

## THE CHALLENGES FACED BY SCIENCE TEACHERS IN ACTIVATING SCHOOL LABORATORIES

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**ABSTRACT:** *The study aimed to identify the most common challenges faced by science teachers in activating the school laboratories. 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. The study population consisted of all the teachers of science and educational supervisors in Jerash Education Directorate. There were 15 teachers and five educational supervisors. The study found that there are a number of challenges facing the science teachers in activating the school labs, the most important of which is the low number of classes devoted to teaching science, the researcher recommended the need to work to restructure the distribution of classes of science and increase the time allocated for practical activity.*

**KEYWORDS:** Science, Laboratory, Challenges.

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### INTRODUCTION

Science contains the basic processes of science, and it is necessary to focus on the practical side and accompanying activities that will give the student these processes and his identification on discovery and experimentation.

Through Attio (1427) on the importance of experimentation and laboratory study, saying: "The laboratory study in which the student conducts experiments and laboratory activity of the most important modern trends in the teaching of science.

Baez also stressed the importance of experimenting in the construction of the science system and that experimentation has an important role in acquiring skills and learning science effectively, so there must be a dedicated place and a place equipped with all requirements that students can conduct scientific activities and experiments freely and safely under the supervision of science teacher and based on As directed by the curriculum and commensurate with the school stage, and better and more appropriate than the school laboratory to perform this role and achieve those goals.

In this regard Shaheen and Hattab (1425 H, p. 64) note that the laboratory is an integral part of the educational process and is of great importance in transforming the abstract into constants, increasing the experience of the teacher and the learner alike, and helps to form tendencies and tendencies and acquire skills better among students, Is a cornerstone of the modern science curriculum.

Najdi et al. (1423H) stressed the importance of the laboratory in the teaching of science and the necessity for students to undertake these activities on their own, provided that they are suitable for their age stages and that they are prepared well in advance by the teacher.

### **Problem of The Study:**

The most important thing that distinguishes the science lesson from the lessons of other subjects is that the content of the material is related to 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.

It is in this sense that this study comes to identify the challenges facing science teachers in activating school laboratories.

### **Questions of The Study:**

1. What are the challenges facing science teachers in activating school labs?
2. Do the estimates of science teachers differ from those of the educational supervisors?

### **Objectives of the study:**

1. Identify the challenges facing science teachers in activating school laboratories.
2. Identify the differences between the assessments of science teachers and educational supervisors of the challenges facing science teachers in activating school laboratories.

### **Importance of The Study:**

The importance of the study is due to the importance of the subject that it addresses. The school laboratory is one of the basic elements in the teaching of science in all stages of education. Therefore, the researcher believes that the results of this study can help the public schools by identifying the obstacles that prevent the use of the school lab in education Science to help prevent these obstacles.

### **Terminology of The Study:**

1. Nashwan (1998) defined the school laboratory as "the place where the scientific activity takes place.
2. Science teachers: Teachers who have a diploma or bachelor's degree or any postgraduate studies in science or any related subject such as chemistry, physics, earth sciences, etc. (Ministry of Education, Jordan)

### **Limitation of The Study:**

1. The study included teachers of science in Jordanian government schools in Jerash governorate and educational supervisors for science.
2. The study was conducted in the second semester of the academic year (2017/2018).

### **The theoretical framework of the study:**

The researcher will present in this part the school laboratory and the challenges of using the science lab

**First: The School Laboratory:**

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 relation to the educational process and the curricula of modern sciences. In addition to its role in acquiring skills, forming scientific trends, achieving the objectives of teaching science, and providing realism for many theoretical information, which will establish information in the minds of students and lead to better understanding of the nature of science and the sense of the importance of experimentation B.

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.

Al-Najdi et al. (2003, p. 280) stated that teachers who are not convinced of the importance of practical lessons conducted by students in the laboratory are far from achieving the objectives of teaching science.

