Scientific reports of Bukhara State University

Volume 5
Issue 1 *BSU 2021 (1)*

Article 20

3-5-2021

IMPORTANCE OF TECHNOLOGY OF INTEGRATED EDUCATION

Sevara Yusupovna Adizova
senior teacher of department of mechanical engineering, BETI, adizova_sevara@bmti.uz

PEDAGOGICS

UDC: 37; 377(077)

IMPORTANCE OF TECHNOLOGY OF INTEGRATED EDUCATION

Adizova Sevara Yusupovna
senior teacher of department of mechanical engineering, BETI
adizova_sevara@bmti.uz

Abstract:

Background. *The article covers the meanings of term "integration", the spheres of use of these terms, the prospects of application in the education system, the concepts of integration of higher education and production. Opinions on the cooperation of higher education and manufacturing enterprises, taking into account the mutual interests, were expressed. The integration is mainly aimed at training qualified personnel, improving their skills, as well as conducting joint research, implementation of scientific developments, formation of qualified specialists' database, etc.*

Methods. *The article used survey, differential-semantic, control, observation and comparison methods to determine the opportunities of students to occupy a place in the labor market through cooperation between higher education institutions and manufacturing enterprises.*

Results. *1. The integration of higher education and industry is, firstly, economical and efficient, secondly, it accelerates scientific and technological progress, and thirdly, they allow the rational use of the intellectual potential of science and higher education not only in one country but in the world community. 2. The integration of higher education and production ensures their integration in the preparation of students in their chosen specialty at the university. The impact of such cooperation depends on the form of its implementation, and the open learning area provides the student with a wide range of knowledge, skills, abilities, professional growth and further activities. 3. It creates favorable conditions for the development of consistency, flexibility, critical thinking, helps to develop a systematic worldview, harmonizes the personality of students, reduces the multidisciplinary nature, expands and deepens interdisciplinary ties, provides opportunities for more knowledge.*

Conclusion. *The main principle of integration imposes equal responsibility on both parties in the process of training quality specialists in technical higher education institutions and industrial enterprises, use the technical base and opportunities of production in higher education, training of modern engineers, working on research projects, internships, employment and other opportunities. The*

interest of the manufacturing enterprise is the opportunity to be provided with the necessary skilled personnel.

Keywords: *integration, higher education, production, training of engineers, integration process, cooperation, integrated education, science, modern engineering, cooperation of two systems, integrated membership, research projects, advanced foreign experience.*

Introduction. Nowadays, the system of higher education of Uzbekistan is in terms of the needs of social sphere and economic sectors, based on ensuring a strong integration of science, education and industry improving the quality of education, training of competitive personnel, effective organization of scientific and innovative activities, and development of international cooperation are of great importance. In this regard, the President of Uzbekistan Shavkat Mirziyoyev set tasks to develop a concept for the development of science in the country until 2030, which sets the foundations for medium, long-term scientific, technological and innovative development [1].

Methods of research. With the rapid development of intellectual potential in the field of engineering and technology in our country, there is possibility to achieve strong scientific and technological prospects. In the post-independence years, the lack of modern laboratories in technical higher education institutions in Uzbekistan and the lack of a clear mechanism for cooperation between higher education and industry have made it difficult for employers to meet the needs of employers. Graduates with higher education do not have enough knowledge and skills to work as specialists in enterprises, and are tuck for working for years as ordinary workers. The participation of industrial enterprises in the training of highly educated personnel in the field of engineering is insufficient. There are many barriers to effective cooperation with industrial enterprises. Therefore, in the current situation there is a need to form educational institutions based on modern educational technologies, to apply pedagogical innovations in education, to find new approaches, forms and methods of engineering education based on the best practices of the leading countries.

The mutual partnership of education, science and industry leads to the formation of innovative entrepreneurial skills by personnel in theory and practice.

Higher education institutions train specialists based on the development prospects of modern enterprises in the economy. Strengthens the theoretical knowledge acquired by students on the basis of innovative cooperation in the same enterprises. Based on the interest of talented students in the industry, innovative cooperation groups are formed in each area.

