PRACTICE-ORIENTED EDUCATION IN UNIVERSITIES: OPPORTUNITIES AND CHALLENGES

Gulmira Tashkeyeva
Kamila Adilzhan
Karlygash Yessenamanova
Makpal Khamitova
Gulnara Nauryzbayeva
Al-Farabi Kazakh National University, **Republic of Kazakhstan**

ABSTRACT

Today, the developing countries face a situation where there is an abundance of specialists with higher education, while the economy lacks qualified practice-oriented personnel. In general, there is a disproportion between the ever-increasing demand of specialists and supply on the labor market, and between the way of professional education and modern business.

Society requires the commercialization of fundamental knowledge, the restructuring of the education system. Without losing its fundamental nature, education today acquires a new, practice-oriented content.

The integration of education, science, and production is the joint use of the potential of educational, scientific and industrial organizations in mutual interests [1].

Kazakhstani universities are becoming leading scientific organizations generating new knowledge and new technologies – national laboratories are being created on the bases of large universities; work is underway to strengthen the university's scientific potential; the integration of university science with production has begun, with some of the most successful universities being granted research status, and so on. Since the current global industry receives new technologies from universities' research centers there is a need to adjust educational activities of HEIs. Scientists must have real opportunities and incentives to engage in scientific research.

Since the competence is a multifunctional tool for measuring the quality of professional education, the competency-based approach, which is focused on the organization of educational and cognitive activity by modeling a variety of situations in various areas of the individual's life, could be an effective tool to increase the practical level of training in higher education.

The implementation of a practice-oriented system of training of an innovatively competent specialist focuses on the result of education, where the result is not the amount of learned information, but the person's ability to act in various situations. Such a system is aimed at improving interaction with the labor market, increasing the competitiveness of specialists, updating the content, methodology and related learning environment.

Methodology: case study.

https://doi.org/10.5593/sgem2020/5.2/s22.103

Study results: the case study shows that the implementation of a practice-oriented system of training an innovatively competent specialist, focusing on the result of education improves interaction with the labor market and increases the competitiveness of specialists. Therefore, this approach can significantly increase the effectiveness of training.

Keywords: practice-oriented system, innovation-competent, competency-based approach, integration, education, business, science, new technologies.

INTRODUCTION

The development of applied sciences and high technologies leads to the creation of a new economy – the “knowledge economy". Society requires the commercialization of fundamental knowledge, the restructuring of the education system. Without losing its fundamental nature, education acquires a new, practice-oriented content.

The developing countries came to a situation where specialists with higher education were in abundance, and the economy lacked qualified practice-oriented personnel. Employers need competent specialists to conduct real business, innovative managers, without which the commercialization of high technology is impossible. In general, there is a disproportion between the ever-increasing demand of specialists and supply on the labor market, between the way of professional education and modern business.

The integration of education, science, and production is the joint use of the potential of educational, scientific and industrial organizations in mutual interests [2]. Kazakhstani universities are becoming leading scientific organizations generating new knowledge and new technologies – national laboratories are being created on the bases of large universities; work is underway to strengthen the university's scientific potential; the integration of university science with production has begun, with some of the most successful universities being granted research status, and so on.

Today, the global industry receives new technologies from research centers – universities. Most of the leading universities in the world have been working with major corporations for many decades. Work aimed at solving a specific problem stimulates the emergence of an “innovative conveyor” that moves the leading economies of the world forward. Most universities with scientific traditions conduct world-class research in dozens of industries and in many different areas at the same time. Since nowadays higher education institutions are faced with the task of mastering new areas of specialist training in the field of innovation process management and the commercialization of technologies, it is necessary to train in the management of innovative projects, marketing of innovations and innovative products, technology transfer, patenting and other forms of intellectual property protection, the formation of innovative networks in the scientific and industrial communities [2].

We need to actively introduce the achievements of science into production. There was a need to make adjustments to the educational activities of universities. Scientists must have real opportunities and incentives to engage in scientific research. Education cannot be practice-oriented without gaining experience, the level of which is more accurately determined by the methods of the competency-based approach.

The introduction of the concept of competence as “the ability to mobilize knowledge and experience to solve specific problems” allows us to consider competence as a multifunctional tool for measuring the quality of professional education.

