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RESEARCH ARTICLE

The Role Of Innovative Technologies In Teaching The Division Of Algae And The Factors Of Increasing Efficiency In Educational Results

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Abstract

This paper contains information on the coefficient of effectiveness of innovative technologies in the learning outcomes of classes on the department of algae in botany and on the creation of an information, technological, organizational and communicative learning environment for students in mastering the module of lower plants based on a competency-based approach.

KEYWORDS

Algae, family, species, innovative technology, competency-based approach, case study, diagnostics of learning outcomes.

INTRODUCTION

Today, changes in the field of education, including the organization of topics, lessons, and assignments in academic subjects based on new pedagogical technologies, require every subject teacher to create high-speed performance indicators. Through this, students expect the skill of the subject teacher and the interesting organization of the lesson.

The moral integrity of a teacher, i.e. generosity, kindness, exactingness, spiritual purity, honesty, loyalty, purity, intelligence, thoughtfulness, moderation, patience, and gentleness, are the high duties of today's teacher. Also, being thoroughly knowledgeable in their field, conducting practical exercises based on innovative technologies and drawing conclusions, understanding the needs and achievements of students, having a culture of speech in the classroom, and being a personal example as a professor-teacher in the field of higher education determine the professional qualities of a teacher.

ANALYSIS BASED ON THEORETICAL DATA

The use of innovative technologies in teaching the algae section of botany is one of the most urgent tasks today. However, we will provide general information about algae.

Algae feed themselves by absorbing carbon dioxide in the light. Since these signs are the presence of chlorophyll, the ability to grow in water or a humid environment, and the ability to photosynthesize, they are often referred to by the general name algae, which refers to the conditions in which most of their representatives live (water). However, the departments that are included in algae are independent departments according to their phylogeny. Therefore, the term algae is not a systematic category, but rather an ecological concept: it unites several independent types of bottom plants that have chlorophyll and often grow in water.

Algae differ from bacteria and fungi in that they contain the pigment chlorophyll in their thallus cells and that they feed autotrophically by absorbing carbon dioxide in the light. However, due to the presence of other pigments, they are brown, red, and blue-green in color. Due to the presence of

chlorophyll, algae are considered autotrophic plants. Algae are very diverse in appearance. Among them, there are microscopic unicellular organisms as well as very large representatives that can reach several tens of meters in length. Algae living in colonies are a form between unicellular and multicellular. Their body consists of a cluster of loosely connected cells. The body of algae is a thallus that is not divided into organs such as stems, leaves, and roots.

However, the thallus of some representatives is somewhat more complex, and the body is divided into certain parts according to their function. Algae reproduce vegetatively, asexually, and sexually. Sexual reproduction occurs in the form of oogamy, isogamy, and heterogamy. Algae live in seas and fresh waters at different depths (100–150 m in clear seas) depending on the clarity of the water. Some of them, mainly microscopic forms, swim freely, forming phytoplankton, while others live attached to the bottom of water bodies and are part of the benthos (a community of plant and animal organisms under the water body). Soil algae are found on the surface of the earth and in the upper layers of the earth. Many of them contribute to the accumulation of organic matter in the soil and are an important factor in fertility.

There are many types of algae, which are divided into the following divisions: blue-green algae - Cyanophyta, red algae - Rhodophyta, green algae - Chlorophyta, golden algae - Chrysophyta, yellow-green algae - Xanthophyta, diatom algae - Diatomeae, pyrrhophyte algae - Pyrrophyta, euglena algae - Euglenophyta, brown algae - Phaeophyta [4; pp. 56-57].

Thus, covering classes in the algae department through new pedagogical technologies increases the student's learning coefficient.

Speaking about the use of pedagogical technologies, we need to give their definitions. In this regard, T.E. Stashko, in his theoretical and methodological views, also noted the views of such scientists as B.T. Likhachev, V.P. Bespalko, I.P. Volkov, V.M. Shepel, M. Choshanov. We believe that the theoretical analysis provided by E.T. Stashko is very relevant.

Pedagogical technology is a set of psychological and pedagogical attitudes that determine a special set and arrangement of forms, methods, ways, techniques of teaching, educational means; it is an organizational and methodological toolkit of the pedagogical process (B.T. Likhachev); 2. Pedagogical technology is a substantive technique for implementing the educational process (V.P. Bespalko); 3. Pedagogical technology is a description of the process of achieving the planned learning outcomes (I.P. Volkov); 4. Technology is an art, skill, ability, a set of methods for processing, changing the state (V.M. Shepel); 5. Teaching technology is an integral procedural part of the didactic system (M. Choshanov).

Thus, the advantages of innovative technologies are as follows: they enable students to acquire solid and conscious knowledge; they develop independence in educational activities; they increase the time spent speaking the educational material in class; they create a positive emotional mood, there is no fear of wrong answers, a sense of confidence prevails; the communicative culture is enhanced; motivation for further education grows; the self-esteem of the student increases; psychological stress of the student and the teacher is relieved. Innovative activities give the teacher the opportunity to: professional growth; emotional satisfaction; the opportunity for self-development; organization of differentiated learning; prediction of learning outcomes; early diagnosis and correction of learning outcomes [3; - pp.129-134].

