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THE USE OF INTERACTIVE LEARNING TECHNOLOGIES IN MATH CLASSES

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Abstract

Dynamically developing modern society places new demands on the system of education, including educational standards. At the forefront of the student such qualities as activity, sociability, the ability to self-education, the ability of listening to others, the ability to work in a team. Traditional education is not able to fully achieve the desired requirements, because the role of the student in that case is passive and limits its development. In that regard, special attention should be paid today to the interactive learning. The paper proposed optimal organizational and methodological conditions of implementation of interactive technologies in secondary schools; identified the stages of classes in interactive mode; consider the barriers of using interactive learning. The leading method to the study of this problem was the method of analysis of psychological and pedagogical literature and practice of the teachers, in order to identify the insufficient development of substantive, organizational and procedural sides of introduction of interactive technologies in the educational process, but also fragmented using of it in practical activities by teachers of mathematics. The materials in this article are valuable for teachers of secondary schools in the selection and implementation of interactive technology in the classroom, and for students of colleges and higher educational institutions of pedagogical specialties.

Keywords: interactive technology; student; teaching; feedback; dialogue; the predictable result.

Introduction

Relevance of the issue

Modern education considers the future human as a person with active communications. These provisions are reflected in the FGOS of new generation, focused on the transition from knowledge based systems to the competence approach in education. The man of the future must be endowed with qualities such as interpersonal skills, the ability to flexibly adapt to changing situations, ability to independently acquire necessary knowledge. Currently the formation of these qualities at school, including mathematics lessons, can be carried out through interactive learning. Interactive learning is becoming popular and even fashion trend in education. Interactive learning techniques contribute to the activation of student's reflection, his conscious involvement to the work, which increases the effectiveness of any learning. However, the analysis of materials related to interactive teaching, proves the concept of "interactivity" in education refers to researchers and practitioners is ambiguous. Many teachers understand "interactive" in learning as any activity using information and communication technologies (Klarin, 2000; Dobrynina, 2008; Efremova, 2000). It actually distorts the essence of the interactive approach. We fully share the view of E. V. Korotaeva, who considers that to determine the lesson simply through the using of interactive learning tools as interactive, illegal. (Korotaeva, 2013; Korotaev, 2014). The use of an interactive Board, electronic journal and other resources is undoubtedly important, but more often the teacher uses information and communication technologies as a visual and/or control means (Bondarenko, 2006; Zakirova, Gaysina & Zhumabaeva, 2015) Thus, didactic support is clearly not keeping up with the rapid penetration of technical means in education. In the article organizational-methodical conditions of realization and barriers of using an interactive technologies in mathematics lessons in secondary school.

Methodological Framework

Literature Review

The analysis of the literature let us to clarify the concept of "interaction" and its essential characteristics. So, the concept of "interaction" that defines interactive learning includes in addition to interpersonal communication ("I'm in contact with other people") and intrapersonal communication ("different parts of my personality are in contact with each other") (Faupel, 2003; Novik & Podgórecki, 2015). It extends the concept of interactive learning, implying an interaction of the learner with his own experience. In

that case, faced two "I" "I'm received a new information" and "I'm having a personal experience". Both "I" in interactive learning process are changing. Under the influence of new information on existing experiences is expanding. Besides the changes in personal experience of the student undergoing changes and information it is refracted under the influence of personal experience and becomes personal knowledge. People can learn the same information, but depending on the breadth and depth of their personal experience, knowledge will be different. Thus, an important characteristic of interactive learning is an internal dialogue, which refers to the existential experience of the received information, giving it a personal meaning (Bondarenko, 2006; Korotaev, 2013). Although a single definition of interactive learning is absent, but scientists agree that it is based on the interaction (Ribakova, Parfilova, Karimova & Karimova, 2015). In the New dictionary of Russian language by Efremova T.F. was given the following definition of that concept "interaction is the impact of various objects and phenomena of impacting on each other, causing their changes" (Efremova, 2000). Having considered the main features of interactive training, we will give a definition of this concept. Interactive learning is the acquisition of new experience, on the basis of active interaction of students with each other, with the teacher and with their personal experience, involving mandatory feedback.