During this academic semester, this group of students conducts after-school and internship-defined internships at the enterprises attached to them. At the same time,

https://uzjournals.edu.uz/buxdu/vol5/iss1/20
DOI: 10.52297/2181-1466/2021/5/1/20

enterprises can get acquainted with the formation of innovative projects on topics of interest to them, the implementation and commercialization of the developed developments, and participate in the implementation of this project in collaboration with the leader of the innovation group.

Management of the infrastructure of this innovative cooperation is carried out through coordinating scientific and technical councils consisting of representatives of relevant government agencies, higher education institutions and enterprises. The Coordinating Council analyzes new developments created as a result of innovative cooperation over the period and the purpose of innovative projects planned for future implementation, the identified measures for the implementation of tasks, expected results, the provision of specialists and funding stages.

In addition, research centers, financial institutions and foreign participants can be involved in the implementation of large innovative cooperation projects. It should be noted that the financing of innovative projects is carried out on the basis of public-private partnership, by private enterprises, individuals and other stakeholders.

The quality and effectiveness of education is determined by highly qualified teachers. Training such personnel is a responsible and arduous process. All the problems of the society are solved positively and wisely, by educated and knowledgeable, businesslike and enterprising personnel. If the interpretation is correct, cadres are the driving locomotives of a human society. The integration of science, production and educational processes is the determining factor of all success. In a complex and multifaceted process such as training, of course, it is difficult to ensure quality and efficiency without the interdependence of specialization and general disciplines.

Changes such as the integration and differentiation of disciplines must be used purposefully and effectively in the process of economic growth and in the process of education and upbringing. It should also be borne in mind that integrative processes require modernization and innovative approaches. All positive changes are reflected in the mirror of society.

Integration in education is the process of establishing connections between the components of a content within a particular education system to shape the child’s personality and self-development, forming a holistic view of the world.

Combining disciplines in a modern school is one of the directions in the search for new pedagogical solutions, the development of creative potential of pedagogical communities in order to have an effective and rational impact on students

Integration helps students to overcome the fragmentation and mosaic of knowledge, ensures their acquisition of holistic knowledge, a set of universal values.

With the rapid growth of the amount of information, the ability to perceive and comprehend it decreases dramatically. The way out is seen in the synthesis of

different subjects, the development of integrated courses, the interconnection of all school disciplines.

There are three levels of integration of curriculum content:

- internal theme - the combination of concepts, knowledge, skills, etc., in separate disciplines;

- Interdisciplinary - synthesis of evidence, concepts, principles, etc. two or more fans;

- trans-topic - a synthesis of components of basic and additional educational content.

- topic - a synthesis of components of basic and additional educational content.

The main ideas of integrative education:

- personal direction of training (person is the main value of the educational process);

- Formation of generalized subject structures and methods of activity (acquisition of knowledge based on the understanding of patterns);

- priority of semantic motives in teaching (motivational, internal, external and organizational);

- Consistency in teaching (understanding of the relationship within the framework of scientific theory);

- problem-based education;

- coverage of activities;

- dialogue (Truth is born in the process of dialogic dialogue).

The goal of integrative education is to form a holistic view of the world.

In the process of integrated education, separate technologies can be distinguished:

- integration;

- design technologies;

- educational technologies in the global information society;

- Teaching large Internet-based systematic training courses.

When planning integrated lessons, the following should be considered:

- blocks of knowledge are combined, so it is important to correctly define the main purpose of the lesson;

- the information necessary for realization of the purpose is received from objects;

- Many links are made in the training material;

- parts of the whole content are planned to become a necessary part of the lesson and the final completion;

- requires careful selection of teaching methods and tools and determining the workload of students in the classroom.

https://uzjournals.edu.uz/buxdu/vol5/iss1/20
DOI: 10.52297/2181-1466/2021/5/1/20

The integration process requires certain conditions:

• study areas are close to each other or close enough;

• the same or similar research methods are used in integral subjects;

• they are based on general laws and theoretical concepts.

For example, in the process of teaching computer science to small school students, it is expedient to establish links between such areas of science as Russian language, mathematics and others.

However, not every combination of different subjects in a single lesson automatically becomes a single lesson. This requires an integral connection, a leadership idea that ensures the integrity of the lesson.

Let's analyze the pros and cons of integration.

