



SOME CONSIDERATIONS ON INCREASING THE EFFECTIVENESS OF EDUCATION IN THE TEACHING OF NATURAL SCIENCES

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Abstract

This article discusses the need to improve the educational system, as well as teaching methodologies in higher education institutions for the preparation of chemist specialists who meet current requirements. It also discusses ideas for the development of this educational systems integration with production.

Keywords: teaching methods, education system, integration, fundamental sciences, curricula, knowledge, skills, continuing education.

Introduction

As the Republic of Uzbekistan wins independence and takes courageous measures to reclaim its due place among the world's industrialized countries, the importance of human elements in ensuring this independence and its bright prospects will definitely grow. As a result, our republic's administration has given special attention to issues of training specialists, education, and training of young people since its inception. In particular, the Law of the Republic of Uzbekistan "On Education", approved on September 23, 2020, PD-4947 of the President of the Republic of Uzbekistan on February 7, 2017 "On the Strategy for further development of the Republic of Uzbekistan", PD-5812 on September 6, 2019 "On additional measures to further improve the system of vocational education" and PD-6097 on October 29, 2020 "On approval of the Concept of development of science until 2030" decrees, PD-4623 of





February 27, 2020 "On measures to further develop the field of pedagogical education", Speech at the solemn ceremony dedicated to Tracher's Day on September 30, 2020 "Teachers and coaches - a great strength, support and backbone in building a new Uzbekistan" and the Cabinet of Ministers of the Republic of Uzbekistan on May 15, 2020 "Development of professional skills On measures to organize the activities of the national system" No.287, based on the content of the priorities set out in the Resolution No.466 on August 7, 2020 "On approval of normative legal acts regulating the system of continuing primary, secondary and secondary special vocational education in the Republic of Uzbekistan", the aim is to develop the professional skills and innovative competencies of the staff, to improve the skills of applying foreign best practices, new knowledge and skills in the field, as well as to put them into practice. Resolution PD-3775 on June 5, 2018 "On additional measures to improve the quality of education in higher education institutions and ensure their active participation in the ongoing comprehensive reforms in the country" and October 8, 2019 The adoption of the Presidential Decree PD-5847 approving the Concept for the Development of the Higher Education System of the Republic of Uzbekistan until 2030 and the measures taken to implement them are a clear example of this. A variety of activities have been carried out in the education system over the years of independence, as in all aspects of our society. It is common knowledge that education based on the work and abilities of educators does not work effectively in today's world. The educator's primary goal is no longer to supply pupils with ready-made knowledge, but rather to assist them in acquiring knowledge on their own. To achieve so, the educational process must be improved to the point that students may fully display their abilities and potential while devoting their entire attention to studying. A non-traditional lesson should be structured to boost the student's activity instead of the usual teacher's activity and effort to convey all of the content. Since independence, much has been done to improve teaching in the education system. This work is also effective in teaching chemistry.

President Shavkat Mirziyoyev spoke about reforming the education system, developing a program to radically improve the education system in 2017-2021, further improving the curriculum, and the main tasks and activities of the Ministry of Education of the Republic of Uzbekistan Introduce effective forms and methods of education, taking into account advanced forms, new pedagogical and information technologies, optimization of educational, psychological and physical workload of students, to organize the creation and publication of a new generation of textbooks and teaching aids that meet international requirements in terms of content and quality, developed in accordance with the updated curriculum and programs using





advanced pedagogical and information and communication technologies. The task of education today is to bring up students to be full-fledged adults and to be able to apply the knowledge and skills they have acquired.

The main task of the "National Program for Human Resource Development" was adopted by the Republic of Uzbekistan, which provides excellent human resources for the economic and spiritual needs. You can compete with other countries overseas experts. In order to achieve this task, it is necessary to improve the eyes of the faculty of chemistry of the educational methodological system or state education that meets its requirements. International norms and standards to be deployed on the basis of standards. In this regard, it is necessary to review the existing curriculum in all areas and structures, based on the achievements of modern science, so that it can be obtained in response to the needs. It is also an excellent student, not an average.

