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Developing skills for a healthy lifestyle by using interactive methods in teaching Biology and Health Education

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Abstract: *The aim of the article is to present the results of using interactive methods in the teaching of Biology and Health Education to 7th grade students for developing skills for a healthy lifestyle. The discussion is based on the topics: "The role of prokaryotic organisms in nature and their importance for man", "The role of unicellular eukaryotic organisms in nature and their importance for man", and "Talus plants. Seaweed". The discussion is supported by fragments of lessons in which interactive methods are used – the method of associations through creating mind maps, discussion, case study, and role play. As a result of using of interactive methods, students develop key competencies for maintaining their own health and the health of society as a whole.*

Keywords: interactive methods, key competencies, healthy lifestyle

Introduction

Health is an asset of primary importance, and taking care of it is an important task both for the nation and globally. According to the definition of the World Health Organization, health is the complete physical, mental and social well-being of a person, and not just the absence of disease and disability. For maintaining a healthy lifestyle, the important factors are the development of personal skills and knowledge. A healthy lifestyle ensures both the protection of our own health and the health of others. It includes a healthy diet, physical activity, abstinence from the use of psychoactive substances and good mental health [1].

Education for sustainable development and a healthy lifestyle has an important role in the teaching of *Biology and Health Education* in the 7th grade. The subject matter of *Biology and Health Education* in the 7th

grade, as well as the learning objectives laid down in the curriculum of the subject, focus on the health and environmental education of students. Health-ecological competence or skills are built for "supporting sustainable development and a healthy lifestyle". This is one of the key competences for the development of modern education and is based on the knowledge, skills and attitudes for the protection of nature both internally and externally [2].

Health education includes: systematic knowledge about health; skills and habits; attitudes to health and a healthy lifestyle; health competence; personal behavior aimed at a healthy lifestyle [3].

Health education is a means of imparting social experience. It is realized as a unity between teaching and learning, and as a related activity of the students and the teacher as a process at the center of which is the personality of the student. While health education is a more general concept and includes "health education" and "teaching health", which are inextricably linked and interrelated. The goals of health education are related to the formation of a high health culture and personal behavior, based on awareness and development of social and communication skills, an ability to lead a healthy lifestyle, decision-making skills, responsibility and risk management in relation to health.

The main tasks related to health education are reduced to the following:

- to provide students with accurate information on issues related to their physical, mental and social health;
- to create conditions for the formation of appropriate values and attitudes that predispose students to healthy choices in complex life situations;
- for learners to acquire knowledge about the environment, about biological features, human relationships, health determinants, risk factors which form the basis and are a prerequisite for a healthy lifestyle;
- for learners to acquire, maintain and use specific knowledge in their lifestyles, related to their health;
- for learners to form and develop social and cognitive skills necessary for a lifestyle which limits health-risk behavior;
- for students to acquire a sense of responsibility for their health and for the health of their family members and society;
- for students to realize and affirm health as the highest human asset [3].

Teaching *Biology and Health Education* in the 7th grade leads to the achievement of the goals of health education. The expected results of teaching health education in the 7th grade require students to be able:

- to describe the physical and personal changes in the process of growing up and the emotional

changes related to them;

- to be able to build and maintain a positive self-image by affirming one's strengths;
- to list and use the main steps in a decision-making process;
- to demonstrate positive thinking skills, and ability to cope with stress and negative emotions;
- to develop self-observation and analysis skills;
- to describe the effects of different psychoactive substances - cigarettes, alcohol, medicines and drugs and to avoid them;
- to use strategies for effective learning, to be able to describe the impact of noise on the nervous system;
- to be able to understand the importance of physical activity and its relationship with physical and mental well-being, tone and self-esteem;
- to participate in active forms of recreation and demonstrate a positive attitude;
- to describe the functioning of the digestive system;
- to describe different foods and healthy eating;
- to name the sources of vitamins and minerals which support health;
- to understand and explain the relationship between nutrition and other daily activities and their importance for a person;
- to understand and explain the reasons why food goes off and the rules for food storage;
- to understand and explain the principles of healthy eating;
- to make and advocate healthy food choices and have basic cooking skills;
- to interpret the information on food labels;
- to avoid unhealthy habits and traditions [3].

