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Kamilya G. Gabdulnova

PhD of Biological Sciences, Associate Professor
Federal State Budgetary Educational Institution of Higher Education
"Vyatka State University" («VyatSU»), Kirov, Russia
ORCID ID 0000-0002-2268-3872
usr11786@vyatsu.ru

Maria A. Kovrova

PhD of Pedagogical Sciences, Associate Professor
Federal State Budgetary Educational Institution of Higher Education
"Vyatka State University" («VyatSU»), Kirov, Russia
ORCID ID 0000-0001-5922-5560
usr12019@vyatsu.ru

THE USE OF A DIGITAL MICROSCOPE FOR THE DEVELOPMENT OF YOUNG SCHOOLCHILDREN'S IDEAS ABOUT PLANTS, ANIMALS AND FUNGI

Abstract. At present the use of technical teaching aids based on digital technologies in the educational process in primary schools is gaining special relevance, and the digital microscope is indicated in a number of syllabi for the course "Nature study" in primary schools in the section "Material and technical support". The teacher is free to decide on what topics, in the study of what objects or natural phenomena, with the use of what methods to use this teaching tool. The aim of the study is to identify the influence of the use of the digital microscope on the development of children's ideas about plants, animals and fungi in primary school. The pedagogical experiment was carried out for 2 years on the basis of two secondary schools in the city of Kirov, Russian Federation. 140 third grade students (72 students in the experimental group and 68 students in the control group) took part in the experiment. For the development of ideas about plants, animals and fungi in primary school children at Nature study lessons two methods were implemented: with the use of the digital microscope (in the experimental group) and without its use (in the control group).

The results of testing third-graders before and after the teaching experiment showed that the use of the digital microscope in the classroom contributed to students' better assimilation of knowledge about the diversity of plants, their respiration, nutrition, reproduction and development, the diversity of animals, their reproduction and development, and the diversity of fungi than in the lessons which did not use the microscope. This is proved by statistically significant differences in the test results of the experimental and control groups after the experiment.

The findings of the study can provide a starting point for subject curriculum developers and teachers interested in using the digital microscope in primary school education.

Keywords: digital microscope; ideas about plants, animals, fungi; Nature study lessons; primary school children.

1. INTRODUCTION

Formulation of the problem. In the Russian Federation, the federal state educational standard for primary general education (hereinafter referred to as the FSES PGE) establishes requirements for the results of students who have mastered the basic educational program of primary general education. Requirements for subject outcomes include "student's experience gained in the course of studying the subject of the given subject area on the acquisition of new knowledge, its transformation and application, as well as the system of fundamental elements of scientific knowledge that underlie the modern scientific picture of the world" [1, p. 8]. To achieve the planned results of the FSES PGE,

the requirements for the facilities involved in the educational process, including those providing students with observation of micro-objects, have been determined.

The digital microscope is an innovative teaching tool, it is indicated in the Model Basic Educational Program of Primary General Education [2], in a number of syllabi of the course "Nature study" in the list of the equipment, and the teacher is free to decide on which topics and in the study of what objects and natural phenomena to use the indicated equipment.

Thus, at present, the use of technical teaching aids based on digital technologies in the educational process in primary school is of particular relevance.

A digital microscope is a type of traditional optical microscope that uses optics and a digital camera to output a digital image to a personal computer monitor. Compared to an optical microscope, the digital microscope has several advantages. Both transparent and opaque objects may be used. To study objects of larger sizes than with a light microscope. To take photos or make videos of microscopic objects. All data is automatically saved on the computer's hard drive. You can sign photos, leave pointers, copy sections of the image, or print them on paper.

The use of the digital microscope in the learning process makes it possible: that both single student and whole group may study simultaneously the researchable object, since the information is displayed on a computer monitor and on a projection screen; to use images of objects as a demonstration to explain the topic; to study the microscopic object in real time; to create presentation photos and videos with respect to the topic being studied.

From the quotation above it follows that the FSES PGE defines the requirements for children's acquisition of fundamental elements of scientific knowledge that underlie the modern scientific worldview; the scientific ideas about plants, animals and fungi are certainly among them.