Ensuring that classroom and independent study hours in subjects approved by state standards and included in the curriculum are complete and effective. Among the natural sciences, chemistry has a special potential. The chemical industry has become a major source of new materials, medicines, plant protection products, fertilizers, and other necessities of life. Today, exposure to chemicals and substances is the basis of various technological processes, such as metallurgy, energy, oil and gas refining, and the food industry. It is difficult to imagine engineering and agriculture without chemicals. It will only open up new sources of energy, substitutes for renewable natural resources that can only be depleted of chemicals. Therefore, the need for chemists is growing not only in the chemical industry, but also in the field of "nonchemistry". In addition to the basic professional requirements, a chemist, like all other professionals, must have a high level of socio-political position, knowledge of socio-economic spheres, high culture, and devotion to the Motherland and its history and culture. The training of chemists who meet such modern requirements requires, first of all, the improvement of the educational system and teaching methodology in higher education institutions. Therefore, improving the education of chemistry and improving the quality of personnel in the field of chemistry remains a pressing issue. Samarkand State University is one of the universities that provides in-depth and comprehensive knowledge in chemistry. At our Faculty of Chemistry, students are taught in a number of disciplines, including inorganic chemistry, analytical chemistry, organic chemistry, physical and colloid chemistry, plant chemistry, and polymer chemistry. They receive bachelor's and master's degree programs in chemistry. Graduates of the university teach chemistry in secondary and high schools, lyceums with in-depth study of chemistry, universities, research institutes, laboratories of various enterprises. These sectors of the economy always need university-trained





specialists. The priority given to the economic development of Uzbekistan is the oil and gas industry, non-ferrous metals, which requires the training of chemists who can serve in this field. Chemists who know the chemical processes involved in the production of metals such as gold, copper, zinc, lead, and mercury should be trained at our university. Due to the development of gas and petrochemistry, the importance of obtaining various solvents, drugs, monomers and polymers, it is advisable to train specialists in this field at the university. Another new direction is the training of chemists-experts who can work in the customs of the independent Republic. The services of such specialists are important in determining the quality of imported or exported products and the price of related products. Chemists are also very important in the purification of drinking water, in determining their composition. Chemists are also needed in tanning, dyeing, converting agricultural and industrial waste into useful products, and protecting the environment. Specialists are chemists who know the process of preparing chemicals for the processing of synthetic drugs, cotton, and wool fibers. Chemicals and chemists are also needed to produce wood processing paper, light and food products. The development of the rubber industry in our country is also the responsibility of chemists. The production of perfumes, soaps, detergents, polymers such as polyethylene, polypropylene, polystyrene, as well as the production of various plastic products remain relevant. Chemistry and chemicals are so ingrained in our lives that it is very difficult to find an area where they are not used. It is obvious that the chemical science and chemical industry make a significant contribution to the economic development of our republic. The issue of training highly qualified personnel at our chemistry faculty is being seriously considered. Their work is supervised by experienced professors and teachers of the faculty. It should be noted that it is impossible to develop the chemical industry in the Republic without a deep understanding of the theoretical foundations of chemistry. Therefore, it is necessary to pay special attention to the training of chemists in Uzbekistan. After all, the Republic is proud of academicians O. Sodikov, S. Yunusov, Kh. Usmanov, M. Nabiev, K. Akhmedov, S. Rashidova, N.A. Parpiyev and others who introduced their homeland and nation to the world. The training of chemists to continue and develop the work of these great scientists is one of the most pressing issues of today. Also, in today's globalization process, the use of modern pedagogical and information technologies in the teaching of chemistry is becoming a necessity. The content of the lessons, using modern pedagogical technologies, is designed for students to search for their own knowledge, to study and analyze it independently, and to draw conclusions. In this process, the teacher creates conditions for the development, formation, education and upbringing of the individual and the team, as well as acts as a manager, organizer,





guide.

One of the main issues identified in the national program of Personnel Training on the experience of applying new integrated pedagogical technologies in the process of teaching methodology of special subjects is the development of this educational system and the integration of production. In this regard, we found it necessary to think about the results of the activities carried out by the Department of inorganic chemistry and materials science of the Faculty of chemistry of Samarkand State University. On the basis of scientific and methodological works of the department, as well as practical work of the basic organizations, the master's degree was prepared and introduced into the educational process on the basis of the model plan for the specialty 5A140500. As a result of integration, the following topical issues are being resolved: targeted training of Master's personnel at the level of meeting the requirements of advanced production and scientific and pedagogical; to establish and improve educational programs and educational and methodological materials on the basis of the requirements of continuous development pedagogical technology; linking scientific works and course work of graduate students in fundamental sciences, the results of final qualifying and master's dissertations to the production and their effective implementation in practice; carrying out all types of internships for students, including the production of workloads, with the help of leading specialists of the department; to meet the staffing needs of organizations on a reciprocal basis; Implementation of educational, scientific, practical experience of professors and teachers of the department in close connection with the production, including their involvement in the production of partner organizations; Involvement of heads of branches of the department under the organizations in the management and consulting of students' graduate and master's dissertations, as well as in the final state certification for their protection. In order to carry out its research activities, the department has developed a plan and topics for future research in close connection with the work of basic organizations. All professors, doctoral students, researchers, masters in the field of scientific work of the department work on scientific and practical topics. Based on the above, in order to increase the efficiency and quality of the process of integration of higher education and industry, it is necessary to develop procedures for the involvement of leading specialists in the educational process of integrated departments, their incentives.





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