

Innovative methods of human capital formation during bachelors academic training

E.S. Belokurova

Graduate School of Biotechnology and Food Science

Peter the Great St. Petersburg Polytechnic University

Saint-Petersburg, Russia
belokurova_es@spbstu.ru

I.A. Pankina

Graduate School of Biotechnology and Food Science

Peter the Great St. Petersburg Polytechnic University

Saint-Petersburg, Russia
pankina_ilona@spbstu.ru

T.V. Pilipenko

Graduate School of Biotechnology and Food Science

Peter the Great St. Petersburg Polytechnic University

Saint-Petersburg, Russia
pilipenko_tv@spbstu.ru

Abstract—The article is devoted to the formation of human capital. Education plays a big role in this process. The formation of human capital begins in childhood and occurs throughout life.

The basis of the modern development strategy of higher education is a competence-based approach that requires improving the quality of education in order to form an active, creative personality of a specialist who is capable of self-education, innovation activity, professional mobility and competitiveness.

At present, innovative educational technologies are widely used in many higher educational institutions of Russia.

In recent years, the following items were included in the educational process: problem lectures, interactive laboratory workshops, role-playing games, interdisciplinary courseworks, health-saving technologies, module-rating learning system, personality-differentiated approach to learning, research method of teaching, organized self-directed work of students.

Keywords—educational technologies, teaching methods, competences.

I. INTRODUCTION

In the XXI century, the problem of human capital formation as an important component of the modern society evolution became an urgent task in many countries of the world [1]. Education plays an important role in the process of human capital formation.

Nowadays, the problem of meeting the needs of society for highly qualified specialists is very urgent throughout the world and in our country. In this regard, much attention is paid to improving the quality of education in universities.

On September 1, 2013, the Federal Law of the Russian Federation “On Education in the Russian Federation” No. 273-FZ dated December 29, 2012 [1] entered into force in Russia. One of the main tasks of modern Russian education is training of highly qualified and competitive specialists, which are required at the international labor market.

The quality of education should be improved in order to obtain specialists able to meet competition.

According to the Federal Law No. 273-FZ, the Russian Federation establishes the following levels of professional education:

1. Secondary vocational education;

2. Higher education – Bachelor’s program;
3. Higher education - specialist program, Master’s program;
4. Higher education - training of top-qualification specialists.

So, the professional education is supposed to be multi-level.

The main targets for realization of the Federal State Education Standards of Higher Vocational Education (FSES HVO) of the third generation are the competence gained in the course of training. Here the term competence means the ability to apply knowledge, skills and personal qualities to achieve success in a particular area.

The content of knowledge, skills and abilities of vocational training should provide obtaining a certain qualification. Educational content is determined by educational programs. Educational programs of higher education include bachelor’s programs, master’s programs and postgraduate programs.

II. METHODS

There are various methods in educational technologies: problem, research, developing, group, interactive, labor, creative and others

The basis of the modern development strategy of higher education is a competence-based approach that requires improving the quality of education in order to form an active, creative personality of a specialist who is capable of self-education, innovation activity, professional mobility and competitiveness [2-4].

At present, the issue of ultimate significance is not the amount of knowledge in various disciplines that a student has acquired while studying at a university, but the ability to apply them in his professional activities, to improve his skills, to educate himself and self-improvement [5-12].

The implementation of the competence-based approach involves evolution of fundamental and practical orientation of curricula, creation of a system of continuous education, improvement of teaching quality, introduction of innovative educational technologies. SPbPU seeks with maximum responsibility to implement the state policy in the field of higher education. One of the directions of this policy is creation of a new economy: economy of knowledge, leadership and innovation. The key element is highly skilled

engineering personnel, who own advanced world technologies, are able to solve new complex problems of industry and are ready to bring the Russian economy to a new level of development.

III. RESULTS

The Higher School of Biotechnology and Food Technologies of Peter the Great St. Petersburg Polytechnic University conducts training for bachelor and master specialists both in general education subjects such as general chemistry and methods of chemical analysis, bioorganic chemistry, general biology and morphology, and in special ones focused on biotechnology of food industry and public food service technology [13]. Based on fundamental knowledge obtained during study of general education disciplines, a basis is developed for further professional training, as well as analytical thinking and the ability to independently acquire knowledge, so that in future professional activities one can not only solve technological problems, but also create new types of food products [14-16].

