EMPOWERMENT OF INNOVATIVENESS FOR REGIONAL DEVELOPMENT: THE CASE OF ŠIAULIAI REGION

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Abstract
Challenges for modern society encourage the interest of how the regions could increase opportunities to accelerate social and economic development and reach the level of developed regions. Especially it is important for rural areas. There is a search for new answers (ideas and innovations) on creating a competitive advantage of regions. Seeking for a better systematic (not chaotic) result of innovative activities various organizations (even working in different sectors) are tied up with other organisations by tight links in their regional innovation system. The collaboration among different organizations is argued to be the main axis for the stimulation of innovativeness. Besides, all innovative activities must be reinforced by organizations' absorptive capacity (i.e. abilities to access external knowledge, anchor and diffuse it) that leads to innovativeness. This article argues the theoretical and empirical approach of how the regional development could be accelerated by empowered innovativeness as a capacity of participants of a regional innovation system. Lithuania as a modern country and the EU member declares the importance of the reduction of internal regional disparities. Consequently, the analysis of a particular regional innovation system, i.e. Šiauliai region, allows disclosing the regional peculiarities and weaknesses of its innovative activities limiting the development process. The goal of this article is to reveal the current situation of innovativeness in Šiauliai region and draw the directions of its empowerment for further regional development. The article consists of two parts: theoretical insights and explanation of methodological approach; and the presentation and discussion of quantitative research results.
Key words: regional development, innovativeness, regional innovation system, absorptive capacity.

Introduction

Innovativeness and competitiveness are perceived as essential conditions for the survival in a global market. The capacity to innovate, learn, adapt, and use the best international experience is the essential presumption for development in the contemporary global system. Innovation creation, exploitation and diffusion become more important in knowledge economy and provide results, reflecting public expectations – the value for regions and countries. Despite the globalization scale, a lot of efforts are still made in specific locations (regions) to gain their competitive advantage, enabling their ability to attract investments and secure the economic and social well-being. Unbalanced economic and social processes proceeding within regions can reduce their competitiveness, thus affecting wealth creation in the whole country. It is very important for less developed countries and their regions. The essential factor enabling regional competitiveness is the innovativeness determined by the structure of a regional innovation system and its absorptive capacity.

European Union member states (including Lithuania) try to equalize inter-regional differences by implementing the regional policy which supports development processes in the less developed areas, consisting mainly of rural areas (Stawicki, 2015). Despite the implementation of many programs and declared regional dimension in the national policy and strategic decisions, significant economic, social and cultural disparities among and even within regions still exist in Lithuania (Puidokas & Daukaitė, 2013). The new EU funding period (2014 – 2020), changing EU and national financial instruments and their purposefulness, increasingly highlight capacities and capabilities of a region to adapt and survive in a competitive environment. Innovations are especially important for regions having rural areas, where one of the most important economic activities is agriculture (e.g., Šiauliai region). Such regions must identify their specifics and find the new ways for development.

Regional policy, regional development, regional economic disparities have been analyzed by many authors (among others: Burneika, 2013; Puidokas & Daukaitė, 2013; Kilijonienė, 2010; Abrhám, 2011; Brauers, Ginevičius & Podvezko, 2010; Prokop & Stejskal, 2015), but the aspect of innovativeness for regional development has not been a subject of detailed studies. Consequently, *the goal of this research* was to reveal the current situation with the innovativeness in the Šiauliai region, identifying directions for an empowerment for its development. The first part of the article introduces the theoretical background and methodological approaches of innovativeness as a presumption for regional development. The second part presents results of the research made by analyzing the statistical data of Šiauliai region in the period of 2004 – 2013. Finally, the research is ended by giving some insights and conclusions. Due to format limitations the paper includes only a part of research results, consisting only of the key indicators of innovativeness.

Materials and Methods

Theoretical approach

The analysis of innovativeness for regional development must be started with the understanding that *innovation* is not the self-acting phenomenon, but rather a process requiring ideas, efforts, time and resources. This process becomes more and more collective in the age of knowledge society and surplus information. Therefore, it requires adequate tools and environment, where it can be accelerated, i.e. the innovation system.