Analysis of recent researches and publications. In the scientific literature, information on the use of the microscope in primary school is scarce and very scattered. So, in the studies of Baroni P., Cadenelli N., Caprara B. et al. on the use of the digital microscope, the analysis of the user interface program is proposed, which allows the use of the digital microscope in kindergartens and primary schools, the results of testing the use of the digital microscope in primary schools are presented [3]. Oliver J., Garcia B. assess traditional and digital microscopy in the school educational process, provide examples of the use of microscopes in classes of different levels, including in primary schools, describe initiatives aimed at encouraging the use of microscopes in teaching schoolchildren [4]. Gabdulnova K.G. gives examples of digital microscope models that are used in Russian primary schools [5].

A number of studies are devoted to the problem of studying microbiology by younger schoolchildren. In the study of Mafra P., Lima N., Carvalho G. S., fourth grade students (9-10 year-olds) in the course of experimental activities examined dental plaque samples using the microscope before and after brushing their teeth [6]. In the experiment of Pavan C., Santovito G., third grade students observed bacteria and yeast [7]. In the work of Lago A., Masiero S., Bramuzzo S. et al. the results of familiarizing primary school students with the use of yeast and bacteria in the food industry are presented on the example of the production of bread and yoghurt [8].

Gaiotto A., Tonon S, Santovito G. give the results of the experiment on studying plants and their seasonal changes using the stereoscope and the optical microscope in the first grade [9], Toninato V., Santovit G. write about studying flowers and inflorescences using the experimental method and the stereoscope in the second grade [10]. In the study of Rossi E., Santovito G., fifth grade primary school students studied Mendel's genetics in the form adapted to their age, using various genetic strains of the fruit fly (*Drosophila melanogaster*) [11]. The work of Allen J., Healy N. presents the results of the study on the use of the microscope when studying light in the classroom in primary school [12].

The general conclusion that can be traced in all of the works is as follows. According to the researchers, the use of the microscope (optical or digital) in the primary school educational process allows the use of teaching methods that promote the activation of children's cognitive activity, makes the studied material accessible for children's understanding, motivates them, and this ensures development of the scientific culture and interest in science.

At the same time, as the analysis of the literature has shown, there is currently a lack of research on studying the influence of the use of the digital microscope on the level of the development of a whole range of ideas about plants, animals and fungi in primary school children. For example, ideas about the diversity of plants, their respiration, nutrition, reproduction and development; the diversity of animals, their reproduction and development; diversity of fungi.

The purpose of the article is to highlight the effectiveness of the use of the digital microscope as a means of developing ideas about plants, animals and fungi in primary school children. The tasks were to give examples of objects of nature, as well as methods and means of teaching in the process of developing ideas about plants, animals and fungi in younger schoolchildren at "Nature study" lessons using the digital microscope; to compare the results of assessment of students' knowledge obtained during the pedagogical experiment.

2. RESEARCH METHODS

Theoretical and empirical methods were used in the research to study the influence of the use of the digital microscope on the formation of ideas about plants, animals and fungi in primary school children. Systematization, comparison and generalization of scientific provisions were used to identify the pedagogical conditions for the formation of natural science concepts in younger students using the digital microscope. Empirical methods that were used are: pedagogical experiment, testing, questioning, statistical method (Wilcoxon-Mann-Whitney test).

The pedagogical experiment to identify the influence of the use of the digital microscope on the development of ideas about plants, animals and fungi in younger schoolchildren was conducted by students of the Faculty of Pedagogy and Psychology of Vyatka State University (Kirov, the Russian Federation) as a part of work on their master's thesis in 2016-2017 academic year (pedagogical experiment # 1) and two bachelor's final qualifying works in 2017-2018 academic year (pedagogical experiments # 2 and 3).

In total, 140 third grade students of secondary schools # 16 and 58 in Kirov took part in the experiment, of which 72 students made up the experimental group (Nature study lessons were conducted using the digital microscope) and 68 students were in the control group (Nature study lessons were conducted without using the digital microscope).

The topics of the lessons: "Diversity of plants", "The sun, plants and you and us", "Reproduction and development of plants", "Diversity of animals", "Reproduction and development of animals", "In the kingdom of fungi" were determined taking into account the syllabus "Nature study" by A.A. Pleshakova, which is one of the most popular syllabi in primary school.