The main groups of effective modern educational technologies are:

1. Structural and logical technologies. The use of modern structural and logical technologies is one of the most important resources for improving the quality of a lesson as a basic unit of a teacher's activity. Modern structural and logical technologies are based on the best traditions of Russian education, a systemic approach and the principles of "from simple to complex", "from theoretical to practical". As the main structural and logical technology, I use a systemic approach as an effective technology of developmental learning. A systemic approach to learning allows students to develop systemic thinking, logical cognition skills, and stimulate students' activity. In addition, a systemic approach ensures continuity and logical consistency of educational material. The development of students' systemic thinking is a gradual process.

2. Information and communication technologies. Information technologies in education are the subject of study of informatics. For other subjects, information technologies serve as a modern and effective tool for improving the quality of the educational process. In other words, when studying biology, the role of informatization is to improve the quality of education through the integration of information and

pedagogical technologies [3; -pp.129-134].

Also, the case study technology is very convenient for revealing the content of classes, especially in the algae department. D.M. Kasimova fully explains her thoughts on the case study in her methodological research.

The case study method is a technology that allows applying theoretical knowledge to solving practical problems. It fully meets modern requirements for practice-oriented learning, having won leading positions and being actively used in foreign practice, it is rightfully considered one of the most effective ways to teach students the skills to solve typical problems that arise in professional activities. For example, Harvard Business School allocates almost 90% of the study time to analyzing specific cases, maintaining the priority value of this method in business training. Case study is not an isolated technology, integrating other methods and allowing for comprehensive improvement of students' skills.

D.M. Kasimova shows the following about the technological features of the method:

1. The method is a specific type of research analytical technology, including various elements of research activities, as well as analytical processes.

2. The case study method can be considered as a technology of collective learning, the most important components of which are work in a group and subgroups, mutual exchange of information and collective development of solutions.

3. Case studies in training also include various elements of synergetic technology, which consists in immersing a group in a situation as close as possible to the real conditions of professional activity, forming the effects of knowledge multiplication, internal insight, exchange of discoveries, etc.

4. The method also integrates technologies of developmental learning, which include procedures for individual, group and collective development, the formation of diverse personal qualities of students.

5. The method includes various components of the technology of "creating success". It provides for activities to activate students, stimulate their success, emphasize the achievements of students.

D.M. Kasimova, while expressing her thoughts on the case method, also discusses the characteristics of the method:

1. Availability of a model of the system considered at a certain point in time.

2. Collective development of decisions.

3. Multiple alternatives to decisions; fundamental absence of a single solution.

4. A single goal in decision-making.

5. Availability of a system of group assessment of activities.

6. Availability of controlled emotional stress of students. Like any other method, this technology has its own methodological difficulties in practical application. One of the main disadvantages of the method is the time spent on the competent preparation of the "case" for the lesson. The teacher must think over the form of its presentation, stages and plan in detail the activities of the students, a combination of individual and group forms of work. The success of the case method depends on three main components: the quality of the case, the preparedness of the students and the readiness of the teacher himself to use this teaching technology [1; - pp. 30-33].

Based on the above considerations, it can be said that the use of innovative technologies serves to form a competent approach in students to educational subjects. We can see this in the research work of E.A. Lamekhova and

Y.G. Lamekhov. It is clear that the graduate-bachelor's degree program was completed in the period of training, and a whole series of competences was formed – general cultural, general professional and professional. The formation of all groups of competences is connected to all the theoretical disciplines, where the students have lectures and practical work, and the basic theoretical material [2; - 248-253].

Let's give recommendations for the organization of practical training from the departments of algae:

1. Using the recommended educational and scientific literature, write down in your diary of educational practice the definitions of the following concepts: species, hierarchy of taxa in the classification of lower plants.

2. Make a general description of the species composition of lower plants. When completing the task, it is recommended to use literary sources on the systematics of lower plants.

3.Complete the table below and provide information on the families and species that are characteristic of the department (Table 1).

Table 1.
Divisions of algae and quantity of the species

No.	Algae section names	The number and names of species in the section
1	Blue-green algae	
2	Dinophytes	
3	Cryptophytes	
4	Yellow-green algae	
5	Diatom algae	
6	Euglenae	
7	Radophytes	
8	Green algae	

After completing the table, the teacher asks the students questions:

1. Which systematic categories of plants are ancient?

2. Which supraspecific taxa of plants were formed relatively recently?

3. Which groups of plants are currently developing in the direction of biological progress, and which in the direction of biological regression?

By what criteria can one determine the direction of development of a group of plants? [2;248-253].

Then the students' answers are filled in and students who provide good information are encouraged.

CONCLUSION

In general, the application of innovative technologies in the field determines progressive indicators in the teaching methodology. Also, based on the competency-based approach, an information, technological, organizational and communicative learning environment is created for students to master the module of lower plants. In addition, students master fundamental knowledge, which serves as a bridge for them to master new knowledge in the future. Based on the formation of a creative approach, students' tolerance and project thinking from a scientific point of view are formed.

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