Forms, Methods, and Tools of Using the Scientific Heritage of Central Asian Scientists in the Process of Higher Pedagogical Education

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Abstract: We know that the science of mathematics develops a person's intelligence, attention, develops determination and will, algorithmic order provides discipline and expands thinking. In this article, we describe the use of forms, methods, and tools in organizing educational activities for students based on the rich scientific heritage of Eastern scholars.

Keywords: education, analysis, processing, mathematics teaching methodology, method, lexicographer, differentiation, will, development.

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When determining the structural structure of the educational process, work based on the teacher's personality, his professional training and the content of pedagogical production, interactive methods in the regular professional growth of teachers, innovative methods aimed at developing the analytical, critical and creative thinking of pedagogues, there is a need to develop the skills and abilities to conduct training using techniques and technologies that provide for the expansion of independent education.

Also, taking into account the time allocation and the pedagogical environment (location of equipment, opportunities for placement of students in the group room, production, etc.) the economic development models and high results based on science and innovation of countries such as Japan, the USA, Germany, France, and South Korea, which fully support the processes of technological and innovative modernization of our national economy. development of recommendations for their application in the conditions of higher educational institutions of the republic based on the study is one of the urgent problems facing the educational system. A number of didactic principles are the correct selection of forms, methods, means of receiving information at a rapid pace, analyzing, processing, theoretically summarizing, summarizing and delivering it to the student during the educational process. : scientificity, effectiveness, systematicity, creativity, free thinking, logical observation, priority of personal and psychological characteristics of students, ability to foresee the result, priority of the possibility of using interactive methods of education, etc. are followed.

In the course of the experiments, a number of innovative technologies were identified to increase the effectiveness of education in improving the technologies of using the scientific heritage of Central Asian encyclopedists in the process of higher pedagogical education.

The "Ven diagram" strategy (method) used in the research is an analytical approach to the subject, directed to the formation of skills of mastering (synthesizing) the general essence of the subject based on some parts. The strategy is implemented according to the scheme based on the formation of small groups. With the help of this method, it helps to acquire the culture of thinking through the conscious assimilation of the content of mathematical concepts, rules and methods, to understand, summarize and analyze information, to set a goal and to choose ways to achieve it.
The writing board is divided into four equal parts, and the following scheme is drawn on each part:

1. Writing board

The strategy helps in the comparative analysis of related theoretical knowledge, information or evidence acquired by students. It is more effective to use this strategy to organize final lessons on specific sections or chapters.

strategy implementation are as follows:

- students are divided into four groups;
- a scheme is drawn on the blackboard reflecting the nature of the task;
- each group is given separate tasks related to the subject (section, chapter);
- after completing the tasks, leaders are chosen from among the group members;
- the leaders summarize the ideas expressed by the group members and fill in the diagram on the blackboard.

The essence of activity organized by groups in the process of applying the "Venn diagram" strategy is as follows (the essence of the activity is "Mathematics of Central Asia and the Near East" in the subject "Mathematics" taught in the undergraduate course of primary education will be revealed based on the study of knowledge on the subject):

1 – table.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Sequence number of the diagram</th>
<th>The content of assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 group</td>
<td>1 diagram</td>
<td>The role of Muhammad Al-Khorazmi in spreading the decimal number system. To learn about the life and scientific heritage of Muhammad Al-Khorazmi</td>
</tr>
<tr>
<td></td>
<td>2 diagram</td>
<td>Ahmad al-Farghani's contribution to the field of mathematics</td>
</tr>
<tr>
<td></td>
<td>3 diagram</td>
<td>Abul Wafa Muhammad Bozhani contribution to the development of mathematics, a general analysis of his works</td>
</tr>
<tr>
<td>2 group</td>
<td>1 diagram</td>
<td>Al-Khorazmi's treatise &quot;On Indian Numbers&quot;.</td>
</tr>
<tr>
<td></td>
<td>2 diagram</td>
<td>Ahmad al-Farghani's analysis of the book &quot;Heavenly Movements and General Scientific Attack&quot;.</td>
</tr>
<tr>
<td></td>
<td>3 diagram</td>
<td>&quot;Merchant&quot; by Abul Wafa Muhammad Bozjani and a book of what is necessary to clerks in the art of arithmetic.</td>
</tr>
<tr>
<td></td>
<td>1 diagram</td>
<td>Al-Khorazmi's &quot;Fi account al-jabr and about the...&quot;</td>
</tr>
</tbody>
</table>
In the process of research, we were able to introduce the scientific heritage of our ancestors to students using the "Venn diagram" method. It is worth noting that the students searched for complete information about our ancestors, the discussion and the activity rich in interesting mathematical information served to improve the students' abilities to work on themselves.

The main goal of applying these technologies to the educational process is the scientific heritage of Central Asian encyclopedists. In the process of higher pedagogical education, it is to improve the pedagogical process, which is the foundation for the formation of a perfect personality, to humanize it, to ensure the independence of students, to achieve an easy understanding of mathematical laws by effectively using the capabilities of technical tools in the teaching process.