Seppänen (2008) identifies four types of innovation systems: national, regional, sectoral and technological. The main links between innovations and dimensions of regional development are highlighted in the conception of *a regional innovation system* (hereinafter referred to as *RIS*), which is understood as a collaboration network of various formal private and public institutions (static elements of a system), based on organizational and institutional agreements, relations and links (dynamic elements of a system), contributing to knowledge generating, i.e. initiation, creation, exploitation (importing and enabling the new technologies and knowledge), and diffusion processes, hereby, increasing regional innovativeness and competitiveness. This institutional network must act and be situated in a particular area, e.g. a region. A few regions can be found in the territory of each country, where acting regional innovation systems can be characterized by the specifics of activity and liaison.

The conception of a region is still a great subject of scientific disputes. So far, the definition of a region (in Lithuanian scientific community) was inseparable from the existing legislation and administrative division. The *region* can be defined as an individual, uniquely combined unit, e.g. a sub-national territorial unit (with clearly determined borders), in which the use of internal and external resources is carried out for socio-economic activities by interactions of natural and social systems (Kilijonienė, 2010; Burbulytė, 2005). Asheim (2011) argues that when analyzing the case of a specific region it is necessary to know which type of the innovation system the particular region could be attributed to:

- territorially embedded regional innovation systems (innovative actions are led only by localized inter-company learning processes, the opportunity for direct interaction with science institutions is underused);
- regionalized national innovation systems (the nature and the level of regional innovations are determined by external actors and relations with them, part of the region's industrial and institutional infrastructure is more integrated into a national innovation system);
- regionally networked innovation system (the nature and the level of regional innovations are determined by favourable institutional and organizational infrastructure, the system includes a localized, two-way learning process, as well as public-private partnerships).

Consequently, the successful performance of a RIS needs more than regional institutions' desire and investments into processes of certain innovations' creation, exploitation and commercialization. The relationship between the RIS, regional environment and the level of economic development of a region is illustrated by Carlsson's (2009) research, which imposed that disparities between regional development (especially, economic ones) are more determined by such indicators as the innovation system and the quality of management, than the nature of political system or the degree of openness in the economy. Competitiveness of a system and economic well-being are determined by the orientation of the interacting participants (i.e. institutions) of a system. Additionally, conducive environmental features of a region are necessary: the dominance of a private funding for research and development (hereinafter referred to as *R&D*), strong and diversified public R&D and consolidating institutions; strong multi-level (business-to-business, business-to-science) communication and interactions with different actors, developed channels, a high level of entrepreneurial, well-qualified workforce and a clear policy, based on social counselling, strategies and innovations, prevailing in a system (Wojnicka *et al*., 2002). Strengthening all these features of the RIS could lead to the more viable regional development.

Regional development can be seen as a dynamic process that allows meeting changes in the environment, improving the current situation, and contributing to the growth and positive change in a particular area or territory. Development of the RIS (increasing number of innovative companies, investments into R&D, number of patents, licensing returns, etc.) is directly connected with the growth of economic and social indicators, such as *gross domestic product (*hereinafter referred to as *GDP*), foreign direct investment, a level of unemployment, a level of demand of educated workforce, etc., which are essential for the creation of well-being in a region. Under conditions of current operating economic systems, innovativeness is an inherent part of a developing or prosperous region.

Innovativeness as tending to innovate (introduce new or different ideas) can be achieved using region's (as well as persons' and organizations' acting in this region) innovative capacities – absorptive capacity (to access external knowledge, to anchor and diffuse it) and development capacity (to create and exploit innovations). The development capacity is not

possible without the absorptive capacity (Mahroum *et al*., 2008; Mahroum & Alsaleh, 2012). According to Narula (2004), Rodrik, Subramanian & Trebbi (2002), the development of the regional absorptive capacity needs:

- appropriate basic infrastructure (roads, railways; phones; electricity; the basic qualified human capital, having primary and secondary education; primary and secondary schools, hospitals);
- developed advanced infrastructure (universities, advanced skilled human capital, having higher education;, research institutes, banks, insurance companies);
- business companies (local companies with the appropriate human and physical capital, taking over the technology flows; branches of multinational companies, acting as users and creators of technology flows);
- appropriate activity of formal and informal institutions (intellectual property rights, technical standards, weights and measures, incentives and subsidies to promote new technology adoption and development; taxation; competition policy, schemes of investments' promotion and targeting, promotion of cooperation between domestic and foreign economic players; entrepreneurship promotion).

The institutional dimension of a regional innovativeness is very important because effective institutions contribute to the economic development of the region more than territorial dislocation or trade relations, despite the fact that formal institutions create only a minor part of knowledge.

