

# EDUCATION AND HUMAN RESOURCES AS FACTORS OF INNOVATION ACTIVITY IN LATVIA

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## Abstract

The national and regional development is closely linked with the ability to create, retain and attract human capital, which in turn is related to the quality of national education and lifelong learning opportunities. The time has come for a major change in the strategy of education system, for finding a broader and dynamic conception of the qualitative aspects of educational development, which is an engine of innovation activity in any society and any country. Education, human knowledge and skills as human capital have now become a key factor in economic development because of modern knowledge economy. A level of human capital characterises not only a human being but also the society as a whole, influencing its development and progress. Education and science are major directions of application of material and intellectual resources to ensure economic, social and cultural development of a particular country. Investing in education is a determining factor of human capital development, therefore, a very important education system in the context of lifelong learning. A high level of education promotes creating of innovative technologies and knowledges. The aim of research is to investigate the relationships among education, human resources and development of innovations in Latvia and to describe the experience of Riga Technical University in the process of education and human resources development.

**Key words:** Innovations development, human resources, education.

**JEL:** O15, J24, I25, O39.

## 1. Introduction

Development of innovation activity is a determinative factor of economic development of any state. In each country, the strategic plan of innovative development of economy is carried out. There is a need not only to determine the existing situation in the development of innovative processes in certain countries, but also to reveal the general regularities (vectors) of development of these processes. Innovation is not a single process of interrelated sub processes. It is not just the conception of a new idea, or not the invention of a new device, or not the development of a new market. The process of innovation acts in all these things simultaneously.

The indicators of the European Innovation Scoreboard (EIS) summarise the main elements of innovation performance. The measurement framework used in the Innovation Union Scoreboard distinguishes among 3 main types of indicators and 8 innovation dimensions, capturing in total 25 different indicators. One of the subgroups in the group of innovation indicators is human resources. Human resources and human capital represent the investment people make in them that enhances their economic productivity. Innovative activity of the European Union member states is measured through the SII (Summary Innovation Index).

## 2. Human resources

The analysis of human capital in the EU member states is carried out on the basis of significant indices: Human Development Index (HDI) and European Human Capital Index (HCI). The HDI is a strategic element in the new approach. It symbolizes the shift in thinking, even if not fully capturing the richness of human development. The HDI shows the

economic and social impact of human potential development on the life expectancy, education and income. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. Table 1 shows the HDI trends for Denmark (one of the leaders of innovation activity in Europe Union) and the Baltic States in 1980–2014.

**Table 1. EU Human Development Index Trends, 1980–2014 (Fragment)**

HDI rank	Country	1980 HDI	1990 HDI	2000 HDI	2005 HDI	2010 HDI	2014 HDI	2008-2014 Change	1980-1990 Average annual HDI growth, %	1990-2000 Average annual HDI growth, %	2000-2014 Average annual HDI growth, %
10	Denmark	0,781	0,806	0,859	0,891	0,898	0,900	-1	0,31	0,63	0,37
33	Estonia	..	0,730	0,776	0,821	0,830	0,840	0	..	0,61	0,61
35	Lithuania	..	0,737	0,757	0,806	0,829	0,834	1	..	0,28	0,75
48	Latvia	..	0,710	0,729	0,786	0,809	0,810	-7	..	0,26	0,82

The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. Fig. 1 shows the HDI dynamics in Denmark, Latvia, Estonia and Lithuania for the period of 1990–2014.

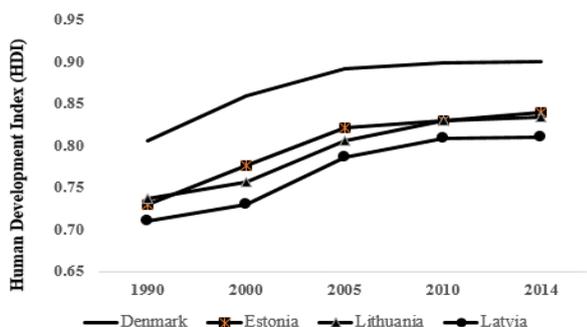


Fig 1. The HDI dynamics in Denmark, Latvia, Estonia and Lithuania, 1990–2014

### 3. Education

The education system in Latvia is administered at three levels – national, municipal and institutional. Riga Technical University which run academic and professional programmes is the biggest university in Latvia by students number (see Fig 2).