The ultimate goal of the health education program is related to the formation of basic skills, which are aimed at developing skills and competencies for creating and maintaining a healthy lifestyle and living conditions, and for voluntary adaptation to health-promoting behavior [4].

Today, teachers around the world face the need to emphasize contemporary health education issues at all stages of education. This requires the formation of competences for evaluation and decision-making, forming relationships and responsible behavior of young people, which can be effectively achieved by combining traditional with interactive teaching methods. Solving cases, role-playing activities, working in small groups, association games, are basic interactive methods that require an active position and acting on health education issues. In such learning environments all participants (students, teachers and, last but not least, parents) value the important things by making choices, making responsible and difficult decisions,

getting to know themselves and others in a model close to reality [4].

In this whole process, the educational institution of school is a particularly important part of the social environment that shapes the behavior of young people. The school environment offers opportunities to practice healthy behaviors. School health education happens both inside and outside the classroom. Teaching methods have the potential to significantly affect student health. This type of education is carried out mainly through the subjects of the cultural-educational field *Natural Sciences and Ecology* through the subjects *Man and Nature*, *Environment* and *Biology and Health Education*, in compulsory and optional training [5, 6].

Based on the national framework for monitoring health education in the school education system, key competencies are being built. Health education emphasizes mental and personal development through:

- prevention of psychoactive substances uses;
- personal hygiene;
- nutrition.

The foundation of the developed methodological concept for health education is based on two main learning approaches: learning through experience - for the age group of children (grades 1-4) and learning through experimentation, which are integrated into the system of learning activities of each topic [6].

One of the ways for the successful implementation of health education in school is the use of interactive methods and techniques based on the simultaneous acquisition of knowledge, formation of skills and attitudes by placing students in situations where they can interact with each other and discuss what they have learned [7, 8, 9, 10, 11, 12, 13]. Interactive learning takes place through interaction and dialogue. In addition, group work is an important form in the process of interaction. The methods and techniques that are included are brainstorming, solving cases, building mind maps using the method of associations, discussion, role-play, etc. [14].

The conducted research on the subject leads to the conclusion that the use of interactive methods in the teaching of *Biology and Health Education* contributes to increasing the health culture of students through:

- changing the traditional teaching style;
- motivation for better assimilation of biological knowledge;
- developing skills for independent study of the learning material;
- improving the conditions for working with outstanding students;
- impact on a greater number of senses;
- formation of qualities such as self-awareness, cooperation, consistency;
- possibility of teaching and methodical assistance to students in their working on biology tasks.

The use of interactive methods stimulates students and their interest in biology. The active involvement of students leads to a better implementation of acquired knowledge and its incorporation into the learning process.

The aim of the article is to present the results of the application of interactive methods in separate topics of the teaching content of *Biology and Health Education* in grade VII with an aim of developing skills for a healthy lifestyle.

Material and Methods

The main methods used in the research were theoretical analysis and observation.

The research was conducted in two 7th grade groups at Hristo Botev school in the town of Aytos, in the academic year 2023/2024 and covered the following topics: "The role of prokaryotic organisms in nature and their importance for humans", "The role of single-celled eukaryotic organisms in nature and their importance for man", and "Thallus plants. Seaweed".

Results and Discussion

Fragment of a lesson on the topic: "The role of prokaryotic organisms in nature and their importance for humans"

Focus question: *What is the role of prokaryotic organisms in nature and for human beings?*

In the stage of the lesson which updates students' basic knowledge, the interactive **method of associations** is used in order to summarize and structure students' knowledge about prokaryotic organisms. The teacher asks each student to write down for two minutes all the words, terms and concepts they can think of related to the term "Kingdom Monera". Then the created individual mind maps are discussed. A mind map is drawn on the board, which is a summary of those of individual students (Fig. 1).

At the end of the lesson, in order to summarize and consolidate the knowledge, the following **case study** is presented:

A new laboratory assistant, who previously worked in a milk plant laboratory, joins a medical laboratory. On the first day of work, she is confused by her new duties and makes a mistake - she sterilizes the medical instruments at a temperature lower than 100°C.