Analysis of the practice

Practical experience of teachers allows us better understand the meaning of interactive learning. So, Dobrynina T. N. compares online training with extractive and interactive modes of learning (Dobrynin, 2008). In extractive mode, information flows are directed from the subject (learning system) to the object of study (the student), but do not penetrate inside the object. A student acting as a passive learner does not show subjective activity. In interactive mode, the flows of information coming to the learner or group, causing an active mental activity, closed within them. Students are here as subjects of the teachings for themselves, teaching themselves (technologies of self-activity, self-education, self-upbringing). In interactive mode the information flows penetrate into the consciousness, call its activity, and generate a reverse information flow from the student to the teacher or another student. Information flows alternating in direction, information is shared, dialogue is not just about education, and search of meanings, values, and formation of personality of a student. Integral components of interactive learning are feedback and activity of subjects of the study. When speaking about the activity of students we mean not only physical activity (when students change their workplace, speaking, writing, drawing, etc.) but also social (students asking questions, answering questions, exchanging ideas, etc.), as well as cognitive activity (students make additions and amendments to the statement of the moderator, serve as a source of new experience, find the solution to the problem, etc.). In this connection the note

of Klarin M. V. that all three types of activity should be interconnected and diverse is advisable (Klarin, 2000). This approach to teaching encourages the inclusion of all students to the learning process. Sharing knowledge and experience, students undertake the part of some teachers, functions, which enhances their motivation and contributes to a more productive learning. In turn, the teacher typically acts only as the organizer of the learning process, the group leader, Creator of conditions for the students' initiatives. It only regulates the process and engaged in its General organization: preparing in advance the necessary tasks, formulates questions or topics for discussion in groups, advises, and controls the timing and order of execution of the plan.

Features of the organization of interactive learning in math classes

After understanding the nature of interactive learning, the question arises: "how to organize it on the math classes?". For this purpose it is necessary to consider it through the prism of the elements of the didactic system: educational objectives, content, forms, methods and means of education. According to Korotaeva E. (Korotaeva, 2014) interactive learning is transforming the usual goals (educational, developmental, bring up) to:

- specifically informative, regarding the need to resolve immediate learning, problem-cognitive situation ("write...", "choose...", "compare...", "analyze...");
- communicative-educational, to the process which produced the rules of cooperation, collaboration skills necessary for joint productive activities today and in the future ("imagine convincing and justify your position...", "compare your solution with have already presented and draw a conclusion...", "please rate the content and presentation of the project (projects)...");
- socio-orientation, aimed at the formation position of a student, due to both his personal and public significant needs ("relate the material studied socially significant phenomena in the life of the city, the country...", "appreciate the culture of participation in discussions...", "determine where the skills mastered in that lesson can be used...").

In modern society the relation to studied subjects is changing. The subject-information environment is expanding immeasurably. The content of the textbooks is beyond the scope of textbooks: TV, radio, computer networks in recent times has greatly increased the flow and variety of information. However, all these sources provides material for passive perception. In society, in the press, on television, in textbooks appeared different perspective on the same events. In this regard, the question arises: can the child remember and assimilate this amount of information? Today, the most of us looking for a ways would enhance the effectiveness of the study process. All times the teacher was worried about a problem how to make everyone was interested in the classroom, involved to educational process so no one was left indifferent. How to use history to develop the personality

of student, his creative thinking, the ability to analyzing the past and present, draw their own conclusions and have their own point of view?

Results

Organizational and methodical conditions of interactive learning on math classes in high school (feedback and activity of subjects of education; training teacher in advance of the required tasks, the formulation of questions or topics for discussion in groups, consultations, control time and order of execution of the plan); defines the content of educational material, encouraging students to dialogue (the content of educational material on mathematics includes many different kinds of knowledge that largely determines the complexity and contradictory nature of its understanding and mastering by students at different stages of learning, and encourages further dialogue or polylogue); grounded learning in mathematics classes in the application of interactive technologies (group, pair, individual); methods of learning for interactive technologies (heuristic conversation, discussion, "brainstorming", method of "round table" technique "business games", competitions of practical works with discussion, role play, collective decisions of creative tasks, case method (case studies), practical group and individual exercises, simulation of production situations, etc.) and their selection by the teacher (depending on the content of educational material and training level class); identified the stages of implementation of interactive learning in the school process (1 stage-traditional lessons with the optimal combination of traditional and interactive methods of teaching; 2 stage-lessons with the comprehensive use of interactive methods of teaching; 3 stage- homework projects involving the creative application of knowledge based on meaningful experience, as well as elective courses), and the stages of classes in interactive mode (highlighting problems in the teaching material, the search for solutions to problems in groups, discussion of solutions, choosing the solutions, the mandatory reflection).