- It allows to implement one of the most important principles of didactics - the principle of systematic teaching.
- Creates favorable conditions for the development of consistency, flexibility, critical thinking for the development of thinking.
- Helps to develop a systematic worldview, harmonize the personality of students.
- The multidisciplinary nature decreases, interdisciplinary relations expand and deepen, and more knowledge becomes available.
- It is a tool to motivate school students to learn, helps to activate students 'learning and helps to develop creativity.

An integrated approach requires a teacher with a high level of pedagogical skills and the universality of their knowledge.

Disadvantages include: - Increased lesson intensity, - Lack of details, in some cases it takes a long time to prepare for the lesson.

Listing the pros and cons of integrated education, we can conclude that, in addition to integration, there are other technologies that allow our young people to get an education that is relevant to real life.

The advantage of integration in training is to create the necessary conditions for the formation of a creative person who understands the world as a whole and can be active in the social and professional spheres, rather than a narrowly educated specialist. The education system fulfills and sets more and more requirements for human beings, and accordingly the quality of education is set, and the teacher's task is to improve the quality of teaching, the quality of knowledge imparted and the connection with other topics through integrated education.

Given the high social significance of integrated pedagogical education in the sustainable development of society, modern requirements, problems in the system and the provision of links between science and education in solving them require the transfer of continuous pedagogical education to a cluster development system.

The innovative cluster of pedagogical education is a whole of all types of education, research institutes and centers, practice bases, scientific and scientific-methodical structures in the system of continuing education, their shared tasks allow to raise the system of pedagogical education to a qualitatively new level.

Therefore, the main goal of the cluster is to combine the educational-scientific-innovative potential of the cluster not only with a high level of civic and professional competence, but also to train modern educators with competitiveness, ability to accept innovations, design and implement new educational programs and technologies.

The cluster system of pedagogical education development works in general areas related to teaching, creation of educational literature, increasing the scientific potential of pedagogical staff, integration of education and upbringing. At the same time, these general areas are privatized in such areas as the management and organization of education, ensuring continuity and integration between types and areas of education, the use of teaching methods and tools.

The following participate as subjects of the cluster system:

- Preschool, general secondary, secondary special, higher and additional education institutions where students, masters and doctoral students undergo pedagogical practice, educational and research activities, innovative and design activities, which serve as a training and experimental base;

- Institutions of additional education for adults in accordance with the updates at different levels of education, institutions for retraining and advanced training of teachers of preschool, general secondary, secondary special vocational education of children and adolescents;

- Scientific and scientific-methodological structures, centers, research institutes engaged in and defining joint research activities;

- pedagogical communities, initiative groups, public associations, governmental and non-governmental organizations;

- Foreign higher education institutions and research centers.

The cluster system unites the entities, each of which operates separately, around a common goal, and at the same time, each entity operates on the basis of a common interest based on a common goal. The subjects of the cluster system support and control each other, each of which creates a spiritual and intellectual space of a separate cluster, expanding its social influence and importance. The innovative cluster of pedagogical education is based on the principles of relevance, membership, consistency, succession, modernity, focus, interest.

Study and analysis of foreign experience in the field of integration of science, education and industry is important aspect of the implementation and improvement of the national program of integration in this area. This topic for a number of reasons is

https://uzjournals.edu.uz/buxdu/vol5/iss1/20
DOI: 10.52297/2181-1466/2021/5/1/20

very relevant for our country today. These are the issues of reforming the education system and related infrastructure, “revitalizing” the field of science, encouraging research, ensuring the interaction of science and business, as well as attracting innovations in production. In order to implement the integration of science, education and production properly, we need to develop our own concept by deeply studying the best foreign practices, their shortcomings and achievements. As this process is long, complex and multidimensional, it is carried out in the form of universities in the American model, the Japanese (Asian) model and the mixed-type European models with the versatility of integration.

Experts from the Russian Academy of Sciences have identified three stages of regional interaction between education, science and industry (ESP).

The first phase is characterized by the leading role of university centers located in small towns. In these centers, universities gathered in specialized laboratories and institutes, design bureaus, engaged in the development of new technologies and industries, and at the same time playing the role of specific "incubators" of scientific and technical firms.

The second stage is characterized by the process of gradual concentration of applied science in industrial regions, repeating the emerging regional structure of the economy.

The third stage corresponds to the modern stage of the scientific and technological revolution. Its feature is that the regions "lose the exclusive right to concentrate scientific institutions in new development areas and the most modern level emerges."

