



MATCHING VOCATIONAL TRAINING AND LABOUR MARKET DEMANDS – THE OPINION OF PUBLIC ADMINISTRATIONS

Ilze Buligina^a, Biruta Sloka^b

^a PhD student, University of Latvia, Faculty of Economics and Management, Aspazijas blvd. 5, Riga, Latvia, ilze.buligina@gmail.com

^b Professor, Dr.oec, University of Latvia, Faculty of Economics and Management, Aspazijas blvd. 5, Riga, Latvia, biruta.sloka@lu.lv

ARTICLE INFO

Keywords:

- VET,
- labour market,
- public administration,
- work-based learning

ABSTRACT

Matching vocational education and training (VET) competencies with actual labour market demands is an increasing challenge for European VET systems. This requires innovation in national VET systems and sets new tasks for public administrations that are responsible for the implementation of the VET systems. The aim of the research is to study the opinion of relevant stakeholders regarding innovation in VET provision. Textual analysis and expert survey among various stakeholders have been carried out. Conclusion has been drawn that experts and social partners express increasing awareness regarding the need of VET innovation. This requires continued research, especially on the interests and motivation of the involved parties.

Reference to this paper should be made as follows: Buligina I, Sloka B,. 2013. Matching vocational training and labour market demands – the opinion of public administrations, *Ekonomiska istraživanja – Economic Research Special Issue 2013*

I. INTRODUCTION

Vocational education and training (VET) is a high level priority in the current EU policy. As a result of fast technological developments, the increasing skills' mismatch between the competence of the trained specialists in national VET systems and the fast changing labour market needs becomes a new challenge. The VET systems often lag behind these changes, partly due to their relative inflexibility rooted in long established tradition. The new situation requires the revision of the existing paradigms and the promotion of innovative approaches - by testing them on limited scale at first and introducing the best approaches at systemic level. This is a challenge for public administrations responsible for the implementation of VET systems. As pointed out in research by Rycroft (Rycroft, R.W., 2006) almost a decade ago - the speed with which modern technologies are innovated seems to be accelerating, and there appears to be some consensus that faster technological change is likely to create substantial problems for public policy makers.

With these challenges in view, in Latvia a VET system reform was started in 2009. Till then in Latvia the VET institutions had primarily been under the centralized state supervision. With increasing awareness that the local economic developments should much more be taken into consideration in VET provision, the dialogue with local governments and social partners was intensified. According to Thematic Report 2011¹ much policy discussion has been devoted to the 'demand-side' and 'supply side' innovation policies. It has been noted that "a growing awareness amongst policy makers for the need to better exploit the power of public spending for innovation and the emerged focus on searching solutions to societal challenges" is a promising sign for the future spread of demand-side innovation policies. Consequently – certain decentralization options now are on the agenda in policy making and implementation, in order to bring the VET closer to the local markets. As pointed out by Boom - only if perfect markets for training can be established, then efficient levels of training can be achieved (Boom, A., 2005). The realization that the VET innovation should be much more fed by the local economic and labour market needs asks for research on the issue, and this issue has prompted our research as well.

In Latvia the aim is to introduce innovation in VET at the system level², and therefore innovative approaches are being piloted at national and local levels. As indicated in the OECD/ CERI study of systemic innovation in VET, a systemic innovation approach is "any kind of dynamic, system-wide change that is intended to add value to the education process and outcomes" (OECD/ CERI study, 2008). Thus, in the governance of VET institutions, the role of local governments and employers should potentially be increased, allowing more freedom to the social partners to decide on the VET implementation mode and content.

