

Education in the Context of Globalization and Technological Changes: Issues of Skills and Competencies in Training Programs

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Abstract

Public administration is concerned with the implementation of governmental policy that serves the wide population, carrying political activity and decision into actions and developing public programmes for the well-being of the society and the citizens. Public administration education and training is one of the critical areas, wherein the universities and training institutions play an important role. The standards and quality of public administration education and training have to in consonance with the pace of globalization and technological changes. Doubling the amount of information occurs on average every 10 years and the need to update and improve knowledge, the need in additional education occurs every three to five years, therefore, in order to keep up with the pace of scientific and technological progress, it is necessary to learn throughout life. Innovation resources, especially financial ones, are always limited in scope, so they need to be structured and used as efficiently as possible. At the same time, along with adequate investment, the success of the national science, technology and innovation policies, as shown by the experience of many countries, also depends on identifying the exact future challenges and opportunities (Gokhberg, L., D. Meissner, A. Sokolov, 2016).

The aim of this research is to study the issues of the training programmes in the context of implementation of public policy in the field of development of science, technology and innovation. The methodological basis for the article is made up of the laws, regulations, and guidelines of the Republic of Latvia and EU, as well as scientific works of foreign authors, also research carried out by the authors. Among the main competences in programmes development can indicate managing of innovation projects, methods of conceptual and critical thinking, startup support programmes and commercialization of innovations, which can then be applied to a number of industries and professions. The research results indicate the need to implement targeted training programs that develop the above-mentioned competencies. The leading role in these issues plays universities, public administration, training organizations and the industry experts.

Keywords: public administration, education, training, technology, innovation

Introduction

Education is one of the foundations of national competitiveness. Within medium and long-term, the national economies of developed countries will be faced with shortages of professional and highly qualified (mostly with college or higher education level) labor. According to the medium and long-term prospects of Latvia's labor market, restructuring of the national economy is hampered by the shortage of appropriately prepared specialists. The main challenges we will face in the future, is insufficient number of qualified professionals, mainly in the fields of nature and engineering (both secondary and higher education levels), and

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the lack of highly qualified specialists with the skills required for the future-technical specialization, which is combined with business and troubleshooting skills. For resolution of these challenges, it is not enough with the increase of the number of budget places; improvements of the education system as a whole are required, including development of creative thinking and fostering the development of creative partnerships at all levels of education.

Educational policy makers need support from researchers for the regular monitoring of the quality of education, incl. the development of monitoring tools, the analysis of results and the development of recommendations, the development of scientifically based instruments and indicators for the assessment of the quality of the learning environment. Specially supported educational studies focusing on innovation in improving teaching methodology. The aim of this research is to study the issues of the training programmes in the context of implementation of public policy in the field of development of science, technology and innovation. The research results indicate the need to implement targeted training programs that develop the main competences such as can indicate managing of innovation projects, methods of conceptual and critical thinking, startup support programmes and commercialization of innovations, which can then be applied to a number of industries and professions. Analysis of the strategy development of Latvia and the EU, the analysis of regulations, also the results of a students and an entrepreneurs survey allow us to work out the directions to improve training programmes, in the context of innovation development and existing business needs. The aim of the integration of education, science development, technology, innovation and business is improvement of the cooperation abilities for scientists and scientific institutions, promotion of scientific activity on application in compliance with industry and market demand for new technologies and innovative solutions. Ensure use of research results funded from public resources for creation of innovative products and services.

1. The Main Competences in Training Programmes Development

The innovative solutions in the educational field closely connected with the business development and scientific researches. The development of business depends on development of the science and of the quality educational programmes. "Latvia 2030" highlights investment in human capital and lifelong learning. Social inequality, migration, security threats, aging populations, depletion of natural resources, depopulation in the countryside - the consequences of these processes are complex and affect people both as market players and as members of society. In order to build an effective policy for the benefit of society (government) and intelligently invest resources in new products, organizational and technological innovations (administration, entrepreneurs), it is necessary to build on a nuanced, up-to-date understanding of the situation, its risks, local reactions to global developments, and optimal solution models.

Sufficient and high quality human capital, appropriate infrastructure, including the infrastructure required for technology development and innovation, and enhanced cooperation is a precondition for the investments in the research and innovation to be effective. Joseph A. Schumpeter sees innovation as the introduction of new products or a new production method, the opening of a new market, accessing new sources of raw materials or, finally, the reorganization of economic processes (Schumpeter, 1934). However, P. F. Drucker determines innovation as a particular entrepreneurial tool by which a change is turned into an opportunity to commence new economic activity or provide a new service. He claims that innovation does not have to be technical, or even of a material nature (Drucker, 1992).

