Implementation of the Khorezmian education model in Uzbekistan: problems and solutions

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The integration of science, education and production is crucial for national development whereby interdisciplinary approaches are vital to enhance learning. This article explores the significance of integrated and problem-based educational technologies, particularly through the Khorezmian model of education, which highlights the interconnectedness of disciplines. When implemented regularly, the model enables learners to develop their critical thinking and practical skills to deal with societal challenges, through being exposed to real-life problems. The model, also, promotes active learning, spiriting learners to identify and solve problems relevant to their lives. In the article, the problems related to the introduction of the Khorezmian education model in Uzbekistan and their solutions are discussed in detail.

Keywords: Interdisciplinary integration; problem-based learning; Khorezmian model of education; active learning; critical thinking; educational technology; teaching strategies; natural science literacy.

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1. Introduction

The integration of science, education and production has an incomparable place in the development of any country. The state that provides this unity develops day by day. Implementation of such incorporation is carried out by ensuring the combination of these systems which requires the application of interdisciplinary integration. For this purpose, teaching on the basis of integrated and problem-based educational technologies is of great importance in the development of society.

"Integration" is borrowed from two Latin words "integration" – to restore, complete and "integer" – whole, and is defined as an act of combining, adding or replacing parts to make a whole [1]. Integration is important in education, as in all fields. Establishing interdisciplinary relations in the teaching of general education subjects through the integration of education, achieving the integrity of the educational content through the interaction between different educational programs, and one-sidedness in the student's knowledge and imagination of the world but it is possible to achieve all-round development.

Interdisciplinarity (integration) serves as a basis for forming a scientific worldview, teaches the student to understand nature correctly and fully, to use it rationally, and to think logically. The main goal of the integration of academic subjects is the synthesis of subjective new knowledge, and the main task of integration processes is the development of pedagogical technologies aimed at the synthesis of subjective new scientific knowledge.

Interdisciplinary integration is not to show the related areas of several educational subjects but to give the student an idea of the integrity of the world around us through integrated teaching. Scientists say that integration accelerates the formation of a student's worldview.

Integration of sciences can be carried out in 2 forms:

1. External integration - interdisciplinary connection.
2. Internal integration - inter-subject connection.

The following levels of integration of disciplines can be defined:

1. Thematic (thematic integration).
2. Problematic integration.
3. Conceptual integration.
4. Theoretical integration.

- In thematic integration, two or three different subjects reveal one topic. This level can also be called illustrative - descriptive.
- Solving one problem with different subject possibilities is problematic integration.
- In conceptual integration, one concept is considered using the tools and methods of various educational subjects.
- Philosophical integration of various theories is theoretical integration [2].

Interdisciplinary integration is the process of combining or connecting different disciplines and disciplines [3]. It is difficult to find a subject that is not related to other subjects. The application of interdisciplinary integration ensures that the knowledge obtained from the fundamentals of science is complete, deep and thorough. Especially in order to fully understand the subjects of natural sciences, it is necessary to study the parts of the subject related to other sciences. This is done through interdisciplinary integration. Also, problem-based teaching is proving to be an effective teaching method

in higher educational institutions. In problem-based teaching, the role of problem-based integration is incomparable. Because in the problematic integration, not only the integration of subjects is realized, but it is proven that it can be used to solve problems.

In problem-based learning, the lesson is focused on solving a specific problem. That problem usually comes from an individual need. As a language learner, for instance, target language needs maybe different due to which specialty one might pursue [4], be it a pharmacist, a student or a factory worker. Likewise, learners in other fields are likely to have their personal needs or problems in learning a certain subject. Areas of application of the subject and limits of application are covered during the lesson, and students are trained to use the acquired knowledge in practice. Mastering the areas of application of the subject and the limits of application requires the implementation of interdisciplinary integration. This, in turn, motivates students to acquire knowledge and forms a method of scientific research in their thinking [5]. Problem-based learning meets the goals of creative active personality development and is proven to be more effective than other forms of learning.