The experiments are important whether they are individual or collective, whether they are illustrative or practical. The most important of these experiments are the following: the training of students in the use of laboratory tools and devices, and the imparting of different skills, in addition to linking learning with sensory stimuli. Which leads to understanding and assimilation and then application and therefore the student's self-reliance in the learning processes, the laboratory is where the activity is associated with the science and therefore can have an important role in learning this article. He also stressed the necessity of having the laboratory in each school and the specifications that help to achieve the objectives as required, and that this can only come through the availability of the necessary supplies and tools and devices to ensure that the experiments and activities as required, and the availability of tools and supplies is important and necessary However, the classification and organization of such content in easily accessible and easily accessible places is also important.

**Second: The challenges of using the science lab**

Al-Saadi noted in his study that there are many challenges facing science teachers in the use of laboratories, which can be summarized as follows:

1. The subjects of the science subject do not fit in with the number of weekly classes scheduled for them.
2. Insufficient time to study for experiments that require more time.
3. The number of students per class.
4. Lack of training on the equipment available in the school laboratory during university studies.
5. Lack of laboratory assistant.

6. Not to follow the hall system.
7. The teacher believes that some subjects of science are simple and do not need any experiments to clarify them.
8. Lack of a practical program to determine the type and number of experiments to be conducted.
9. Lack of number of educators and specialists in laboratories.
10. The absence of a laboratory in the school (Sa'adi, 1988)

Or the study of alshawarib has identified these challenges as follows:

1. Lack of the students' abilities and circumstances to conduct experiments on their own.
2. There is not enough time to prepare and prepare laboratory experiments.
3. The absence of a special share of the laboratory in the school program.
4. Inadequate budget allocated for the purchase of tools, devices and scientific materials.
5. There is no guidance in Arabic attached to the equipment to explain how it works.
6. Lack of tools, devices and materials necessary to conduct experiments.
7. Insufficient time for laboratory experiments.
8. The absence of a full-time laboratory supervisor (alshawarib, 1991)

### **Method and procedures**

The sample of the study consisted of (15) teachers and (5) educational supervisors who were selected in the form of random.

### **Study Tool:**

The researcher prepared one main research tool, a questionnaire consisting of (16) paragraphs to identify the challenges faced by science teachers in activating the school labs and the extent of the estimates of science teachers to the obstacles of using the school laboratory on the estimates of educational supervisors.

**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. Mathematical averages and relative weight.
3. Testing (T).

**Reliability of the Study Tool:**

The researcher applied the tool on a survey sample of the study population of (18) teacher and Educational supervisors 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 (0.77) in this study, while the corrected reliability coefficient (0.87) 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
0.87	0.77

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

**Analysis of data and answering the study questions:**

The first question: What are the challenges faced by science teachers in activating school laboratories?

In order to answer this question, the researcher calculated the arithmetic averages and the relative weight of the response of the study sample members, which consisted of a questionnaire consisting of (16) words as follows:

**Table (2) The mean and the relative weight of the responses of the sample of the study sample**

no	Paragraph	mean	Relative weight
1	Study hours are not enough	2.105	70
2	There is no dedicated room as a laboratory	2.0	66
3	The length of the textbook hinders the use of the laboratory	1.947	64.9
4	Do not approve the ministry's examination questions on laboratory experiments	1.894	63.1
5	Frequent holidays and delays	1.842	63.3
6	Lack of staff as laboratory assistant	1.631	54.3
7	Practical experiences cause me embarrassment and trouble	1.526	50.6
8	I do not have enough experience to conduct experiments	1.526	50.6
9	Laboratory experiments have nothing to do with the student's condition	1.473	49.1
10	I do not have enough time to experiment	1.421	74.3
11	I am afraid of devices and tools	1.315	43.6
12	I feel that students are not interested in practical experiences	1.263	42
13	I feel that students are not disciplined in the laboratory	1.263	42
14	Practical experiments bear extra effort	1.263	42
15	I feel that the efficient teacher does not need a laboratory	1.0	33
16	There is no laboratory at school	1.0	33

The above table shows the most common challenges faced by science teachers in activating science labs in the schools in which the research was applied. The highest average of the paragraph that stipulated (insufficient classes) was an average of (2.015) and a relative weight of (70%) (I feel that the efficient teacher does not need a laboratory) with an average of (1.0) and a relative weight (33). The other challenges vary in their arithmetic mean and their relative weight from teacher to teacher. School for another.