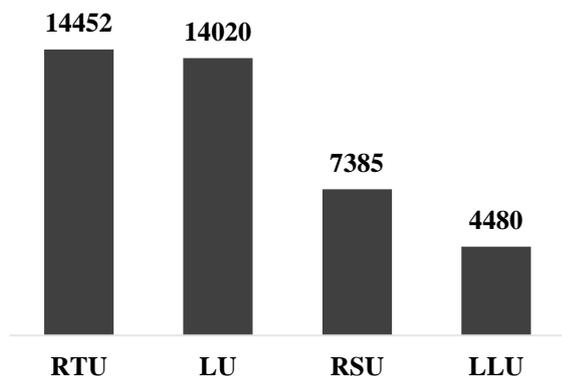


Fig 2. Students number in Latvian universities in 2015. (RTU – Riga Technical University, LU –University of Latvia, RSU - Riga Stradins University, LLU – Latvia University of Agriculture)

The number of students in Riga Technical University is stable by years (see Fig 3).

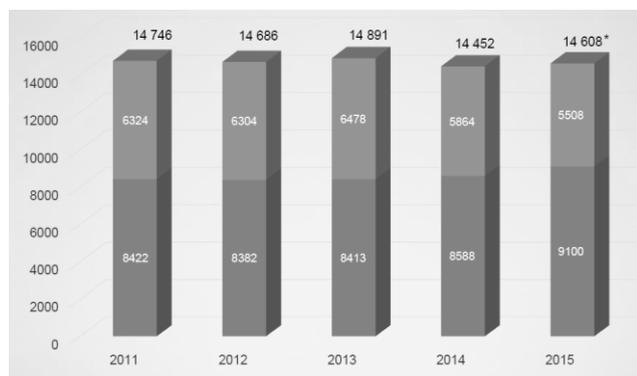


Fig 3. Students number in Riga Technical University, 2011–2015

Latvian higher education establishments started to offer special study programmes targeted at persons with a prior higher education. In 2000, the Faculty of Engineering Economics of Riga Technical

University offered an opportunity to obtain a second higher education in the area of entrepreneurship economics and management. At first, there were only 11 applicants and only 4 graduates. In the following years, the number of applicants for studies to acquire the second higher education notably increased. Therefore, on 24 February 2003, the Division of Continuing Education (DCE) under the Faculty of Engineering Economics and Management (FEEM) was established. Further education programmes have become very popular (in 2003/2004 there were 54 applicants, in 2004/2005 – 80; in 2005/2006 – 110; in 2013/2014 – 336). Currently, there are 372 students at the Division of Continuing Education in programmes of second higher education: “Economics”, “Entrepreneurship and Management” and “Human Resource Management”.

Fig 4 and Fig 5 shows the changes in the structure of education in Latvia in 2008 and 2013. The number of students majoring in engineering sciences and service engineering has increased. At the same time, the number of the students majoring in social sciences has reduced. It is explained by an increase of technological effectiveness of production, introduction of modern technological processes and innovative technologies in the production process.

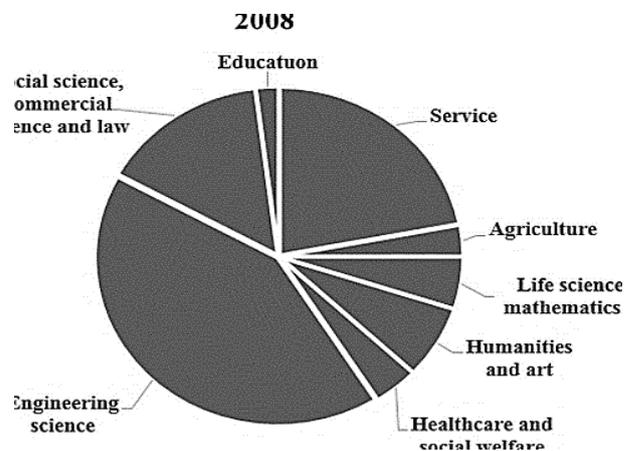


Fig 4. The structure of education in Latvia in 2008

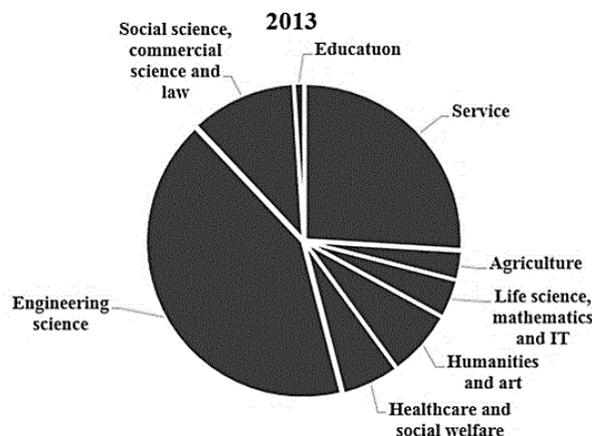


Fig 5. The structure of education in Latvia in 2013

Nowadays, it is possible to speak about transformation of borders between different stages in a

person's life – with the tendency for the border of young age to be shifted forward, owing to the possibility of lifelong learning. At the same time, the need for higher education can be stimulated not only by different external socio-economic and political factors, but also by internal motivation and needs, the main of them being:

- need for self-expression in both general and professional sphere of competence;
- need for increasing self-respect and self-assessment;
- increased awareness of education as a valuable asset.