For the experimental study six tests, which were developed for the above mentioned syllabus, were selected and modified. Each test includes 10 test tasks that require choosing the correct answer from the proposed. Tasks 1–8 allow checking the basic level of development of ideas on the topic. Tasks 9-10 are complicated, formulated in such a way that the student can show how he/she is able to apply the acquired knowledge in practice, see the main point, and establish cause-and-effect relationships between man and nature, between individual objects of nature.

Criteria for assessing the development of natural science ideas by topics:

"Diversity of plants": ideas about groups of plants: algae, mosses, conifers, flowering and common essential characteristics of plants of each group; examples of plants of each group; the ability to distinguish groups of plants by their characteristics.

"The sun, plants and you and us": ideas about respiration and nutrition of plants, substances involved in these processes; the role of leaves in the respiration and nutrition of plants; the ability to identify the organs involved in plant nutrition and characterize the role of light in this process.

"Reproduction and development of plants": ideas about pollen and pollination of plants by insects; ways of spreading fruits; stages of plant development; the ability to determine adaptations of fruits to spread by wind and animals, to determine the role of flowers in the formation of fruits.

"Diversity of animals": ideas about groups of animals: mollusks, crustaceans, insects, fish, amphibians, reptiles, birds and animals and general essential characteristics of animals of each group; examples of animals of each group; the ability to attribute animal species to the corresponding animal groups.

"Reproduction and development of animals": knowledge of the initial and subsequent stages in the development of animals of each group; the ability to identify some of the characteristics of animals at different stages of development.

"In the kingdom of fungi": knowledge of the parts of the fungi (for example, cap mushrooms), the diversity of fungi, their role in nature; the ability to distinguish between edible and poisonous mushrooms, to determine the role of fungi in nature.

Taking into account the selected criteria, there were determined four levels of development of third-graders' concepts about plants, animals and fungi: high level, above-average level, medium level and low level.

Lessons with and without the digital microscope were included in the educational process in accordance with the calendar-thematic planning of Nature study lessons. In total, 28 lessons were held on 6 topics (12 lessons in experiment # 1 and 8 lessons in experiments # 2 and # 3). The type of the lesson was combined. The leading teaching methods were visual: demonstration of the natural object and phenomenon, demonstration of the experiment. The choice of visual teaching methods was associated with the provision of the primary classes of the city with microscopes (no more than one or two microscopes per primary school).

Educational tools: Levenhuk-50 digital microscope with Levenhuk C-Series digital camera, Digital Blue QX5 digital microscope, laptop, projector, screen; living objects of nature or their parts (plants, animals, fungi), or finished specimens; auxiliary laboratory equipment (slides and cover slides, beakers of thin glass with water, pipette, tweezers, microscopic needle, etc.).

3. RESULTS AND DISCUSSION

3.1. Justification of the teaching methodology with the use of the digital microscope

In the process of working on the development of ideas about plants, animals and fungi in third-graders, the methodology for formation of natural science ideas by Klepinina Z.A., Akvileva G.N. [13], Pakulova V.M., Kuznetsova V.I. [13], Usova A. .B. [14] and others was taken into account. According to it, the conditions for formation of adequate perceptions are: observation of natural objects, the accurate and vivid word of the teacher, exercises that clarify perception, practical work involving all senses of children, increasing children's activity, relying on their knowledge and life experience. The conditions for formation of correct ideas are: formulation of questions and tasks that

require reproduction of sensations, organization of exercises to recognize and distinguish between objects of nature, a sketch from memory, filling in tables, diagrams.

For realization of conditions for formation of correct ideas, after demonstration of each specimen on the wide screen, children independently worked with task cards. The tasks on the cards are aimed at recognizing and distinguishing the features of objects and phenomena being studied. The use of this technique was also based on the study of Herrlinger S., Hoeffler T. N. on the impact of work with images when studying biology in the fourth grade [16]. Sketches from memory, according to Ainsworth Sh., Prain V. and Tytler R. contribute to visualization of objects and phenomena, allow students to make discoveries, explain results, and arouse interest [17].

Teaching methods: demonstration of natural objects and demonstration of experiment were implemented in accordance with the recommendations of Z.A. Klepinina and Akvileva G.N. [12].

