acquire practical skills remains in their minds because the experiences become reflex for what they have created, which make the student is the main focus.
- 3) The results of this study also benefit the designers of science curricula, science teachers and science supervisors.

Study limits and determinants

The dissemination of the results is:

Time Limits: This study was applied during the second semester 2013/2014.

Area limits: The study was implemented in (Zahra Al Madaen Elementary Mixed School) in Naour area, which contains sufficient computers in its schools.

Human limits: The study was limited to a group of ninth grade students.

Objective Limits: The educational material was limited to the unit of "human body organs" from the biology book that is scheduled for the ninth grade students.

Procedural definitions

The terms are defined theoretically and procedurally as follows:

- A. Scientific activities: Educational scientific activity or laboratory experience that the student(s) or teacher or both do inside or outside the school under the supervision and guidance of the teacher, that design of practical activities for students to reach their own knowledge (Zaitoun, 1999) , In this study is meant the implementation of practical (procedural and written) for the purpose of reaching knowledge, some of which are originally designed in the book, some of them originally designed in the book, and some by the researchers.

- B. Computer simulation:

Saleh (2004, p. 15) defines it as an advanced type of computer education program that deals with the representation and imitate behavior or phenomenon accurately. And provides events and procedures artificially, take into consideration the simplification and ease, and gives the learner an opportunity to control these events in terms of their recurrence or time. Thus, The learner can indulge in the educational situation through the multiplicity and diversity of computer teaching aids in addition to the multiple interfaces of the learner's interaction with the programs.

Procedurally: It is defined as a computer program based on the copying and analogy of phenomena and processes of human body.

Motivation to learn biology: Defined by (Yusri 2002, p.55) as "a set of emotions that motivates the learner to engage in learning activities that lead to the achieving of the desired goals".

Procedural definition :Is the readiness of the study members to participate and interact in the implementation of the lesson and mental stimulation to biology, measured by the total degree obtained in the motivation measure to learn biology prepared for this purpose

Theoretical framework

Practical activities and their importance for teaching science:

Is a consolidation of scientific curriculum that allows the student to practice his hobbies and deepen the concept of scientific thinking has and allows him to highlight his abilities and talents to practice theoretical and applied programs in the various fields of science in ways that interesting and enjoyable to benefit the student and society and the homeland (Stanford, 2013).

And scientific activities are a way of testing hypotheses and interpreting them. As its known that scientific activities do not produce theories in biology, as in physics. The theory is a deductive layout molded in mathematical formula while it in biology scientific activities describe quantitatively and qualitatively existing organisms systems or complex molecules found in organisms such as chromosomes, DNA, and hypotheses in biology, in the form of a description of mechanisms of action that are systematically causally connected and occur regularly (Stanford, 2013).

The study is characterized by scientific activities with several characteristics, the most important of which is the focus on the practical aspect of science, while not neglecting the cognitive content, linking the activity of the class and the laboratory, and providing some factual information and theoretical ideas that the student learns about science. Therefore, the experiences that the student can acquire from during the laboratory study, makes the laboratory has played an important role in the development of scientific and forecasting thinking skills (Abu Al-Hija, 2006).

Computer simulation and its importance in teaching science

Marai and Al-Hailah (2002) point out that the computer and its technical programs help improve learning, education, media and culture and control the behavior of people in their daily lives, and should not be a focus in the process of education on the computer as much as the educational program that is placed in it, the computer is only a tool for transport and storage and registration, while the program is within it is the process of real education, and computerized educational software of all kinds enables the learner to learn for himself without the need for knowledge of computer science.

The simulation has been used since human existence in the universe. Historical evidence suggests that the first simulation game in human history is the 3000 BC chess game in China, which was aimed at training in military exercises. The simulation is rooted in Greek civilization, where Plato showed the importance of imitating life situations through training and education (Heinich et al, 1993).

