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IMPLEMENTATION OF MODERN TECHNOLOGY «FLIPPED CLASSROOM» IN A BIOLOGY LESSON

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Summary

The study of the effectiveness of the use of didactic games with elements of trilingualism in biology lessons as a way to increase motivation to study biology is considered. Didactic games are aimed at solving the problems of teaching and raising children. The main component of the didactic game is educational activity, which is intertwined with gaming activities. Due to the presence of game actions, didactic games used in the classroom make learning more entertaining, emotional, help to increase the arbitrary attention of children, create prerequisites for deeper mastery of knowledge, skills and abilities. Such active activity of students during the lesson is an effective way to increase motivation, as it develops interest in the subject, attracts the attention of students, the whole class is involved, including both passive and active guys.In a modern school, great attention is paid to the motivation of learning, because it is the presence of students' motivation for the subject awakens their desire for learning, comprehension and active action.

Key words: *didactic games, trilingualism, motivation for learning activities, effectiveness of application.*

Introduction. Flipped learning applies to Bloom's revised taxonomy that includes such levels of cognitive work, as remembering, understanding, applying, analyzing, evaluating, and creating [1]. The combination of the two techniques has recently been referred to as flipping classroom structure: moving content coverage outside the classroom, to spend precious in-class time on more demanding tasks [2]. One of the most important components of modern flipped learning technology is the «Flipped Classroom» learning model. The founders of the flipped classroom model are two teachers – Jonathan Bergman and Aaron Camz, who in 2007 first came up with how to provide their lectures to athletes who often miss classes, and then developed this idea into a new educational direction[3]. Publications in major American newspapers and magazines helped them in this. At all levels of education, teachers today have the task of educating creative, critically-thinking students who can assimilate, integrate and apply knowledge at different levels: from simply reproducing facts, understanding concepts, and applying algorithms to solve problems to the metacognitive skills needed to analyze and respond to complex problems in one's own life and the life of society.

Tasks:

1. To study the psychological and pedagogical literature on the problem of research.

2. Develop biology lessons based on the «Flipped Classroom» learning model.

3. Apply the «Flipped Class» method in a biology lesson in high school.

4. Analyze the effectiveness of the «Flipped Classroom» learning model in biology lessons.

Blended learning involves combining classroom-based technology and e-learning technology. If the student did not understand something from the theory, it is difficult to catch up. During the lesson, the teacher is in a hurry to present the material so that everything is on time. Often this is not enough for a full explanation of the topic, and the child does not keep up with the pace of the teacher's explanations. Students go home with a bunch of questions — they have to call their parents, connect with tutors and try to understand what the essence of the material and homework is. The solution offered by the flipped class: the theory is submitted before the lesson, and the student can spend as much time studying it as it takes — at least five times to review the lecture and make several notes. It's easier to assimilate the material this way.

The flipped classroom has the advantage of more opportunities for students to interact. Even the most interactive lectures are likely to actively involve only a subset of the students. In the flipped classroom, the instructor works directly with individual students during contact hours. Most of the class time in flipped classroom model can be spent with these students that are struggling, as opposed to the traditional lecture where most of the questions posed during discussion come from the stronger students, [4]. To understand the advantages of a flipped classroom, it is important to understand the problems in the traditional teaching system. In the traditional model, the teacher is the center of attention and is the main source of information throughout the lesson. He must answer questions, explain the material in detail, organize group and individual work, come up with applied tasks and monitor emerging discussions.

A growing trend towards distance learning, especially in for-profit institutions, has taken advantage of the Internet by providing access to content for use by students in a self-paced environment. The benefit of distance learning is that the learner can access information at their own pace and can continually reference recorded material [5]. According to the «Flipped Classroom» method, students receive theoretical knowledge at home with the help of electronic educational resources. The practical activity of students is carried out during the biology lesson itself. After completing homework, students come to the lesson theoretically prepared. They can use the whole lesson for practical work, generalization of the acquired knowledge, group or pair activities, and knowledge testing. During the class lesson, the teacher focuses on consolidating and deepening the knowledge gained by children. During the lesson students actively work and interact in groups or pairs, and discuss issues that have arisen during the independent study of the material. During a standard lesson, students learn only the material that they managed to memorize and do not have time to think about the information received. Through the use of video or other information media, the teacher allows students to repeatedly view the material, which makes the study of a particular topic the most effective. This learning model also helps to involve passive students who do not have the desire to think independently, study and interact with other students. This learning model develops students' independence, responsibility, creative thinking, and functional literacy.