Answer the questions:

1. *What is sterilization and for what purpose is it performed?*
2. *What are the health risks for the people who use the medical instruments and why?*

3. How does pasteurization differ from sterilization?

Fragment of a lesson on the topic: "The role of unicellular eukaryotic organisms in nature and their importance for humans"

Focus question: *What is the importance of unicellular eukaryotes for nature and human beings, and what hygiene rules should we follow to prevent diseases?*

In presenting the new subject matter the teacher uses a **panel discussion**. The topic of the discussion is: *"Human diseases caused by unicellular eukaryotes: causes, signs, prevention."*

The students are divided into two groups, each of them reflecting on separate sub-topics of the main topic:

Group I: Human diseases caused by unicellular organisms;

Group II: Prevention of diseases caused by unicellular eukaryotes.

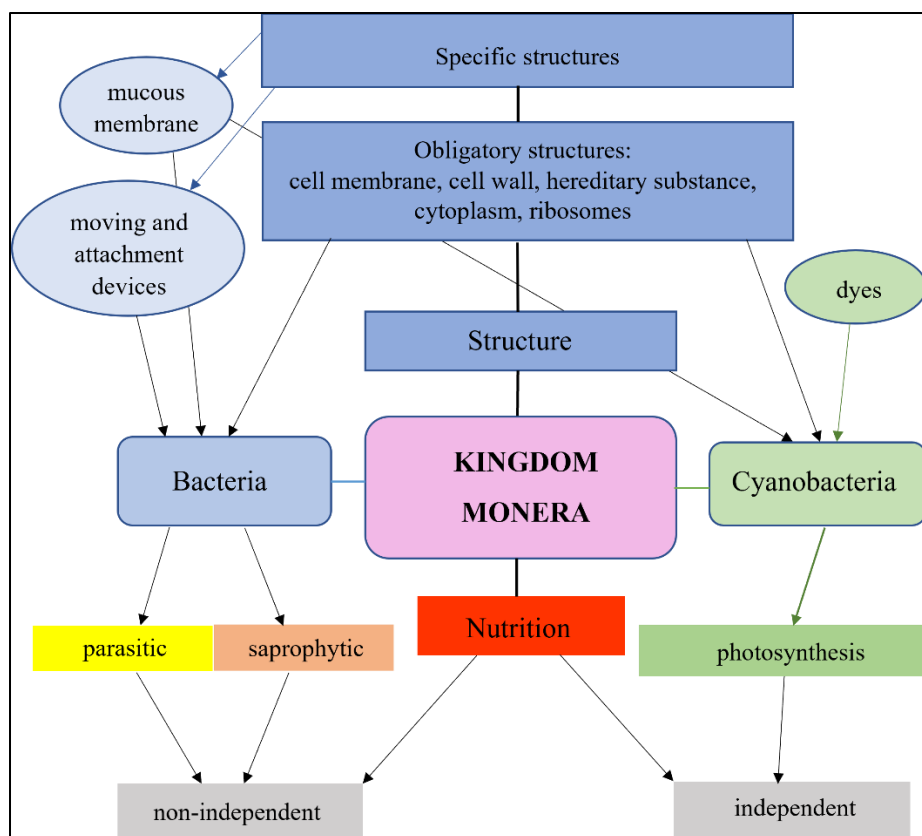


Figure 1. Mind map with the core "Kingdom Monera"

The teacher sets the time for work, instructs the students about the group discussion, emphasizing that they should record their ideas on a worksheet. After the time is up, each group appoints a speaker to present

the group's opinion to the class. Parasitic protozoa have been found to cause diseases such as dysentery, malaria, sleeping sickness and toxoplasmosis. The students explain the ways of infection and protection against infectious diseases.

