

IMPROVEMENT OF KNOWLEDGE ACTIVITY OF SCHOOL CHILDREN IN PHYSICS LESSONS

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ABSTRACT:

The quality and safety of life depend on the civilization of society, which determines the level of education of the population. According to the modern reform of Jordan education, most pupils and students should learn most of the educational programs on their own. Teachers and university professors well merge the material studied.

The development of a student's cognitive activity has always been one of the priority tasks of education. The new educational paradigm, which is based on a system-activity approach, is also focused on the comprehensive development of the student's personality and the formation of his highest stage of activity and independence - creative activity. Physics lessons, according to the Educational Standard, should ensure the formation of educational competencies and ideas about a holistic scientific picture of the world. It can achieve this in various ways, including using active learning methods. This article provides a classification of active learning methods, the use of which helps to increase the cognitive activity of students, and describes the results of using these methods in physics lessons at the level of basic general education.

Keywords:

learning, characteristics, implementation, activity, holistic scientific picture, formation of educational.

INTRODUCTION

The quality and the safety of life depend on the civilization of society, which determines the level of education of the population. According to the modern reform of Jordan education, most pupils and students should learn most of the educational programs on their own. Teachers and university professors well merge the material studied.

Due to political, economic, technical and social transformations, a person needs to have a basic level of knowledge in all subjects studied in high school. However,

Special attention should be paid to the teaching of the humanities, in particular, physics - science The definition of physics shows that it is the science that deals with the study of nature, which comprises matter and energy, and therefore we can say that physics is concerned with defining the basic quantities in the universe (such as speed, acceleration, charge, momentum, ...) and physics attempts to find relationships Quantities besides laws that act as (such as Newton's laws, Coulomb's law, laws of quantum mechanics, statistical mechanics, ...); It usually does this correlation of quantities using mathematics, graphs, statistics, and other mathematical methods. [6] Of the big questions that have been answered p I have some but most of them are still pending, such as [2] How did the universe originate? What is the fate of the universe? Why is the night sky dark? How does lightning happen? What are particles and what are waves? What are the

forces controlling nature in the universe? Is there a theory that can describe everything? If you find what? These and other questions are the prerogative of physics and answering them gives us great benefits. For example, while humans were trying to answer them (for example, Maxwell, Faraday, Amber, ...), these scientists and others came to what might be the greatest thing in our lives. Today electricity, generation, and utilization, they found it when they were trying to answer a series of questions related to the study of light, electric fields, magnetism and, in more scientific terms, electromagnetic theory. [7]

Studying the course of physical is determined by its important social functions as a science. The most significant of them are: cognitive, which includes the study of various aspects, phenomena, facts, and events of the emergence and the functioning of the Jordan at various stages of its education; descriptive function, which boils down to fixing what is happening and the primary systematization of information; educational (cultural-worldview) function and the function of social memory, which are responsible for the formation of cultural-historical consciousness, self-identification of society and personality; prognostic (which allows determining the development trends of society and the state) and practical-recommendatory (practical-political) function. Both functions involve the use of past experience to solve the problems of the present [2]. There are many methods of teaching physics, however, for the realization of the unity of the above functions and the formation of skills necessary for future higher

education, a skillful combination of various technologies are necessary. So, in high school, we can distinguish individually oriented and debatable methods, each of which has certain technologies.

Cognitive activity:

The Cognitive activity is one of the most common psychological characteristics of a person's creative abilities. In pedagogy, cognitive activity is one of the most important links in the development and implementation of special training and education methods, which are commonly called active. The cognitive activity can arise as a situational intellectual need to find a solution to a specific problem. Increasing the cognitive activity of students is one of the most important tasks of the modern stage in the development of didactics at all educational levels.

The aim of this work:

The aim of this work is to identify ways to increase the cognitive activity of students in physics lessons.

It knows that much cognitive activity of students can be relatively divided into two main types: reproductive and productive [1]. It mainly aims the reproductive cognitive activity at mechanical reproduction and adaptation, while the productive form forms the basis for the development of the most important mental properties of a person.

Modern requirements for learning outcomes at various levels of education are regulated by the relevant educational standards (ES). One of the main tasks of the new standards in the formation of the students' ability and readiness to perform certain types of activities - universal educational actions (UEA) as personal and meta-subject learning outcomes. [2-4]

We must not forget those physics, as a science, in the school's framework curriculum requires that the main method of presentation of the material was an explanation. Such a monologist presentation of new material by a teacher is not always perceived by students as one would like. We must deduce it either from experiment or theoretically, using inferences and a good mathematical apparatus, which not all students fully know. This again raises the problem of motivation, which will help to solve the psychological peculiarity of children.

- curiosity, which is a natural and very strong motivator for a person, because even Aristotle argued that knowledge begins with a surprise.

Particularly popular not only in education but also in vocational training and retraining began to use methods of active learning.

- These are the ways of interaction between the mentor and the group, aimed at enhancing the mental, practical and creative activities. The theoretical foundations of active learning methods are not new. KD contributed to its development. T.S. Panina, S.L. Rubinstein and many

others. However, an exact classification, to date, does not exist. Some authors expand this concept, including problem education, training in cooperation, all kinds of training and educational games, and much more. Others narrow the concept of active teaching methods, implying by them the free exchange of opinions in the process of activity when solving a specific problem situation.

Increasingly, in pedagogical and psychological literature there is a classification of methods of active learning [4- 7], in which they are divided into four groups:

1. Discussion methods, based on direct communication of participants with a passive position of the leader. The presenter only acts as an organizer of interaction and can take part in making a group decision. Free or directed discussions, discussion of life or professional incidents.