It is worth saying that it is from the scientific heritage of Central Asian encyclopedists improvement of technologies used in the process of higher pedagogical education, implementation of effective forms and methods requires professional skills and intellectual potential from pedagogues. Also, in order to fully introduce advanced pedagogical technology and changes in the educational system, first of all, it is necessary to arm pedagogical personnel with new pedagogical technology methods and techniques.

Thus, it is appropriate to take into account the following methodological recommendations when passing the topic "Mathematics of Central Asia and the Near East":

1) in the introductory part of the topic, give a brief historical information about "Mathematics of Central Asia and the Near East";
2) mastering the technique of working on tasks at the specified level;
3) formation of cognitive and communicative activity, readiness to acquire knowledge independently;
4) development of mathematical thinking ability;
5) to integrate the knowledge of students from the scientific heritage of our ancestors with the development of modern mathematics and to form knowledge, skills and abilities to strengthen it and to ensure that they can apply them in practice.

From the scientific heritage of Central Asian encyclopedists The content and requirements of the curriculum for the improvement of the technologies used in the process of higher pedagogical education, the modernization of the educational system to the extent that it meets the modern requirements, and the upbringing of the young generation capable of intellectually mature, strategic and analytical thinking, the following principles take priority:

First, to implement the mathematical teaching of Central Asian thinkers while ensuring the continuity between the stages of education;

secondly, during classroom training in the higher education system, bringing examples from the work of Central Asian thinkers based on the essence of the subject and combining it with today's mathematics;

thirdly, training Olympiad winners who are interested in mathematics, directing them to research
in the field of higher education and science for their future development;

dfourthly, to meaningfully illuminate the contributions of Central Asian thinkers in the field of mathematics through scientific research, to justify the connection of research with practice and production, to connect mathematics with life and to strengthen it;

ffifth, effective use of the scientific heritage of our ancestors, strengthening the study of mathematical issues related to the formation of thinking and imagination;

sth, based on advanced foreign experience, introducing modern pedagogical technologies based on the principle of 'PAST - PRESENT - FUTURE', as well as using modern educational technologies, solving various problems using various technical tools, and developing analytical skills formation

Improving the technologies of using the scientific heritage of Central Asian encyclopedic scholars in the process of teaching mathematics in the process of higher pedagogical education we found it necessary to emphasize the importance of a differentiated approach. In our experience and observations, it became clear that differentiation (that is, an individual approach) helps to study the student's personality in depth, to identify strengths and weaknesses. It is advisable to choose the methods suitable for the student only after a deeper study of the student's personality. Applying common methods for all students is equivalent to conducting education blindly, and in this case, the effectiveness of education will be very low. The problem of educational differentiation is currently being solved to a certain extent in developed countries, and it must be said that these solutions are helping to achieve positive results.

Also, on the basis of the principle of historicity, holistic approach, individual approach, differentiated approach, humanistic approach, formation of mathematical knowledge and skills of students, expansion of their worldview, development of creativity and imagination, development of creativity of Central Asian thinkers. Strengthening the connection between learning and today's life has an important pedagogical value.

At this point, it is worth noting that, based on the concept of developing the public education system of the Republic of Uzbekistan until 2030:

Preparing to participate in PISA (Programme for International Student Assessment), PIRLS (Progress in International Reading Literacy Study), TIMSS (Trends in Mathematics and Science Study) international student assessment program;

Implementation of the program "STEAM - education" (Science, Technology, Engineering, Art, Mathematics - mathematics); the implementation of the state educational standard of general secondary education based on the competency approach is indicated as an important task. So, in order to educate a student who can meet these requirements, a primary school teacher must have enough knowledge, skills and qualifications, in other words, pedagogical competence.

Therefore, in the course of our experiments and observations, on our part, educational technologies and methods in higher education institutions (lectures; interactive case-studies; logical thinking seminars, quick question-and-answers); work in groups; making presentations; individual projects; To work as a team and protect projects, on the basis of the development of students' independent and creative thinking skills, directly connecting the educational process with practice, i.e., organizing "binary" trainings in cooperation between teachers and students. was placed. The advantage of "binary" classes is that during the class, students can think independently, their will is trained, speech culture develops, and they gain experience through researching problem situations.

Of course, the effectiveness of the educational system also depends on the level of training of pedagogical personnel. First of all, a teacher must love and respect his profession, look at the student with great interest and affection, and be able to feel his great responsibility to the society. A pedagogue should be able to determine and take into account the level of knowledge and upbringing of each student, be able to correctly select, analyze and summarize educational
materials, have a perfect knowledge of educational methods, tools and forms necessary for pedagogical skills, to be demanding towards the student, he should be able to use them appropriately depending on the pedagogical situation, to be able to analyze his work and draw conclusions.