The competency-based approach is closer to the goals and objectives of a practice-oriented education, as it determines the turn to strengthen students' practical training, i.e. the formation of adapted skills, experience of active creative activity, emotional-volitional relations to the world, other people and oneself, and most importantly, practical experience through an increase in students' production and research practice [3-5]. The competency-based approach focuses on the activity content of education. The main content of the training is actions, operations related to the problem that needs to be solved. With this approach, educational activity acquires research and practice-transformative character. In the curriculum, the activity content of education is reflected in the emphasis on the methods of activity, abilities, and skills that need to be formed; on the experience of activities that should be accumulated and comprehended by students. The student should, if necessary, be able to quickly and accurately use the sources of information to resolve certain problems.

Active participation in the educational process of students is a product of the teacher’s activities, therefore, the formation of key competencies is possible with their systematic inclusion in various types of educational and extracurricular activities. The competency-based approach is focused on the organization of educational and cognitive activity by modeling a variety of situations in various areas of the individual’s life. With this approach, preference is given to creative activity, the main task of which, in contrast to the traditional one, is the organization of productive activity.

The competency model of a graduate is often presented as a set of expected (desired) educational results, the achievement of which a student can demonstrate at one stage or another in mastering the main program or as a package (set) of competencies that each graduate of this program must master [4].

In the higher education system, there are several approaches to practice-oriented learning (Figure 1).

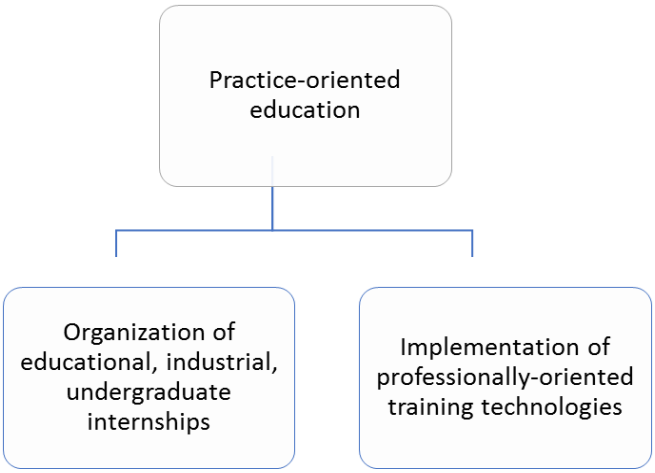

Figure 1. Organization of practice-oriented education [1]

While for some specialists, practice-oriented education is associated with the organization of a student's training, production and undergraduate practice with the aim of immersing him in a professional environment, correlating his idea of a profession with the requirements of a real business, others consider the introduction of professionally oriented technologies to be the most effective training, contributing to the formation in students of significant personal qualities for future professional activity, as well as knowledge, skills and skills that ensure high-quality performance of functional duties in the chosen specialty.

From this perspective, the traditional element of education – the practice of students - acquires a new meaning and becomes an essential element of university training programs. It is necessary to make the practice truly continuous, mainly in the same organization or in the same industry vertical.

During the introductory practice, students master the experience of educational-cognitive activities of the academic type, where the actions of specialists are modeled, theoretical issues and problems are discussed. In industrial practice, experience is gained in professional activity as a specialist in an organization (or his assistant). In pre-diploma practice, there is an integration of ideas about the activities of the organization, its business processes, proposals are developed aimed at improving the efficiency of production activities. Of course, such a model of continuous practice is not feasible in the conditions of a random choice of practice sites. In our opinion, the search for permanent business partners (employers) and the organization of branch departments at them is of great importance. In this case, the reverse process arises rather quickly. Employers begin to consider specific students as their talent pool and make suggestions to improve the content of specific disciplines, and then – work and training programs.

Branches of departments at enterprises and scientific institutions are a common form of integration of higher education with science and industry in our country. They are created for the effective use of the research and laboratory facilities of enterprises in the educational process, for the training of specialists in new areas in which the university does not have an educational and laboratory base, as well as for the development of communication between university teachers and enterprises in the field of scientific research [1].