In Nature study lessons in experimental classes, development of students' ideas about plants, animals and fungi was carried out on the basis of the ideas, means and teaching methods presented in Table 1

Table 1

Natural science ideas and objects, methods for their formation using the digital microscope at Nature study lessons in the third grade with the use of the digital microscope

The topic of the lesson	Natural science ideas	Single ideas	Learning tools, learning objects	Teaching methods
"Diversity of plants"	Algae	Algae	Final preparation of spirogyra	Demonstration of natural objects
"The sun, plants and you and us"	Plant respiration	Stomata in the skin of the leaf	Temporary preparation geranium leaf peels	Demonstration of natural objects
	Plant nutrition	Chloroplasts in leaf cells	Temporary preparation of vallisneria leaf	
	Role of culm and leaves in plant nutrition	Starch granules	Temporary preparation of starch granules of potato tuber (uncolored and colored with iodine solution)	Demonstration of experiment
"Reproduction and development of plants"	Plant reproduction	Blossom dust Hamuluses of tenent multiple fruit	Geranium pollen, agrimony multiple fruit	Demonstration of natural objects
	Plant development	Sprouts	Radish sprouts, dry seeds and seeds in conditions of humidification	Demonstration of experiment
	The role of external conditions in plant development	The role of water in plant development	Radish sprout root	Demonstration of natural objects
"Diversity of animals"	Lower animal	Paramecium caudatum	Final preparation of Paramecium caudatum	Demonstration of natural objects
	Crustaceans	Small crustacean	Temporary preparation of daphnia	

	Insects	Compound mosquito eyes Fly leg	Final preparation «Female mosquito head», Final preparation «Fly leg»	
"Reproduction and development of animals"	Reproduction and development of animals	Eggs and larvae	Artemia crustacean eggs and larvae	Demonstration of natural objects
	Development of animals	Fish roe Fish scales Feather	Keta roe and scales, contour feather, down feather	
"In the kingdom of fungi"	Mushrooms	Spores	Temporary preparation of champignon spores	Demonstration of natural objects
	Yeast	Yeast	Temporary yeast preparation, ready-made preparation of	
	Mold	Mold	mold mucor	

3.2 Main results of the pedagogical experiment

At the ascertaining stage of the pedagogical experiment, the majority of students of the experimental and control groups showed an average level of development of concepts about plants, animals and fungi (59.72% and 57.45%, respectively) (Fig.1)

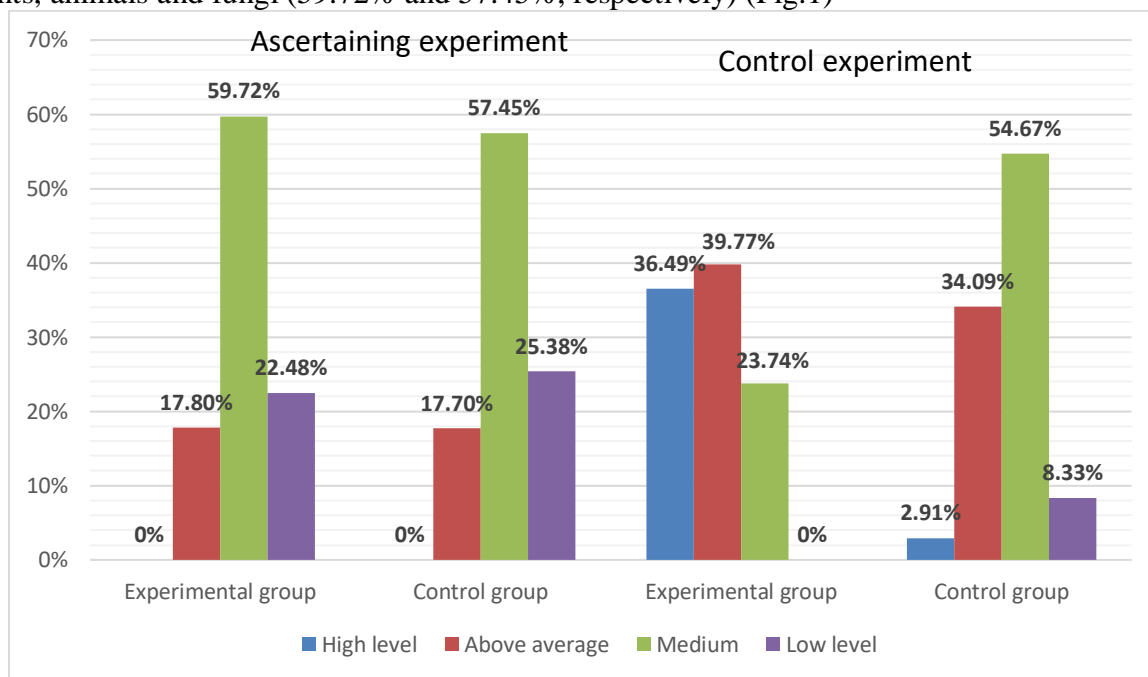


Fig.1. Levels of development of third-graders' concepts about plants, animals and fungi at the ascertaining and control stages of the pedagogical experiment

