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Formation of younger students core competencies in learning mathematics

The article presents a method for the formation of younger students core competencies in math class. The essence, structure, functions, development of competence of younger students, provides methods for designing and teaching conditions. Emphasizes the importance of building students' skills of academic work rational organization of. Discloses a general training and skills and their combination provides a reliable basis for further training of pupils cognitive activity, they determine the acquisition of deep and tight knowledge. It is told about the feasibility of competence in mathematics lessons in elementary school. The question of the students key competence formation of students is regarded with the means of innovative educational technologies. The methods for facilitating, are presented, as the effective formation of the primary school students competence.

Key words: modernization of education, training and cognitive competence, basic competence, competence-based approach, information competence, humanization, democratization, the methodology of thinking, intensification, formation competencies.

One of the most urgent problems of modern society — the formation of personality, ready not only to live in a changing social and economic conditions, but also to actively influence to the existing reality, changing it for the better. At the forefront are certain requirements for the individual — creative, active, socially responsible, having a well-developed intellect, highly educated, professional and competent. It is known that the largest capacity for development is manifested in childhood lays the groundwork for the individual, intensive basic attitudes are formed, the basics of worldview, habits, develop cognitive abilities, emotional and volitional. Fold multiple relations with the outside world. Dynamism of modern civilization, strengthening the role of the individual in society and industry, the growth of its needs, and the humanization and democratization of social relations, the intellectualization of work, a rapid change in technology and technology — these and other trends necessitate changes in the formula of «education for life» by «education through life.»

The main criterion for the success of the modernization of education is to achieve a level where any citizen of our country, having received the appropriate training and qualifications, may be claimed in any country of the world.

Kazakhstan enters into the world educational space, will be resolved by updating the structure and content of education; improving learning technologies, further development of the national system of education quality assessment.

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In this regard, certainly a significant role in the development of the child's school plays. It is important that it is here formed psychologically necessary baby Institute, where he could diversify, would learn to express their thoughts and feelings.

Today, the Kazakh school, as well as before the formation of the world, the task is identifying new approaches to education, to enter the «golden age» of exploration and discovery, to rethink the methodology of thinking, learning, work, creativity, and life in general.

In his message, «Let's build the future together!» 28 January of 2011, President of the Republic of Kazakhstan Nursultan Nazarbayev said: «Quality education should be the basis of industrialization and innovative development of Kazakhstan» [1].

One of the responses of the education system at the time the request is the idea of competence-oriented education. Competence approach reflects this kind of educational content, which is not reducible to knowledge-the orientation component and offers a holistic experience in solving the problems of life, fulfilling the key (relating to many areas of social functions, social roles, competencies). As pointed out by B.D.Elkonin, «We refused from not the knowledge as a cultural object, it is the particular form of knowledge». According to SES RK 2003.-2008-readiness competence effectively mobilize internal and external resources to achieve success in order to meet individual and social needs that makes up the social order to the educational system.

Based on the documents, it can be argued that the purpose of education at the national level — to promote the establishment of a competent, intellectually and spiritually advanced person, ready to participate effectively in the social, economic and political life of the Republic of Kazakhstan [2].

The content of education is the most important component of the educational system. The decision of «eternal» questions «what to teach?» What should be the content of the training the student, now more than ever, is of particular relevance. Development activity, independence, initiative, creative approach to business — it demands of life itself, is determined largely by the direction in which it is necessary to improve the educational process. Psychological abilities of younger schoolboys, their natural curiosity, compassion, a special arrangement for the assimilation of new willingness to accept anything that gives a teacher, create favorable conditions for the development of key competencies of students.

During the initial training, the possibilities of children to the analysis, the perceived differentiation in math class, which has a positive effect on the cognitive activity of students. In the context of the intensification of the overall development of younger students through the organization of their activities of observation, thinking activity, practical action in mathematics lessons they develop internal motivation for learning. Learning becomes addictive process of cognition, activities of students.

Regular performance purposefully selected non-standard jobs, tasks and exercises will have a positive impact not only on the quality of students' knowledge on the program material, but also on the activation of cognitive activity; significantly expand the amount and concentration, and the ability to enrich the stock draw in their verbal reasoning, explanation.