However, it is necessary to emphasize that regional innovativeness is mainly due to the level and efficiency of a regional innovation system as a whole more than to capacities of particular institutions of the RIS. Therefore, two main approaches of *empowerment of innovativeness* should be highlighted: the maintenance (providing human and material resources, creation of favourable legal and institutional environment) and the supervision (monitoring of outcomes and adjustment). According to this theoretical approach, the analysis of Šiauliai region was conducted.

Methodological approach

Large countries have large regions (in the meaning of the geographic scope), where researchers can measure certain statistical indicators important for various economic and social studies. Such data are accumulated in different databases; therefore, new scientific researches occur, analyzing regions' situation of innovativeness, and the level of absorptive capacity. According to the classification of international organizations, smaller countries are considered as indivisible regional units (i.e., in accordance with the regional classification of European Union, Lithuania is classified as NUTS II type region). With reference to Clemens & Radelet (2003), the development of absorptive capacity and problems of it in some countries, especially smaller ones, are similar. Thus, it can be argued that this attitude is dominating among communities of researchers and practitioners, and creates preconditions for the deficiency of research, carried out in small countries or regions.

Nevertheless, the scope of new value creation (as well as absorptive capacity leading to innovativeness) is different not only in different sectors of the economy, but also in institutions, regions or countries. Regions in small countries differ by social and economic indicators. Furthermore, the ability to absorb knowledge, to use targeted institutional activity and create innovations varies in organizations, operating in the same region. Moreover, each region in a country has a certain established institutional system as its regional innovation system. According to Petraitė (2009), regional innovation systems are always different, because of different evolutionary, institutional and socio-economic contexts. Therefore, in order to reveal the current situation and to identify the possibilities to empower the innovativeness for regional development, it is essential to examine each case thoroughly and in detail, as it was done in this research, analyzing the case of Šiauliai region.

Under the current legislation, Lithuania has 10 regions (in accordance with EU classification, NUTS III regions), the so called "counties". They are territorial units, but not administrative any more (because of the administrative reform, implemented in the country in 2009 – 2010). However, all statistical data are accumulated for counties (in the regional level), and the institutional structure of Lithuanian regional innovation system can be comprehended easier just by the approach of territorial division.

Šiauliai region is situated in the north of Lithuania, so, it is the peripheral region (has the border with Latvia). Šiauliai region's territory is the second largest area in Lithuania after Vilnius region. It holds the fourth place in the country by population. The centre of the region (Šiauliai city) is the fourth by population as well. The main peculiarities of Šiauliai region are identified according to a very important strategic document 'Development Plan of Šiauliai Region 2014 – 2020' (Šiauliai Regional Development Council, 2013). The document states that an integrated development of urban and rural areas remains one of the essential directions of regional policy (2014 – 2020). According to this document, the main aim of development of Šiauliai region is to become 'a significant place in the country's economic, social and cultural life, where the competitive economy is created and a greater social cohesion of society is achieved'.

Šiauliai region can be characterized by certain socio-economic features perceived as strengths and weaknesses (based on Šiauliai Regional Development Council, 2013). The decision to choose this region for the analysis was influenced by further specifics as well. The region can be identified as rural, because it has the highest area of used agricultural land utilized in the country; gross agricultural production of the region is the highest in the country, and regions' added value, most successfully created in sectors of agriculture, forestry and fisheries, is the biggest in the country as well. Even the largest part of foreign direct investments in the region (according to the dimension of economic activity) goes to manufacturing and agriculture. Lithuania has only four regions with universities (main institutions, initiating and realizing R&D in the RIS) and Šiauliai region is one of them. The main disadvantages as well as challenges for economic development can be identified as low added value of goods and services produced in the region, the lagging behind other three biggest regions in Lithuania (Vilnius, Kaunas, Klaipėda) by such indicators as number of employees, turnover and added value in costs of production, the scale of young people emigration, the percentage of innovating companies is the lowest in the country, the high percentage of innovators, dropping or ceasing innovative activities.