Educational work programs of disciplines are built on the basis of a systematic approach to determining the content of training, a specific sequence of studying various disciplines has been developed, allowing one to ensure continuity and succession of knowledge. The content and structure of educational disciplines are subordinated to the goals of professional training, so that future technologists and biotechnologists of food industry can understand what is required for each discipline.

For the best mastering of educational material in the system of higher educational institutions, training in the main disciplines is carried out using both well-proven classical forms of education: lectures, laboratory and practical classes, and modern forms, including distance learning using electronic educational resources. The university realizes the possibility of free education on the basis of modern educational platforms: Open Education, Lectorium, Open Polytech, Coursera, etc., where one can take online courses in basic disciplines studied at Russian universities and universities of the world.

In recent years, the following items were included in the educational process: problem lectures, interactive laboratory workshops [1,2], role-playing games, interdisciplinary courseworks, health-saving technologies [3], module-rating learning system [4], personality-differentiated approach to learning [5], research method of teaching [6,7], organized self-directed work of students [8].

The educational methods used at the Higher School of Biotechnology and Food Technologies are focused on the all-round evolution of person, fundamentalization of education, the use of advanced information technologies, and therefore electronic educational resources are being developed.

One of the modern disciplines is the "Basics of project activity", in which students learn to work in a team in accordance with casted roles. Teamwork teaches students how to manage a small group of people, which will certainly help them in their future professional activities.

From the first year of study, students of SPbPU take an active part in many events held at the site of the University and other educational institutions. These are student scientific

conferences, subject competitions, cultural and sports events, career guidance events for schoolchildren using special and laboratory equipment (microscopes, test kits, titrating apparatus, etc.). Every year in November, the University hosts the Scientific and Practical Conference "SPbPU Science Week" for students, graduate students and young scientists with international participation. Each student has the right to participate in the conference, both with a report and with theses publication. In February and March, students participate in the celebration of Maslenitsa, which SPbPU conducts for residents of the Kalininsky district of St. Petersburg. 2-3 times during the school year, students help teachers in preparation and conduction of workshops and research shows for the University of Children. The students are very helpful in preparing and holding Open Days, in preparing and holding voluntary work days in spring and autumn.

All ongoing activities in SPbPU with the participation of students can be classified and presented in the form of a diagram (Fig. 1).

IV. CONCLUSION

Thus, during learning, participation in events, students not only acquire knowledge and skills, but also develop socially important and professionally important personal qualities, that is, the future specialist becomes personalized.

Innovation educational technologies allow developing collective mental activity, ability to work in a team, sense of purpose, high creative abilities, that is, to carry out formation of professionally significant chemical and technological knowledge of future food technologists and biotechnologists of the food industry. It should be noted that pedagogical innovations make it possible to intensify not only the work of students, but also the teaching staff to improve the educational process. Enthusiasm, creative search should go from the teaching staff, since the outlook of the student as the future leader, his positive attitude towards life and his profession are formed at the university.



Fig. 1. Activities for students carried out at SPbPU

The formation of human capital begins in childhood and occurs throughout life. Education has an important influence on formation of human capital. Modernization of the Russian education significantly affects organization of the educational process in higher education institutions. One of the main tasks of improving the education system is to create conditions for self-realization and evolution of students. A person who is able to realize himself is in demand in modern society, which is noted in the legal documents defining the educational policy of the country.