Innovation in VET – as innovative approaches to VET implementation and the training of innovation competent labour force is a high level EU priority as well. The European Commission in the presentation "Innovation Priorities for Europe" refers to the weakness of public education and innovation systems³, thus implying the close link between the two issues. The need for inno-

¹ Trends and Challenges in Demand-Side Innovation Policies in Europe. Thematic Report 2011 under Specific Contract for the Integration of INNO Policy TrendChart with ERAWATCH (2011-2012), technopolis [group], 26 October 2011 Authors: Kincso Izsak & Jakob Edler

² The Concept „Raising the Attractiveness of Vocational Education and Training and Involvement of Social Partners to Secure the Quality of Vocational Education" (confirmed by the Order of the Cabinet of Ministers of 16.09.2009, Nr 629) and the Guidelines "Optimisation of the Vocational Education Institutions' Network 2010 – 2015" are the principal VET policy documents in Latvia for the period 2010 – 2015)

³ Innovation Priorities for Europe. Presentation by J.M.Barroso to the European Council of 4 February, 2011.

vative approaches in VET is being addressed in a key EU education and training policy document „Education and Training for the Period 2011-2020“⁴ and in a CEDEFOP Briefing note⁵, especially pointing out the problem of skills’ mismatch between the trained labour force in VET systems and in the actual labour market. The Bruges Communiqué, which is a key VET policy documents for the coming decade, points to the role of innovation in VET saying that “in knowledge society vocational skills and competences are just as important as academic skills and competences”⁶, implying that competitive economies need skilled and innovation competent labour force at all levels. Moreover, since technological challenges and innovation go beyond the field of science and technology and refer also to the policy making and administrative processes, various stakeholders need to be involved in the process. As rightly pointed out by Simon McGrath from Nottingham University (UK) and by Rosemarie Lugg from Cambridge Educators: “much of VET policy internationally draws on a toolkit that does not work. Policymakers need both to be more modest and reflexive in their expectations of what knowledge can be mobilised for policy purposes and more serious in their commitment to supporting the generation of the types of knowledge that they claim to value. International and comparative educators need to be clearer in seeking to shape research agendas; more rigorous in our approaches to research; and better in our external communication of our findings. There is a particular challenge of reawakening research on VET-for-development from twenty years of slumbers”. (McGrath, Lugg, 2012). It should be kept in mind also, that growth is not exclusively related to economic factors only, but has meaningful links with the job satisfaction as well, as pointed out by several authors, e.g. in recent research by Keller and Semmer (Keller, A., Semmer, N.K., 2013). Therefore, for successful policy making, the results of empirical studies on the views of various stakeholders should be taken into consideration much more than it traditionally is.

With the above in view, the present paper will address the role of various stakeholders in the implementation of VET innovation in Latvia. The research presented in the paper are based on textual analysis and empirical study performed by the authors - in 2012 among public administrators and experts, and in 2013 among employers within the Iecava region of Latvia. The public administrators and experts were asked to evaluate the need for innovative approaches in VET system in Latvia and the value of the innovative (in the context of Latvia) work – based learning approaches⁷. The employers, however, were asked to evaluate not only the need for innovative approaches in VET and the value of work – based learning, but also to develop more specifically on the mode and content of training in order to prepare a competent labour force. The content of the empirical study comprises the novelty of the work, since little research exists on this issue in Latvia. The introduction of work-based learning approaches started only in 2012 (at policy level) and 2013 (at practice level). For this reason the present research through its recommendations will be able to contribute to better policy making in Latvia as well.

⁴ Education and Training for the Period 2011-2020, 2011, European Union, also available at http://ec.europa.eu/education/vocational-education/doc/bruges_en.pdf

⁵ European Centre for the Development of Vocational Training, 2012, Europe’s Skill Challenge, Lagging Skill Demand Increases Risks of Skills Mismatch, Briefing Note

⁶ The Bruges Communiqué on Enhanced European Co-operation in Vocational Education and Training for the Period 2011-2020, 2011, European Union, also available at http://ec.europa.eu/education/vocational-education/doc/bruges_en.pdf (viewed 16.04.2013).

⁷ Work based learning (dual system) is a well-known and traditional VET system in quite many countries, like Germany, Austria, the Netherlands, Denmark, also Belgium, but not part of the formal VET system in Latvia. Therefore it is being considered as innovative in Latvian context. In co-operation with German partners, based on the memorandum on co-operation in VET, signed between Latvia and Germany, 4 pilot projects on the implementing of work-based learning have been launched in Latvia in 2013.