Seeking to draw the directions of regional development in the aspect of innovativeness, it is necessary to perceive the view of the indicators of regional innovativeness and their dynamics. A large research 'Development of regional innovation system's absorptive capacity' was implemented and introduced by Vita Juknevičienė (one of the authors of this article) in 2015. In the light of new data and due to format limitations, the article represents only the key indicators of innovativeness (2004 – 2013; it covers longer period, but because of limitations for data accessibility some meanings are missing). The whole system of indicators was transformed, concluded and presented in the aforementioned research with reference to the main recognized methodologies of innovativeness of countries and regions and particular significant scientific studies in the field: Hollanders & Tarantela (2011), Hollanders *et al*. (2012), Mahroum *et al*. (2008), Mahroum & Alsaleh (2012), Jucevičius *et al.* (2011). The presented indicators are directly connected with three main dimensions of the conception of absorptive capacity as the main presumption for innovativeness, as well as two dimensions of empowerment. Methods of systematization and interpretation are applied for the analysis of quantitative data. Data were renewed in 2016 from databases of two institutions: Statistics Lithuania and The State Patent Bureau of the Republic of Lithuania.

Results and Discussion

As stated above, for the empowerment of innovativeness in a region, appropriate human and material resources must be provided, as well as favourable legal and institutional environment (the maintenance) created and data of innovative activities and indicators of economical situation (the supervision) monitored. But it must be emphasized that good maintenance does not guarantee good final results, therefore, the supervision is needed.

As it was highlighted, empowerment of innovativeness is feasible through maintenance and supervision. The maintenance requires for the favourable legal and institutional environment in the RIS. *Legal system* is in force throughout all the country, therefore, legislation of innovation policy guarantees equal accessibility of consultancy, assisting and financial support instruments (e.g., tax relief for innovative companies), programs and their resources for all regions including Šiauliai (authors would like to emphasize the importance of the gap between accessibility and obtainment or initiative and efforts to obtain). The *institutional structure* of Šiauliai RIS is based on three components (university, business and government). Despite the region's rural profile, too few scientists of Šiauliai University are working on researches, concerned with specifics of agriculture, forestry and fisheries sectors. Though Šiauliai University is a core for scientific activities in the region and it is engaged not only in the development of science, but also implements applied researches for private and public sectors. This presumption helps to explain the fact that marketing innovations takes the largest part of implemented innovations in regional companies (Šiauliai Regional Development Council, 2013). R&D activities are reinforced by regional colleges (they provide higher non-university education in Lithuania as well). Region's business enterprises are specializing in various economic activities; therefore, they become members of different clusters and networks even outside the region. The network of self-government institutions (7 municipalities and 60 neighbourhoods) is located in Šiauliai region, but only a few institutions are working on the regional basis (e.g., The Service of the Government representative of Šiauliai county, Šiauliai Regional Development Council, etc.). A few types of innovation and business support institutions can be identified in the region: regional development agencies, a business incubator, business information centres, specialized innovation centres, a research institute and centres, etc. Unfortunately, Šiauliai region has neither science and technology parks or science and business valleys, nor high-tech science laboratories. The structure of Šiauliai regional innovation system reminds the composition of innovation system in other six less-

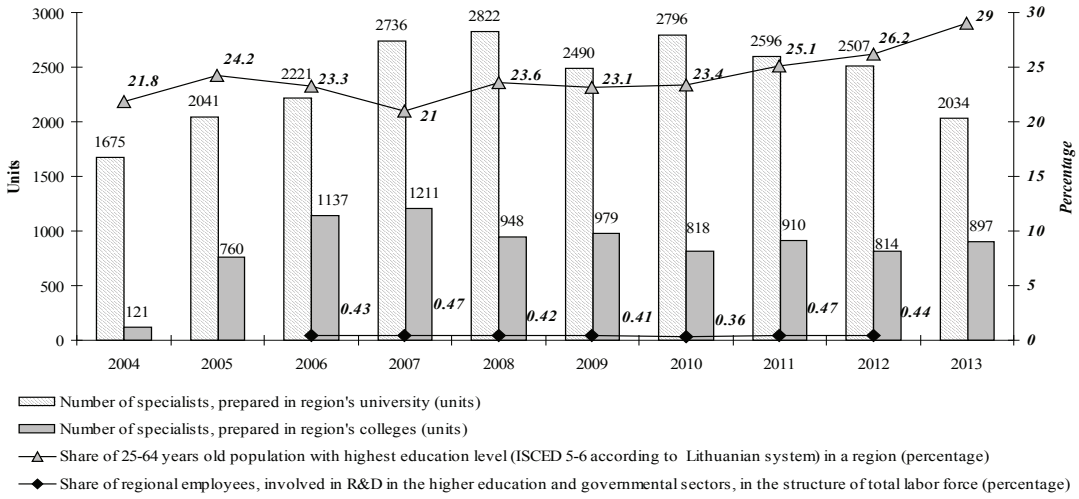

Figure 1. Dynamics of main social indicators of innovativeness in Šiauliai region (2004 – 2013).

developed Lithuanian regions with the exception of regional university factor. To sum it up, the legal and institutional preconditions appeared favourable for development of innovativeness in Šiauliai RIS and it can be empowered through individual organizational activities as well as collaboration between the RIS actors and partners of sectors, clusters and networks.