The incorporation of integrated teaching into problem-based teaching is of great importance in solving the problems related to natural sciences in the country. Directing teaching to problem-based learning and using an integrated approach is the very essence of the Khorezmian model of education. The Khorezmian model of education is interdisciplinary thinking, memorizing and avoiding monotony, putting what you think into practice with your own skills, connecting art and science as well as science and social life. It is an educational model that aims to teach our children, the owners of our future, to solve problems. It develops and implements interdisciplinary courses using methods and techniques based on a problem-based learning model, inquiry-examination, collaboration, and student-centered teaching strategies [6]. The basis of the Khorezmian education model is the process of students' identification of everyday, real-life problems, design of algorithms for solving them, identification of ways to solve existing problems, and creation of innovative ideas using programming capabilities. According to the Khorezmian model of education, students identify a problem in the area where they live and look for a solution to the problem based on the integration of disciplines. Because no problem can be solved by just one subject. According to the Khorezmian model of education, the stages of problem solving are as follows:

1. Identifying problems.
2. Ability to choose a problem.
3. Study problematic situations and conduct research.
4. Prove the problem and determine its basis, write a sentence about the problem in life.
5. Identify the causes (small issues) of the problem.
6. Determination of possible solutions.
7. Choosing a solution.
8. Practical application of a suitable solution to the chosen problem.
9. Evaluation of the implemented solution.
10. Summarize the solution.
11. Reporting and sharing.

Interdisciplinary integration is carried out at all the above stages. Because, from identifying the problem to the stage of determining its solution, problems and solutions are studied from the point of view of all areas, and an alternative solution is given. Teaching based on the Khorezmian model of education creates the following:

a) When students work with problems, they learn to think about their own thinking.

b) When solving problems, students make connections between previously learned knowledge and new knowledge.

c) Education occurs as a result of establishing a connection between students' knowledge and life.

d) Pupils choose a problem from their own life, not a problem given by the teacher.

e) Pupils are active planners, implementers and evaluators.

The Khorezmian model of education creates a foundation for students' creative and critical thinking and practical use of the knowledge they have acquired. Students who are able to apply the acquired knowledge in practice are considered literate in natural sciences. Personnel who are literate in natural sciences can find solutions to existing problems in society.

2. Research methods

In addition to the fact that the implementation of the Khorezmian model of education in Uzbekistan has many advantages, the following problems may arise:

1. The lack of information about the Khorezmian education model of the teaching staff working in Uzbekistan.
2. Absence of Khorezmian classes where the Khorezmian model of education can be applied in general secondary schools.
3. The problem of popularizing the activities of schools operating on the basis of the Khorezmian model of education and achieving high performance at the district level.

4. The problem of popularizing the activities of schools that operate on the basis of the Khorezmian model of education and have achieved high indicators/high performance at the regional level.

5. The problem of popularizing the activities of schools that operate on the basis of the Khorezmian model of education and have achieved high indicators/high performance at the republican level.

The above problems can be solved step by step. Solving the problems that arise can be done through the following block diagram:

The problems of introducing the Khorezmian education model in Uzbekistan and the stages of their solution (in the case of general secondary schools)

1. Lack of information about Khorezmian education model among pedagogues working in educational institutions of Uzbekistan.

   1.1 To make and distribute posters on seminar training in order to familiarize teaching staff in higher education institutions, general secondary schools and pre-school education organizations with Khorezmian education model. The prepared poster should include the place and time of the training.

   1.2 The poster invites pedagogues working in various fields to volunteer to participate in a Google survey.

   1.3 Acquaintance of the pedagogues gathered voluntarily with the contents of the Khorezmian education model and the achieved results (based on articles and data).

   1.4 To teach the pedagogues gathered by volunteers how to find problems in the Khorezmian model of education, justify them as a problem, identify the causes of the problem, determine the solutions to the problem and put it into practice.

   1.5 Pedagogical staff, divided into groups based on the Khorezmian model of education, identify the problems observed around them and find solutions to them. Pedagogical staff who have successfully mastered the Khorezmian education model are awarded a certificate of success.

2. Lack of Khorezmian classes that can apply the Khorezmian education model in general secondary schools.

   2.1 Pedagogical staff who have successfully mastered the Khorezmian model of education organize clubs based on interdisciplinary integration in their schools based on the Khorezmian model of education. The material and technical base should be well formed and a creative environment should be created in the schools where the circle is organized. For this reason, it is appropriate to start organizing clubs from specialized or creative schools.

   2.2 Teachers of different subjects gather together to form a club with students with low mastery. As a result of this process, the problems will be small, and the solved problems should cover topics that the students have not mastered.