However, in the course of the study, some shortcomings of this teaching method were noticed. Some students had technical problems with uploading homework to the website, so they dropped the assignments on the «What's App» platform. Testing of children was carried out on the website https://onlinetestpad.com/. However, not all students had internet access. In such cases, classmates helped each other

out by distributing the Internet through their gadgets. The main problem with implementing the flipped classroom model is a significant increase in the amount of work of the teacher during the transition period. It is necessary to redraw the curriculum and divide the available material in such a way that part is transferred to the vodcast, and part is left for classroom work. It is necessary to develop tests to control students, create a system for evaluating independent work at home and teamwork in the classroom, and master the tools for developing vodcasts and their placement. A single model of «flipped learning» does not yet exist; this technology is widely used to describe the structure of almost any classes with students, which are based on viewing /listening to pre-recorded lectures and then discussing them directly with the audience. Students can view/listen to several lectures in a row, lasting 5-7 minutes each. To check the assimilation of the educational material passed by students, the teacher may periodically arrange online surveys or test tasks. The timely reaction of students to these surveys and the possibility of re-viewing lectures help clarify unclear points in the assimilation of educational material. The distinctive features of flipped learning include: changing the role of a teacher who turns into a mentor. The role of the teacher remains the leading one, but his activity is aimed at coordinating the training of students, providing counseling, providing assistance, and creating an educational and problem situation for cognitive research activities; educational materials are presented in the form of electronic educational resources.

Materials and methods. An experimental study of the effectiveness of the «flipped classroom» learning model for high school students in biology lessons was conducted based on the State Institution Complex «Music College - Music Boarding school for gifted children» in Pavlodar.

The study was conducted in 3 stages:

I. Developing Classroom missions and short-term biology plans for 9th-grade students.

II. Conducting a pedagogical experiment using the lessons developed.

III. Analysis of the effectiveness of the «flipped classroom» learning model.

The essence of the «flipped» class methodology can be reduced to three main components:

- Preparation (selection or creation) of a virtual educational environment by a teacher: video tutorials, presentations, other materials, and assignments for them, as well as the choice of electronic service for feedback from students.
- Organization of educational activities: the teacher's definition of key competencies on the topic, forms of work with students in the classroom, preparation of assignments for students in the classroom. At the same time, students in the process of working together with the teacher solve additional tasks: deepening, consolidating, and repeating the material they have passed.
- Current and final assessment of students' knowledge and competencies. The teacher can choose together with the students several forms of final work, for example, in the form of a test or a project [6].

Results and discussion. The study involved 9th grade students. To test the effectiveness of the «flipped classroom» learning model, students were introduced to the principles and features of the new teaching methodology. Students have registered on the website https://classroom.google.com. Every week, missions were uploaded to the site, which included working with a textbook, watching videos, and completing three-level tasks.

During the class lesson, the students actively worked in groups and engaged in practical activities. At the end of the lesson, the students were tested on the

completed material on the platformhttps://onlinetestpad.com/.

At the end of the quarter, the students wrote a test paper on the sections they passed. The test work consisted of open-ended questions. The verification work included the following tasks:

1. Anaerobic respiration provides a rapid flow of energy, but only for a short time. Aerobic respiration can serve as an energy source indefinitely with a sufficient amount of respiratory substrate (mainly ca rbohydrates).

(a) Give an example of two sports where anaerobic breathing is more effective.

(b) Give an example of two sports where aerobic breathing is more effective.