For most teachers in the classroom, technology in education means the use of computers and the Internet as a source of information for the teacher and learner. These tools have contributed to increasing the quantity and scope of information. Students can now use the Internet to obtain contemporary information with enhanced teaching aids such as video clips and photos easily, so the Internet contributes to the educational process. But some do not tend to use technology in education for many reasons such as in some classrooms have only one computer per classroom, and some schools do not have the ability to connect to the Internet. But even in classrooms where

one computer creates new opportunities and challenges for teachers, a computer can provide a student or group of students with a new set of educational materials (Kelvin-Seifert, 2014). Also it can also provide the teacher with an experience of students' ability to accomplish the required scientific activities at a specific time, and can also enrich students with high motivation with new teaching material, and help low-motivation students catch up with their peers. One of the most important things the computer does in education is to change the teacher's function from a full information provider to a leader and a side guide. So if the school has a large number of computers and a high ability to connect to the Internet, students have the ability to lead the learning process themselves, and through the Internet we can modified the conceptual errors of students who suffer from them (2014 Kelvin-Seifert). It is noted that this process needs to be funded. If there is not enough money, Internet access and the purchase of computers become impossible.

Al-Far (2002, p. 22) pointed to the main advantages of computer simulations, such as presenting and shaping the position of practical life, while maintaining clarity on the processes of this situation, and allowing the learner, apprentice or supervisor of training to control this situation to varying degrees. It is also give the freedom of modification of some of these situations, as well as allowing the learner to make mistakes without having serious consequences that threaten or harm his life, and to allow the learner to actively participate in learning and to make decisions on his own rather than just a passive receptor of information. And meant here to simulate the steps of conducting a particular experiment and controlling its variables, thus helping the student to infer the relationships and acquire the scientific concepts. It also allows the learner to be independent in decision-making in the learning process, and to provide non-traditional educational positions for the learner in a way that stimulates his thinking and uses advanced computer capabilities that other media do not have.

The use of simulation is an effective way in the learning process as they are learning here in the learning environment of discovery which is confirmed by Bronner, which is one of the pioneers of inductive method, which is one of the most important methods in the teaching of science and mathematics, so the transition and transformation to the use of e-teaching method as it is one of the objectives of the educational process and the programs of contemporary education. This requires a change in quality and development in light of current and future labor market requirements. In order to adapt to the information society, we should integrate the issue of e-teaching as one of the teaching methods used in teaching students of all stages of study. And there must be fundamental transformations in learning and teaching methods.

Motivation

Motivation is defined as energy or engines that enable the individual to choose specific aims and try to achieve it. It is internal process guides the individual to keep his or her behavior active through time (Baron, 1998).

Teachers are interested in developing a certain kind of student's motivation towards learning which is indicated as student tendency to practice meaningful academic activities that worth effort that can touch the academic benefits and the resulting benefits, and can be described motivation to learn as a general feature and a special case at the same time. There are many factors that contribute to building motivation for learning, including planning, focusing on goals, and meta-

awareness of what an individual tends to learn, active search for new information, a clear understanding of feedback and a sense of satisfaction with achievement, (abu-Awad, 2009).

Motivation is the force that activates behavior and aims to achieve goals. It is indirect concept that observable and evidenced by a number of behaviors from individuals that exhibit a high level of motivation such as attention, enthusiasm and positive participation by students in academic activities Which takes place inside or outside the classroom, the good preparation of exams, and the positive adaptation of the learning and learning attitude (Taoq and others, 2013).

Based on the above, it can be said that motivation is the internal energy of the individual must exist for the occurrence of behavior.

The concept of motivation

The notion of motivation in the theories of psychology has been widely researched, and this concept has occupied a space of research and study in the 20th century, especially in recent decades. There are many definitions of motivation mentioned in Khalidi (2011), including the following: "Motivation" is defined as a series of processes that guide very purposeful behavior Motivation is diverse and involves very different comparisons "(Taylor et al., 1982). Motivation: "is a set of internal conditions that drives an individual's behavior in order to restore the balance that has been disrupted." The motivation refers to a tendency to reach a certain goal, which is to satisfy internal needs or external desires. The motivation differs from the need that arises in the organism at a deviation Biological or psychological conditions necessary to preserve the survival of the individual "(Towak et al., 2003). Motivation refers to the factors that activate and direct behavior and lead to have motivated individuals. (Al-Qadi, 1981).

