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WAYS TO EFFECTIVELY USE SMARTPHONES IN WORKING WITH GIFTED STUDENTS IN BIOLOGY LESSONS

Allanazarova I. A.
Biology Teacher, Chirchik State Pedagogical University
Chirchik City, Tashkent region, Uzbekistan
E-mail: indira2005@mail.ru

ABSTRACT
Working with gifted students involves the identification and development of the natural inclinations and creative potential of each child, the realization of his inclinations and capabilities. The article is devoted to the problems of digitalization of secondary education, the study of the possibilities of modern digital technologies, the description of the feasibility of their application in secondary school and promising areas of development and use. The article describes ways to effectively use device in working with gifted students in biology lessons. At the same time, the necessity of a systematic approach to solving this problem is explained.

Keywords: giftedness, smart phones, device, digitalization, 3d objects, applications.

The use of modern pedagogical technologies in biology lessons very effectively allows students to develop their interests and needs in mastering the basics of natural science.

In the modern world, natural sciences are of great importance in human life. First of all, the human body itself is the functioning of systems according to the laws of physics, chemistry and biology. Biology, of course, has a special role for human health and life, the importance of which is difficult to overestimate. Biology, as a subject, explains the structure, vital activity, interconnection and mutual influence of various forms of life, including humans. All existing spheres of human activity in one way or another positively or negatively affect his health, his environment, which is closely related to him. Biology, like any other subject, provides great opportunities for self-realization, the embodiment of ideas and plans. Students, in the course of studying the laws of biological systems, can determine in which area of professional activity related to the science of biology, they would like to realize themselves. This may be the field of medicine, pharmaceuticals, research activities.

To understand the structure of the objects of study in biology, the laws of the functioning of biological systems, the teacher makes efforts to develop students' natural science thinking. According to research in the field of psychology and psychodiagnostics, a person, due to physiological characteristics, can develop either a natural-science, or a mathematical-logical, or humanitarian type of thinking. In modern pedagogy, there is a tendency towards the development and cultivation of innate abilities in children, the so-called "giftedness" in a particular field of science.

The phenomenon of giftedness is well studied in modern pedagogy, but the issue of the development of giftedness in the study of individual disciplines is not covered enough. One of the main tasks of modern education is to reveal in children their talents in various fields of activity, to reveal their strengths to the student as early as possible, to give them the opportunity to develop further. [eight]

In a previously published work, ways were proposed to identify gifted students with a natural-scientific type of thinking. [6]. In this work, one of the stages of the developed algorithm was to involve gifted and interested in the subject students in the development and implementation of innovative technologies.

Innovative educational technologies as a process is a purposeful, systematic and consistent introduction into practice of original, innovative methods, methods of pedagogical actions and means covering a holistic educational process from determining its goal to the expected results. The concept of innovative pedagogical technologies includes a fairly wide range of pedagogical techniques and teaching methods. However, among this diversity, one can single out the use of modern technical teaching aids, which act as sources of visual and audio information.

Computers, laptops, video projectors, presentations, etc. have been used in pedagogical practice for several decades. [7,9]. However, the use of modern devices, gadgets, tablets, smartphones in the activities of a teacher in biology lessons has not yet found such an active application. At the same time, the children of the modern generation of the middle and older age groups have all the necessary skills to work with modern means of information exchange.

According to literary sources, in the world pedagogical practice, the use of modern digital technologies in the educational process is already taking place. [1,2,3]. However, this practice is mainly used in universities.

However, as our own observations and experiments in the field of pedagogical activity show, in addition to negative consequences, modern digital means of information exchange have many areas of application, both in the personal life of the student and in the educational process.