In the research process we have identified that to develop and implement an interactive math classes is not easy, it requires from teacher a lot of time on detailed pre-training (in some cases supporting a special didactic notes, leading tasks, familiarization with the structure of the classes, operations with management by students during prepare for the lesson). Widely used in school lessons with use of interactive methods is impeded by the lack of students' high level of formation of skills for management interaction, various discussions, conversations, discussions. Also complex element in the application of interactive teaching is the inadequacy of the perception of the students by non-standard ways of solving the problem or the solution. Plays a role the lack of time of the lesson. Also be aware that online training is not always suitable for solving problems where the content of the material requires quiet and concentrated work.

But, nevertheless, in the course of monitoring students during the interactive

sessions, and during follow-up communication with them, it was found that interactive learning promotes:

- development of personal reflection;
- awareness of inclusion in the common work;
- the formation of an active subjective position in training activities;
- inclusion in the educational process of all students;
- development of communication skills;
- acceptance of moral norms and rules of joint activity;
- increased cognitive activity.

Formation of a class group as a community. From our point of view, the organization of interactive learning in math classes at the beginning doesn't work. Accustomed to traditional education, students do not immediately rebuilt and start to interact productively. In this regard, with the explicit development of communicative competence the cognitive component begins to "limp".

Discussions

So, during the interactive training should be a change of all participants of the interaction. That involve not only interaction among students (group learning), so the interaction of students with the teacher. The content of educational materials must be constructed with some problem, difficulty, contradiction, and would encourage further dialogue or polylogue. The content of educational materials on mathematics includes many different kinds of knowledge that largely determines the complexity and contradictory nature of its understanding and mastering by students at different stages of learning. For that reason structural and conceptual complexity of the training material is a promising basis for creative interactive learning. This interactive lesson is applicable to both group learning and paired, and individual. Depending on the content of educational material, training class using various interactive teaching methods. There is a huge interactive techniques and training methods that can be applied in mathematics lessons: heuristic conversation, discussion, "brainstorming", method of "round table" method of "business game", competitive tendering practical work with discussion, role play, collective decisions of creative tasks, case method (case studies), practical group and individual exercises, simulation of production situations, etc. thus, regardless of methods the majority of theorists and practitioners – Dobrynin, 2008; klarin, 2000; Korotaev, 2013; Ribakova, Parfilova, Karimova & Karimova, 2015; Vopel, 2003 and others agree on one thing in a sequence of stages in the organization of activities in interactive mode. That sequence includes the following stages: identification of problems in the educational

material, the search for solutions to problems in groups, discussion of solutions, choosing the solutions, and mandatory reflection. Also as systemically important components of such a class is called dialog, allowing the use of modern information and communication technologies in education.

Conclusions

Thus, undoubtedly, interactive learning is the students' acquisition of a new experience through active interaction with each other. The use of interactive technology promotes students' cognitive activity, stimulates personal reflection of students gives the possibility to consciously join to common work that promotes formation of active subjective position in educational activities, provides such a condition of effective pedagogical interaction as the inclusion of all students to the educational process. Feedback, as a necessary condition for the application of interactive techniques and methods, develop communication skills, namely acceptance of moral norms and rules of joint activity of pupils. Binding feedback forms the class as a group community; increasing the effectiveness of training. However, the emphasis should be on what to include interactive techniques and methods in the outline of the lesson are the barriers (content material, require a calm and focused individual work; the lack of students' high level of formation of skills for management interaction, various discussions, conversations, discussions; inadequacy of the perception of the students non-standard ways of solving the problem or out of the situation; the lack of time in the classroom), which in the first stage of the use of interactive learning reduce the speed of the learning process. In particular, this is clearly reflects to the implementation of interactive learning in mathematics lessons. However, undoubtedly interactive learning displays school education to a new level that is why deserves further study and elaboration.

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