Motivation is the main force that drives an individual and directs his behavior towards a specific goal. He is the driving force of his behavior. Individuals vary in their levels of motivation because of several internal factors which related to the differences between individuals and external environment in which they live. While the educational technology has evolved rapidly, there has been less attention to the development of an instructional technology that stimulates the learner's drive towards education .

In particular, motivation is necessary before beginning education directly to attract the learner's interest in learning or motivation for education, It is equally important during the course of the education that the learner will continue his activity during the lesson, and in order for the learner to accept other subjects, his motivation must be stimulated in order to continue his research and investigation. (Al-Hila, 1999).

Importance of motivation

Al-Khalidi (2011) stressed that motivation refers to what motivates the individual to carry out an activity or behavior, and directing this activity to a certain destination. This confirms the assumption that the behavior is functional, That is, the individual practices a particular behavior because of the consequences of this behavior or the consequences of saturation of some of his needs or desires, and perhaps this fact is the underlying Muslim concept of motivation, which shows the concept of internal cases of consciousness, and the processes of the promotion and direction of behavior and keep it.

Al-Kawafha who is (Al-Khalafi, 2011) emphasizes the importance of motivation as an educational goal in itself. The motivation of students, their orientation and the generation of particular concerns make them accept to engage in cognitive, emotional and dynamic activities outside

school work and in their future lives. The important educational goals published by any educational system. The importance of motivation from the educational aspect is also seen as a means that can be used to achieve certain educational objectives effectively by considering them as one of the factors determining the student's ability to attain, Therefore learning does not happen in the way we want it unless there is a motive that motivates the learner to learn, and the best educational attitudes that focus on learners abilities and what motivate them (Al- sharqawi 2001).

Previous studies

After a review of educational studies and researches, a group of Arab and foreign studies and researches related to the subject of scientific activities and computer simulations were found, and their contribution to the development of predictive thinking and it has been reviewed in an attempt to identify the efforts exerted in study, the results thereof. The most important studies:

-Abu El-Hyja study in Jordan (2006). The aim of the study was to investigate the impact of the implementation of scientific activities using individual, cooperative and competitive strategies in providing the practical laboratory skills and achievement of the students of the basic stage. Part of biology curriculum selected for the ninth grade. Consisting of three groups of 254 female students, the first experimental group to study by individual strategy, the second experimental group study by cooperative strategy, the third experimental group study by competitive strategy. Three tools were used in the study: the mental abilities test (the Sequential matrices of Riffen), the measurement of the acquisition of practical laboratory skills and the test of educational achievement. The results showed statistically significant differences in the acquisition of practical laboratory skills in favor of the cooperative strategy, and the existence of significant difference in learn achievement in favor of the cooperative strategy.

-In a study conducted by Al-Hafez and Amin (2012) in Iraq, the aim was to discover the effect of the use of the virtual laboratory for physics and chemistry experiments in developing the observation power of middle school students and their Knowledge achievement, And randomly selected two groups of students in the first middle grade to represent the experimental and control samples. Each group consisted of (30) students males or females. The two researchers prepared two tests in the achievement of physics and chemistry, and used observation power standard and Check, also they put numbers of hypotheses to verify of reaching the goal of the study and data analysis using appropriate statistical methods; it has been reached that there is no statistically significant difference between the experimental group and the control group in the academic achievement in physics, which means that the use of the virtual laboratory does not have a clear role in the academic achievement of students . And present of statistically significant difference between the experimental group and the control group in the academic achievement of student in chemistry and specially the experimental group. This indicates that the use of the virtual lab has a clear role in increasing student achievement and there is no statistically significant difference between the experimental group and the control group in developing the observation power of its members. Which mean that the virtual laboratory has no clear role in developing students' observation power?

-In Turkey; (Akca, Feyzioglu & Tuysuz, 2003) Conducted a study aimed to the impact of computer simulation in academic achievement and trends in the tenth grade in Chemical solutions in chemistry compared to the traditional way, the study sample consisted of 84 students from tenth grade students in Izmir, were distributed to respondents in two groups: Control studied chemistry

with computer education, and experimental studied chemistry in the traditional way, the results of the study showed a statistically significant difference in student achievement due to the method of teaching in favor for the experimental group. The study also showed a Positive trend to education with computers.

