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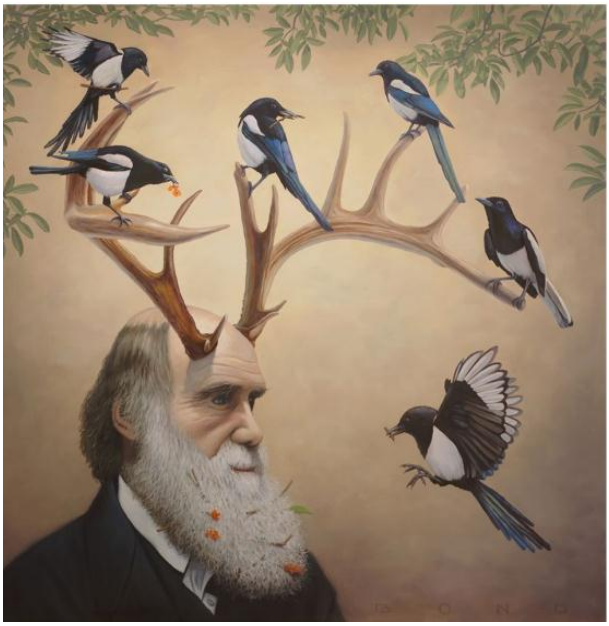

Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

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Issues of forming information skills of students in mathematics lessons through ICT

Klara H. Karamova[1], Lenar M. Mukhametshin[1], Elena E. Ivanova[1]
[1]Kazan Federal University, Kazan, Russia
lenar mukhametshin@mail.ru, Elena Ivanova@mail.ru,
klara_karamova_kazan@mail.ru

Salavat F. Usmanov[2]
[2]Kyrgyz-Russian Slavic University, Bishkek, Kyrgyzstan
Salavat Usmanov@mail.ru

Abstract

The article is devoted to the problem of forming of information skills of students in mathematics lessons using the information computer technologies in the context of the requirements of the Federal State Educational Standard via comparative qualitative research methods. As a result, the use of ICT in mathematics lessons allows students to visualize the studying material, facilitates the work of teacher, raises the level of academic results of students due to their interest. In conclusion, the use of ICT tools would inevitably become a way of improving the quality of mathematical education.

Keywords: Information, Technologies, Computer, Educational, ICT.

Cuestiones de formación de habilidades de información de estudiantes en lecciones de matemáticas a través de las TIC

Resumen

El artículo está dedicado al problema de la formación de habilidades de información de los estudiantes en lecciones de matemáticas utilizando las tecnologías informáticas de la información en el contexto de los requisitos de la Norma Educativa del Estado

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Federal a través de métodos comparativos de investigación cualitativa. Como resultado, el uso de las TIC en las lecciones de matemáticas permite a los estudiantes visualizar el material de estudio, facilita el trabajo del maestro, eleva el nivel de resultados académicos de los estudiantes debido a su interés. En conclusión, el uso de herramientas TIC se convertiría inevitablemente en una forma de mejorar la calidad de la educación matemática.

Palabras clave: información, tecnologías, informática, educación, TIC.

1. INTRODUCTION

The modern stage of development of the world community makes new demands on the level of mathematical training of students. Mathematical education is an integral and essential part of human culture, which gives not only a certain circle of knowledge, improves intellection, develops worldview, teaches to build and to optimize activities, teaches to make decisions, to check actions and to correct mistakes, but the most important is to contribute to the forming of information skills, if the educational process is expected using information and computer technologies (ICT) (GALEEVA, YAO & EMANOVA, 2018).

Nowadays the need to update teaching methods for improving the efficiency of the educational process has increased. Modern reality, which is inextricably linked with the process of informatization and in connection with the development of scientific and technological progress, sets fundamentally new tasks for education, with the aim of educating a competitive, creative person who can freely navigate in the

huge flow of information, understand the latest information technologies. Informatization of the educational space, in its turn, will radically affect to the quality of training graduates of the school - potential carriers of a new type of thinking that meets the requirements of social development through a significant increase of the educational process efficiency, otherwise society faces a chronic lag in these areas, therefore, failure in solving the tasks set by the 21st century.

In the process of studying this aspect of the educational process, we asked the following questions: why we need new learning technologies; what the contribution of computer technology to the development of new learning technologies is; and what the result will be due to its active implementation (UVAROVA, 2014).