In order to summarize and systematize the information, students are presented with a poster illustrating the disease of malaria, which lacks captions (Fig. 2). The following task is set: *Complete the poster with which you will inform the public about one of the infectious diseases.*



Figure 2. Poster illustrating the disease of malaria

In advance, the teacher has prepared picture cards with inscriptions, which the students have to put in the appropriate places on the poster. They are the following:

malaria, disease carrier, symptoms, life cycle and spread of parasites, high temperature, tiredness, vomiting, muscle pains, host organism, spread, cause

At the end of the lesson, the following **case study** is discussed: *Parents take their child, who has severe abdominal pain and stomach problems, to the doctor. The child feels tired and has a high temperature. The doctor examines the child and finds blood on their underwear and traces of watery stools. The doctor asks the parents what food and water the child has consumed. During the conversation, it is established that the child spent time in a village, swam in the river and drank some water from the river.*

1. Why did the doctor ask what the child did and where she was?
2. What is the disease that the doctor suspects?
3. What caused the disease?
4. What are the possible ways of contracting this disease?

Fragment of a lesson on the topic: "Talus plants. Seaweed"

Focus question: *What is the diversity of thallus plants and what determines their distribution and importance?*

At the stage of presenting the new material, the teacher uses a **role play**. The topic is: "*Algae - role in nature and for man*".

Students are divided into 3 groups: ecologists, nutritionists and pharmacists. Each group receives their role, presented in Table 1.

Table 1. Content of the role of each group

Group number	Role	Instructions for the role play
1.	Ecologist	You are an ecologist, you are familiar with sea water pollution and heat pollution, which leads to the extinction of various types of algae. You propose measures for the preservation of ecosystems in the Black Sea.
2.	Nutritionist	You are a nutritionist and you deal with the foods of the future, such as algae, which is a superfood. You know algae as antioxidants that slow down the aging process. You offer healthy foods that protect against a number of diseases.
3.	Pharmacist	You are a pharmacist who deals with products and medicines to obtain an extract of algae that successfully treats cancer, diabetes, stress. You inform the public about treatment options with algae products.

The first group are the ecologists. They are concerned about the pollution of the seas and oceans on a global scale, as well as the warming of the waters. This turns out to be detrimental to the development of mostly brown algae in the Adriatic Sea, which are almost on the verge of extinction. Without algae, the life of other inhabitants of the World Ocean becomes difficult.

Next is the group of nutritionists who demonstrate pictures of different food products derived from

algae. Seaweed is a superfood. They contain 20 times more minerals than vegetables. Algae are strong antioxidants and slow down the aging process in the body.

Last is the group of pharmacists. They emphasize the benefits of algae for human health. They contain a large amount of Iron and Omega-3, which help to treat severe diseases of the cardiovascular system, diabetes, stress. Algae are used to produce iodine and medicine.

During group work, a mind map is built on the board, using associations, with a central concept: Thallus plants (Fig. 3).

