

This process is similar to what chemists have to do when they make products. How long do they allow the reaction to run for? When do they know it will be “done”? If there was a way to see inside the reaction and to know exactly when it would be

done, then this would reduce waste in the process and ensure that your product is “done” and is the right product that you intended to make.

12. *Inherently Safer Chemistry for Accident Prevention*

This principle focuses on safety for the worker and the surrounding community where an industry resides. It is better to use materials and chemicals that will not explode, light on fire, ignite in air, etc. when making a product. There are many examples where safe chemicals were not used and the result was disaster. When creating products, it is best to avoid highly reactive chemicals that have potential to result in accidents. When explosions and fires happen in industry, the result is often devastating. [1]

The principles are general, and they are primarily geared to the bench scientist. For successful implementation of green chemistry within industry and in our society is education. There is a great need for organized efforts to integrate green chemistry and sustainability into methodology of teaching chemistry. [4] But there is still much to do. New materials, processes and methods must be invented. To find

solutions, we need new perspectives, ideas, and problem-focused methodologies. Collaboration on green chemistry and chemical policy can be effective if it is carried out through well planning, strategy and methodology. By developing the educational system to reflect the true needs of industry and society, we can ensure that the next generation of scientists in the workplace is far better equipped to create materials and products that are truly sustainable.

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MODULAR TECHNOLOGY IS ONE OF THE MOST EFFECTIVE METHODS OF TEACHING GEOGRAPHY IN GENERAL SECONDARY SCHOOLS.

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ABSTRACT

The article examines the ways of teaching geography to schoolchildren using modular technologies. The paper reveals the issues of the need to change the education system of our country. The article describes the realities of the modern society of the XXI century-the time of new technologies, new information flows, with which only specialists with the necessary skills and qualities can interact. In this connection, the paper discusses the task of teachers to cultivate highly qualified specialists at all levels of education. In addition, the article presents the ways of organizing and using innovative technologies in geography lessons, examines the structure and methodology of the approach, and highlights the main problems faced by a teacher at school when implementing innovative technologies.

Keywords: modular technology, geography, teaching, methods, interactive, students.

In the scientific literature on the problem, many studies have appeared that have considered the precedent of the emergence and development of innovative technologies in relation to economic development. But over time, researchers have come to the conclusion that the problem of assessing the quality of innovative properties in various fields cannot be fully studied only from the point of view of economic theory. There was a need for a different approach to the consideration of innovations, which included not only scientific and technical parameters, but also factors of management, law, education, and culture.

The theoretical and methodological level of innovation, taking into account and analyzing the structure, essence and classification of all internal

processes, was actively studied by such scientists as M. M. Potashnik, N. B. Pugacheva, A.V. Khutorskoy, V. I. Zagvyazinsky.

M.M. Potashnik, professor at Moscow State University, has conducted numerous studies on the innovative approach to teaching lessons. So, in the course of lectures "Lesson of the XXI century", the author raised the main problem of modern pedagogy: the lack of interest in learning among students. In his work, Potashnik considered the reasons for children's disinterest in learning, on the basis of which he developed clear criteria for a high-quality modern lesson, which involves innovative technologies. In addition, the study describes the features of using

interactive methods and their relevance in the context of specific classes [1].

A.V. Khutorskoy in the monograph "Pedagogy. Textbook for universities. The Third Generation Standard" considered modern innovative learning technologies, including heuristic learning, competence-based, system-activity and meta-subject approaches. In addition to analyzing the application of the above methods, the author presented the specifics of the implementation of approaches in the context of the functioning of new education standards. Khutorskoy is the creator of numerous methodological conferences, seminars and courses that reveal the subtleties of using pedagogical innovation [2].

N. B. Pugacheva in her works [2, p. 121] on the creation and description of an innovative educational environment with the specification of the methods used scrupulously considered the competent process of organizing and coordinating such an environment, identified the main pedagogical problems of introducing innovation in school practice.

V. I. Zagvyazinsky-the author of many works on didactics, methodology and implementation of pedagogical innovations-in the monograph "Pedagogical innovation: problems of strategy and tactics)revealed the laws and principles of innovative development of education, outlined the value orientations, goals and results of education. In addition to strategic goals, Zagvyazinsky touched upon the practical implementation of innovation: the problems of applying the competence approach in modern schools, ways of organizing individualized education of schoolchildren [3].

V. S. Lazarev in his work "Pedagogical Innovation" paid great attention to the psychological readiness of teachers for innovation, recognizing the issue of the quality of pedagogical training as the most important in the process of transformation of the educational system [4].