Consequently, the transition to 12-year education is, in fact, reform of the entire national education system. With the prerequisites for the transition to 12-year education, in accordance with the Law of the Republic of Kazakhstan «On Education», the State Programme for the Development of Education of the Republic of Kazakhstan for 2005–2010, a new state comprehensive standard 12-year secondary education, in which the expected results defined in as core competencies of the graduate [3]:

– value-oriented competence;
– general cultural competence;
– cognitive competence;
– information technology competence;
– the competence of social interaction;
– the competence of personal self-development;
– communicative competence.

Elementary School — an organic part of the first stage of secondary school. It is in it lays the groundwork for the subsequent stages of education. Reform has provided for the primary grades is extremely clear educational goals and objectives: to lay the foundations of a comprehensive development of children, to ensure the formation of strong numeracy skills, literate writing, language development, cultural behavior.

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These requirements emphasizes the importance of building students' skills of rational organization of labor training, general training and skills, which together provide a reliable basis for further learning and cognitive activity of pupils, contribute to the acquisition of deep and lasting knowledge.

Realize all the possible competence in mathematics lessons in elementary school. Technique of formation of key competencies includes 5 stages:

Stage 1 — Cable-motivational.

Are effective instructional techniques to attract involuntary attention of students to initiate their positive emotional relationship to the studied material and the inner need of his knowledge. At this stage, students have to understand why and what they need to study the subject, and of learning what is the main learning objectives for future work.

Stage 2 — the opening of mathematical knowledge.

At this stage the crucial techniques that require concentration, holding, independent research, stimulating the growth of cognitive needs.

Stage 3 — formalization of knowledge.

The main purpose of receptions at this stage — the organization of activities of students, is aimed at the full-term study of the established mathematical fact, the use of analytical and systematic search method.

Stage 4 — the application of mathematical knowledge.

Techniques for creating problematic situations Nada stage should intensify research activities of students and to promote deep learning.

Stage 5 — generalization and systematization.

Procedures must establish a link between the study of mathematical facts lead in knowledge, self-education students to carry out management.

It is best to implement value-semantic competence suitable holding Olympiad, which includes non-standard tasks requiring the use of a pupil is subject logic, not material from a school course. At first glance, it is difficult to realize the general cultural competence in math class. However, usage problems with hidden information part [4].

For example: «It is known that the student class 2 should be given every day for two hours of homework. How many hours per week student spend on homework? «.

Thus, while working on this task, the pupil learns unwittingly accepted norm. It is an organization of educational work, the distribution of their time during the day, doing homework for some time. Problem with a hidden, implicit information part are simple in operation, and this technique is quite applicable to the school. It is only important when summing up the lesson students focus not only on the mathematical components of the lesson, but also on the general cultural. The implementation of educational and cognitive competence does not cause too much difficulty, because its formation by a variety of practical techniques for the organization of the students. One way to accomplish this is to conduct a competency verification activities in the form of the test. The expediency of this work in terms of competence-based approach is that the work pupils acquire basic skills. And it is the ability to deal with tests for children will be very useful in the future, because they will take the SNT (a single national test).

Educational and cognitive competence is realized in the modern school, she has a practical orientation in the work of students, research activities. After school organized work on the creation of research projects in mathematics. But we should not forget the importance of this sector in the future life of the child.

Information competence involves the use of various information resources child. Optional use of the Internet. After all, you can start with newspaper clippings.

Thus, the main objective of the lesson of competence will not be found by the study material and the formation of skills of work with information sources. The main thing is to observe the sequence complexity of tasks from lesson to lesson. Necessary to carry out the approach to the student, taking into account its capabilities, both physical and intellectual. Communicative competence is not new in the school education system, because its implementation involves the use of various methods of collective work (such as discussion, group work, pair work, etc.). These techniques are widely used in different stages of a lesson of mathematics in primary school [5].

Social and Labour competence can be implemented as follows. The class is held a few lessons with the use of the different options on the stage of the oral accounts. Then the children are encouraged to control work with several types of jobs oral account, result, we obtain feedback with good results.

Thus, children develop the ability to apply skills calculated in different situations. If you constantly work to improve the oral accounts of the children, they will learn how to calculate the amount of purchases

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in the store until the moment how to approach the box office, this skill refers to the social and labor sphere, ie using knowledge in practice.