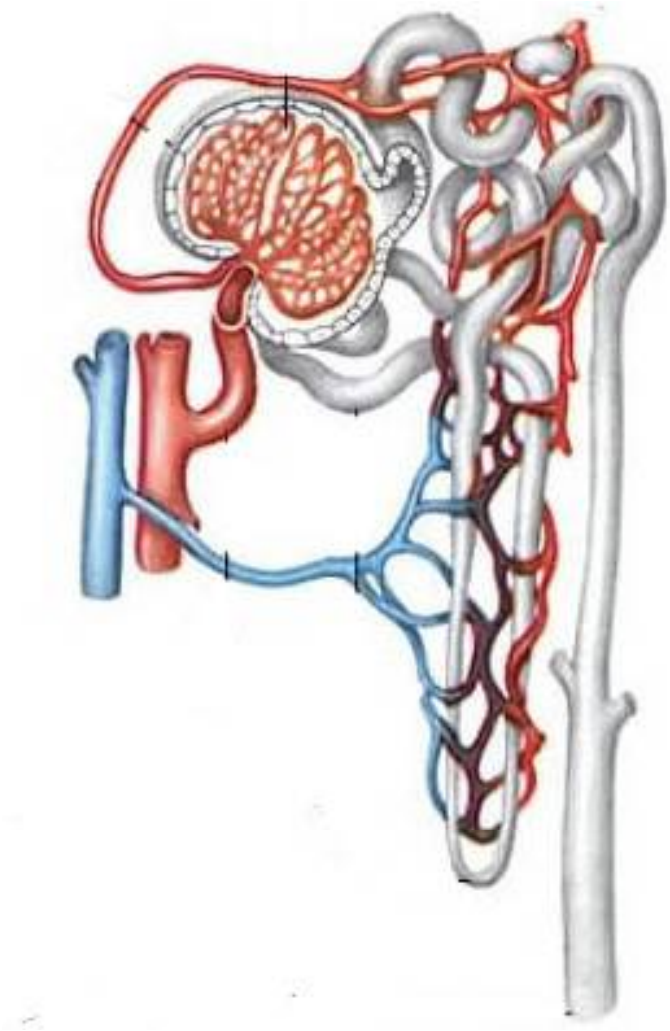
2. Name the reason for the high pressure in the glomeruli of the nephron.

3. Urolithiasis of the kidneys ranks second after infectious and inflammatory diseases.

(a) Explain the reason for the formation of kidney stones.

(b) Describe the measures of primary prevention of urolithiasis of the kidneys.

4.Indicate the following structural elements in the picture: Bowman's capsule, convoluted tubule, Henle loop, collecting tube, carrying arteriole, bringing arteriole, picture 1:



Picture 1. Structure of nephron
(https://ds04.infourok.ru/uploads/ex/1339/000431e8-c42bebd1/img7.jpg)

5. Determine the main excretion product in the following animals and justify your answer, table 1:

Table 1. Products of the allocation.

Animals	**The main product of the allocation**	**Physiological justification**
Mammals, humans		
Freshwater invertebrates, constantly living in water, amphibians, freshwater fish		
Terrestrial insects, birds, reptiles		

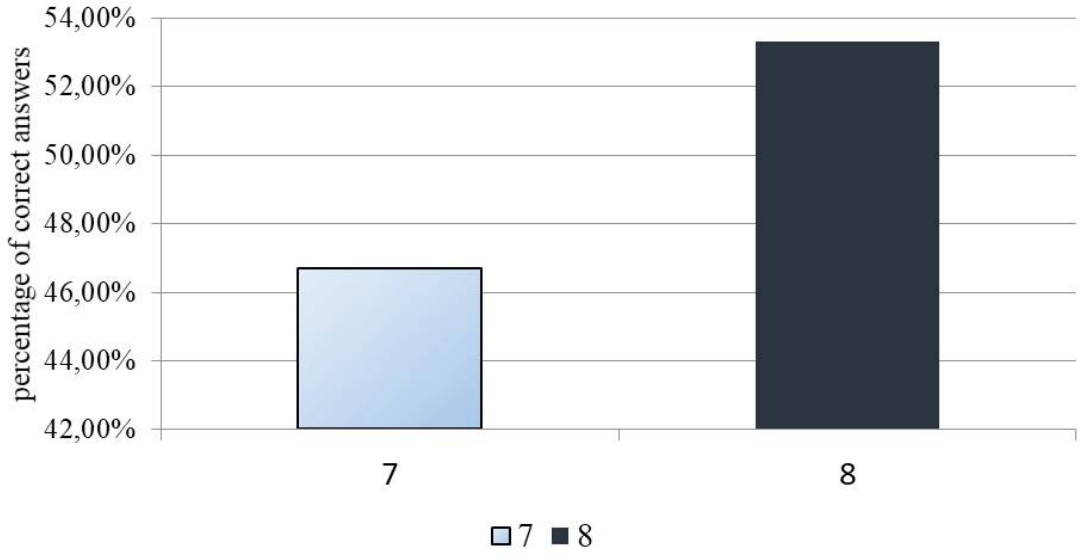
6. Name the structural and functional unit of human kidneys and other vertebrates.