2. METHODS

Teaching mathematics requires practical work, self-study, making tests, virtual excursions, conducting lessons in the form of a game. There is not enough time and equipment to do some work. The time has come when in order to increase motivation and interest in studying mathematics it is necessary to look for new means for a modern student. This led to the use of multimedia discs, presentations, video clips. Students more and more increasingly use Internet resources, which allow them to broaden their horizons. While analyzing this situation, we are faced with the problem of searching that technology which should improve the quality of education.

Familiarity with the possibilities of introducing modern information technologies into the educational process suggests that all contradictions are resolvable through the process of creating optimal conditions for satisfying information needs (VINOGRADOVA, 2005).

The concept of information skills includes a comprehensive opportunity to independently search for, to select the necessary information, to analyze, to organize, to present, to transfer it; to model and design objects and processes, to implement projects, including in the sphere of individual and group human activities. The teacher should contribute to the future specialist's development of imagination and intuition, spatial representation, teach him to foresee the result and predict the way to solve the problem. The use of information technologies lets to improve the quality of knowledge. The use of ICT in teaching is one of the most stable directions in the development of the educational process; it can be used within any curriculum, allowing to change the teaching process and to improve students self-training, increasing students interest in studying (VASILIEVA, SITNIKOVA, SHESTAKOV & SHIROKIKH, 2006).

Computer technologies can be used in explaining new studying material, displaying various tasks on a projector, checking homework and consolidating past material, repeating it, knowledge and skills processing, as well as in a distance way - in research and project activities of students. Computer resources can also be used as a source of studying material: electronic textbooks, tasks, tables, schemes and tests, by the way, Internet resources and electronic libraries can also be

included in this category. In the modern world, it is difficult to imagine our life without technology. Computers greatly make easy work. Without leaving home, it is possible to get access to printed publications of any year, to find the necessary information, etc. With the help of text editors' control and self-training works, work plans and the classes developed by the teacher can be made up (SALEKHOVA & SPIRIDONOVA, 2018; KUL, 2018; LUO, LI, PENG & FAN, 2018).

While explaining a new studying material, one can use presentations created in the PowerPoint program, which allow the speaker to convey visually the material to students, increasing their learning level. This makes students' memorization easier, activates their perception, helps to increase attention, and reduces tiredness. Lessons using computer technologies help to solve the following tasks: learning basic knowledge of the subject, systematization of acquired knowledge, forming of motivation to learn, assistance in self-training work. Such lessons have a number of advantages: the topic presented in the form of a presentation will interest students, reduce learning time and allow a teacher to devote more time to repeat the studying material.

A high level of visibility gives a high percentage of learning and memorization (SARANTSEV, 2002). The novelty of the computer elements of the lesson in combination with other teaching methods make the lesson unusual, fascinating. With a didactically correct approach, the computer activates the attention of students, makes

stronger their motivation, and develops cognitive processes, thinking (USHAKOVA, 2016; MENDONÇA & ANDRADE, 2018).

That all suggests the formation of information culture among students as a set of rules of behavior in the information society. The use of ICT should be the basis for the development of education. Information technologies have a mission to change the structure of the educational process with the informatization of education (KARAMOVA & AKHMETSHINA, 2010). A more complete opportunity discovery of multimedia technologies in a lesson is achieved in the self-training of each student with an interactive product, such as an interactive whiteboard that enriches the capabilities of computer technology, providing a large screen for working with multimedia materials that all students can see, it removes the student-teacher interaction to a new level.

An interactive whiteboard is a very convenient educational equipment, unlike a usual multimedia projector, allows not only to show slides and videos, but also to draw, to mark on the projected image, to make any changes, and to save it as computer files. On the screen one can easily move objects and labels, add comments to texts, pictures and diagrams, highlight key areas and add colors. Prepared in advance texts, tables, diagrams, pictures, music, as well as hyperlinks to multimedia files set a fast tempo activity: it is not necessary to spend time on writing text on a regular blackboard or moving from screen to keyboard (BATROVA & SALEKHOVA, 2015).