Competence of personal self-improvement means mastering apprentice in the ways of activity that will be useful to him in a certain contemporary situations. Implementation of this competence can be considered at the stage of the lesson as a reference for the independent solutions represented by three levels: on the evaluation of «satisfactory», «good», «excellent.» Select the level must be carried out by the student. If the student felt that it is easy enough to cope with the task selected difficulty, he can move on to more complex, thereby allowing it to get to work a higher mark.

It should also be noted that it may be the opposite situation. It is possible that a student will choose a job can not afford and then be forced to return to a lower level. There is an active assessment of their own strengths and capabilities. Child, without any clue without «labeling» really analyze what he has accomplished in this relatively short period of time. Sure, he draws conclusions about how to work the next time in order to achieve high results. Therefore, the work at this stage promotes the formation of the competence of personal self-improvement.

The modern world is changing at a tremendous speed, and thus methods of obtaining knowledge and understanding must change. The learning process should be dialogical, search, project. Educational technology must meet the following requirements: be directed to the development of thinking, teaching analysis, help yourself to gain knowledge, to make choices, engage in debate, to disagree with the dogma, to participate in the discussion.

The main line of the reform of elementary school today is the tendency to change the priority goals of education of younger students, where the fore the task of development of their personality, the formation of strong numeracy skills, literate writing, language development, cultural behavior.

These core competencies, personal self-improvement as competence, social-working, communication, value semantic, informational, educational and cognitive, general culture can be implemented in math class.

In elementary school, children learn to solve the problem of finding the length of an open and a closed polyline, moving gradually to finding the perimeter of a polygon.

In the course of studying the considered geometrical material students master the following competencies:

1 describe the studied knowledge of different ways of fixation;

2 reliably justify them;

3 to use the acquired knowledge and execute practical actions;

4 draw conclusions and generalizations, to present convincing them;

5 seek rational solutions to the problem.

In the context of a powerful flow of information, diversity of its sources, it is important to inculcate students ability to provide important, independently find the necessary information quickly process scientific information, to use this knowledge in real-life situations. Creative, transformative activity is closely linked to the activity and autonomy of the individual. A.Disterveg wrote: «The development and education of any one person can not be given or reported. Anyone who wants to join them, should reach this own activities, their own, their own stress. From the outside it can only get excited... Because amateur — means and at the same time the result of education.

If in order to identify the degree of cognitive independence younger students, to offer third-graders to answer the question: «What is called the perimeter?», Write the formula of finding the perimeter of a rectangle and solve the problem, which is required to find the length of a rectangle if you know its width and the perimeter, we can see that most students know what is the perimeter, but the students who can apply the knowledge gained in the changed situation, much less.

This is due to the fact that the lessons neglected the development of cognitive autonomy of students. Cognitive independence — is the quality of the individual, reflecting the level of self-development of the student in his readiness for autonomous learning activities, the ability to self-learn new knowledge and skills. Internal readiness for cognitive activity depends on a combination of knowledge, skills and abilities of educational work [6].

In order to increase students' interest in mathematics should be at this stage, to invite them to find information on the measures of length, which were used in ancient times. Students can learn this information from parents to use children's encyclopedia, to request information by using search engines. For the answer to any question of our proposed list of students will have to take the help of classmates or parents. Thus, in

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primary school children formed the ability to organize their work, cooperate and work in a group, and to use appropriate measuring instruments.

Finding the answer to at least one of the questions shows that the acquisition of competences is based both on experience and on the activities of the students themselves.

In our opinion, it is an organic synthesis of cognitive interests, needs and learning opportunities can boost student self-reliance, initiative in learning, facilitate productive cognitive activity. These components are formed not only in the classroom, but also outside school hours.

In order to generate self-management skills and communication skills in the study of mathematical material, I propose to use the lessons of the following instructional techniques: exercise with a number-Controller, circular examples.

The essence of the task with the number-CONTROLLER is that each student has learned to control any intermediate action, as in the case of discrepancy between the number of students prepared to the controls, they are required to check the performance of each of the five examples.

Assignments of the second type represent circular examples. In the process of decision you must make sure to answer the first example was the beginning of the second, the second answer — the beginning of the third, and so on, the answer is the latter — the beginning of the first.

Therefore, the student who decides not true one of the examples will not be able to complete the solution of the circular reference. Baby monitors itself, checking the correctness of performing arithmetic operations each example.