In a study (Qrara'a, 2000), the study aimed to investigate the effect of the teaching method using the various educational media, the level of previous achievement and sex in the achievement in chemistry for the ninth grade students and their motivation to learn. The study sample consisted of (80) students divided into four groups of the ninth grade in Tafileh State schools, the effect of the method of teaching using multiple educational media (experimental group) exceeded the educational achievement in chemistry and the motivation of students to learn in the traditional way. Girls also outnumbered males in education, but their motivation to learn was equal. High-achievement students outnumbered low achievers in learn attainment and learning motivation, although multiple educational media benefited low achievers in educational results.

In a study conducted by Al-Afoun and Al-Banna (2009) on the knowledge of the impact of multimedia on achievement and the development of second preparatory grade students' motivation towards chemistry, the last five chapters of the chemistry book were assigned to the second preparatory grade. (210) Behavioral purposes were identified, and the teaching plans of the experimental and control groups were prepared as (19) plan for each group. The results of the study were in the presence of a difference of statistical significance and significance level (0.05) for the benefit of the experimental group, as the students of the experimental group who studied of multimedia superiority on students in the control group who studied according to the traditional method (without multimedia) in academic achievement, therefore the first zero hypothesis was rejected for the study, and there was a difference of statistical significance and level of significance (0.05) for the benefit of the experimental group. The students of the experimental group who studied of multimedia superiority on students in the control group who studied according to the traditional method (without multimedia) in the development of motivation towards learning chemistry, thus rejecting the second zero hypothesis of research.

In a study for Issa (2011), the aim of the study was to investigate the effect of using two models based on the constructivist curve in the acquisition of concepts and motivation towards science. The study sample consisted of 211 students from the eighth grade of the Directorate of Education in Al-kura and divided for three groups, a group teaching the teaching material using 5E's models, the second teaching material using the John Zahorek constructivist model and the third was a control group by using traditional way. The results showed that there were statistically significant differences in the test of the acquisition of scientific concepts due to the effect of the teaching model for the two experimental groups when compared to the control group in favour of the 5E model, and present of statistically significant differences due to the effect of the interaction between the teaching model and the gender, and present of statistically significant differences between the average responses of the sample members on the motivation scale towards total science learning due to the impact of the teaching model for the group taught according to the teaching 5E's model

-In a study conducted by Al-Fenjari (2012), it aims to investigate the effect of using the interactive board combined with the real evaluation in science education for the third grade students in their achievement and their motivation to learn. The study was conducted on 47 students of Al-Ettihad Secondary School for Girls, indicating that there is a statistically significant difference between the experimental group and the control group in the post-measurement of the achievement tests and

for the benefit of the experimental group (teaching using the interactive board associated with the real evaluation) compared to the control group (the regular way) A statistically significant was also found between the experimental group and the control group in the post-measurement of the motivation for science learning in favor of the experimental group, in addition to a statistically significant difference between the experimental group and the control group in the post-measurement for the benefit of the experimental group in compare with the control group(the regular way.)

Comment on studies

It should be noted from the foregoing, through a review of previous relevant studies, that these studies have reached the following:

First: the way of the impact of the use of scientific activities in the achievement of students, there were differences of statistical significance in the achievement of students in favor of scientific activities in all previous studies.

What distinguishes this study, it came to cover some of what was missing previous studies, especially in the following purview:

The comparison was made between two methods, not the traditional one, and the benefit of each in the development of motivation towards learning biology. The present study introduces dependent variables that did not link the other studies between them and the two independent variables. They relate to the method and may be related to one of the objectives for one goal of Learning and education which is motivation

The difference between the results of the previous studies and their differences in some fields may be due to several factors, including: the difference in the number of sample members, the period of study, the nature of the educational program, the educational stage, and the nature of the scientific knowledge. This is in line with what some researchers in the purview d of science teaching (Saad and Al-Yousif, 1988; Zeitoun, 2001) reported that there is no ideal teaching method suitable for all educational situations and for all individuals who are taught to teach different forms of scientific knowledge. It is therefore difficult to describe an ideal way to achieve all educational goals in science teaching.