Sufficient scientific and research capacity is an important prerequisite for transformation of Latvia's national economy to the knowledge and innovation-based model. It is necessary to increase the number of persons employed in science by increasing the number of doctoral students, to invest in development of science and research infrastructure, to create well-equipped laboratories for implementation of technology-oriented projects to growing of the commercialisation potential of research results and to build a model of cooperation between the scientific and economic sectors.

The National Development Plan defines the development of competences of the Latvian population as one of the priority directions of action in the context of human security. But the focus of expert focus group discussions was often critical of Latvia's education system and its ability to prepare a skilled workforce that could work in science-intensive industries. This criticism was usually expressed by experts in science, technology, engineering and mathematics.

A modern and future-oriented education system that promotes the transformation of the economy and the implementation of the priorities of the smart specialization strategy is defined as one of Latvia's priorities for growth. Educational policy makers need the support of researchers to carry out regular monitoring of the quality of education, incl. in the development of monitoring tools and recommendations, as well as in the development of scientifically based tools and indicators for quality assessment of the learning environment.

Figure 1 shows a picture of the main competences of innovative entrepreneurs affecting the growth and development of the technology based start up.

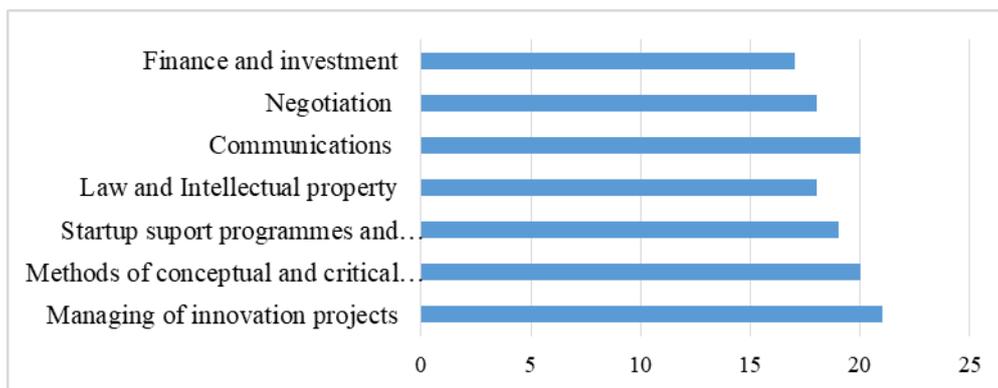


Figure 1. The main competences of innovative entrepreneurs

The data was obtained as a result of a survey of innovative entrepreneurs, representatives of Latvian technological startups who are engaged in technology commercialization projects and were created on the Commercialization Reactor platform. The survey of the CEOs and start up team members was conducted by the authors in January of this year. The technologies are relate to the different fields of science, such as IT, Artificial Intelligence, Biotechnology, Industry& Engineering, Agriculture, Medical.

2. Indicators of the Study Process Evaluation

The Eurostudent project research provides insight into current issues such as: access to higher education, description of study conditions, assessment of the study process, international mobility during studies, student employment, integration into the labor market, structure of student income and expenditure, participation in society life.

The Eurostudent project is an international initiative where student surveys are conducted according to a common methodology since 1999 in the countries of the Bologna Process. This year in Europe, the Eurostudent

study is being carried out for the sixth time, with 30 countries participating. Latvia has participated in the project since 2003, when the second phase of the research was implemented. The Eurostudent VI (2017) study in Latvia was implemented by the Institute of Philosophy and Sociology of the University of Latvia. In the study quality evaluation are included the main aspects of the study process such as the study infrastructure, the study process organization and the quality of the study course teaching.³ The indicators of the study programmes evaluation are present in the table 1.

Table 1
Indicators of the study process evaluation

Study infrastructure/material technical provision	Study process organization	Study course teaching
Indicators: <ul style="list-style-type: none"> • library activity • material and technical equipment in laboratories • computer classes availability of premises for study needs outside the time of lectures 	Indicators: <ul style="list-style-type: none"> • organization of studies and schedule of classes • provision and organization of practice • possibility choose courses from a wide range of study courses • offer of courses in foreign languages • lectures of guest lecturers, • possibilities of scientific work • information about possibilities to study in international student exchange programs 	Indicators <ul style="list-style-type: none"> • quality of teaching, • quality of the work of the lecturers • attitude towards the students • communication with the students in the context of examination work • availability of consultations • openness of the lecturers to cooperate with students