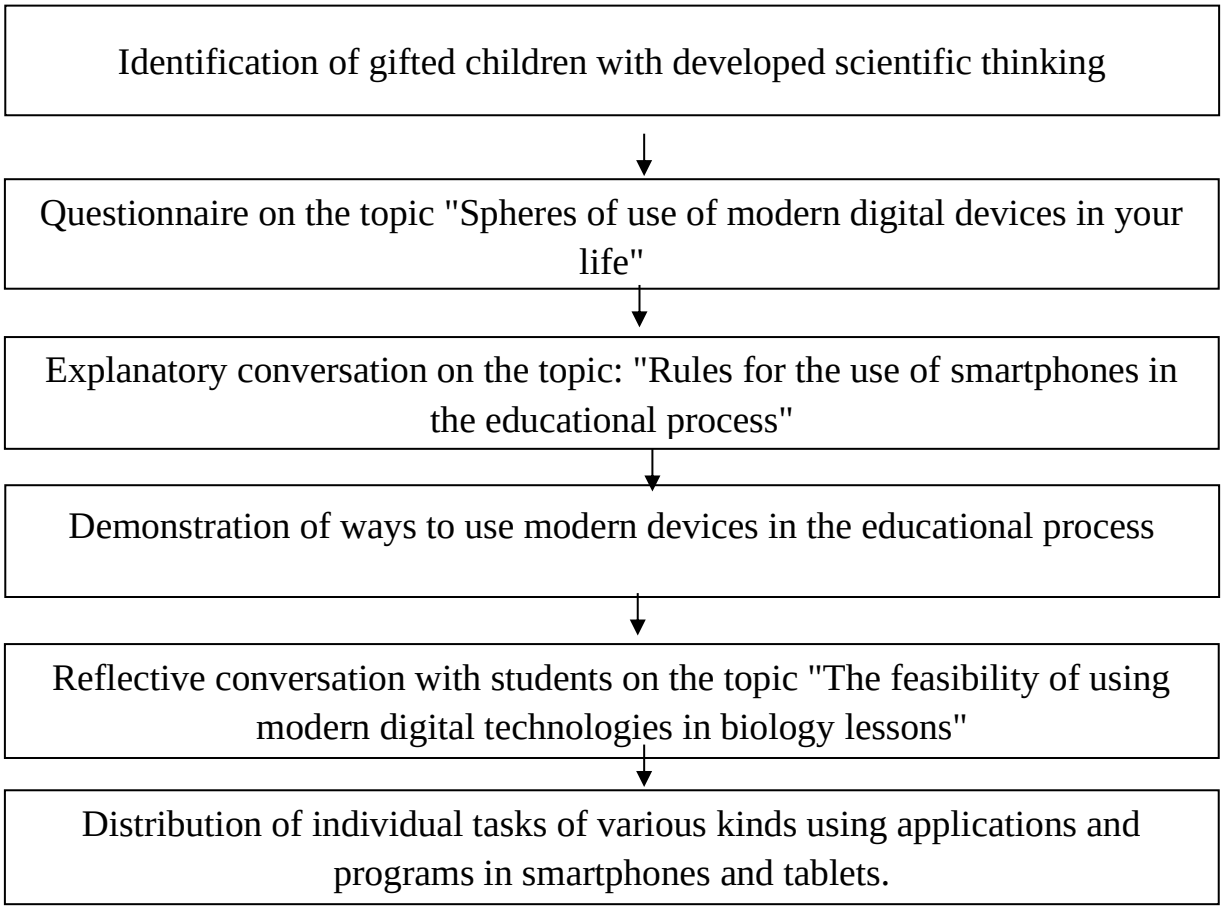
In a previously published work, the methods of using modern devices in the educational process were described, among them the following can be especially noted: the speed of searching for educational information using www (World wide web), the ability to store a large amount of textbooks, encyclopedias in digital format, educational videos, animations, etc., the ability to learn a foreign language anytime and anywhere, the development of creative potential (creating educational projects, video and photo collages, etc.), the use of educational applications and programs specifically for smartphones and tablets. [1,2,3]. Particular attention can be paid to the use of 3D technology objects. [1,2,3,4,5]. To use these technologies, you can use various applications and programs additionally installed in modern devices. These programs demonstrate various objects in biology in 3D format and are of an educational and developmental nature.

In the course of personal teaching practice and according to a survey of experienced and novice teachers, the ways of using smartphone and tablet applications in the educational process at biology lessons in schools of various types were analyzed.

Pedagogical experiments were carried out in several local schools. At the beginning of the pedagogical experiment, according to the developed algorithm of actions (previous works), gifted students with developed natural science thinking were identified. [6].

To analyze the effectiveness of using modern devices in the educational process, the algorithm of actions presented below was developed.

Scheme 1. Algorithm of actions for the implementation and analysis of the effectiveness of the use of modern devices in the educational process in the classroom in the subject "Biology"



Questions and results of the survey will be presented below.

The following applications were used for the demonstration: electronic textbooks and encyclopedias in biology, programs for online and offline testing, applications for learning a foreign language, human anatomy in 3D, programs for creating educational projects, and students were also introduced to various ways to search for information on the Internet using phones and tablets.

At the end of the experiment, the students were given a list of individual tasks of their choice, including work with the search for additional information on educational topics of the subject "Biology", according to the curriculum, preparation of a video project on 3D modeling in biology, maintaining a healthy lifestyle, etc.