II. THEORETICAL FRAMEWORK AND RESEARCH APPROACH

Academic research on the implementation of innovation as part of public policies has been performed in many countries. The studies on innovation in VET has also been a routine part of academic research in several countries, for example, in Australia, United Kingdom, the Netherlands and other countries. McGrath points out that the current decade has shown interest and return to issues of vocational education, including important international organizations, like UNESCO (McGrath, 2012). Political aspects of innovation with the studies of the positive transformational power of public innovation policies, the issue of policy framework and identification of governmental and business roles to support innovation, as well as the development of the National Innovation System has been analysed extensively, e.g. Sharif (Sharif, 2006). Lundval and Borrás have contributed to the research on the development of the innovation concept and to the presentation of the acquired knowledge in a systemic way, developing the idea of innovation as an interactive process (Lundvall and Borrás, 20015). The policy aspects of innovation have been also addressed by Courvisanos (Courvisanos, 2009).

Bennett et al claim that the VET systems need to be flexible and innovative, capable of addressing the needs through the innovative design and delivery of training programs (Bennett et al, 2004). According to research by Ruth and Deitmer there exists a multifaceted relationship between the actual learning environment and its capability to educate skilled workforces, and these authors link it to the specific ability to get involved in the innovation process (Ruth & Deitmer, 2010). Billett discusses and shows the relationship between the workplace experiences and the engagement of workers (Billett, 2008), Baartman and de Bruijn point to the links of knowledge, skills and attitudes and the development of competence (Baartman, de Bruijn, 2009). Kearny stresses that the capacity of workers to contribute to the intellectual capital of the company becomes increasingly important, and thus also the VET programs that develop corresponding skills (Kearny, 2004, p. 60). Regarding the question of the effectiveness and benefits of dual learning – various authors develop on this, e.g. Tynjala points out the benefits of workplace learning (Tynjala, 2008). However, Koudahl points to the possible problems in the implementation of the dual system in VET during the time of crisis, due to increasing lack of motivation and benefit for employers who are important subjects in the dual work-based learning system. Consequently, the existing academic and policy discourse clearly indicate to the need of change of paradigm in VET systems, and public administrations should take this into consideration when implementing and reforming their VET systems.

Apart from the textual analysis consisting of the synthesis of relevant academic and policy discourse regarding our research problem, also an extensive empirical study in the form of a survey has been carried out. The target group for the empirical study was both - high and medium level public administrators in education and research and experts from various research institutions, as well as representatives from regional employers and employers' organisations as a pilot group. Two slightly different research questionnaires were developed for these specific target groups. The administrators, experts and employers were asked relevant questions to evaluate the current situation and the potential future developments. More specifically, the target group consisted of: 1) high and medium level public administrators from the education and research domain, as well as research experts chosen according to their status and proved competence. Practically most relevant public administrators and experts were approached at the start of the survey – with significant experience in education and research, and who parallel to their major field of competence are also highly aware of the priorities and processes of the overall education system (to have an informed and well considered opinion); 2) employers of the Iecava region - covering both, small

and medium size enterprises, as well as several larger enterprises in the region. The reason for the slightly different questionnaires for the two target groups was twofold. First of all – the expert survey was carried out in 2012 as an initial study of the opinions at policy and expert level. The other (employers’) questionnaire was developed in the framework of a regional research a year later, with new VET policy developments having taken place during that year. For this reason the questions for the Iecava employers’ survey were formulated in such a way that not only conclusions could be made regarding the perception of the same issue by different target groups (constituencies), but in addition, the opinions of employers could be learned about the value of some more recent policy initiatives (e.g. the dual learning approaches).

