

THE IMPACT OF THE LEARNING STRATEGY THROUGH SOLVING PROBLEMS IN THE DEVELOPMENT OF ACADEMIC ACHIEVEMENT FOR JORDANIAN PUBLIC SCHOOL STUDENTS IN BIOLOGY

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ABSTRACT: *The objective of the present study was to identify the impact of problem solving strategy in the development of academic achievement for Jordanian public schools students in biology. To achieve the objectives of the study, the researcher followed the analytical descriptive approach in terms of applying the study tool, data collection and analysis, The study population may be from all 10th grade in the southern Ghor District, The sample of the study consisted of a group of students from the 10th grade of Al Safi Secondary School for Boys with (30) students. The study found that there is an impact of the problem solving strategy in the development of academic achievement for Jordanian public schools students. (65%) in the development of academic achievement for Jordanian public schools students in the biology sector. He recommended that the problem solving strategy be implemented in all areas of the Hashemite Kingdom of Jordan because of its many benefits in the development of academic achievement for Jordanian public schools students In biology.*

KEYWORDS: Strategy, Problems, Collection, Biology

INTRODUCTION

The human societies have witnessed a technological scientific revolution that resulted in many changes and rapid developments, which led to the emergence of many political, social, environmental, economic and other problems that confront individuals and groups in their daily lives. These societies were forced to make efforts to develop educational institutions to prepare individuals To cope with the changes that are taking place in the current era, on the one hand, and to address the problems that these variables have on the other hand.

Every day there is new data on the stage of life that needs new experiences, ideas and skills to deal with successfully. In other words, we need a creative person who is capable of solving the problems he faces and adapting to his natural and social environment according to the desired values and goals. (Ibrahim, 2004, 192)

Education is the basic starting point for improving the quality of education through human resources, which are indispensable in achieving comprehensive development, which takes into account all aspects of growth in an integrated and balanced manner, focusing on how knowledge is used and applied and generated, and solved. Problems in a sufficient and rapid manner, as well as focus on the motivation of learning and continuity and work to make the learner constantly questioning and research in order to reach the production of knowledge itself rather than receiving and keeping ready.

Hence, the educators began to review the teaching methods and strategies used in the schools, and the search for special teaching strategies that make the learner an effective component in

the educational process. Recent theories have focused on the role of the student as the centerpiece of the generalization process, while the role of the teacher should be organized, facilitated and guided. While directing students to work in groups of students of different ages and abilities to solve the problems they face. (Suleiman, 2005, 18)

Problem of the study

General education and teaching biology, especially by providing students with the necessary scientific knowledge and intellectual and scientific skills and the formation of values and trends, and the development of the direction of research and scientific thinking, by engaging them in activities effectively to form new concepts and connect them to their lives and environment away from indoctrination and accordingly falls on the science teacher. In particular, great responsibilities, which prompts him to be distinctive and inspiring in the way he teaches and methods of teaching, and brilliant in the use of available means, to be able to achieve the educational goals of biology and land education. (Ministry of Education, 2001, 4-5)

Therefore, the current study problem is the knowledge of the impact of the learning strategy through solving problems in the development of academic achievement for Jordanian public school students in biology.

Questions of the Study:

1. What is the impact of the learning strategy through problem solving in the development of academic achievement for Jordanian public school students in biology?
2. How much does the learning strategy contribute to problem solving in the development of academic achievement for Jordanian public school students in biology?

Hypotheses of the Study:

1. There is no statistically significant effect at the level of significance ($\alpha = 0.05$) of the learning strategy by solving problems in the development of academic achievement for Jordanian public school students in biology.

Objectives of the Study:

1. Learn about problem solving strategy.
2. Measuring the impact of the learning strategy through solving problems in the development of academic achievement for Jordanian public school students in biology.
3. Identify the contribution of the learning strategy through solving problems in the development of academic achievement for Jordanian public school students in biology.

Importance of the Study:

The importance of the current study is that it focuses on developing the students' skill in problem solving by adopting the steps of scientific thinking through their study of the topics of biology in problem solving strategy. This is in line with the recent trends in the Ministry of Education, which focus on adopting skills input as one of the main approaches in teaching and building National Curriculum.

The limits of the study:

1. Spatial boundaries: The study was conducted at the Southern Ghor District.
2. Time Limits: The study was conducted in the second semester of the academic year (2017/2018)
3. Human Boundaries: The application of the study was limited to a sample of (30) students from public schools in the southern Ghor District.