In accordance with the stages of development of production, forms of its integration with research institutes and all levels of the educational system, including universities, are being developed. The role and place of the latter in this process increases with the emergence and improvement of different directions and forms of integration.

The first direction of integration of education, science and industry is to form a single information environment. In modern society, information plays a very important role in communication, interpersonal communication and scientific, educational and production activities. The active interaction of science, education, and production depends on where the media are often the same communication subjects. The integration of information in education, science and industry will accelerate scientific and technological progress not only within one country, but throughout civilization, and allow the rational use of the intellectual potential of science and education.

The second direction of integration of educational institutions should be the creation of an effective system of continuing (lifelong) education. Life education has

responded to changes in the world community in recent years, including changes in the structure of production, the internationalization of social life, and the development of new technologies.

The fourth area of integration of education, science and industry is the order of personnel, the scope and content of training. Only the integration of education, science and industry, the demand for personnel, can solve the problem of employment of young professionals.

The interaction of education, science and industry cannot but affect the methods and forms of teaching in the context of vocational education. The synthesis of a set of educational disciplines, forms and methods of teaching is aimed at forming in the future specialist a more complete idea of the object of his future professional activity. An important aspect of integration is the formation of an open educational space that allows a specialist, regardless of national or state affiliation, to engage in professional activities in accordance with their qualifications.

The integration of education, science and industry can be divided into separate areas. It involves combining the learning process with scientific and or production activities and is the most important form of adaptation of the specialist to the conditions of subsequent professional activity.

Forms of implementation of the directions of education, science and production relations can be classified according to the degree of interaction.

The simplest (interdepartmental) degree involves the interaction of individual scientific, educational and production organizations and their subdivisions.

Local experience includes a range of education, science and industry:

In the first case, educational-scientific-industrial complexes and educational-scientific-production associations, which are a form of cooperation between higher education institutions, research institutes (RI) and industrial enterprises, secondly, the association of departments (faculties) of technical higher education institutions, laboratories (departments) with experimental production sites and workshops of research institutes and industrial enterprises. The main purpose of these structures is to train, retrain, improve skills and ensure the effectiveness of research.

Typically, in the opening of new specialties that require new equipment and qualified specialists in a technical higher education institution, branches of departments are created to use the modern laboratory base and basic departments of research institutes and enterprises. Both branches and basic departments are needed to increase the level of training of future specialists and bring the educational process closer to the realities of modern production.

The final direction of integration is engineering centers, which bring together higher education institutions, research institutes and design bureaus. The main activity of the centers is the development and introduction of new equipment and

https://uzjournals.edu.uz/buxdu/vol5/iss1/20
DOI: 10.52297/2181-1466/2021/5/1/20

technologies, training of personnel required for the introduction of new products into production.

In the Strategy of actions for the further development of the Republic of Uzbekistan the tasks as "continuation of the path of further improvement of the system of continuing education, increasing the capacity of quality educational services, training of highly qualified personnel in accordance with modern needs of the labor market" are stated [2]. In this regard, it is important to systematize the processes of integration of higher education and industry, increase the efficiency of the use of innovative technologies, the introduction of innovative models of the level of professional education based on the requirements and terms of customers.

In the education system of our country, more attention is paid to the training of quality personnel, as well as interactive methods, cooperation with customers, efforts to work as a team. As one of these efforts, we can exemplify the integration of higher education and production. We can see integration with production in various forms. For example, the fact that students go to internships in manufacturing enterprises, the topics of diploma and course projects are based on production problems, the results of research projects are recommended to enterprises, etc. We have set a supreme goal, which is to train modern engineers and meet the needs of customers. So what should be the role of cooperation in achieving such a goal? In order to achieve mutual benefit, of course, responsibilities and mutually specific tasks must be defined.

Results and discussions. Based on the results of analytical study of the research, it should be noted that today, especially in the system of technical higher education, research in purpose to improve the pedagogical capacity of interaction with industry in ensuring the quality of training of modern engineers, the integration of higher education and industry has not been carried out. In the study of higher education and industrial integration, we need to consider the content and essence of the concept of direct integration. Research and analysis of the scientific pedagogical literature show that the term integration is a complex concept with many meanings and refers to multi-level processes. Social-economic, political, cultural, educational system, interdisciplinary, interdepartmental, interdisciplinary integration, higher education and industrial integration in the training of modern engineers are good examples of this [3].