7. What kind of disease causes infectious inflammation of the bladder?

8. What is the name of a liquid with a characteristic pungent odor, poisonous and highly soluble in water, formula - NH_3?

The experiment, which lasted almost 2 months, gave excellent results. Below is a diagram showing the results of the verification work, picture 2:

According to the test results, it was revealed that 53.3% of students have a high level of assimilation of the topic, and



Picture 2. Percentage of correct answers

46.7% have an average level of assimilation of knowledge. The positive dynamics were played by the absence of low academic performance indicators. These results were achievedbecause students came to the lesson with basic knowledge of the topic being studied.

The «flipped classroom» technique contributed to the transition of the traditional lesson to a new level. A variety

of group classes have activated passive students. Students began to understand the subject better due to increased preparation time and quick feedback from the teacher.

Conclusion. Based on the tasks set at the beginning of the study, the following conclusion can be drawn:

* In the course of the study, the psychological and pedagogical literature on the new teaching methodology was studied

* 6 missions and 6 short-term plans have been developed to work on the «flipped classroom» learning model

* The «flipped classroom» methodology is an effective tool for improving academic performance. As a result of the study, 53.3% of students revealed a high level of knowledge in the subject, and 46.7% - average. No low indicators were found.

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Биология сабағында «Төңкерілген сынып» заманауи технологиясын енгізу

Аңдатпа

Биологияны оқуға деген ынтаны арттыру әдісі ретінде биология сабақтарында үштілділік элементтері бар Дидактикалық ойындарды қолдану тиімділігін зерттеу қарастырылды. Ойын әрекеттерінің арқасында сабақта қолданылатын дидактикалық ойындар оқуды қызықты, эмоционалды етеді, балалардың ерікті назарын арттыруға көмектеседі. Дидактикалық ойындар балаларды оқыту мен тәрбиелеу мәселелерін шешуге бағытталған. Дидактикалық ойынның негізгі компоненті – бұл ойын әрекетімен байланысты оқу әрекеті. Сабақ барысында оқушылардың мұндай белсенді әрекеті мотивацияны арттырудың тиімді әдісі болып табылады, өйткені ол пәнге деген қызығушылықты дамытады, оқушылардың назарын аударады, бүкіл сынып қатысады, олардың арасында пассивті де, белсенді де балалар бар. Қазіргі заманғы мектепте оқуға үлкен көңіл бөлінеді, өйткені ол оқушылардың пәнге деген ынтасының болуы олардың оқуға, түсінуге және белсенді әрекетке деген ынтасын оятады.

Түйінді сөздер: *дидактикалық ойындар, үштілділік, оқу іс-әрекетін ынталандыру, қолдану тиімділігі.*

Внедрение современной технологии «Перевернутый класс» на уроке биологии

Аннотация

Рассмотрено исследование эффективности применения дидактических игр с элементами трехъязычия на уроках биологии как способа повышения мотивации к изучению биологии. Дидактические игры направлены на решение задач обучения и воспитания детей. Главным компонентом дидактической игры является учебная деятельность, которая переплетается с игровой деятельностью. Благодаря наличию игровых действий дидактические игры, применяемые на занятиях, делают обучение более занимательным, эмоциональным, помогают повысить произвольное внимание детей, создают предпосылки к более глубокому овладению знаниями, умениями и навыками.Такая активная деятельность учащихся во время урока является эффективным способом повышения мотивации, так как развивает интерес к предмету, привлекается внимание учеников, задействуется весь класс, среди которых и пассивные, и активные ребята. В современной школе мотивации обучения уделяется огромное внимание, потому что именно наличие мотивации учеников к изучению пробуждает их желание к обучению, осмысливанию и активному действию.

Ключевые слова: *дидактические игры, трехъязычие, мотивация к учебной деятельности, эффективность применения.*

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