2. Game methods with the obligatory use of important elements of the game: game situation, roles, active playing. It aims these methods of gaining new experience, which for various reasons was not available.

3. Rating methods that activate the activity of students because of the effect of competition. For example, performance ratings, popularity ratings, and success ratings.

4. Training methods aimed at providing a stimulating, corrective, developmental impact on the personality and behavior of the training participants.

It gives preference to group forms of activity rather than individual ones.

For experimental substantiation of theoretical arguments, I held a series of physics with middle-school students of an average secondary school. The essence of the experiments was: they conducted a lesson on a particular topic on parallels in a traditional form and in another class using active learning methods. After some time, it carried slice work out in both classes.

Lesson on the subject "Pitch, Timbre and Volume. Propagation and reflection of sound. They constructed echo sound resonance as follows. In one class, the lesson went classically. Having planned the goal of the lesson, and having determined the main tasks, the children, together with the teacher, began to draw up supporting abstracts. During the explanation, students were shown computer models, videos, interesting facts were given. The lesson also used elements of discussion and group work. At the end of the lesson, the reflection allowed the teacher to judge that 84% of the students had learned the lesson material, while the rest needed additional explanations.

Here, the topic was in the form of a business game. After defining the topic and setting goals, it divided the class into five teams. Each team was engaged under a different class of the same parallel in the collection of information on the topics defined by the teacher. The result was a mini-conference at which each group

presented information on a poster, diagram, poster, and collage are drawn up. Besides the traditional textbook, students could use their mobile gadgets to access the Internet as a source of information. The students themselves tested the work. For this, each group had to give the remaining four points from one to four. I added the points of each group up. The winner was the team with the highest total points. However, when conducting such a competition between teams of students, the main thing is not to bring matters to conflicts caused by a discussion of the results of the work of groups or their evaluation, then each student

will leave such a lesson with a sense of involvement in the overall success and certain useful “links” in his head.

Reflection at the end of the lesson in the form of a game showed results similar to those of a traditional lesson. Despite this, the slice work in the form of a test carried out in these classes in the next lesson revealed excellent indicators.

The results:

It shows Qualitative results of the work in table 1.

Table 1. The results of slice work.

Qualitative indicators	9 "A" class (traditional lesson)	9 "B" class (lesson in the form of a business game)
The number of students in the class.	26	25
Cope with the work.	22	25
Wrote work on the assessment of "4" and "5"	13	19

I processed student tests using the statistical processing methods of the experimental results according to the Cramer-Welch criterion. [3] Based on the calculated value of the criterion with a probability of 95%, perhaps there are statistical differences in the samples. The differences in the quality indicators of the results of the two classes are not random but are due to the way they organize the lesson.

Lessons on the topic “Reflection of Light” in the eighth grades were conducted according to the same scheme. For comparison with the traditional lesson in the 8th “B” class, students of the 8th “A” were asked to make a mini-project. At the beginning of the lesson, the children learned that in some countries there are settlements located among the mountains into which sunlight penetrates in the winter months only thanks to mirrors. For example, in Italy, there is a small village of Viganella, in Norway - Ryukon. [8] Work was done in pairs. The purpose of the project was that using the materials of the textbook and the information prepared by the teacher on the reflection of light, the students had to draw a mirror at the right angle on the diagram so that the Sun could illuminate the village. To complicate the work of each group in the diagram, the positions of the village, the mirrors and the Sun were different.

All students who completed the project completed the assignments, while several students in the parallel class did not complete the assignment. The calculated

Cramer-Welch criterion [9] again suggests that the use of active learning methods in the lesson contributes to better assimilation of educational material.

To increase motivation among high school students, it is more advisable to use grade ratings. The meaning of the rating is that when passing through each section of physics, the teacher suggests that students solve additional qualitative and quantitative problems. Having completed 80% of these tasks correctly, any student earns 1 extra point to the result of the test on this topic. Even if at the beginning the idea with rating tasks will not be taken by students, the results of the first test will lead to the fact that the effect of competition and the teenager’s inner desire to be the first will become a serious motivator for him in the learning process.

The conclusion:

Thus, the use of active teaching methods in physics lessons will allow the teacher to increase the cognitive activity of students, implementing the differentiated approach provided by the Educational Standards, creating a situation of success for each student, and forming a positive motivation for learning.

References:

1. Kashitsin A.S., Eremin S.V. Methods of statistical processing of the results of a pedagogical experiment / Teaching aid / Shuya: Publishing house of FSBEI HPE "ShSPU", 2012.

2. Panina TS, Modern methods of enhancing learning / TS. Panina / Publishing House Academy, 2008.
3. Smagina M.A. Methods of active socio-psychological training / Teaching and methodological. allowance / S .: Publishing house of the State Pedagogical Institute, 2008.
4. Broadbent, B. (2002). ABCs of E-Learning: Reaping the Benefits and Avoiding the Pitfalls. San Francisco: Jossey-Bass/Pfeiffer.
5. Morrison, D. (2003). E-Learning Strategies: How to Get Implementation and Delivery Right First Time. New York: Wiley.
6. Nielsen J. Usability Engineering, 1994. 201 p.
7. Golovach V. Usability Secrets: Why a Good User Interface (UI) Is Not. equivalent to a positive user experience (UX). 2014. Log access mode. URL: <http://lpgenerator.ru> (accessed date: 03/14/2016)
8. Golovach V. Usability testing at a low price. 2008. Log access mode.
9. Donskoy M. The user interface // SK Press: electron. journal 1996. Log access mode.