Technical higher education institutions also mainly have close cooperation with manufacturing enterprises. The cooperation is mainly aimed at summer internships, obtaining information on coursework and diploma projects, as well as master's dissertations. We can see that the professors and teachers have established cooperation through their research work and various projects. This partnership is taking shape as an integration of higher education and industry. If we analyze the work and tasks carried out jointly, it becomes clear that more interest is focused on

technical higher education institutions. However, with such integration, it is a bit difficult to train modern professionals who are mutually beneficial. From the above considerations, we can say that it would be expedient to ensure the integration of higher education and production in the training of modern engineers [4].

As you know, integration is a collaborative activity in which two systems work together to ensure that each system achieves more than the apart. In integration two systems work together too, with the aim to achieve a common result. Both systems achieve the set goal by achieving more than the result achieved alone. Research and scientific pedagogical literature have shown that integration is a complex concept with many meanings, representing processes in many areas. A vivid example of this is the integration in the laws of nature, social-economic, political, cultural spheres, the education system, interdisciplinary, interdepartmental, interdisciplinary integration, higher education and production in the training of modern engineers [6].

By integration of higher education and production, we consider not only the training of modern engineers, but also joint activities that take into account the interests of the two systems. Explaining the social and pedagogical significance of higher education and industrial integration is an important task of research. Of course, we emphasize that effective results cannot be achieved without ensuring the integration and implementation mechanism of integrated education and inter-system integration.

In order to ensure the continuity of integration, it is necessary to establish a systematic interaction between higher education and industry. Education of personnel, their advanced training and retraining, as well as joint research, introduction of scientific developments, etc. These integration processes cover different areas of activity and show itself in different forms [8].

The integration of higher education and industry is, firstly, economical efficient, secondly, they accelerate scientific and technological progress, and thirdly, they allow the rational use of the intellectual potential of science and higher education not only in one country but also in global scale. The generalization, analysis, and use of this experience can be of great benefit to all participants in this process. The collaboration of higher education and industry ensures their integration in the training of students in their chosen specialty at the university. The impact of such collaboration depends on the form in which it is implemented, and the open learning space provides the student with a wide range of knowledge, skills, abilities, professional growth, and subsequent opportunities.

The integration of science, education and production and its quality in education and the role of training in adapting to the needs of the labor market and the use of economic and legal mechanisms to increase its effectiveness have not been studied. In order to make relevant recommendations, it is first necessary to study the views on

https://uzjournals.edu.uz/buxdu/vol5/iss1/20
DOI: 10.52297/2181-1466/2021/5/1/20

the content of the concept of quality of education.

The use of new innovative technologies in the teaching of mechanical engineering, which is one of the main areas of specialization taught to students of technical higher education institutions engaged in the training of specialists in modern techniques and technologies, to establish interaction between science and industry. expedient.

Innovative technologies are the pedagogical process and the introduction of innovations and changes in the activities of teachers and students. When using innovative technologies, the educator is required to know the following:

- Knowledge, skills and qualifications in information and communication technologies;
- be aware of foreign experience in modern pedagogical technologies;
- have the ability to use didactic games, interactive methods in the organization of the higher education process;
- mastering knowledge on advanced pedagogical technologies;
- the formation of technology for the transformation of knowledge into skills and abilities;
- be able to effectively use moving games in the classroom;
- be able to connect the lesson to the Internet, if possible;
- work hard, follow the news in each field, etc.

The interaction of education, science and industry leads to the formation of innovative skills of interest of specialists in the field, both theoretically and practically.

Technical higher education institutions train specialists based on the development prospects of modern enterprises in the field of mechanical engineering.

Strengthens the theoretical knowledge acquired by students on the basis of innovative cooperation in the same enterprises. Based on the interest of talented students in the industry, innovative cooperation groups are formed in each area. During this academic semester, this group of students conducts after-school and internship-defined internships at the enterprises attached to them.

Development of proposals and recommendations to improve the quality of education, its content and the role of improving the quality of education based on the study of views on the integration of science, education and industry to fulfill the priorities of education in our country.