Due to the limitations of the article, we will consider only a few of them in the context of a geography lesson in secondary schools in Kazakhstan and Kyrgyzstan. The competence-based approach is a continuation of the activity-based approach and a way to implement the personality-oriented approach. It implies that students are directed by the teacher to engage in conscious, active, diverse, gradually becoming more complex activities. The implementation of this activity requires the students to exert strong-willed efforts, the expenditure of forces to achieve the desired result. But at the same time, it allows students to form unique competencies that are necessary for society in the future and in the current situation.

A special feature of the organization of the competence approach in the geography lesson can be considered the building of a special structure of the lesson (in comparison with the classical lesson). Note that the structure of the lesson was formed based on the system of A.V. Khutorsky. So, the lesson contains the following steps::

- formation of educational tension;
- конкрет specification of the object of education;

- clarification of the task and task;
- resolving a problem situation;
- рассмотрение review and display of the resulting educational product;

- product analysis and ordering;
- задейств use of cultural and historical precedents and analogues;

общая general reflection.

The teacher in the lesson construct notes the educational and cognitive, value-semantic, general cultural, personal, general labor and communicative competencies that students form during the lesson. Analytical activities include::

- analysis of static materials on the topic

- analysis of maps, atlas;

- subsequent ordering of the material.

The assessment activity of the student in the geography lesson consists of:

обуч assessment of information on the topic by trainees (for example, when studying the natural conditions of Kazakhstan and Kyrgyzstan, its climate, soil structures, topography and internal waters are evaluated);

subject assessment of students' information on the topic in the context of the development of agriculture, industrial economy, prospects for tourism development, road map — everything related to the topic under study (for example, the natural conditions of Kazakhstan or Kyrgyzstan from the point of view of improving tourism in a particular region).

Next, we will consider project methods for teaching geography to schoolchildren, which also relate to innovative modern technologies. They effectively help at the stage of creative activity and can adapt to the subject realities. The basis for the implementation of the project method in the teaching of schoolchildren is the problem posed, for the solution of which it is necessary not only to have knowledge of geography, but also to possess interdisciplinary knowledge. This deepens the relationship of modern geography with history, chemistry, algebra, biology and even literature, this fact must be used when teaching children with the help of innovative technologies. Activation and accumulation of cross-subject knowledge contribute to the formation of cross-subject competencies, that is, it allows the student to use integrated, versatile knowledge when solving the task.

Summarizing the above, we can note that the project method in geography lessons at school allows the student to show creative activity, improve cognitive skills, while the main task of the teacher is to correctly direct students, stimulate their own mental and activity activity, not limited by the teacher's opinion.

The advantage of the project method is that every student, even if they have less knowledge or do not know how to apply it in practice, has the opportunity to develop these abilities, as well as to improve their creativity and independence. Project work eliminates the formal nature of studying geography by students, activates their interaction to achieve a practical learning result.

The selection of project topics is determined by the external situation. When teaching geography, the project method can be applied within the program material on any topic, which is explained by the selection of topics taking into account the practical significance for students. So, the main task becomes the formulation of the problem set before the students, which they will solve in the process of project work.

The latter would like to consider interactive methods that are used in modern schools in Kazakhstan and Kyrgyzstan when teaching geography. Interactive methods can be attributed to a significant means of implementing a competence-based, system-activity approach, as well as to an element of innovative technologies in general. The inclusion of interactive methods in teaching stimulates cognitive activity, increases the motivational mood, activates the ability to independently and creatively solve emerging problems (that is, to take responsibility for finding an effective way to achieve the goal in an unfavorable external environment). All these qualities contribute to the formation of creative, divergent thinking of future specialists, develop an active activity approach and independence.

The advantages of interactive methods are widely known, but they are not without disadvantages. Today, many teachers, having evaluated the effectiveness of interactive techniques, begin to actively use them during the lesson. This often leads to distortions in the structure of the active lesson and the transformation of the lesson into a game activity. In our opinion, the teacher should clearly understand the relevance of the use of these methods, the degree of completeness of their implementation in the fabric of the lesson and consciously limit the use of interactive content, improving the quality of its implementation[5].

Separately, it should be noted directly interactive tools for teaching geography to schoolchildren (for example, an interactive whiteboard, a projector). Thanks to their presence, it is much easier to organize capacious, effective, holistic lessons on the subject, which are characterized by high assimilation of knowledge. Advanced computer technologies, which are considered innovative, facilitate the presentation of material to the teacher and act as a significant element in the process of forming modern active learning.

At the same time, despite the acute urgency of improving the educational system, the introduction of innovations meets frequent resistance both from teachers-practitioners and from the management apparatus. A. I. Prigozhin called such trends as "anti — innovation barriers", and V. A. Slastenin - "psychological barrier". The reason for the formation of such confrontations must be considered psychological unpreparedness for the perception of everything new. Practical teachers try to "pass" new trends through the prism of their own worldview and transfer them to their own experience. The main criterion in this case will be the absence of the need to destroy the already built pedagogical system.