At the control stage of the pedagogical experiment conducted in the experimental group (lessons were conducted using the digital microscope), number of students having a high level of development of concepts about plants, animals and fungi were 12.5 times more than in the control group, number of children with an above average level were up by 4.68%; children with an average level of development of concepts about plants, animals and fungi were less by 2, 3 times than in the control group. No children with a low level has been observed. In the control group, children with a low level of concepts were 8.33%.

At the stage of the control experiment, the test results showed significant differences between the groups in terms of the degree of acquisition of knowledge about plants, animals and fungi by children.

So, with respect to the topic "The Sun, plants and we are with you", the most difficult questions for children were those related to the respiration and nutrition of plants. The number of children who correctly stated that during respiration plants absorb oxygen from the air and emit carbon dioxide, was 2.5 times higher in the experimental group than in the control one.

Questions about small and microscopic animals were difficult for children when studying "Animal diversity" topic. The number of students who demonstrated knowledge about such animals was 2 times higher in the experimental group than in the control one. These children pointed out that animals include both unicellular (paramecium caudatum) and crustaceans (artemia, daphnia).

While studying topic "In the kingdom of mushrooms", children had difficulties with matters about the diversity of mushrooms. In the experimental group, number of children with a good knowledge of the variety of fungi were 5.6 times more than children belonging to the control group. Based on the results of studies with the use of the digital microscope, children reliably attributed to mushrooms not only the champignon, but also yeast and mold.

Table 2 shows the results of testing the students of the experimental and control groups, obtained in the course of the pedagogical experiments

Table 2

The number of correctly completed test tasks (on average out of 10 tasks) by third-graders and empirical values of the Wilcoxon-Mann-Whitney criterion at the ascertaining and control stages of the pedagogical experiment

Indicators	Pedagogical experiments						Overall experimental results # 1-3 (N=72; M=68)	
	#1 (n ₁ =24; m ₁ =22)		#2 (n ₂ =24; m ₂ =24)		#3 (n ₃ =24; m ₃ =22)		Ascertaining experiment	Control experiment
	Ascertaining experiment	Control experiment	Ascertaining experiment	Control experiment	Ascertaining experiment	Control experiment		
Experimental group (number of correctly completed test tasks)	5,42	7,92	4,58	6,42	6,14	8,50	5,34	7,58
Control group (number of correctly completed test tasks)	5,36	6,23	4,46	5,50	5,83	6,79	5,21	6,18
Empirical value of the Wilcoxon-Mann-Whitney criterion (W _{EMP})	0,2419	4,1671	0,4743	2,4125	0,8466	4,5299	0,3587	5,2266
Comparison of W _{EMP} with critical value W _{0,05} =1,96	W _{EMP} <1,96	W _{EMP} >1,96	W _{EMP} <1,96	W _{EMP} >1,96	W _{EMP} <1,96	W _{EMP} >1,96	W _{EMP} <1,96	W _{EMP} >1,96

Note. n₁, n₂, n₃, N - number of students in the experimental group in pedagogical experiments # 1, 2 and 3; m₁, m₂, m₃, M - number of students in the control group in pedagogical experiments # 1, 2, and 3.

The number of correctly completed test tasks (on average out of 10 tasks) in pedagogical experiments # 1-3 in experimental classes at the stage of the control experiment, that is, after the training experiment, was 1.2-1.3 times higher than in the control classes.

The overall results for the three pedagogical experiments showed similar results. In the experimental group after the training experiment the number of correctly completed tasks was 2.24 higher than it was before, whereas it was only 0.97 in the control classes.

The empirical values of the Wilcoxon-Mann-Whitney criterion indicate that the use of the digital microscope in the process of developing ideas about plants, animals and fungi in teaching third-graders leads to statistically significant differences in the results in the experimental and control groups.