Cooperation in the field of innovation is a mechanism that strengthens the processes of scientific and technological integration, creates a harmonious, active innovation environment, which provides mutual exchange of experiences between strategic partners and suppliers, and on this basis economic and technological progress.

Conclusion. As a basic principle of integration, we can indicate that technical higher education institutions and manufacturing enterprises have the same responsibility in the process of training quality professionals. At the same time, it pursues the interests of both parties. One of the main interests of the higher education system is to train modern engineers, work on scientific projects, conduct internships, etc., using the technical base and opportunities of this production. The interest of the manufacturing enterprise is, first of all, the opportunity to search for, select and create a database of specialists, to reduce the costs of retraining and adaptation, to train the necessary specialists. At the same time, the employer takes an active part in the formation of professional knowledge of specialists, the adaptation of graduates to the working conditions of the enterprise and the formation of "teacher-coaching" systems. In turn, students not only get acquainted with certain production conditions and master the basics of professional activity, but also have the opportunity to get a job in their specialty after graduating from technical higher education institutions.

REFERENCES

1. Decree of the President of Republic of Uzbekistan dated October 8, 2019 No PF-5847 "On approval of Concept of development of the higher education system of Republic of Uzbekistan until 2030". www.lex.uz

2. Decree of the President of Republic of Uzbekistan dated February 7, 2017 No PF-4947 "On the Strategy of actions for the further development of the Republic of Uzbekistan". Collection of legislative acts of Republic of Uzbekistan, 2017, No. 6, Article 70, No. 20, Article 354, No. 23, Article 448.

3. Kustov Yu.A. Succession of professional and higher education institutions. - Sverdlovsk: Publishing House of Ural University, 1990.

4. Suleymenov E.Z., Vasilieva N.V. "Integration of education and science", - Almaty, National center of scientific and technical information of Republic of Kazakhstan, 2006

5. Fedorets G.F. Problems of integration in theory and practice of teaching (Paths of development). - L., 1990.

6. Fayzulloyev, O. M. (2018). The peculiarities of the interpretation of the Uzbek fairy tales. ISJ Theoretical & Applied Science, 12 (68), 212-215.

7. Fayzulloyev, Otabek Mukhammedovich and Durdiyeva, Dilnoza Durdimurodovna (2021) "Technology For The Selection Of Adequate Options In The Translation Of Children's Games," Scientific reports of Bukhara State University: Vol. 4 : Iss. 6 , Article 9. https://uzjournals.edu.uz/buxdu/vol4/iss6/9

8. Begimkulov U.Sh. "Informatization of pedagogical education: theory and internship", Monography, Tashkent. Fan, 2011, pp. 1-232.

9. Nuridinov B.S., Urinov U.A. "Social cooperation in the field of education, a factor of training qualified personnel", Journal of vocational education, vol. 6, no. 1, pp. 11-16, 2003. ISSN: 2010-7498.

10. Urinov U.A. "Social psychological priorities of social cooperation", European Journal of Research and Reflection in Educational Sciences. Great Britain. Progressive Academic Publishing, vol. 8, no. 2, pp. 62-65, 2020. ISSN: 2056-5852.

11. Urinov U. "Status and problems of cooperation with higher educational enterprise

https://uzjournals.edu.uz/buxdu/vol5/iss1/20
DOI: 10.52297/2181-1466/2021/5/1/20

enterprises", International Journal of Psychosocial Rehabilitation, vol. 24, no. 8, pp. 5277-5282, 2020. ISSN: 1475-7192.

12. Urinov U.A. "Methods of formation of professional skills and abilities of students in the framework of social partnership in higher education", Scientific-theoretical and methodical journal Pedagogical skills, vol. 3, no. 3, pp. 76-79, 2019. ISSN: 2181-6833.

13. Adizova S.Yu. "Innovatıon In Scıence, Educatıon, And Productıon Integratıon As A Successor" International Journal of Advanced Science and Technology, Vol. 29, No. 8, (2020), pp. 3167-3172, ISSN: 2005-4238 IJAST.

14. Tukhtaeva Z.Sh., Adizova S.Yu. "Specific features of organizing integrated lessons" Journal "International journal of innovations inengineering research and technology [IJIERT]" Volume 7, Issue 4, Apr.-2020.P 250-254.