'Adequate human and financial resources are needed for creation and maintaining of the innovativeness' (Mudrak, van Wagenberg, & Wubben, 2005), consequently, this research represents the provision of adequate resources for Šiauliai RIS and the ensuing socio-economic changes in the region. The most important factor empowering innovativeness is *human potential* as the main input (for maintenance) of innovativeness development. Šiauliai RIS, seeking for regional development, must prepare the necessary qualified specialists (or attract them from other RIS) and has to be able to retain them in the region working in R&D.

Unfortunately, the total number of graduates of higher education institutions (university and colleges) in Šiauliai region has the tendency to decrease approximately -6.7% per year from 2010 (see Figure 1), what reflects the general tendency for decline in Lithuanian universities and colleges (approximately -5.8%). It is mostly related to the negative demographic changes across the country; the emerging scale of international and internal emigration of young and potential people from region because of new studying and working opportunities, more favourable living conditions, sharpening economic disparities between regions; the impact of economic crisis; and the question of image of higher education institutions of Šiauliai region, created in mass media). Šiauliai RIS lags behind because the labor force (even having enough specialists with higher education – approximately 24% and it is increasing) is not enough involved in R&D activities as the main field to strengthen innovativeness and to gain advantages – this share does not reach even 0.5% (in 2013 in Lithuania there were 35.2% of specialists with higher education, but the share of labor force involved in R&D activities reached only 1.3%).

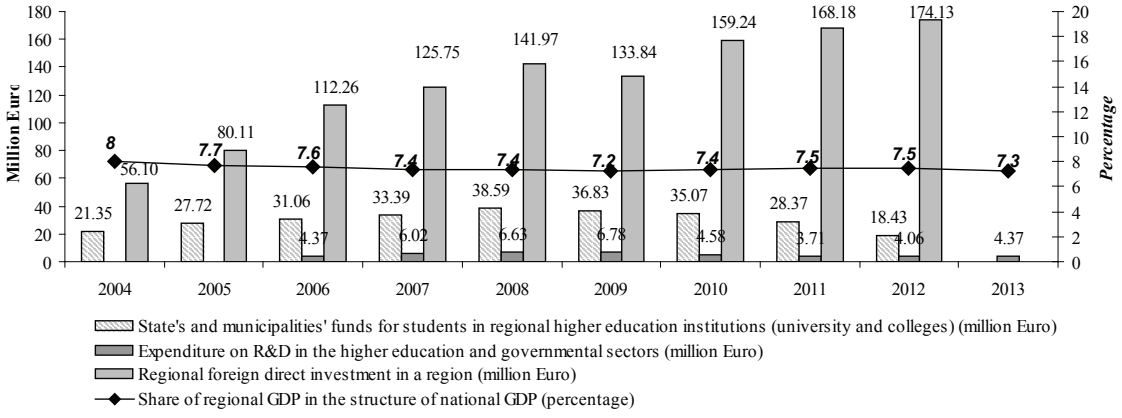

Figure 2. Dynamics of main innovativeness' economical indicators in Šiauliai region (2004 – 2013).

