

the teacher on an equal footing, to express themselves, develop students' ability to gather information, its analysis and synthesis, to develop the ability to not only achieve results of its own activities, but also to be able to evaluate them.

Stimulating role of module-rating technology plays a student pass or exam in semester depending on the amount of points collected. And we can speak about not only the assessment of "excellent" but less high positive assessments. At the Department of inorganic chemistry students are trained in almost all professions, therefore, depending on the complexity, the discipline of chemistry contains 3–5 modules, control measures which are required for the student. The distribution of controls is built during the semester so that the student each week gets points for some kind of training. The sum of points on all modules of a rating for the discipline for the semester evaluation scores current student work takes into account the quality of the work and its timeliness.

Score in points of the current student work takes into account the quality of the work and its timeliness. The basis of assessment learning modules disciplines are based on current control of scores of students in the semester, summed for all types of training activities. The final appraisal for the discipline of chemistry is an exam, which is held after the planned student teaching works. The minimum number of points accumulated during the semester and to take to the exam, set within 48.

Because the program "chemistry" discipline involves the examination, at the final qualification imposed additional module and a final control, which in this case is a mandatory event. This control is carried out during the final semester and it is 30 points out of 100. Thus, 70 points a student can earn for work in term 1 and 30 points based on final inspection. As a result, when a student on the sum of all 61 or more modules are inadmissible.

It should be noted that according to the results of the final evaluation the student won't be able to get the final assessment on the discipline which is below, then during the semester for the modules. Student, received the minimum number of semester credits (48–50 points) even while getting maximum scores on the exam (30 points) cannot qualify for an assessment at the rate of this approach is the motivating factor for students throughout the semester, students who do not pass the control event, continue to work on it within the time period established by the Department, prior to its execution.

Department of inorganic chemistry, of Belgorod State Technological University named after V.G. Shoukhov developed evaluation tools for monitoring, which takes into account the quality and timeliness of all types of training activities. At the beginning of the semester the students get acquainted with the system and form of rhenium in the form of a promotion and points for personality that contributes to the rational organization of the educational process and to monitor performance.

At the Department of inorganic chemistry students are trained in almost all professions, therefore, depending on the complexity, the discipline of chemistry contains 3–5 modules, monitoring activities which are indispensable for the distribution of the student built during the semester so that the student each week gets points for some kind of training. Basic kinds of control of knowledges, abilities and skills during of every module are laboratory works, homework, calculations and graphically tasks and computer testing. The sum of points on all modules forms a rating system on for the semester.

The assessment of points of the current student is work takes into account the quality of the work and the timeliness. Basis of assessment learning modules disciplines are based on current control of scores of students in the semester, summed for all types of educational works. The final certification on the discipline of chemistry is an exam, which is held after the planned student teaching works. The minimum number of points accumulated during the semester and to take to the exam set within 48. Because the program "chemistry" discipline involves the examination, at the final qualification imposed additional module and a final control, which in this case is a mandatory event. This control is carried out during the final semester and it is 30 points out of 100.

Therefore, we can say that the module – rating system affect the formation of adequate student self – esteem, stimulates independent work and helps to increase competitiveness in their studies.

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UNIVERSITY E-LEARNING: DYNAMICS OF STUDENTS' ABSTRACT THINKING DEVELOPMENT

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The author of the article analysis the e-learning role in medical university students' abstract thinking development. The article made on the research experimental material represents indicators of students skills to abstract from the irrelevant objects or

phenomena details, the dynamics of students' abstract thinking development throughout the mathematical e-learning process in medical school. The author shows that the usage of modern information technologies in the learning process allows to influence actively on students' abstract thinking development, providing approximately 20% of all students to a higher level of abilities development to abstract from non-essential properties and characteristics of objects and phenomena, which is highly important throughout the students cognitive activities development and acts as a guarantee of successful self-education and inclusion into the system of continuous education where students should solve professional tasks by themselves, passing the way "analysis-synthesis- abstraction- generalization".

Abstract thinking is human nature unique attribute that allows the individual to abstract from the irrelevant objects or phenomena details, highlighting the most significant and characteristic features. Developed abstract thinking allows person to find creative ways of solving problems, uncommon approaches of reaching academic, practical and professional goals. Thus, the development of abstract-logical thinking is the basic condition for professional growth, successful learning and continuing education throughout life.

The problem of the students' abstract thinking development is studied at many levels [1, 2, 3]. However, the question of abstract thinking formation with the help of modern information and computer technologies has not found its proper research and understanding [4, 5, 6].

That's why, the aim of our research is defined as studies of abstract thinking development by using new information technologies in e-learning process at the University. As mathematics is the most abstract science of all known, we decided to explore the students' abstract thinking formation and development throughout the mathematics e-learning process.