Hence, this study is intended to cover some of the previous studies, especially in the following fields:

- 1) The comparison was made between two methods, none of them is the traditional method, and the benefit of each in the development of motivation.
- 2) The present study introduced a variable that did not link the other studies between it and the two independent variables (the method), and may have a relationship to the objective of learning and education; and It is a motivation for learning biology.

Method and procedures

Methodology of the study

The purpose of the study is to use the experimental method by using the pre-test and post-test on the study groups for the purposes of statistical control of the difficulty of distributing the study subjects to the groups randomly. This design can be expressed as follows

EG1: O1O2 X1 O1O2

EG2: O1O2 X2 O1O2

Symbol	indication of experimental design codes for study
G1	First experimental group
G2	Second experimental Group
O1	Application of the motivation scale
X1	Teaching learning strategy based on scientific activities
X2	Teaching a learning strategy based on computer simulation

Society and Study Sample

Study Society:

The ninth grade students; in the public schools in the capital Amman Governorate in Jordan and the students of Zahra Al Madaen Elementary School in the Nauor.

The sample of the study was conducted in one school for girls (Zahrat Al Madaen Mixed Primary School) and the number of ninth grade students (66) distributed among two study groups (Division A, 33 students, and division B and 33 students). The individuals of the study were chosen specifically because they are the stage in which the separation of the curricula into the disciplines of science at its four branches (physics, chemistry, biology and geology) in Jordan. As well as the school has chosen because the school contains two classes for the ninth grade, in addition to the similar economic, social and cultural conditions of the sample members. And the administrative and teaching staff of this school expressed their cooperation with the researcher in applying the study. The method of identifying the division that represents the group The first or second experimental group in the school was randomized, representing (a) the first division, studying with scientific activities, the second group (b) studying with computer simulation.

Study tool:

Motivation Scale Towards Biology:

For the purpose of the study, a measure of motivation for the life sciences was composed of (45 paragraphs) divided into four sub-dimensions. The following steps were taken in constructing the scale:

Viewing of educational literature and previous studies that deal with the subject of motivation in terms of its concept and importance, characteristics and components and conditions of composition and methods of measurement.

The definition of motivation as a procedural is: the readiness of the students of the research sample to participate and interact in the implementation of the lesson and mental counseling towards the biology measured as the total degree obtained in the measure of motivation towards learning biology prepared for this purpose.

To view a number of measures of motivation towards science in some studies, for example: (Al-Qahra (2000), Al-Afafun and Al-Banna (2009), Al-Fangri (2012).

Four dimensions of the scale were identified: self-efficacy, the practice of active learning in biology, the interest in biology teaching, the goal of achievement. Each of these dimensions included a number of positive and negative Sub-scale, and number of positive trend and negative trend paragraphs , and their numbers in each dimension.

Table 2

Subdirection Dimensions and numbers and trend of positive and negative paragraphs

Sub dimension	Positive paragraphs	Negative paragraphs	total summation
Self efficacy	1,2,3 7,6,5,4 , 10.9.8 11,12,13	14, 15	15
Practice active of biology learning	16,17,18,19,20,21,22 23,24,25,26,27	-	12
Interest in biology	28,29,30,31,32,34,35,36,37,	-	9
Goal of achievement	38,39,40,41,42,43,44,45	-	9
total summation	43	2	4

The quinary Likert gradient was used: (Strongly OK, OK, Not Sure, Disagree, Strongly Disagree) was used to respond to the metric paragraphs.

Believe the motivation scale

Ostensibly honesty:

The scale was presented in its preliminary form to a group of arbitrators with expertise and experience in (curricula and methods of teaching science, educational psychology, measurement, evaluation, educational supervision and teachers). Each of them was asked to express his opinion on the following matters: - The extent to which the paragraphs of the scale were prepared for the measurement, the extent to which the paragraphs were considered for the correct language formulation, as well as the relevance of the paragraphs to the level of the ninth grade students, and any addition or deletion or modification they deem appropriate. After restoring the initial versions notes were taken, And make the necessary adjustments, most of which focused on redrafting some paragraphs, and Merge some paragraphs and other fragmentation, and the adopting a word is not sure rather than neutral. This was taken when adjusting, while keeping the number of paragraphs in the scale (45), and Appendix (2) showing the measure of motivation towards life science learning in its final form.