From the analysis of pedagogical literature, we know that in addition to the form of training in the auditorium: lecture, seminar, practical training, there are additional forms of training, including practical experience training, additional classes, optional, excursion included.

Due to the fact that we organized training sessions as an elective subject (mathematics is optional) in the process of experimental work, we paid special attention to circle exercises, game-type exercises, excursion hours and video puzzle lessons, which gave positive results.

For this purpose, we tried to conduct the training based on the principle of historicity, based on the nature of the subject, and in different ways and means depending on the content of the material being taught. We enriched the educational process with non-traditional educational methods.

Non-traditional education performs didactic functions such as making students interested in their profession, expanding their scope of knowledge, educating and activating their ability to be present, and developing their ability to think independently. As it was noted in the experiments, if the training was carried out in the usual way – based only on listening, the students absorbed a maximum of 20% of the information, and when advanced pedagogical methods were used, this indicator was 80%. It has been confirmed that it has increased to 90 percent.

In the process of teaching mathematics, in the process of improving the technologies of using the scientific heritage of Central Asian encyclopedic scientists, the non-traditional educational methods improved by us have acquired an important pedagogical value in solving the following tasks.

Their main ones are:

1. To develop students' understanding, knowledge, skills and abilities regarding the content of using the scientific heritage of Central Asian encyclopedic scholars;
2. To develop students' scientific outlook, confidence and beliefs;
3. Enriching and educating students' national spirituality;
4. Opening and improving the internal capabilities, mathematical abilities and talents of young people.

As a logical continuation of the above thoughts, we can say that knowledge is the methodological basis of the educational process. We know that the knowledge of mathematical laws begins with the process of knowing the objective world, and factors are determined in the process of mastering their external and internal essence. Based on observation, imagination and abstract thinking, facts are summarized and theories, laws and categories are created as a result of drawing scientific conclusions.

Therefore, it is appropriate for us to study the process of knowledge of scientific information discovered by our ancestors, conditionally divided into two parts - theory and practice. The reason is that if we consider the theory as a systematic thought that expresses new knowledge, new knowledge, mathematical axioms, theorems, laws, formulas, graphs, numbers, etc. are taught in the theoretical part, ideas and thoughts are formed in the theory. In the process of practice, students strengthen their knowledge by solving problems and examples of the information they learned in theory. In a word, practice is a criterion that shows the validity of knowledge.

In the course of our research, we paid special attention to the formation of students' scientific worldviews. It should be said that the task of scientific knowledge is not to reveal the essence of phenomena, the laws of their development, but to show the reasons for the manifestation of a
certain law. The scientific factor is an element of scientific knowledge and is acquired on the basis of observation and experience, knowledge not based on the factor has no scientific value and no importance for practical activity. That's why it is of great pedagogical importance to find the common connections and laws underlying the factors in their work, to know their essence, and to put them into practice, to form the skills of students to work on themselves by using the scientific heritage of our ancestors wisely.

The process of formation of students' scientific worldview and practical skills based on the mathematical discoveries of O'OQO is also important because the teacher creates conditions for the development, formation, learning and education of the individual in this process, and at the same time performs the function of management and direction.

The process of formation of students’ scientific worldview and practical skills on the basis of O'OQO mathematical discoveries can be carried out in several stages.

Based on analytical materials, it should be noted that in the modern higher education system, "Increasing the quality of education in the field of mathematics (also in the module-credit system) should be focused on the content and organizational structure of education. Planning as an element that determines that the main attention in mathematics education is aimed at renewal, based on the achievements of pedagogical technology and information and communication technologies, in the development of the methodological preparation of future primary school teachers at a high level, from the pedagogical views of Central Asian mathematicians, universality in the field of mathematics The use of discoveries in the educational process has an important pedagogical value.

1. From the scientific heritage of Central Asian encyclopedic scholars Mastering professional knowledge and pedagogical innovations related to the design and organization of the educational process in the process of higher pedagogical education allows the formation of cognitive activities and mathematical abilities of students, and the acquisition of competencies to organize the educational process effectively.

2. From the scientific heritage of Central Asian encyclopedic scholars the process of diagnosing the professional pedagogical creativity of future elementary school teachers in improving the technology of use in the process of higher pedagogical education shows that they should follow certain principles.

3. In the process of teaching mathematics, the creation of educational programs, methodological developments and work plans based on the definition of the content of methodical possibilities of improving the technology of using the scientific heritage of Central Asian encyclopedic scientists allows to enrich them in terms of content.

4. Innovative pedagogical technologies in improving the technology of using the scientific heritage of Central Asian encyclopedic scientists in the teaching of mathematics: differentiated educational technologies; gaming technology; teaching technology by stations; multimedia technology; case technology; style of projects; online learning technology; Web Quest Technology; interactive learning technology; collaborative learning technology; the use of developmental technology and others creates the basis for the successful implementation of education. Also, effective use of interactive methods and information and communication technologies is a requirement of the time.

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