European Journal of Training and Development Studies
Vol.5 No.2, pp.1-8, June 2018
Published by European Centre for Research Training and Development UK (www.eajournals.org)

ACTIVATION OF SCIENCE LABORATORIES IN JORDANIAN PUBLIC SCHOOLS AND ITS IMPACT ON STUDENTS' ACHIEVEMENT IN PHYSICS

Amal Mohammad Mahmoud Al-Hawamdeh

M.A Degree in Astronomy Science, Institute of Astronomy and Space Sciences – Al Al-Bayet University, Amman Post office, University of Jordan, Amman, Jordan. Postal Code (11942)

ABSTRACT: *The present study aimed to identify the effect of activating the physics labs in Jordanian public schools on the achievement of students in physics. To achieve the objectives of the study, the researcher followed the analytical descriptive method in terms of applying the study tool and data collection and analysis. For the Directorate of Education Jerash, while the sample of the study was (30) students.The study found that the effect of activating the physics labs in the Jordanian public schools on students' achievement in the physics subject. The study also found that the lack of materials for lab work is one of the most important obstacles that prevent the use of physics labs, The researcher recommended the need to hold training courses for the physicists in particular and science teachers in general to clarify the importance of the physics lab in increasing student achievement.*

KEYWORDS: Physics, Laboratories, Achievement.

INTRODUCTION

Physics contains the basic processes of science, so it was necessary to focus on the practical side and accompanying activities that would give the student these processes and the identification of the discovery and experimentation.

Kazim pointed and Lissy (1998, p. 22) to the importance of laboratory activity and its important role in the study of physics and it is difficult to imagine an effective program of physics without the use of laboratory activity, and scientific experiments are not limited to activities that take place in the lab, but extends to other sites, as The student's own experiment is very important in the teaching of physics.

Ali pointed out (2001, p. 192-193) that laboratory activity contributes to achieving many of the goals of science education such as understand the nature of science and scientific knowledge and the development of basic science processes and increase real students to learn, and the development of scientific thinking and creativity among students and the development of attitudes and values and tendencies and scientific concerns of the skills Learners.

Al-Khalili et al. (1417H, 306-307) explained that experimentation is directly related to the concept of modern science. It is one of the most teaching methods that is related to physics. However, experimentation requires sufficient knowledge and special training for the teacher so that the activity is effective and meaningful to the student. To develop direct learning experiences, develop scientific thinking skills, acquire manual work skills, and develop positive attitudes towards work.

From this point of view, this study aims to identify the importance of activating physics laboratories in Jordanian public schools and its impact on student achievement in physics.

Problem of the Study:

Perhaps the most important characteristic of the physics lesson from the lessons of other subjects is to link the content of the material to the practical activity and experimentation which is in no way impossible. In order for the students to carry out the activities and conduct the experiments, the suitable place must be provided with all necessary equipment and requirements.

From this point of view, this study aims to identify the importance of activating physics laboratories in Jordanian public schools and its impact on student achievement in physics.

Questions of the Study:

1. Is there any effect of activating physics laboratories in Jordanian public schools on students' achievement in physics?

2. What are the obstacles to activating physics laboratories in Jordanian public schools?

Hypotheses of the Study:

1. There is no effect at the level of significance ($\alpha = 0.05$) is statistically significant for the activation of physics laboratories in Jordanian public schools on the achievement of students in physics.

Objectives of the study:

1. To understand the effect of activating physics labs in Jordanian public schools on students' achievement in physics.
2- Identifying the obstacles of activating the physics labs in Jordanian public schools.

Importance of the study:

That the importance of the study is due to the importance of the subject, which is addressed, the school laboratory is one of the basic elements in the teaching of physics at all stages of education. Therefore, the researcher believes that the results of this study can be useful to the public schools by identifying the obstacles that prevent the use of the school laboratory in teaching physics, which helps to avoid these obstacles later.

Terminology of the Study:

School Laboratory:

Nashwan (1998, p. 126) defined the school laboratory as "the place where the scientific activity takes place.

Al-Muhaisin (1419H, p. 95) defined the school laboratory as: "That part of the school dedicated to conducting experiments and practical presentations, verifying the validity of the laws and theoretical hypotheses in practice.