Source: prepared by authors on base of EUROSTUDENT VI

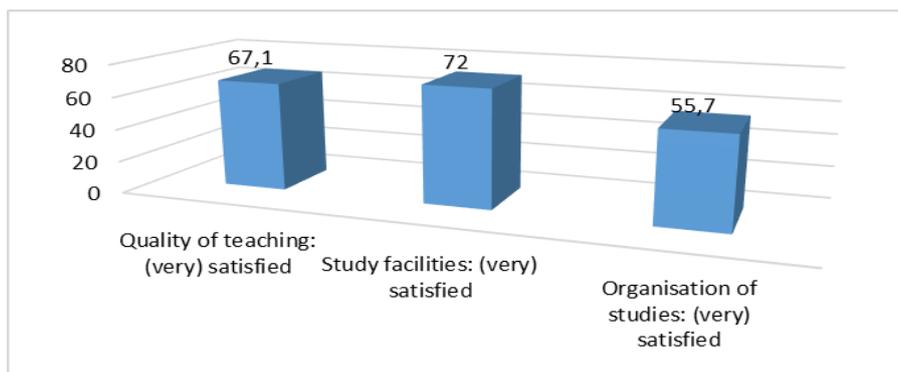
In the tables below are present the data which demonstrate the level of satisfaction by the main aspects of the study process, in accordance with the indicators in table 1.

Table 2
Students' satisfaction with selected aspects of their current study programme in Latvia.
Share of students who are satisfied with a certain aspect (%), (2017)

	< 22 years	22 - 24 years	25 - 29 years	30 years and older
Quality of teaching: (very) satisfied	66,0	64.3	69.8	72.3
Study facilities: (very) satisfied	74.1	70.3	69.1	75,0
Organisation of studies: (very) satisfied	52.2	52.7	59.6	64.6

Source: EUROSTUDENT VI, J.29 – 31

³ Latvijas Republikas Izglītības un zinātnes ministrija, 2017. Latvijas Universitātes Filozofijas un socioloģijas institūts, 2017. Eurostudent VI.



Source: EUROSTUDENT VI, J.29 – 31

Figure 2. Students' satisfaction with selected aspects of their current study programme in Latvia (2017) Share of students who are satisfied with a certain aspect (%, aggregated)

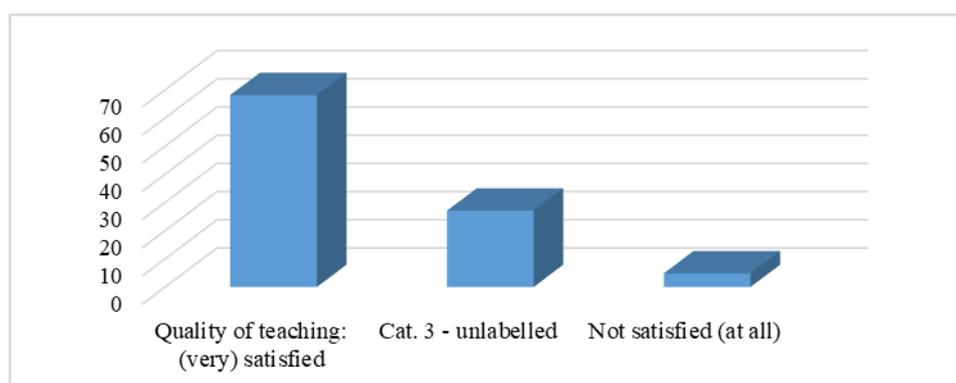
Table 3

Students' satisfaction with their current study programme in Latvia:

Quality of teaching (2017)

< 22 years			22 - 24 years			25 - 29 years			30 years and older			
		Unit	Count		Unit	Count		Unit	Count		Unit	Count
very satisfied	15.3	%	118	14.2	%	107	21.7	%	101	24.7	%	85
cat. 2 - unlabelled	50.6	%	388	50.1	%	379	48	%	223	47.6	%	164
cat. 3 - unlabelled	29.6	%	227	30.7	%	232	26.6	%	124	21.5	%	74
cat. 4 - unlabelled	3.7	%	29	4.8	%	36	2.9	%	13	4.4	%	15
not satisfied at all	0.6	%	5	0.2	%	1	0.7	%	3	1.9	%	7

Data source: EUROSTUDENT VI, J.29 (2017)



Data source: EUROSTUDENT VI, J.29 (2017)

Figure 3. Students' satisfaction with their current study programme in Latvia: Quality of teaching. Share of students (%, aggregated)

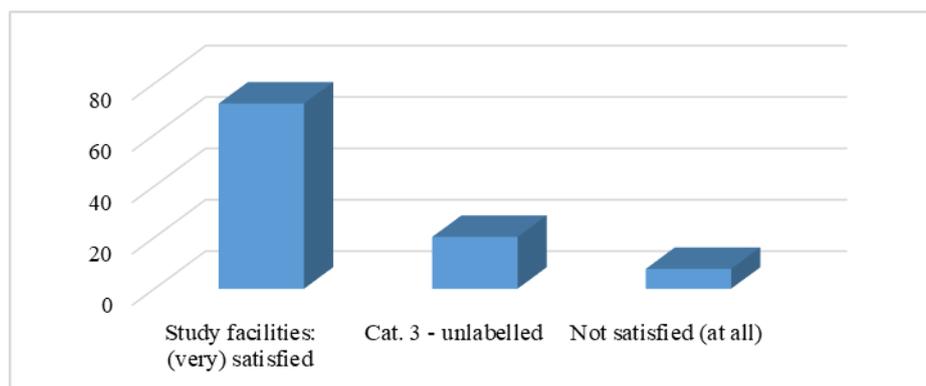
Table 4

Students' satisfaction with their current study programme in Latvia: Study facilities.