In Latvia, people with higher education participate in adult education activities more actively. In total 11% of people with higher education were involved in adult education activities in 2013. People with primary education are the least active ones, as only 2.7% of them participate in lifelong learning activities.

#### 4. The relationship between innovative human resources (HDI) and development of innovations (SII)

The Innovation Union Scoreboard provides a comparative assessment of the innovation performance of the EU member states and the relative strengths and weaknesses of their research and innovation systems. The Summary Innovation Index gives an “at-a-glance” overview of aggregate national innovation performance. Fig 6 shows the EU member state innovation performance in 2015.

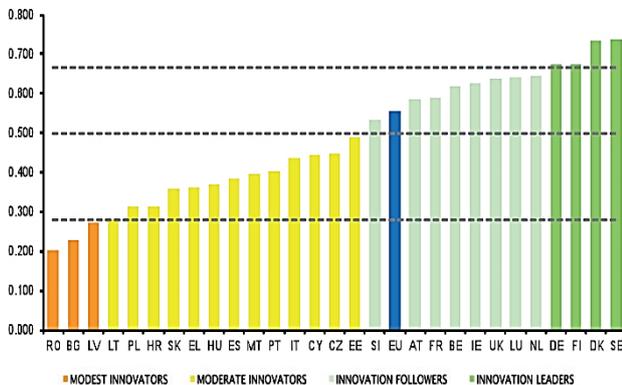


Fig 6. The EU member state innovation performance in 2015

Comparing the data in Fig 6 we can make the conclusion about the preservation of structure of country groups according to the innovation performance of the EU countries.

Fig 7 and Fig 8 show the average growth rate of SII of the EU member states in 2005 (a) and in 2014 (b).

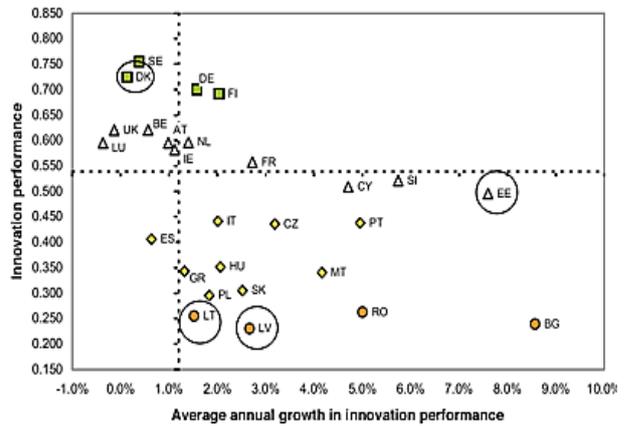


Fig 7. Average growth rate of SII of the EU member states in 2005 (a)

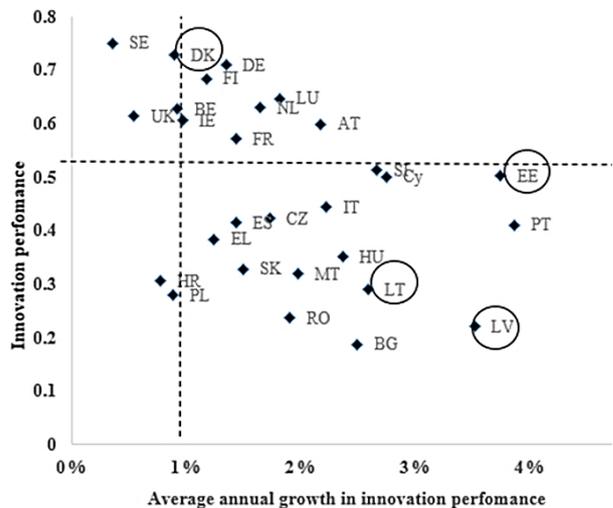


Fig 8. Average growth rate of SII of the EU member states in 2014 (b)

Information provided in Fig 7 and Fig 8 show that the average growth rate of SII in Latvia increased from 2.8% in 2005 to 3.51% in 2014. In Lithuania, the growth of this indicator also increased from 1.5% in 2005 to 2.58% in 2014. A growth rate of innovative activity in Estonia slowed down. In 2005, the average growth rate of SII in Estonia was about 8%. In 2014 the level of this indicator reduced to 3.74%.

Let us consider in more detail one of the most topical issues – the impact of human resources (HDI), innovations measured by means of indicators on the changes in the basic economic indicator – GDP.

Fig 9 and Fig 10 show the SII and HDI relationship of the EU member states in 2005 (a) and in 2014 (b).