In mathematics it is expedient to provide students with various types of «circular» examples. For example, the «circular» with examples of geometric shapes each of which corresponds to the predetermined number.

As shown, the particular interest in students' assignments for the development of computational and algorithmic culture, in particular, the «circular» examples using flowcharts. Students are asked to solve the first oral examples, and then fill in the blanks in the block diagram.

Mutual testing in mathematics lessons can be arranged as follows. For one or two days before mutual testing for some traversed topic or section of the program, students who were most active and found a good knowledge of, get a card with questions, tasks for which they will be asked, for example, a neighbor's party (this option is simply more convenient in terms of organization). These one or two days will allow this student himself to test their knowledge on the issues proposed: he will act as a teacher. And prepare students who will be asking. At the appointed day for 10–15 minutes before the end of the lesson student asking his charge, puts pencil against any given issue «+» or «-». Students who received all «+» have the right to the next day to interview someone who was not yet sufficiently prepared.

This work allows you to:

1 check knowledge at half the class of students, the other half has already been tested as pre-prepared to conduct the survey;

2 by the number of signs «+» and «-» can navigate, what material is digested well and above what is necessary to work more.

3 during the peer review revealed the individual characteristics of children, their relationships with friends.

Mutual testing as one of the techniques of self-control, in math class promotes the formation of skills to control their actions and fosters qualities such as honesty, truthfulness, self-discipline. Observations and interviews with children show that mutual testing knowledge will significantly increase their activity, increases the interest for knowledge, and love them. This is due to the emerging appreciation in children a sense of maturity and independence, because every student in one way or another considers himself a teacher's aide.

Ongoing work and its results suggest that the use of instructional techniques as a means of developing core competencies younger students in math class increases children's interest in learning, provides access to the study of program material, activates mental activity students develop observation, wit, logical thinking.

Today, according to the State standard of general education of 12-year secondary education, the school must form a coherent system of universal knowledge, skills, and experience of self-employment and personal responsibility of students, that is, the core competencies that define the modern quality educational content. Learning success is possible only if the needs, level of training, cognitive features of the pupil and optimal conditions for the acquisition of knowledge and development of skills.

Obviously, the activities aimed at the formation and development of key competencies of students requires teachers as deep mathematical knowledge and careful preparation for the lesson.

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Кіші жас оқушыларына математика сабақтарында негізгі құзыреттіліктерді қалыптастыру

Мақалада кіші жас оқушылардың бойына математика сабақтарында негізгі құзыреттіліктерді қалыптастырудың әдістемесі ұсынылған. Кіші жас оқушыларының құзыреттіліктерін дамыту үдерісінің бағыттары, құрылымы, мазмұны ашылып, педагогикалық міндеттер мен жобалау амалдары берілген. Оқушыларды оқытуда еңбек дағдысын қалыптастырудың тиімділігіне баса назар аударылған. Терең және мықты білім алуларына мүмкіндік беретін, кейін оқушылардың танып-білу әрекеттерінің жиынтығын қамтамасыз ететін, жалпы оқу икемділіктері мен дағдыларын қалыптастыру жолдары ашылған. Бастауыш мектептің математика сабағында құзыреттілікті қалыптастырудың мүмкіндіктері туралы айтылған. Инновациялық-педагогикалық технология құралдары арқылы оқушыларға негізгі құзыреттілікті қалыптастыру жолдары қарастырылған. Бастауыш сынып оқушыларына құзыреттілікті нәтижелі қалыптастыруға мүмкіндік беретін әдістер келтірілген.

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Формирование ключевых компетенций в процессе обучения математике младших школьников

В статье представлена методика формирования ключевых компетенций младших школьников на уроках математики. Раскрыты сущность, структура, функции процесса развития компетентности младших школьников, представлены способы проектирования и педагогические условия. Подчеркивается важность формирования у учащихся навыков рациональной организации учебного труда. Раскрыты общие учебные умения и навыки, в совокупности обеспечивающие надежное основание для последующей учебно-познавательной деятельности школьников, способствующие приобретению глубоких и прочных знаний. Рассматривается вопрос формирования ключевых компетенций школьников средствами инновационных педагогических технологий. Представлены методы, способствующие эффективному формированию компетентности учеников начальных классов.

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