   2.3 Teachers of different subjects gather and organize a club for students with a high level of mastery. Based on the activity of this club, the scope of problems is high and the problems being solved include the knowledge acquired by the students which is aimed at further enriching it through putting it into practice.

   2.4 The problems to be solved in the organized circles should be specific to the age of the pupils and the knowledge they are learning. It is appropriate for the circles to be organized in the following form:

      2.4.1 For primary school pupils (grades 1-4). In primary education, several subjects are taught by one teacher, and this teacher necessarily connects his subjects. In primary education, mother tongue, mathematics, technology, science, English and reading can be integrated [7].

      2.4.2 For pupils of grades 5-7. In middle classes, integration can be implemented to a certain extent. Because the scientific level of the taught subjects and the intellectual potential of pupils allow solving small-scale problems. At this stage, certain problems can be solved through mutual integration of subjects such as mathematics, natural science, computer science, history, and English. In the implementation of interdisciplinary integration, it is best to start with disciplines that are close to each other.

      2.4.3 For pupils of grades 8-9. At this stage, the subjects that can be integrated increase somewhat, and the teaching of natural science into physics, chemistry, biology and geography increases the scope and level of problems.

      2.4.4 For pupils of 10-11 grades or students of academic lyceums and vocational schools.

   These circles should be scientifically based and based on the integration of a larger number of disciplines. In particular, they should solve a certain problem based on scientific evidence. These clubs are very important for vocational school

students. This circle is an opportunity for them to apply the acquired knowledge in practice.

2.5 In order to further expand the scope of Khorezmian education model, students and teachers jointly create projects that are designed to search for solutions to problems, to be presented in front of students' parents and the school community at the end of each term. This process is carried out by organizing Khorezmian Eves.

3. The problem of popularizing the activities of schools that operate on the basis of Khorezmian model of education which have achieved high indicators at the district level.

3.1 Organizing a Khorezmian seminar in order to popularize the activity of the Khorezmian education model at the district level.

3.2 Through inviting science teachers and parents to the seminar, arousing interest in the Khorezmian model of education among parents.

3.3 Demonstrating the performance of students who are trained in clubs run according to the Khorezmian education model at the seminar. Manifesting the projects created by students of all levels in sequence.

3.4 Supporting teachers who participated in the seminar and who want to open a club of the Khorezmian model of education through district-level training.

3.5 Clarifying the structure and activities of Khorezmian education model clubs and making suggestions and recommendations in a roundtable discussion with teachers who have successfully mastered the Khorezmian education model.

4. The problem of popularizing the activities of schools operating on the basis of the Khorezmian model of education and achieving high performance at the regional level.

4.1 Organization of the festival of the Khorezmian model of education in order to popularize the activities of the Khorezmian model of education at the regional level.

4.2 Conducting a competition of the best projects among Khorezmian education model clubs within the framework of the festival.

4.3 Within the framework of the festival, holding the competition "The best team of teachers of the Khorezmian model of education" among the teams of teachers working in the clubs of the Khorezmian model of education.

4.4 Within the framework of the festival, holding the contest "The Best team of students of Khorezmian education model" among students studying in Khorezmian education model clubs.

4.5 Organization of the Center of Khorezmian education model, consisting of teams that recorded the best results according to the results of the festival.

5. The problem of publicizing the activities of schools that operate on the basis of the Khorezmian model of education and have achieved a high level throughout the Republic.

5.1 In the center of Khorezmian education model, teaching pedagogues the basics of the Khorezmian education model, the goals and tasks of the model, and the implementation of this process online.

5.2 Regularly analyze the activities of classes and clubs operating in the center based on the Khorezmian model of education and introduce a system for evaluating their activities.

5.3 To encourage pedagogues whose activity is highly rated and to assign a certain number of bonuses to them.

5.4 Providing financial incentives and scholarships to students in classes and clubs where the Khorezmian model of education operates.

3. Conclusion

Solving the problems arising in the introduction of the Khorezmian model of education in Uzbekistan on the basis of the block diagram presented above is of great importance in ensuring the integrity of science and education and production. Though there are many ways to create literacy in natural sciences. However, it is also interesting for students to create natural literacy by solving the problems observed around them. This, in turn, arouses students' interest in learning more in the process of solving problems. The main goal of the Khorezmian education model is to apply the acquired knowledge in practice and solve problems, which is the basis of training qualified personnel in the development of society.

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