Share of students (%), (2017)

< 22 years			22 - 24 years			25 - 29 years			30 years and older			
		Unit	Count		Unit	Count		Unit	Count		Unit	Count
very satisfied	38.2	%	293	33.2	%	252	33.7	%	156	37.9	%	131
cat. 2 - unlabelled	35.8	%	275	37.1	%	281	35.4	%	164	37.1	%	128
cat. 3 - unlabelled	18.6	%	142	21.8	%	165	21.7	%	100	18.6	%	64
cat. 4 - unlabelled	6.3	%	48	6	%	46	8.3	%	39	5.4	%	19
not satisfied at all	1.1	%	8	1.9	%	14	0.9	%	4	1.1	%	4

Source: EUROSTUDENT VI, J.29 – 31



Source: EUROSTUDENT VI, J.29 – 31 (2017)

Figure 4. Students' satisfaction with their current study programme in Latvia: Study facilities.

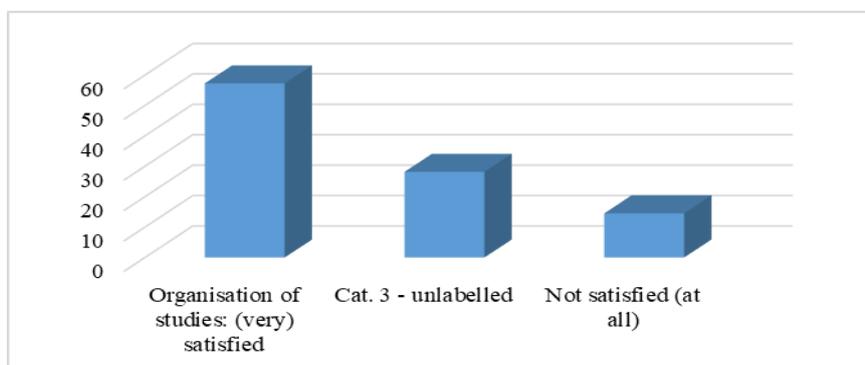
Share of students (% , aggregated)

Table 5

Students' satisfaction with their current study programme in Latvia:
Organisation of studies (2017)

< 22 years		22 - 24 years		25 - 29 years		30 years and older		
	Unit %	Count	Unit %	Count	Unit %	Count	Unit%	Count
very satisfied	15.8	121	15.8	119	23.3	108	26.2	90
cat. 2 - unlabelled	36.4	279	36.9	279	36.4	169	38.4	132
cat. 3 - unlabelled	31.3	240	27.5	208	30	139	23.9	82
cat. 4 - unlabelled	13.9	106	14.8	112	8.9	41	9	31
not satisfied at all	2.5	19	5	38	1.5	7	2.5	9

Source: EUROSTUDENT VI, J.30



Source: EUROSTUDENT VI, J.30 (2017)

Figure 5. Students' satisfaction with their current study programme in Latvia: Organisation of studies Share of students (% , aggregated)

The level of students satisfaction is average and depends on age group, that indicating the need to continue research.

Conclusions

The Integration of education, science development, technology, innovation and business promot of scientific activity on application in compliance with industry and market demand for new technologies and innovative solutions, also improves of the cooperation abilities for scientists and scientific institutions, ensure use of research results funded from public resources for creation of innovative products and services. The modern training programmes should promote development of the main professional competences, such as managing of innovation projects; methods of conceptual and critical thinking; startup suport programmes and commercialization of innovations,which can then be applied to a number of industries and professions, communication, law and intellectual property, finance and investment.

Therefore, is necessary to pay attention to the fact that in order to develop the above mentioned competences, within the framework of training programs, the government should continue to support such areas of activity as:

- the creation of forecast study courses of future market products and incorporate them into a training programmes;
- the strengthening of cooperation with industry and the entrepreneurial activities, for solving of topical and practical business problems;
- the support for such research, which goal is to create new commercialisable knowledge and technology;
- the support and development of the contact points established at the universities for the support of technology transfer and innovations;
- the development of competence centres as a long term platform for cooperation of scientific institutions and entrepreneurs, by providing support for implementation of innovative research and product development projects.

The research results indicate the need to implement targeted training programs that develop the above-mentioned competencies. The leading role in these issues plays universities, public administration, training organizations and the industry experts.

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