Formed and developed pedagogical habits prevent the introduction of pedagogical innovations, initiating the emergence of "innovative resistance". T. A.

Stroková in her works repeatedly drew attention to the resistance to innovation, which is characteristic of all levels of the pedagogical system. So, starting from the very top echelons of the structure, where there are typical anti-innovation judgments ("this already exists", "why invent a bicycle?", "this is not a solution to the problem", etc.), and at the level of specific teachers: "this is difficult to implement in our school", "this will not suit my students" [5, p. 193].

The stage of using innovation, which, in our opinion, is now taking place in Kazakhstan and Kyrgyzstan, no longer demonstrates open resistance of the participants in the process. Meanwhile, there is a hidden or unintentional reaction. So, L. S. Podymova wrote about the methods of "piecemeal implementation", "eternal experiment", "reporting and parallel implementation" that create problems. This fact should not be ignored, but on the contrary, it needs to be given maximum attention in order to cope with the fears and contradictions of teachers in the field, to bring the introduction of innovative technologies to the final level. That is why the introduction of innovation should, first of all, be accompanied by a large-scale and effective explanation of all problematic issues, both from the technical and psychological side[6].

We tend to agree with S. D. Polyakov, who suggested that the process of resistance to innovation should be perceived as natural. The author presented an illusory view that the development of new technologies in pedagogy can be completely painless. This is especially true for our significant state in territorial terms. In our opinion, the birth of a new one in most cases represents a certain turning point: established stereotypes, established preferences and developments.

But, taking into account this situation, we do not call for inaction in any case. On the contrary, the elimination and minimization of innovative resistance should be the most important task of the heads of educational institutions in Kazakhstan and Kyrgyzstan. The basis of such work can be the algorithm proposed by Zagvyazinsky: positive perception of innovation by the teacher — understanding of the essence and proper result of innovations — positive emotional response to innovations — acceptance of innovations and formation of preferences — formation of value orientations in relation to innovations by the teacher — creation of their own system of innovative values — full assimilation and acceptance of innovations.

Note that the above algorithm describes an ideal situation that is almost never encountered in life. But, despite the emerging resistance, the consistent implementation of this mechanism forms the basis for the full adoption of innovative technologies by teachers and their further integration in practice. Thus, the work with innovative resistance is the responsibility of the head of the educational institution and should be based on the identification of the true causes of resistance and their resolution through the use of personal innovative reserves.

Summing up the article, it should be said that geography is a unique science that allows students to provide a storehouse of useful and relevant information in the future. Teaching geography contributes to the

formation of the intellectual experience of the student, as well as develops the ability to process and analyze information flows.

Since the effectiveness of teaching geography directly depends on the quality of the student's cognitive activity, innovative technologies are used in the educational system for its activation and comprehensive development. Modern, active geography classes stimulate the cognitive interest of students, give them the opportunity to develop skills in cognitive search, improve their creative potential and initiate the development of creative activity.

In order to effectively implement innovative approaches to learning, the teacher must have the skills of organizing and using innovative technologies, not the methodology. At the same time, due to the possibility of innovative resistance, the task of revealing the importance and subsequent popularization of innovation in the teaching staff falls on the shoulders of the head of the educational institution.

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МЕТОДИКО-ТЕОРЕТИЧЕСКИЕ ОСНОВЫ ПОДГОТОВКИ ВОКАЛЬНЫХ ПЕДАГОГОВ РОССИИ

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АННОТАЦИЯ

В настоящее время вокальная педагогика претерпевает кризис, поскольку не обладает объективными критериями и показателями для сохранения традиций русского вокального исполнительства. В статье представлены необходимые методико-теоретические сведения для подготовки вокальных педагогов на современном этапе развития российского образования.

ABSTRACT

Currently, vocal pedagogy is undergoing a crisis, since it does not have objective criteria and indicators for preserving the traditions of Russian vocal performance. The article presents the necessary methodological and theoretical information for the training of vocal teachers at the modern stage of the development of Russian education.

Ключевые слова: вокальная методика, педагог, пение, педагогическая наука, вокально-исполнительская деятельность

Keywords: vocal technique, teacher, singing, pedagogical science, vocal and performing activities

Методико-теоретические основы являются составной частью педагогической науки на современном этапе развития образования России.

Подготовка вокальных педагогов является первоочередной задачей образования для сохранения национальных традиций русской вокальной школы. Сегодня назрела необходимость

в развитии научного потенциала и расширении кругозора молодых специалистов, на основе которых могли бы объективно оцениваться явления, связанные с голосообразованием и формированием специалиста вокально-исполнительской деятельности (певца или педагога).