One of the most noticeable features of lessons using the digital microscope was the students' consistently high cognitive interest in the material being studied. This was evidenced by the children's desire to take seats closer to the microscope and the screen, their questions addressed to the teacher, the desire to participate in activities on their own initiative, and active use of the acquired knowledge. A joyful atmosphere reigned in the lesson, children were expecting new "discoveries" related to the microcosm. The students' cognitive interest in studying nature using the digital microscope is proved, in particular, by their answers in the questionnaire. When asked if they wanted to learn more about nature, all the children answered affirmatively, for example, they wrote: "I really want to learn all about nature. I understand better with the microscope." The obtained results of children's observations are consistent with the conclusions of Siry C., Brendel M. about the inseparable role of emotions in teaching science in primary school [18].

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The purpose of this research work was to present the results of using the digital microscope as a means of developing ideas about plants, animals, and fungi in primary school children.

At the stage of children's perception of the observed object using the digital microscope it is required to strive to create the following conditions: observation of the object by schoolchildren should be accompanied by special tasks aimed at clarifying perception; the teacher needs to express thoughts briefly, accurately, logically, so that the verbal description of the object coincides with what children observe. At the stage of forming representations it is necessary to formulate questions and tasks that require reproduction of sensations, sketches from memory, filling in tables, diagrams. During such work sensory experience is recreated. The teacher is to lead children to the knowledge of the general through the study of the singular, the particular. This approach is extremely important in relation to younger students, whose psychophysiological feature of thinking is concreteness and figurativeness. Consequently, if in the process of forming natural science ideas teachers use the digital microscope, they should select objects reflecting a single idea or containing it as an element.

The conducted pedagogical experiments showed that the use of the digital microscope in the Nature study lessons in the process of developing ideas about plants, animals and fungi in younger schoolchildren leads to statistically significant improvement in students' performance compared to traditional lessons. Students demonstrated a higher level of knowledge about diversity of plants, their respiration, nutrition, reproduction and development; diversity of animals, their reproduction and development; diversity of fungi.

According to the researches of Pentin A.Yu., Kovaleva G.N., Davydova E.I. and Smirnova E.S., and the results of international studies TIMSS-2015, Russian primary school

graduates were more successful in natural science tasks for reproducing knowledge ("knowledge") and use ("use"), they were to a lesser extent successful in explaining phenomena or describing observations ("reasoning"). According to the authors, in order for the natural science curriculum for the Russian primary school to meet modern requirements for the preparation of younger schoolchildren in the field of natural science, the changes should to a greater extent affect the methods of teaching natural science, which should be aimed at maintaining and stimulating the curiosity of younger students, their natural desire to explore nature [19]. We are convinced that such teaching methods should be associated with the use of the digital microscope.

The data obtained in the study can be used to develop syllabi in the subject and by primary school teachers interested in using the digital microscope in the process of developing students' ideas about plants, animals and fungi. The prospects for our further research are associated with identifying the influence of teaching methods, first of all practical methods of using the digital microscope, on development of ideas about plants, animals and fungi in primary schoolchildren.

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ЗАСТОСУВАННЯ ЦИФРОВОГО МІКРОСКОПУ ДЛЯ РОЗВИТКУ УЯВЛЕНЬ У МОЛОДШИХ ШКОЛЯРІВ ПРО РОСЛИНИ, ТВАРИН ТА ГРИБИ

Габдулінова Камілія Гапбасівна

кандидат біологічних наук, доцент,

Федеральна державна бюджетна освітня установа вищої освіти "В'ятський державний університет"

(В'ятДУ), м. Кіров, Росія

ORCID ID 0000-0002-2268-3872

usr11786@vyatsu.ru

Коврова Марія Олександрівна

кандидат педагогічних наук, доцент,

Федеральна державна бюджетна освітня установа вищої освіти "В'ятський державний університет"