All resources can be commented directly on the screen, using the tool «Pen», and saved as the created notes for future lessons. Files of previous classes can always be opened to repeat the past material. All those students do on the board can be saved and used later. The teacher can always return to the previous stage of the lesson and repeat its key points. The learning process becomes bright, dynamic and allows the teacher to engage actively all students in it. Students like to answer near such a board, to work with a tool that can be managed with just a few touches, in such a case, students are more attentive (VAKHRAMEEVA, EMANOVA & YAO, 2016; MOHAMMADI, AFZALPOUR & IVARY, 2018).

It is important to note that for the effective use of information technologies, the teacher needs to follow existing and newly appearing computer learning tools, in addition, he must be able to combine these tools depending on the volume and complexity of the studying material, to work independently and to select software tools that will provide the supply of new material in an optimal form, as well as create his own didactic materials and work with various programs. On studying new material thematic presentations are useful. The unusual presentation of material, brilliance and brevity of records allow students to perceive the new studying material better.

Visual and auditory memory work both. It is convenient to use presentations while organizing the self-training work of students in a lesson, including group work of students. Tasks are shown on the screen, and after some time the answer to the question appears on the

screen. Presentations are also used while organizing oral work in the lesson. Presentations are also used while repeating studying material (using colorful slides in a short time one can repeat a large amount of material). In addition, students who have missed a lesson can use presentations for self-training work. Modern ICT provide students more information-rich objects: such as pictures, video clips, complex data structures and their combinations, accessible on the Internet and other intelligent computer networks. ICT significantly increase the possibilities of visual perception, making the invisible images real, changing color and shape of the objects.

3. RESULTS AND DISCUSSION

Information technologies can be used in four directions: while using of presentations; interactive whiteboard; test creation and while using of digital educational resources. Working in the first direction, it is better to use simple and accessible software that can be used by every teacher — the MS PowerPoint environment — to implement the visibility principle. As a result of the work, the following studying material can be compiled using IT:

1) For example, lessons on topics: Rational expressions, the Main property of a fraction, Reduction of fractions, and others.

2) Extracurricular activities such as Journey to the world of mathematics. In addition to teachers' developments,

mathematics discs with algebra and geometry exercises can be used: operations with percentages, calculation of percentages, linear equations, etc. On such discs' descriptions of examples in detail, practical tasks, as well as tests are given.

3) Making computer tests in MS PowerPoint. The advantages of test control are the objectivity of school grade, the veracity of information, reliability, differentiating ability, implementation of an individual approach to training, comparability of results for different groups of students within different programs, textbooks.

4) Development and implementation of computerized textbooks or their models which are called digital educational resources (DER). Practical experience of using them in various academic disciplines has shown many advantages as compared with traditional textbooks, namely: providing feedback of student-teacher system for the constant creative improvement of a computerized textbook; a significant reduction of time to study academic disciplines; creating the illusion of the teacher's constant presence next to the student (due to animated illustrations) and making revival the dry pages of the textbook; creating a pleasant psychological mood among students; ensuring individualization of training due to the selection of educational material by each student and changing the sequence of its study, taking into account students' psycho-physiological features, the possibility of returning to difficult issues repeatedly

and self-control while choosing and solving problems of different degree of difficulty; checking and evaluating students' achievements online.

Studying is a multifaceted process, and knowledge control is only one of its sides. The use of an automated system solves the problem of teacher's burning syndrome and student's burning syndrome partly.

4. SUMMARY

The analysis of the scientific and methodological literature, the logical and didactic analysis of the textbooks, the generalization and systematization of the information made it possible to draw a number of conclusions, namely: the use of ICT in mathematics lessons allows students to visualize the studying material, facilitates the work of teacher, raises the level of academic results of students due to their interest, as well as reduces the studying materials' explanation time and pays more attention to learning.

The use of computer and information technologies in lessons is no longer an innovation, but a necessity, since society is developing with enormous speed and the teacher's active interaction with students in keeping with the times, daily interaction with computer technologies let navigate in the information space easily. In general, due to ICT, variability in lessons is realized, since information technologies

contribute to the creation of effective studying systems depending on the pedagogical and methodological preferences of teacher, taking into account the level of training of students, their age characteristics, profile and peculiarities of the studying material base of one educational institution.