According to the results of the survey, it was revealed that modern devices were mainly used for purposes not related to the educational process.

Below are the questions and results of the survey:

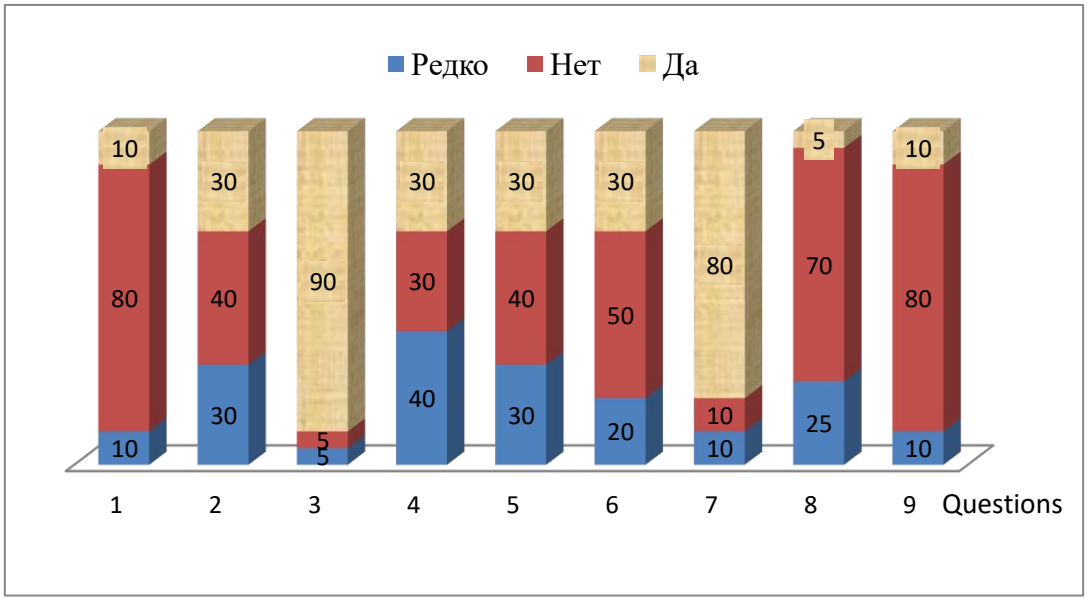


Fig.1. Diagram illustrating the degree of use of devices in the lives of students according to the survey (in %). The numbers in the lower horizontal row correspond to the order of the questions.

Survey Questions:

1. Do you use devices to keep track of your health?
2. Do you use devices in the preparation of lessons?
3. Do you use devices for social communication (social networks)?
4. Do you use the Internet to prepare lessons?
5. Do you use the built-in browser in your devices to search for educational information?
6. Do you use applications in devices for independent and additional learning?
7. Do you use devices for games, entertainment?
8. Do you use devices for study projects?
9. Do you think about the impact of devices on your health?

According to the developed algorithm, after the survey, an explanatory conversation was held, a demonstration of how to use applications and programs of smartphones and tablets in the educational process in biology classes, and a reflective conversation.

The reflective conversation demonstrated the high interest of students in the application and use of modern digital tools in the educational process. It was found that students perceived the ways of using devices in the educational process as an additional and effective tool for a deeper and clearer understanding, consolidation and assimilation of educational material in the course "Biology", since due to the ambiguity and versatility, it is not always possible to understand many aspects of the structure , the functioning of biological systems at different levels of life.

It was also revealed that students reacted differently to different ways of using devices in the educational process. Some students were more interested in the effectiveness of using programs that represent biological models in a three-dimensional, three-dimensional format, while others seemed interested in project work using applications that develop and open up creativity in children. According to the above, the tasks for the last stage of the developed algorithm were distributed according to the students' own preferences. The results of the assignments and the development of the evaluation algorithm will be considered in subsequent papers.

The conducted pedagogical experiment showed that the use of modern digital technologies can serve as an excellent way to stimulate and motivate students in the educational process in biology classes. Modern devices can serve as compact and mobile carriers of educational data, be a tool for developing creative and analytical skills, which corresponds to the goals of supporting and subject competencies in pedagogy. They can also be used in the implementation of various methods of innovative technologies, such as problem-based learning technology, health-saving technologies, project-based learning, etc. However, the use of these devices should be under the control of parents and teachers, since in addition to useful properties, modern devices also have negative consequences. Therefore, an integrated approach is needed in the development and implementation of these devices in the educational process.

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