(В'ятДУ), м. Кіров, Росія

ORCID ID 0000-0001-5922-5560

usr12019@vyatsu.ru

Анотація. Сьогодні застосування в освітньому процесі початкової школи технічних засобів навчання на основі цифрових технологій набуває особливої актуальності, а в низці робочих програм початкової школи з курсу «Навколишній світ» у розділі про матеріально-технічне забезпечення вказаний цифровий мікроскоп. Педагог може сам вирішувати, при вивченні яких тем, об'єктів або явищ природи, з використанням яких методів він буде застосовувати даний засіб навчання. Метою дослідження є виявлення впливу застосування цифрового мікроскопа на розвиток у молодших школярів уявлень про рослини, тварин та гриби. Педагогічний експеримент проводився протягом 2-х років на базі двох загальноосвітніх шкіл міста Кірова (Російська Федерація). У ньому взяли участь 140 учнів 3 класу (72 учні експериментальної групи і 68 учнів контрольної групи). Були реалізовані дві методики розвитку в молодших школярів уявлень про рослини, тварини та гриби на уроках про навколишній світ: із застосуванням цифрового мікроскопа (в експериментальній групі) і без його застосування (в контрольній групі). Результати тестувань третьокласників до і після навчального експерименту показали, що застосування цифрового мікроскопа на уроках сприяло кращому засвоєнню учнями знань про різноманітність рослин, їх дихання, харчування, розмноження і розвиток; різноманітність тварин, їх розмноження і розвиток; різноманітність грибів, ніж на уроках без використання мікроскопа. Про це свідчать статистично значущі відмінності результатів тестування в експериментальній і контрольній групах після навчального експерименту.

Отримані під час дослідження дані можуть стати відправною точкою для укладачів робочих програм з предмета та для вчителів, які зацікавлені у використанні цифрового мікроскопа у освітньому процесі початкової школи.

Ключові слова: цифровий мікроскоп; уявлення про рослини, тварин; уроки про навколишній світ; молодші школярі.

ПРИМЕНЕНИЕ ЦИФРОВОГО МИКРОСКОПА ДЛЯ РАЗВИТИЯ ПРЕДСТАВЛЕНИЙ У МЛАДШИХ ШКОЛЬНИКОВ О РАСТЕНИЯХ, ЖИВОТНЫХ И ГРИБАХ

Габдулинова Камиля Гапбасовна

кандидат биологических наук, доцент,

Федеральное государственное бюджетное образовательное учреждение высшего образования

"Вятский государственный университет" (ВятГУ), г. Киров, Россия

ORCID ID 0000-0002-2268-3872

usr11786@vyatsu.ru

Коврова Мария Александровна

кандидат педагогических наук, доцент,

Федеральное государственное бюджетное образовательное учреждение высшего образования

"Вятский государственный университет" (ВятГУ), г. Киров, Россия

ORCID ID 0000-0001-5922-5560

usr12019@vyatsu.ru

Аннотация. В настоящее время применение в образовательном процессе начальной школы технических средств обучения на основе цифровых технологий приобретает особую актуальность и в ряде рабочих программ по курсу «Окружающий мир» начальной школы в разделе о материально-техническом обеспечении указан цифровой микроскоп. Педагог волен сам решать, по каким темам, при изучении каких объектов или явлений природы, с использованием каких методов он будет применять данное средство обучения. Целью исследования является выявление влияния применения цифрового микроскопа на развитие у младших школьников представлений о растениях, животных и грибах. Педагогический эксперимент проводился в течение 2-х лет на базе двух общеобразовательных школ города Кирова (Российская Федерация). В нем приняли участие 140 учащихся 3 класса (72 ученика экспериментальной группы и 68 учеников контрольной группы). Были реализованы две методики развития у младших школьников представлений о растениях, животных и грибах на уроках окружающего мира: с применением цифрового микроскопа (в экспериментальной группе) и без его применения (в контрольной группе). Результаты тестирований третьеклассников до и после обучающего эксперимента показали, что применение цифрового микроскопа на уроках способствовало лучшему усвоению учащимися знаний о разнообразии растений, их дыхании, питании, размножении и развитии; разнообразии животных, их размножении и развитии; многообразии грибов, чем на уроках без использования микроскопа. Об этом свидетельствуют статистически значимые различия результатов тестирования в экспериментальной и контрольной группах после обучающего эксперимента.

Полученные в исследовании данные могут стать отправной точкой для составителей рабочих программ по предмету и для учителей, заинтересованных в использовании цифрового микроскопа в образовательном процессе начальной школы.

Ключевые слова: цифровой микроскоп; представления о растениях, животных, грибах; уроки окружающего мира; младшие школьники.



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