5. CONCLUSION

The use of information and communication technologies should not be considered as a simple addition to existing teaching methods, but as an effective tool that should lead to changing of all educational process's components, starting from the content and ending with its organizational forms. Thus, ICT develops human mental abilities, open up new perspectives and development directions, create a harmonious system of a new global culture and open up broad and interesting opportunities to improve the quality of education.

In this studying work we dealt with the problems of mathematical education, which is an integral and essential part of human culture, it provides not only a certain range of knowledge but improves thinking, contributes to the formation of information skills, if the educational process is accompanied by the use of information and computer technologies actively. In order to restructure the education system to meet the needs of the state in a developed logical thinking person, the main possibilities of computer and communication learning tools were reviewed.

As a result, we came to the conclusion that the use of ICT tools would inevitably become a way of improving the quality of mathematical education. If to use the methodological recommendations, where interdisciplinary connections of mathematics and computer science implement, competence and improvement the skills of teachers in the ICT use in educational activities and as well as the motivation of students and teachers both in the ICT tools use would increase most. Today there is no need to discuss whether computerization of education is needed or is not needed. It is obvious that in the near future the ability of a teacher to use a computer in the educational process will become an essential element of his professional competence. In conclusion, it can be noted that teaching mathematics with the use of new information technologies makes possible to set diagnosable goals and correct the studying process, to make the learning process effective, manageable and to provide an opportunity to implement a full cycle of educational activities.

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REFERENCES

BATROVA, I., & SALEKHOVA, L. 2015. “Bilingual teaching high school students of information communication technologies by means of the Russian and English languages at schools of

Tatarstan". **Social Sciences (Pakistan).** Vol. 10, N° 5: 604-609, 2015. Pakistan.

GALEEVA, N., YAO, K., & EMANOVA, G. 2018. "Development of sustainable design: directions and problems". **Amazonia Investiga.** Vol. 7, N° 15: 196-201. USA.

KARAMOVA, H., & AKHMETSHINA, G. 2010. "The model of conditions for training creative self-realization of students-designers". **IIOAB Journal.** Vol. 9, pp. 88- 92. India.

KUL, U. 2018. "Influences of Technology Integrated Professional Development Course on Mathematics Teachers". **European Journal of Educational Research.** Vol. 7, N° 2: 233-243. USA.

LUO, C., LI, M., PENG, P., & FAN, S. 2018. "How Does Internet Finance Influence the Interest Rate? Evidence from Chinese Financial Markets". **Dutch Journal of Finance and Management.** Vol. 2, N° 1: 01. UK.

MENDONÇA, C., & ANDRADE, A. 2018. "Elements of Digital Transformation in Dynamic Capabilities in a Brazilian Capital". **Journal of Information Systems Engineering & Management.** Vol. 3, N° 3: 18. UK.

MOHAMMADI, H., AFZALPOUR, M., & IVARY, S. 2018. "Comparison of the effect of rest interval between sets and set â€"repetition configuration during bouts of eccentric exercise on muscle damage and inflammatory markers". **International Journal of Applied Exercise Physiology.** Vol. 7, N° 1: 56-62. UK.

SALEKHOVA, L., & SPIRIDONOVA, I. 2018. "The basic conditions for development of mathematical speech of students in the process of bilingual education". **Obrazovanie i Nauka.** Vol. 20, N° 2: 60-87. Russia.

SARANTSEV, G. 2002. **Methods of teaching mathematics in school**. M: Prosvecshenie. p. 224. Russia.

USHAKOVA, V. 2016. **The use of information technology in mathematics lessons.** Young scientist. N° 8, pp. 1053-1055. Russia.

UVAROVA, N. 2014. **The role of online communities in professional pedagogical activities.** The world of science, culture, education. N° 6, pp. 119-120. Russia.

VAKHRAMEEVA, T., EMANOVA, J., & YAO, M. 2016. **Forming interest in reading for integrated school lessons by means of visual practices.** International journal of humanities and cultural studies. Spessial Iss. pp. 211-217. North Africa.

VASILIEVA, G., SITNIKOVA, N., SHESTAKOV, A., & SHIROKIKH, A. 2006. **The use of ICT in teaching mathematics: Textbook**. Permian: PSU. USA.

VINOGRADOVA, L. 2005. **Methods of teaching mathematics in school: Textbook**. Rostov on Don: Feniks. p. 252. UK.

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