The researcher explains the previous result that the laboratory experiments take quite a while in the preparation of the equipment and order and the presentation of the material required in practice, in time for the study quota, which is (45 minutes), in addition to that there are many schools with duplication in the day (morning and evening), which Reduces the time allocated to the school laboratory, and explains the researcher paragraphs (15, 16) on the least arithmetic mean and relative weight of the lack of knowledge of science teachers the objectives of teaching science and methods.

### **The second question: Are the estimates of science teachers of the obstacles to the use of the school laboratory different from those of educational supervisors?**

To answer this question, the researcher relied on the T test to examine the differences between the independent samples and the result was as follows:

**Table (3) Group Statistics and Independent Samples Test**

TOTAL	Job	N	Mean	Std. Deviation	Std. Error Mean		
	Teacher	15	26.9333	2.01660	.52068		
	Educational Supervisor	5	26.4000	1.94936	.87178		
	t-test for Equality of Means						
			t	df	Sig. (2- tailed)	Mean Differe nce	Std. Error Differenc e
	Equal variances assumed		.516	18	.612	.53333	1.03375
	Equal variances not assumed		.525	7.105	.615	.53333	1.01544

By looking at the previous table, we find that there is no difference in the estimates of science teachers of the constraints of using the school laboratory on the estimates of educational supervisors, since the value of sig was greater than the level of morale ( $\alpha = 0.05$ ) and thus accept the hypothesis of zero, the hypothesis of nothingness. The average of arithmetic estimations of science teachers reached (26.93). The arithmetic average of educational supervisors' estimates came close to (26.40), which confirms that there is no difference in the estimates of teachers and educational supervisors of the obstacles of using the science laboratory.

The researcher explains this result: that the general view of the uses of the school laboratory to activate the practical activity of science is not different according to the job title. The nature of the education profession requires all its employees to pay attention to the outputs of education and all the difficulties facing teachers during classes.

## Results

1. The most common challenge facing science teachers in activating science laboratories is the low number of classes devoted to science.
2. There is no difference in the estimates of science teachers of the obstacles of using the school laboratory on the estimates of educational supervisors.

## Recommendations

1. Restructuring the distribution of science classes and increasing the time devoted to practical work.
2. Provide all the supplies and tools needed by science teachers for laboratory experiments.
3. Assigning at least one classroom to each school for the practical activity of science.
4. Reviewing the curriculum of science and making it compatible with the time allotted for the study.

## REFERENCES

- Al-Najdi, Ahmad Abdul Rahman and Rashed, Ali Mohiuddin, and Saudi, Mona Abdul Hadi: Teaching Science in the Contemporary World Introduction to Science Teaching, second edition, Dar Al-Fikr Al-Arabi, Cairo, 1423.
- alshawarib, Ghassan: Educational Problems in Teaching Science as Seen by Science Teachers in the Basic Stage, Unpublished Master Thesis, University of Jordan, Amman, Jordan, 1991.
- Nashwan, Yacoub Hussein: The New in Science Education, First Edition, Dar Al-Furqan Publishing, Amman, 1422H.
- Saadi, Sahira Abbas: "Obstacles to conducting practical experiments in physics in middle schools in Baghdad", unpublished master thesis, Baghdad University, Faculty of Education, Ibn al-Haytham, 1988.
- Samurai, Nabih Saleh: The Basics of Teaching Science and Modern Trends, Dar Al-Akhwa Publishing, Jordan, 2005.
- Shaheen, Jamil and Khawla Hattab: The School Laboratory and its Role in Teaching Science, First Edition, Dar Al-Muhammed Publishing, Amman, 1425H.