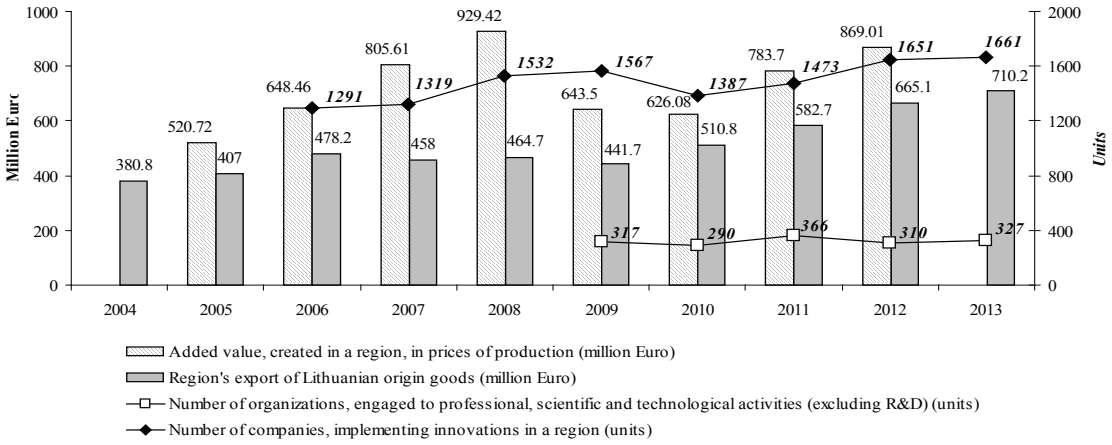

Figure 3. Dynamics of main indicators as a result of innovativeness in Šiauliai region (2004 – 2013).

Innovative activities as an integral part of organizational operations usually require bigger *material resources*. Despite the decline in governmental spending on higher education students (since 2008 approximately -14.7% per year in Šiauliai region and -13.9% in Lithuania) and still low level of investments in R&D (expenditures did not reach 4.5 million Euro in Šiauliai region in 2013, when Lithuanian indicator exceeded 76 times the regional one), the analyzed region has the tendency of growth in regional foreign direct investment, i.e. the indicator tripled in the past 10 years (see Figure 2), as well as the indicator of FDI in Lithuania during mentioned period.

Declining social potential and low investment into it and the search for new solutions lead to a low level of regional GDP share in national GDP (the total amount of regional GDP is not decreasing in recent years, but a decreasing level of the indicator testifies about more accelerated pace of economic development in other regions of Lithuania). Therefore, Šiauliai regional development could be awakened only with the help of targeted national and foreign investment. Especially the investment is needed for supporting and strengthening activities, creating a higher added value, which can be used as one of a few indicators, *measuring and monitoring the output* of innovativeness in the region (see Figure 3).

The economic crisis in 2009 has made an impact on current institutional and economic situation of Šiauliai region. The number of companies, developing human, scientific and technological potential as well as innovative companies is approaching the pre-crisis level in the RIS. The same could be said about the regional capacity to create the added value (especially, when this indicator lags far behind in comparison with more developed regions in Lithuania). The number of registered patents in the region can be included in the supervision of regional innovativeness. But patenting in Šiauliai region is very poor. Approximately 1-2 patents from this region had been issued in the State Patent Bureau by 2011; 2012 was an exceptional year, when even 5 patents were registered; and there were no patents at all in 2013 (in Lithuania the number of issued patents reaches approximately 68 every year).

Only the growing economic factor of Lithuanian goods export proclaims the bigger exploitation of opportunities of the available potential at the international level (it is 60% greater than in 2009, the time of crisis and almost twice greater in comparison with the beginning of the analyzed period in 2004). It confirms the statements of economists and market analysts about the combination of affordable prices and high quality of Lithuanian goods that generate the confidence in Lithuanian production at the international markets. But at the same time this indicator shows the widening gap between the development of Šiauliai region and Lithuania as a whole: an input of Šiauliai region in total Lithuanian goods export had dropped from 6.34% (in 2004) to 4.78% (in 2013). Such indicators presenting the output of innovativeness indicate various limitations for the development of Šiauliai region and explain main causes of retardation. All three analyzed dimensions are related directly; therefore, strengthening one of the activities could create preconditions for the progress of two others.

Conclusions

The analysis of the innovativeness in Šiauliai region gives some possible directions for empowering all capabilities (including innovativeness) for regional development. The legal and institutional environment is quite favourable to engage the potential and resources into innovative activities. Human resources are ready to face the challenges of modern society and employ their competencies (with a reference to their knowledge and practice gained from their education). Though it should be noted that Šiauliai region should

find the ways not only of how to prepare the necessary qualified specialists in its own or other RISs, but also how to attract and retain the necessary labour force within Šiauliai RIS. That is why *entrepreneurs should be* ready to create friendly environment for non-traditional new activities and decisions and the possibilities to create personal economic stability. The empowerment of innovativeness requires willingness of organizations to change and become more involved in the cross-sectoral collaboration. Besides, governmental and other institutions in the national innovation system and the RIS must continue the implementation of innovation support policy and more actively apply instruments for the fostering of the innovation culture in the society. Just growing number of conscious, open-minded people can generate innovative ideas and supervise businesses with a higher added value in the RIS, contributing to the regional development and well-being of the whole society.

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