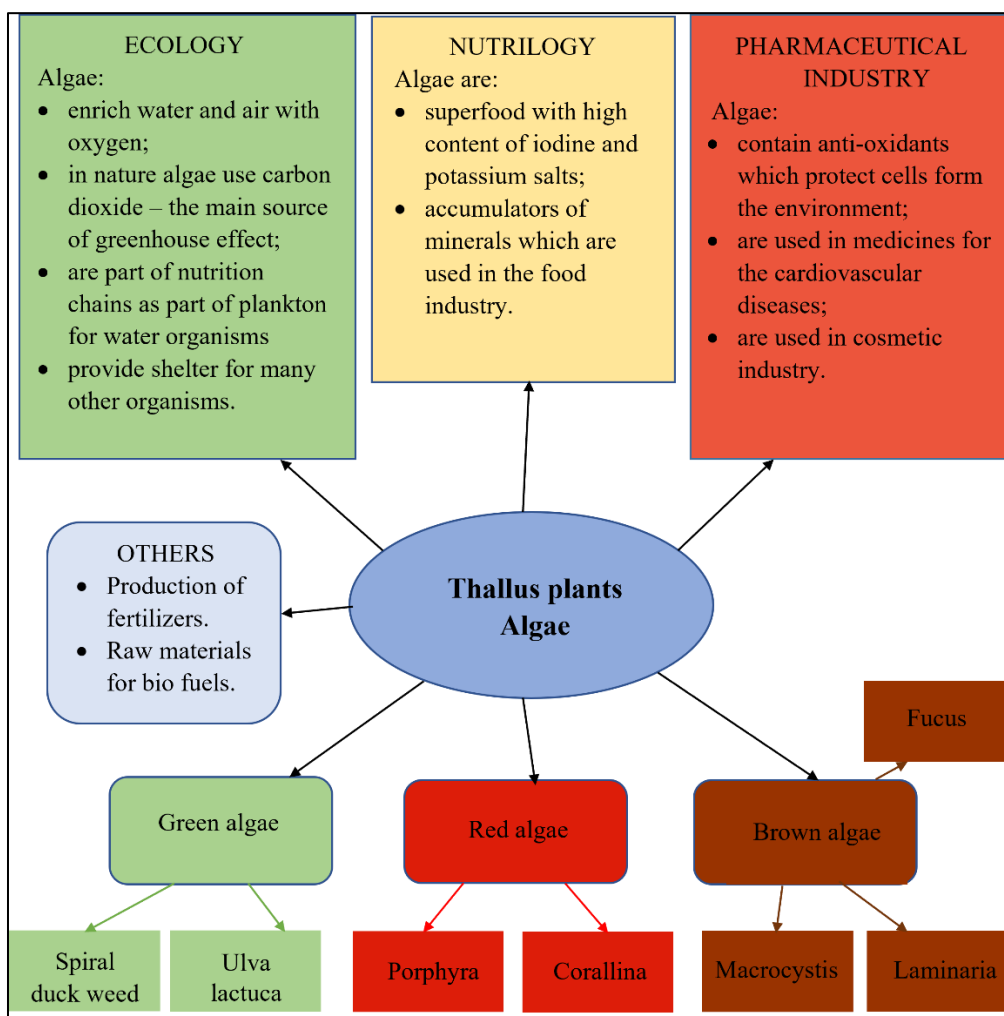


Figure 3. Mind map with the core "Thallus plants. Algae"

In order for students to apply the learned information, a **case study** is set for homework: *On the coast of the Black Sea lives the plant veined phyllophora. It is 0.5 meters tall. It is made up of plant cells that form a thallus. It resembles a bush composed of red leaf-like plates with curled ends.*

Answer the questions:

1. Can we call the described plant an algae and why?
2. Which class does veined phyllophora belong to? Justify your answer.

Conclusions

By using interactive methods, students develop the following competencies related to protecting their own health and that of society:

- interpret questions related to the study of the representatives of the Kingdom Monera, unicellular eukaryotes and algae, and their place and role in nature and for human beings;
- name and describe human bacterial diseases for the purpose of health prevention;
- name types of single-cell eukaryotic organisms-parasites and the diseases they cause in humans for the purpose of health prevention when choosing a solution in specific situations;
- name and describe ways of infection with bacteria and single-celled eukaryotic organisms-parasites and based on this to suggest measures for preventing infection;
- name and describe ways and measures to combat bacteria and single-cell eukaryotic organisms-parasites;
- know and apply rules of conduct and action in order to prevent the dangers of diseases caused by bacteria and single-celled eukaryotic organisms-parasites;
- argue the need for strict personal, domestic and public hygiene to preserve the health of individual people and society as a whole;
- show increased interest and positive motivation in matters of academic knowledge about bacteria, unicellular eukaryotes and algae and their importance in nature and for humans;
- show an interest and attitude towards healthy human nutrition - the basis of a healthy human lifestyle;
- think quickly and take adequate measures and practical actions to protect human health.

The use of interactive methods leads to an increase in the interest and motivation of students in acquiring biological knowledge. Skills for independent acquisition of new knowledge and their application are formed. Students work with desire, and quick feedback is received. The teacher has the opportunity to adapt the training according to the individual capabilities of the students. Positive emotions are created in the classroom due to the existing interactive environment. The classes are liked and expected by the students. The interaction between the teacher and students improves, students are not afraid of giving the wrong answer. All this leads to an improvement of the learning process.

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