At the Faculty of Physics and Technology, Al-Farabi Kazakh National University, the Department of Solid State Physics and Nonlinear Physics conducts joint training of undergraduates and doctoral students with the Astrophysical Institute, as well as laboratories of materials science and electronics of NCCIT. At present, it is planned to conclude an agreement on opening a branch of the department in large telecommunication companies of the Republic of Kazakhstan [6-8].

Modern requirements for the training of an innovatively competent specialist lead to the fact that production and research practices should be based on the latest, most expensive equipment. Therefore, the base of practices should be selected in accordance with the real needs of production and have all the necessary resources to improve the skills of future specialists.

Studying the experience of organizing vocational education shows that the principle in the training of a specialist is its practice-oriented nature. This is expressed in a number

of features, of which the most important are: the total number of hours devoted to practical education (up to 50% of the time of study at the university); the use of certain (creative) methods in training (the method of problem-oriented learning, the method of projects, etc.); orientation of training to work in a group, team; the integration of academic subjects as a "way of approaching" the educational (classroom) situation to the real, actual; a way to set a holistic view of future professional activity and its large fragments; guidance practice by an experienced mentor [5].

We are convinced that in order to organize a practice-oriented training system for an innovatively competent university graduate, an activity-competent approach is needed. The vector of the activity approach is aimed at organizing the learning process, technologies of practice-oriented education, where the entire learning process takes on an activity character. The competency-based approach is focused on the achievement of certain results, the acquisition of significant competencies. Mastering competencies is impossible without gaining experience, i.e. competencies and activities are inextricably linked. Competencies are formed in the process of activity and for the sake of future professional activity. Under these conditions, the learning process takes on a new meaning, it turns into a learning process (learning), i.e. into the process of acquiring knowledge, skills, and experience in order to achieve professionally and socially significant competencies.

For the successful organization of practice, it is necessary to adjust the work programs for practice. The structure of tasks should be systemic, with many system-forming principles, but there should be one more principle – the principle of dynamism. All work tasks must be connected by a single internal logical line.

At various stages of the development of the educational system, the key methodological approaches to learning are used: practice; broadcast material; analysis and analysis of situations; the game; imitation; project.

The project is one of the most effective teaching methods. The essence of the project approach is that the student is integrated into the collective work system aimed at solving a real practical problem. Designing the development of the situation, analyzing the data, he or she gets the opportunity to master a way to perform the relevant work or task. The group form of organizing the training project forces the participants to organize joint activities and establish working communications, that is, it teaches to act in a team.

At the Department of Solid State Physics and Nonlinear Physics, Faculty of Physics and Technology of Al-Farabi Kazakh National University, the project method is used when performing thesis.

Creative teams of teachers and students belong to the intra-university form of integration. The involvement of students in scientific, engineering and commercial activities under the supervision of senior colleagues has a beneficial effect on the development of creative abilities of future specialists, and affects the improvement of the quality of their training.

Intensive targeted training is a system that includes the selection of students according to their inclinations, the intensive development of identified inclinations and the

targeted use of trained specialists is carried out on a contractual basis between universities and enterprises [1].

Integration of Al-Farabi Kazakh National University with large enterprises is carried out within the framework of the Faculty of Physics and Technology through cooperation with international companies:

1. “Huawei Technologies Kazakhstan” LLP has opened the HAINA (Huawei Authorized Information and Network Academy) Academy of Information and Communication Technologies (ICT).

2. Huawei provides the necessary ICT equipment class for classes. Presented the opportunity to certify the best students of this course. This will allow our graduates to become highly qualified specialists in the field of information and communication technologies, digital technologies and telecommunications, which corresponds to the priority areas noted by the head of state.

3. The Huawei company issues vouchers representing a 100% discount on passing the certification exam to all graduate students of the HAINA-KazNU Academy [9].

It is planned to organize regular practice for the most successful and talented students of the Academy on the basis of the headquarters of the Huawei company in Almaty, as well as in the branches of the partners of the company, both on open vacancies and on internship positions. Additionally, Huawei regularly holds Republican Olympiads. Students who showed the best results at the national stage of the competition received awards from the company, and 3 (three) of them got the opportunity to represent Kazakhstan at the International stage of the competition in the city of Shenzhen, China.