Terminology of study:

1. Problem Solving Strategy: A type of performance that is reflected in the mental processes used by the student in carrying out any problem and requiring skill. Students can learn and improve through practice (Bouaziz, 2014)
2. Obtaining: Information and skills acquired by learners as a result of a particular subject study or unit of study (Abu Jado, 2007, 40)

Theoretical Literature of the Study:

First: Problem Solving Strategy

Problem solving is one of the main skills students need today, and recent studies in problem solving have indicated that this skill has become an important requirement of life, and this is also the focus of modern teaching and learning theories. The education system is often criticized for demanding reform of teaching and learning methods and curriculum development through the perception that students memorize knowledge facts and applications, and the need for the curriculum to include problem solving skills and applications as one of higher thinking skills. Today, there are strong trends in education to integrate problem solving skills as a key component of the curriculum. This was noted by the American Society for the Advancement of Science in 1993, where problem solving skills have been adopted as an important criterion for the development of scientific curricula. Although students of different ages lack the skills to solve problems, the requirements of the labor market require that the individual possess higher thinking skills because rapid economic and scientific change presents many challenges. Therefore, students must meet these challenges and realize their importance through problem solving and decision-making training. As scientific knowledge is constantly increasing, it becomes necessary for students to develop their higher-order thinking skills, although the curriculum has evolved their basic thinking skills. The development of higher thinking skills, including problem solving skills, helps the student to acquire complex scientific knowledge and increase his / her scholastic achievement (Suleiman, 2005, 41)

Types of Strategies:

There are a variety of types of strategies that contribute to problem solving, including:

Try strategy:

Trying to apply suggested solutions to the problem. The attempt may be wrong, that is, you will not succeed in reaching the solution, so try again, so that one attempt succeeds in finding the right solution to the problem. The application of this strategy depends on a set of steps:

Proposed to solve the problem. An initial test of each probability, to ascertain the extent to which it can reach the appropriate solution. Limit expected attempts to success in a given number. Guess the solution to be reached. (Al-Balushi and Saeedi, 2009, 17)

Simplification Strategy:

Is a strategy that contributes to transforming the nature of the problem from complexity to simplification, so that it can be easily accepted by the party or the parties that suffer from it. The more the problem is divided or simplified into simple sections, the easier it becomes to solve them. , Which:

- a. Think carefully about the problem.
- B. Identify factors to occur.
- C. Solve simple sections, by following them at the beginning of the problem.
- D. After ensuring that part of the problem is resolved, the actual work begins to be completely resolved.
- E. Access to the right solution simply. (Ahmad, 2003, 12)

Creative Thinking Strategy:

Is a strategy linked to mental thinking, which depends on creativity in reaching solutions to problems, and is characterized by this strategy as a comprehensive, that contribute to the treatment of the problem depending on all elements, and tools that help in solving, and also depends on the development of new ways to solve problems, Strategy on the following steps:

- a. Think about all the details of the problem.
- B. Consider the problem with a new perspective, and it is possible to rely on the opinion, or experience of someone else.
- C. Try to find a new way to resolve the existing problem.
- D. Develop a range of creative solutions to choose the right solution. (Abu Jado, 2007, 33)

Steps to problem-solving skills (ideal style):

I = Identification

D = Definition

E = Exploring strategies

A = acting on ideas

L = looking effects

Steps of Problem Solving for (Syert)

1. Look at the total pictures, do not look at the details.
2. Do not rush to issue judgment, do not commit yourself to the situation early.

3. Ask oral questions of various forms.
4. Be flexible, and examine the flexibility of your hypotheses.
5. Go back, return from the feed to the foreground (from the last problem to the first).
6. Advance in a way that allows you to return to your partial solution. (Debussy, 2003, 78)

Problem-Based Learning Model for Students:

1. Solving the problem is based on learning in an instructional environment that leads problem solving to learning.
2. To present the problem and formulate it in a simple language that suits students' thinking.
3. Provide a safe, active, cooperative environment.
4. Focus on the student.
5. Students evaluate their own performance.
6. Great importance is given to personal preferences of students.
7. Teaching students the method of exchanging personal experiences.
8. Educating students about the responsibility of solving problems and their consequences and adopting its results.
9. Develop students' self-confidence and express their feelings and ideas. (Bouaziz, 2014, 154)

METHOD AND PROCEDURES

The study population and sample:

The study population consisted of the male students in the Southern Ghor district in the Hashemite Kingdom of Jordan counting (220) while the sample consisted of (30) students of the **tenth grade** in the Southern Ghor district.