We chose the clinical psychology faculty students of medical university as an object of our research as students' abstract thinking development is extremely important while searching for scientific psychological methods, analysis and interpretation of psychological research results.

We can point out several tasks of our research:

– to study clinical psychology students' abstract thinking development at the initial stage of mathematics e-learning;

– to analyze clinical psychology students' abstract thinking development at the final stage of mathematics e-learning.

Materials and methods of research. The testing of 30 first-year and second-year clinical psychology students was carried out. First-year students were tested as the starters of mathematics e-learning. Second-year clinical psychology faculty students were involved into mathematical e-learning

testing after passing the mathematical course examination.

The experiment was held in constant conditions for both groups of students: the research was held at 11 a.m. in the academic auditory. The research duration was about 20 minutes. The clinical psychology faculty students performed the testing independently without using any electronic devices. The testing was built on the basis of Atmhauer intelligence structure test including the scale of mathematical abilities determination.

Results of research and their discussion.

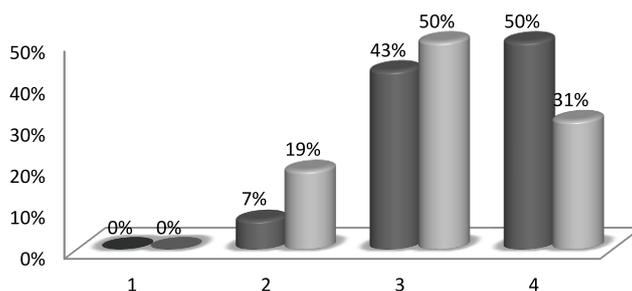
As a result of students' abstract thinking development research at the initial stage of mathematics e-learning we have identified 7% of students with average ability to abstract from non-essential properties and characteristics of objects and phenomena. Highly developed ability to use abstract symbols and notations has not been demonstrated by anyone, from students at the initial stage of mathematics e-learning. According to the test results large group of students at the initial stage of mathematics e-learning had low level of abstract thinking development. So, half of the students at the mathematics e-learning initial stage (50%) had problems with operating abstract symbols and concepts. And 43% of first year students number at a medium – low level of abstract thinking development did not have properly formed abilities to transfer information about real objects to symbols.

For students' abstract thinking development dynamics research throughout mathematics e-learning course, we carried out the analysis of second year students testing results to abstraction from objects and phenomena irrelevant properties. The research results show that mathematics e-learning develops students' abstract thinking. E-learning has transferred 19% of all students to a higher level of abilities development to perform operations with abstract symbols and concepts.

Number of students with the low level of abstract thinking development was decreased from 50% to 31% at the final stage of mathematics e-learning process. At the same time, the usage of mathematics e-learning teaching instruments helped to expand the group of students with average abilities development level to transfer information about real objects and characters from 7% to 19% (Figure).

Mathematics e-learning delivered 7% growth (from 43 to 50%) of all students' number at a medium – low level of abilities development to abstraction from objects and phenomena irrelevant properties. This fact, in our view, can surely be a confirmation of e-learning effectiveness in students' abstract -logical thinking development.

Test results comparison in each test assignment shows that 80% of all students coped with their tasks much better at the mathematics e-learning final stage (Table).



Comparative analysis of students' abstract thinking development level before and after mathematics e-learning:
 1 – high level of abstract thinking development; 2 – average level of abstract thinking development;
 3 – low-average level of abstract thinking development; 4 – low level of abstract thinking development
 (Dark color indicates students' results before mathematics e-learning. Grey color indicates students' results after mathematics e-learning)

The testing results comparison separately on each task offered to examinees

The task number offered to examinees	The number of examinees coped with test tasks surely (%)	
	2 year – students at the final stage of mathematics e-learning	1 year – students at the initial stage of mathematics e-learning
1.	56%	43%
2.	38%	29%
3.	19%	36%
4.	44%	36%
5.	44%	21%
6.	25%	29%
7.	19%	14%
8.	50%	29%
9.	63%	57%
10.	56%	43%

More than 40% of second year students gave the correct answers in seven out of ten (70%) tasks of the test, which is two times higher rate than at the beginning of mathematics e-learning. 40% of second year examinees demonstrated fluency in transferring information about real objects to abstract symbols at the mathematics e-learning final stage, surpassing 30% rate of the first year students. Less than third of senior students number gave the correct answer just in 30% of the offered tasks, compared to 50% of the questions in the initial phase of e-learning.

Thus, all the research results allow to make a conclusion about abstract thinking development positive dynamics throughout mathematics e-learning process, transferring about fifth part of students to a higher level of abilities development to USE abstract symbols and notation. The research results can truly serve as a reliable proof of the mathematics e-learning effectiveness in students' mathematical abilities development. We hope, it will act as the momentum for the introduction of new and widespread usage of the familiar e-learning forms and methods in educational process of higher educational institutions.

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