The Innovation Union Scoreboard uses the most recent statistics from Eurostat and other internationally recognised sources such as the OECD and the United Nations as available at the time of analysis with the cut-off day by the end of November 2014.

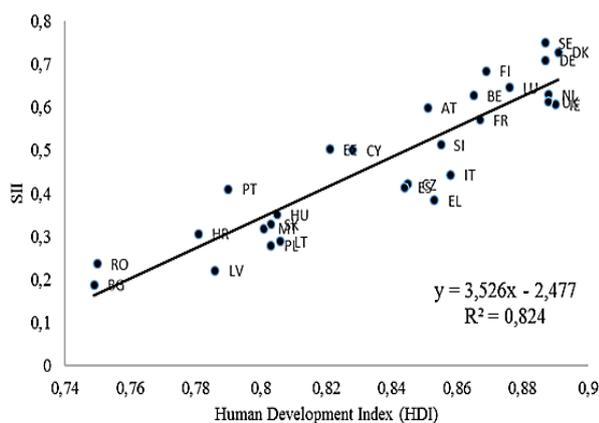


Fig 9. SII and HDI relationship of the EU member states in 2005 (a)

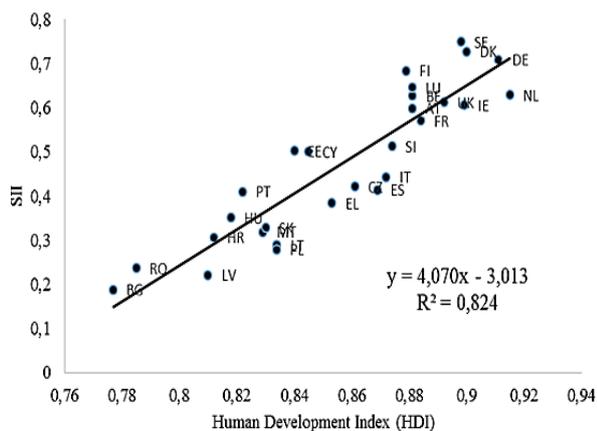


Fig10. SII and HDI relationship of the EU member states in 2014 (b)

Figures 9 (a) and 10 (b) show a positive dependence of SII and HDI parameters. Thus, in comparison with 2005, there was an increase in the growth rate from 3.526 in 2005 to 4.07 in 2014. The data provided in Figures 7 (a) and 7 (b) show a minor change in the structure of arrangement of the countries according to the level of innovation performance and the level of growth rates of HDI.

## 5. Conclusion

The indicators of the European Innovation Scoreboard (EIS) summarise the main elements of innovation performance. The existing relationships

among human resources (HDI), innovations (SII) and development of economy (GDP) are significant for evaluating the process of national economic development in every country. The research shows that the most important drivers of innovation changes in economy are education and human resources.

Interdependence between the SII development and economic development has been investigated by using scenario modelling. Scenario modelling has been implemented combining the SII data with GDP per capita and forecasted by the Ministry of Economics of the Republic of Latvia of rates of growth GDP for the period till 2020.

The information obtained as a result of the analysis will allow correcting in due time an innovation policy of the state, removing the reasons causing a deviation in the really achieved and forecasted values of parameter SII, and providing a necessary level of economic development (GDP) owing to the growth of innovation activity.

## References

1. *Economic development of Latvia*. Report of Ministry of Economics, June 2015, Republic of Latvia. Riga, 172: [https://em.gov.lv/en/economic\\_development/report\\_on\\_the\\_economic\\_development\\_of\\_latvia/](https://em.gov.lv/en/economic_development/report_on_the_economic_development_of_latvia/).
2. *Innovation policy in Europe*: <http://trend-chart.cordis.lu/index.cfm>.
3. *Innovation Union Scoreboard 2015*, Printed in Belgium, 94: [http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/files/ius-2015\\_en.pdf](http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/files/ius-2015_en.pdf)
4. Jurenoks, V., Didenko, K., Jansons, V. (2009). *Innovation Modeling Methods Using for Investigation of Behaviour of Real Socio-Economical Systems*. XI International Scientific Conference "Management and Sustainable Development" Yundola, Bulgaria, 4–8.
5. Jurenoks, V., Didenko, K. (2006). *Innovation Process Management*. Management and Sustainable development. Bulgarian Swiss Forestry programme (BSFP). Yundola, Bulgaria, 95–100.
6. Jurenoks, V., Jansons, V. (2006). *Innovation Process Development in Latvia*. The 14-th International Scientific Conference Enterprise management: Diagnostics. Strategy, Efficiency, Yundola, Bulgaria, 339–344.
7. Sonilo Berdo, *Education Factor and Human Resources Development*. <http://www.academicus.edu.al/nr1/Academicus-MMX-1-072-079.pdf>.
8. Human Development Report 2015. *Work for Human Development*. <http://hdr.undp.org/en/2015-report>.