The researcher defines the school laboratory as: the place for experiments and practical activities associated with physics lessons and equipped with all the necessary requirements for the implementation of these activities.

Achievement:

The academic achievement measures the number of scientific concepts among students, which is one of the most important indicators on which educational systems measure the amount of learning, and thus it is an indicator of the extent of achievement of educational and educational goals. "The concept of achievement is used to indicate the degree or level of success achieved The student in the field of study; it represents the acquisition of knowledge and skills and the ability to use them in current or future situations "(Allam, 2006, p. 14)

Qatami and Qatami defined it as "the means by which we reach numerical indications of the extent to which the goals are achieved" (Qatami, Qatami, 2001, 75)

Al-Shuaie and Al-Balushi defined him as: "The student acquires knowledge, skills and values after passing through the experiences and educational attitudes of a particular subject." (Shuaile and Balushi, 2004, p. 66)

Limitations of the Study:

1. Human Limits: The study included students in the Eighth grade in the Jordanian public schools of the Directorate of Education in Jerash for the academic year (2017/2018).

2. Time Limits: This study was completed in the academic year (2017/2018).
3. Scientific Limits: This study focused on measuring the effect of activating physics laboratories in Jordanian public schools on students' achievement in physics.

LITERATURE REVIEW:

It will show the importance of the physics lab and the objectives achieved by the use of the physics laboratory and the obstacles facing teachers in the use of physics labs.

The importance of physics lab:

Shaheen and Hattab (1425 H, p. 64) stressed the importance of the laboratory in the present era and its role in transforming the abstract into constants and upgrading the level of expertise of both the teacher and the learner, and its connection with the educational process and the modern physics curriculum. In addition to its role in acquiring skills, forming scientific trends, achieving the goals of teaching physics, and providing realism for many theoretical information, which strengthens students' minds and leads to a better understanding of the nature of science and a sense of importance. Workout.

Nabiha al-Samarrai (2005, p. 74) referred to the modern philosophy of the laboratory as that it should provide the practical side of the theoretical to the theoretical knowledge that the student has derived. The application may also remove the student from the laboratory room to the events and observations. The role of the student turns into a positive role based on the conclusion and the recording of the results and observations The laboratory is a way to stimulate thinking among students and motivate them to discover solutions on the one hand and raise new problems on the other, is a motivation towards creativity and innovation, making the educational process continuous and exciting.

Attallah (1423 H, pp. 304-305) pointed to the importance of the laboratory and the practical activities and that the recent trends in science teaching emphasize this and take it very interest and therefore because of its prominent role in the success of science programs and methods. He pointed out that the laboratory is closely related to the knowledge content of the science curriculum and the implementation of practical activities that have a prominent role in achieving the objectives of teaching physics.

He pointed out that the modern view of the laboratory focuses on the process rather than the place or time in which the activities are conducted. But that does not prevent the laboratory from being viewed as a natural place or environment for practical activities.

Objectives achieved by the lab:

Atallah (1423, p. 306) states that the laboratory achieves the following objectives:
1. Evidence of the validity of scientific information and knowledge in the forms that the student had learned earlier.

2. Applying scientific concepts that the student has learned in new situations.

3. Developing some new skills and science processes in the student.

4. The student will arrive at a reliable scientific knowledge.

5. Use the application and promote the objectives of student learning in advance.

6. Training and acquiring the skills of science operations.

7. Achieve the principle of learning by doing.

8. Acquisition of scientific trends and tendencies.

Obstacles to using the school laboratory:

zaytun (2004, pp. 177-178) cited the following constraints for using the laboratory:

1. There is no laboratory quota in the course.

2. The number of classes taught by the teacher per week.

3. The number of students per class.

4. Length of the curriculum - the size of the study material.

5. Lack of time to prepare and prepare experiments.

6. Lack of laboratory tools and devices.

7. Lack of security and safety in the laboratory.

8. Lack of laboratory records to prepare experiments and prepare for activities.

9. Lack of necessary water, electricity and heat sources in the laboratory.

10. Insufficient financial resources to fund laboratory experiments.

11. There is no room or room for the school laboratory.

12. Non-concentration of general tests on the laboratory in teaching science.

13. The time of the session is insufficient for laboratory testing.

14. Lack of knowledge of the teacher operation and maintenance of laboratory devices.

15. The teacher is not sufficiently prepared to perform laboratory experiments.

16. The lack of cooperation of the school administration in the financing of laboratory experiments.

17. Avoid failure of laboratory experiment in front of pupils.

18. Avoid consumption or damage of laboratory materials.

19. Difficulty controlling pupils in the laboratory.

20. Avoid breaking laboratory tools and devices.

21. Weak attitudes and attitudes of the teacher towards laboratory work.

22. Lack of emphasis on science curricula on laboratory activity.

Shaheen and Hattab (1425 AH, pp. 182-185) cited some of the obstacles of laboratory work, as follows:

1. There is no dedicated laboratory room.

2. Narrow space inside the laboratory hall.

3. Lack of basic services such as water, electricity, gas and sanitation.

4. Lack of suitable furniture.

5. Lack of adequate ventilation.

6. Poor availability of appropriate equipment with curriculum.

7. Lack of safety tools and first aid kits.

8. Low level of validity of devices and laboratory tools.

9. Present the lesson theoretically, and then experiment after some time.

10. Poor ability of the teacher to use or employ devices to achieve the objectives of the lesson.

11. Shortness of time leading to non-termination of laboratory work and not getting results.

12. The large numbers of students and the resulting risks.

13. Failure to maintain order and cleanliness.

14. The teacher's inability to provide appropriate guidance when required.

From the above it is clear that one of the most important obstacles that prevent the use of the laboratory in teaching physics:

1. Increase the teaching quorum of the teacher of the material.

2. The length of the curriculum for the study plan.

3. Administrative and routine constraints that can prevent or limit the use of the laboratory.
4. Some teachers are not convinced of the importance of using the laboratory.

5. Lack of materials and devices necessary for conducting experiments, or difficult to access.

6. The number of students per class, the size of the space and the lack of seats in the laboratory room.

METHODOLOGY OF THE STUDY

A) population and Study Sample: The current study population consists of 10 students in the Jerash Education Directorate in the Hashemite Kingdom of Jordan (1737). The sample of the study consisted of (30) female students of the Eighth grade of the secondary school of girls.

B)The Study Tool:

The researcher prepared an achievement test for physics to measure the effect of activating physics labs in Jordanian public schools on students' achievement in physics in the form of a multiple choice consisting of (20) question.

C) Statistical treatment:

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

1- Using the Cronbach's Alpha coefficient to determine the stability of the tool.

2. The arithmetical averages and the standard deviations.

3. One sample t test.

D) Reliabilityof the Study Tool:

The researcher applied the tool on a survey sample of the study population of (20) students to calculate the stability of the study tool through the equation of the consistency of internal consistency (midterm fragmentation) 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 0.87 in this study, while the corrected reliability coefficient (0.93) 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
0.93	**0.87**

Corrected reliability equation = 2 × split – half reliability coefficient / 1 + split – half reliability coefficient

Data Analysis and Testing of Study Hypotheses:

First hypothesis: There is no effect at the level of significance (α = 0.05) is statistically significant for the activation of physics laboratories in Jordanian public schools on the achievement of students in physics.

Table No. (2) The arithmetic means, standard deviations and T – value of the sample members responses to the study tool

No.	Arithmetic mean	Standard deviation	T	df	sig
35	18.25	1.65	8.254	29	0.000

By looking at the previous table. We found that there is a statistically significant effect on the level of alpha (0.05) to activate the physics labs in the Jordanian public schools on the achievement of students in physics, where the value of the significance level was less than the value of the alpha level (0.05), thus accepting the alternative hypothesis, The 18.25 average arithmetic mean the strength and positive relationship.

RESULTS

1. There is a statistically significant effect of the activation of physics laboratories in Jordanian public schools on students' achievement in physics.

2. There are many difficulties facing the physics teachers in activating the physics labs, the most important of which is the lack of materials for laboratory application in Jordanian public schools.

Recommendations

1. Conducting training courses for special physics scientists and science teachers in general to explain the importance of the physics lab in increasing student achievement.

2. Providing materials for laboratory work in Jordanian public schools.

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