Since September 2015, Al-Farabi Kazakh National University and Samsung Electronics have successfully mastered the Samsung Innovative Service Academy. During this time, teachers of Al-Farabi Kazakh National University held special courses for students of the specialty "Radio Engineering, Electronics and Telecommunications" in the development of software for mobile devices and conducted applied research in the field of information and communication technologies and digital solutions based on devices and infrastructure provided by the company Samsung Electronics. Several student developments for the company's Start-up contests were also proposed, and some of them are functioning today.

Since December 2019, a pilot educational project has been launched and special certification courses in Machine Learning for students of Al-Farabi Kazakh National University, as well as for other universities of the Republic of Kazakhstan. Equipment and full support is carried out by employees of the Department of Solid State Physics and Nonlinear Physics together with employees of Samsung Electronics.

In 2019, an agreement was signed with the international company Eltex on the joint training of specialists in the field of industrial electronics and telecommunications. The company has provided equipment for trial research and application in training, and is also ready to provide equipment for the educational process on the basis of joint financial contributions.

Practice is the main "piggy bank" of experience and is aimed at acquiring practical experience by type of professional activity. Each employer wishes to hire a ready-made specialist with experience. In each graduation group there are graduates who get jobs in those organizations where they underwent practice. The use of such forms provides a gradual immersion in a real professional environment, which contributes to a more rapid adaptation of graduates in the workplace and in the professional environment; willingness of the future specialist to work in a team; ability to present oneself.

CONCLUSION

The implementation of practice-oriented training at the university is aimed at bringing the educational organization closer to the needs of life, and allows creating conditions for targeted training of an innovatively competent university graduate.

The implementation of a practice-oriented system of training an innovatively competent specialist, focusing on the result of education, when the result is not the amount of learned information, but the person's ability to act in various situations, is aimed at improving interaction with the labor market, increasing the competitiveness of specialists, updating the content, methodology and related learning environment. Therefore, this approach can significantly increase the effectiveness of training. This is facilitated by a system for selecting the content of educational material, which helps students assess the significance, practical relevance of acquired knowledge and skills. In a practice-oriented educational process, the students' existing life experience is applied, and a new experience is formed on the basis of acquired competencies. This experience becomes the basis for the development of students. Thus, a model of the competitive personality of the future specialist is formed.

REFERENCES

[1] Tashkeyeva, G., Sadirbekova, D., Zulbukharova, E., Abykanova, B., Sariyeva, A. Practice-oriented education in universities: Opportunities and challenges. International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, Bulgaria, 2019, pp 245 - 250;

[2] Medeubaeva, K., Assilbayeva, F., Shokobaeva, G., Mukhamejan, N.Interactive teaching in the educational environment of a university 18th International Multidisciplinary Scientific Geoconference SGEM 2018, Bulgaria, issue 5.4, pp. 161-169, 2018.

[3] Yar-Mukhamedova, G., Yar-Mukhamedov, E. Investigation of corrosion resistance of chrome based nano-composition coatings in the conditions of oil production.12th International Multidisciplinary Scientific Geoconference SGEM, Bulgaria, Vol.12/issue 56, 2012, pp. 475 - 480;

[4] Abykanova, B. et. al. Professional competence of a teacher in higher educational institution International Journal Of Environmental & Science Education, Turkey, 2016, Vol. 11, /issue 8, pp. 2197-2206, 2016;

[5] Abykanova, B., Sariyeva, A., Sadirbekova, D., et. al. Application of methods of interactive training in the educational environment of higher educational institutions

16th International Multidisciplinary Scientific GeoConference SGEM, Bulgaria, 2016, pp. 747-754;

[6] Imashev, G., Kenzegulov, B.Z., Sardarova, Z.I., et. al. Applied questions of electrodynamics in physics course International Electronic Journal of Mathematics Education, United Kingdom, vol. 11/issue 7, pp. 2163-2177;

[7] Idrissov, S. et. al. Intensification of students' creative activity in educational environment of higher educational institutions, Life Science Journal, USA, 2014, pp. 133-137;

[8] Yar-Mukhamedova, G.Sh. Investigation of the texture of composite electrodeposited chromium-carbon coatings // Materials Science. Vol. 36, №5, 2000.- Pp.752-754.

[9] Alimgazinova, N. et. al. Innovative methods of training disciplines of the electrotechnical cycle. International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, Bulgaria, pp 153 -161, 2018.