The honest of The construction of the measure of motivation towards learning biology:

In order to extract the semantics of the construction validity of the scale, the correlation coefficients of the vertebrae were extracted with the total score in the pre-sample from outside the sample of the study, which was composed of (30) students, where the scale paragraphs of the scale and the coefficient of discrimination were analyzed between each paragraph and total score on the one hand, and between each paragraph and its link to the field to which it belongs, and between each area and the total score on the other hand, and the correlation coefficients of paragraphs with the tool as a whole ranged between (0.39-0.81) With the range (0.37-0.83) and Table (3) shows that.

Table 3

The correlation coefficients between the parameters of the motivation measure towards learning biology and total score and Field to which you belong

Paragraph number	Coefficient of correlation With the tool	Coefficient of correlation With the domain	Paragraph number	Coefficient of correlation With the tool	Coefficient of correlation With the domain	Paragraph number	Coefficient of correlation With the tool	Coefficient of correlation With the domain
1	.65**	.62**	16	.54**	.59**	31	.66**	.74**
2	.50**	.58**	17	.78**	.79**	32	.76**	.75**
3	.73**	.69**	18	.78**	.76**	33	.58**	.49**
4	.45*	.49**	19	.61**	.69**	34	.67**	.72**
5	.56**	.49**	20	.41*	.37*	35	.50**	.40*
6	.39*	.53**	21	.65**	.72**	36	.63**	.65**
7	.81**	.82**	22	.46*	.64**	37	.62**	.67**
8	.80**	.72**	23	.72**	.81**	38	.61**	.65**
9	.59**	.67**	24	.68**	.62**	39	.73**	.83**
10	.57**	.55**	25	.65**	.51**	40	.70**	.61**
11	.52**	.61**	26	.51**	.58**	41	.44*	.52**
12	.57**	.60**	27	.71**	.78**	42	.62**	.60**
13	.79**	.83**	28	.56**	.69**	43	.62**	.59**
14	.55**	.53**	29	.66**	.71**	44	.70**	.82**
15	.75**	.71**	30	.72**	.80**	45	.75**	.74**

*Statistical function at the level of significance (0.05).

**Statistical function at the level of significance (0.01).

It should be noted that all correlation coefficients were of acceptable grade and statistical function, and therefore none of these paragraphs were deleted.

Table 4
Cross - domain correlation coefficients and total score

	Self efficacy	Practice active of biology learning	Interest in biology	Goal of achievement	Motivation as a whole
Self efficacy	1				
Practice active of biology learning	.911**	1			
Interest in biology	.897**	.926**	1		
Goal of achievement	.910**	.866**	.893**	1	
Motivation as a whole	.972**	.961**	.964**	.951**	1

*Statistical function at the level of significance (0.05).

**Statistical function at the level of significance (0.01).

The values of correlation coefficients are shown to range between (0.866 and 0.972), which are high values and function at significance level (0.05).

Stability of the motivation scale

To ensure the stability of the tool, the internal consistency was calculated on a pre-sample from the outside of the sample of the study contain (30) students, according to the equation cronbach alpha, and the table below shows these transactions, and considered these ratios suitable for the purposes of this study.

Table 5

Coefficient of internal consistency cronbach alpha

Fields	Internal consistency
Self efficacy	0.87
Practice active of biology learning	0.85
Interest in biology	0.85
Goal of achievement	0.82
Motivation as a whole	0.95

The values of Table (5) show that the cronbach alpha coefficient is between 0.82 and 0.95, which is high and acceptable for study purposes.

Recommendations and proposals

In light of the results of the study, the researcher makes the following recommendations and proposals:

First: Instructing science teachers in general and biology teachers in particular to use the scientific activities in teaching, and the processing of labs in particular biology labs and provide them with all the tools and devices and means necessary to meet all levels of diverse students and multiple intelligence, and the compatibility of scientific activities and applications.

Second: To enrich the biology curriculum with scientific school activities consistent with the bases and principles of modern teaching theories, and to present their knowledge content in a way that is compatible with modern teaching and evaluation strategies.

Third: Conduct further studies and research on the subject of motivation, computer simulation and its applications in different of educational stages.

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