REFERENCES

- [1] E. Razinkina, L. Pankova, I. Trostinskaya, E. Pozdeeva, L. Evseeva, A. Tanova, Student satisfaction as an element of education quality monitoring in innovative higher education institution. E3S Web Conf., Volume 33, 2018, High-Rise Construction 2017 (HRC 2017)
- [2] N. Almazova, D. Barinova, O. Ipatov, (2018). Forming of Information Culture With Tools of Electronic Didactic Materials, Proceedings of the 29th DAAAM International Symposium, pp.0587-0593, B. Katalinic (Ed.), Published by DAAAM International, ISBN 978-3-902734-20-4, ISSN 1726-9679, Vienna, Austria.
- [3] N. Almazova, S. Andreeva, L. Khalyapina The Integration of Online and Offline Education in the System of Students' Preparation for Global Academic Mobility. Digital Transformation and Global Society. Third International Conference, DTGS 2018 St. Petersburg, Russia, May 30 – June 2, 2018 Revised Selected Paper, Part II. p. 162-173.
- [4] L. M. Borisova, E. S. Belokurova, I. A. Pankina Innovative methods in the preparation of bachelors in the University Materiály X mezinárodní vědecko - praktická konference "Aplikované vědecké novinky – 2014". - Dyl 9. Pedagogy.:Dust's. Publishing House "Education and Science". p. 66-71
- [5] E. S. Belokurova, L. M. Borisova, I. I.A. Pankina Educational and methodical questions of the organization of laboratory practice in the higher professional institution. Materials of the X International scientific-practical conference "Science: theory and practice - 2014" Volume 5. Pedagogical science. Psychology and sociology.: Przemysl. Science and education - 104). p. 39-42.
- [6] C.-H. Wang, D. M.Shannon, & M. E. Ross, (2013). Students' characteristics, self-regulated learning, technology self-efficacy, and course outcomes in online learning. Distance Education, 34, 302–323. doi:10.1080/01587919.2013.835779. [Taylor & Francis Online], [Web of Science].
- [7] U. Doris Bolliger & Martin Florence (2018) Instructor and student perceptions of online student engagement strategies, Distance Education, 39:4, 568-583, DOI: 10.1080/01587919.2018.1520041
- [8] Patrick R. Lowenthal & Joanna C. Dunlap (2018) Investigating students' perceptions of instructional strategies to establish social presence, Distance Education, 39:3, 281-298, DOI: 10.1080/01587919.2018.1476844.
- [9] Doris U. Bolliger & Colleen Halupa (2018) Online student perceptions of engagement, transactional distance, and outcomes, Distance Education, 39:3, 299-316, DOI: 10.1080/01587919.2018.1476845.
- [10] Hengtao Tang, Wanli Xing & Bo Pei (2018) Exploring the temporal dimension of forum participation in MOOCs, Distance Education, 39:3, 353-372, DOI: 10.1080/01587919.2018.1476841.
- [11] Jill W. Fresen (2018) Embracing distance education in a blended learning model: challenges and prospects, Distance Education, 39:2, 224-240, DOI: 10.1080/01587919.2018.1457949
- [12] Yukselturk, E., & Bulut, S. (2007). Predictors for student success in an online course. Journal of Educational Technology & Society, 10(2), 71–83. Retrieved from <https://www.learntechlib.org/j/JIOL/>[Web of Science®].
- [13] L. M. Borisova, E. S. Belokurova, I. A. Pankina well. Experience in the application of personality-differentiated approach to learning in high school. Development of the creative potential of a person and society: materials of the II international scientific conference on January 17-18, 2014.- Prague: Vědecko vydavatelske centrum "Sociosfera-CZ" - 256 p.
- [14] E. S. Belokurova, L. M. Borisova, V. V. Pelenko the Use of the Institute of tutoring in the organization and management of the educational process at the University. // Technical and technological problems of service. 2015. №2 (32), p. 96-100.
- [15] E. S. Belokurova, I. A. Pankina The role of nutrition in the formation of human capital. The European Proceedings of Social & Behavioural Sciences EpSBSe-ISSN:2357-1330, Volume LI, Pages 1-2014(30December2018), Selection and peer-review under responsibility of the Organizing Committee of the conference p.1367-1377.
- [16] N.T. Zhilinskaya, S.A. Eliseeva, N.V. Barsukova The Role Of Interdisciplinary Scientific Research In Forming Specialists Of Food Biotechnology. The European Proceedings of Social & Behavioural Sciences EpSBSe-ISSN:2357-1330, Volume LI, Pages 1-2014(30December2018), Selection and peer-review under responsibility of the Organizing Committee of the conference p. 1458-1466.