Study Tool:

The researcher has prepared one main research tool, which is a test consisting of (20) multiple choice paragraphs to measure the impact and extent of the contribution of problem solving strategy in the development of student achievement in biology.

Statistical processing:

The data of this study were processed according to the following methods:

1. Use the Chronbach's Alpha parameter to determine the stability of the tool.
2. Simple linear regression analysis.

Reliability of the Study Tool:

The researcher applied the tool on a survey sample of the study population of (20) student to calculate the Reliability of the study tool through the equation of the consistency of internal consistency (Split – half) and corrected by the equation of Spearman Brown, and the following table indicates the value of stability and corrected stability value.

The reliability coefficient was (0.68) in this study, while the corrected reliability coefficient (0.80) was acceptable in this type of humanitarian studies. See Table (1).

Table (1) The study tool reliability coefficient

Corrected reliability coefficient	Split – half reliability coefficient
0.80	0.68

$$\text{Corrected reliability equation} = 2 \times \text{split – half reliability coefficient} / 1 + \text{split – half reliability coefficient}$$

Data Analysis and Testing of Study Hypotheses:

The first main hypothesis: There is no statistically significant effect at the level of significance ($\alpha = 0.05$) of the learning strategy through solving problems in the development of academic achievement for students of Jordanian public schools in biology.

To answer this hypothesis and determine its validity, the researcher sought to analyze the simple linear regression as follows:

Table (2) Simple linear regression analysis

	T	sig	F	df	sig	Prediction coefficient value
Problem Solving				1		
	4.87	0.000	14.12	28	0.000	0.775
				29		

The following table shows that there is a statistically significant effect at the level of ($\alpha = 0.05$) of the problem, solving strategy in the development of student achievement in biology. The calculated value (F) (14.12) was greater than the value of (F) (4.20) in the table, and thus accept the alternative hypothesis and reject zero, as the previous table shows that the problem solving strategy contributes (77.5%) to the development of student achievement in biology, that is, it has the greatest impact on the other variables and factors that can contribute to the development of student achievement. In biology, the student's tendency to learn scientific materials that rely on understanding rather than conservation, and other variables.

The researcher explains the previous outcome of the strategy of solving problems by activating mental work and stimulate thinking, which makes the student makes a mental effort regularly, especially if the teacher followed with some moral support, to ensure continuity of the student in the effort and solve the problems that may face.

RESULTS

1. There is a statistically significant impact of problem solving strategy in the development of student achievement in biology.
2. Problem solving strategy contributes 77.5% to the development of student achievement in biology.
3. High school students tend to learn through modern teaching methods.

RECOMMENDATIONS

1. Disseminate the strategy of problem solving in all areas of the Hashemite Kingdom of Jordan because of its many benefits in the development of student achievement in biology.
2. Holding workshops and training courses for science teachers in order to clarify the importance of such strategies in the development of student achievement in biology and other materials.
3. Integrate such strategies into the student curriculum to become a general approach to all educational materials.

REFERENCES

- Abu Jado, Saleh Mohammed and Ali Nofal, Mohammed Bakr (2007). Teaching Theory and Practice, Dar Al-Misir, Amman, Jordan.
- Ahmed, Amal (2006). Experimental Psychology, Damascus University Publications, Damascus.
- Al Balushi, Sulaiman and Saeedi, Abdullah (2009). Methods of Teaching Science Practical Concepts and Applications, Dar Al-Masirah, Amman, Jordan.
- Al-Dibsi, Ahmad and Al-Shihabi, Saleh (2003). Methods of Teaching Natural Sciences, Damascus University Press, Damascus, Syria.
- Bishara, Gabriel and Elias, Asma (2007). Educational Curriculum, University of Damascus Publications.
- Bouaziz, Mohamed Abdel Rahman Rabah (2014). The effectiveness of problem solving strategy in the development of achievement and basic science skills and scientific thinking for students of the tenth in natural science, unpublished master thesis, Faculty of Education, University of Ouargla, Algeria.
- Ibrahim, Majdi Aziz (2004). Encyclopedia of Teaching, Floor (4), Dar Al Masirah, Amman, Jordan.
- Suleiman, Sana Mohammed (2005). Cooperative Learning, Its Foundations, Strategies and Applications, Science of Books, Cairo, Egypt.