Before the expert survey the questionnaire was tested among proved professionals in the above mentioned fields. Evaluations had to be made in scale 1 – 10, where 1: fully disagree; 10: fully agree. Based on the material obtained by the questionnaire, the primary analysis of the opinions of the various target groups has been conducted and the results compared.

The qualitative analysis has been complemented by quantitative analysis by applying the indicators of central tendency or location (arithmetic mean, mode, median), as well as indicators of variability (variance, standard deviation, standard error of mean, range, etc.) as well as cross-tabulations. This has enabled us to draw conclusions regarding the research problem based on which further practical recommendations for possible steps in policy making could be prepared and taken.

The public administrators and experts were asked questions concerning the need to strengthen the VET systems for innovation, the need to pay more attention to the training of innovation competent labour force and the value of training at the work place approach⁸.

The employers of the Iecava region were asked questions

1. to find out their attitude towards the need of innovative approaches in VET in general and specifically regarding work based learning (dual system) approaches⁹;
2. to find out their attitude and satisfaction with the VET content and mode of delivery¹⁰ – in order to secure more flexible approaches to better match the demand. This was important in order to obtain material on the present level of satisfaction of employers regarding the results of the functioning of the VET system and their readiness to introduce new education forms, as well as participate themselves in this process, mainly by providing practical placement places and come up with suggestions for curriculum development.

In the following part the results of the empirical research are presented and analysed.

⁸ The questions to the administrators and experts were: 1. The VET system should be much more strengthened regarding innovation; 2. The VET system should pay more attention to the training innovation competence of the labour force; 3. The training implemented by employers is the most important approach in the training of innovation competent labour force.

⁹ The questions concerned the employers’ attitude towards innovation and work based learning: Do you find it necessary to introduce innovative approaches in VET in general? Do you support the introduction of work-based learning (dual system) in VET?

¹⁰ The questions concerned the employers’ satisfaction with: Information on possibilities to train employees; Information on training abroad; Information on distance education programs; Increase of professional competence at work place; Creation of special professional training programs; Offer of professional education programs for company; Regular information on distance education courses

III. THE RESULTS OF THE EMPIRICAL STUDY

During the empirical study the following results were obtained. The results of the study concerning the opinions of the public administrators and experts are on the need for innovation in VET system is represented in Table 1. Experts were selected with relevant experience and knowledge on developments in the field in other countries.

TABLE 1 - PUBLIC ADMINISTRATORS AND EXPERTS' VIEWS ON THE NEED FOR INNOVATION IN VET SYSTEM IN LATVIA IN DECEMBER 2012

	<i>The VET system should pay more attention to the training innovation competence of the labour force</i>	<i>The VET system should be much more strengthened regarding innovation</i>	<i>The training implemented by employers is the most important approach in the training of innovation competent labour force</i>
Mean	7,70	7,55	7,79
Std. Error of Mean	0,398	0,484	0,379
Median	8	8	8
Mode	8	10	8 and 9
Std. Deviation	1,780	2,164	1,653
Variance	3,168	4,682	2,731
Range	6	7	7
Minimum	4	3	3
Maximum	10	10	10

Source: Authors calculations based on expert survey results. Evaluation scale 1-10, where 1-not important; 10- very important (n=21)

Experts gave high evaluations for the proposed statements. Only several experts gave the evaluations 3 or 4 (no one gave lower evaluations on all statements). All averages were rather similar, mode and median in all statements of the experts were not lower than 8 (in scale 1 – 10), variability of expert's responses were rather low for all analysed statements. It means that experts really see the importance of innovations in the VET in Latvia and policy makers as well as educators need to find the right ways for implementation of them.

The results of the study of opinions on the need for changes in vocational education in Iecava district of employers (randomly selected using entrepreneurs register and interviewed by phone) of Iecava region of Latvia are represented in Tables 2 and 3. For most of respondents it

was necessary to make request several times as entrepreneurs were very busy. The response rate of entrepreneurs was 22.4 (%), which in survey organisation and realisation theory is recognised as acceptable rate. Refuses for participation in the survey mainly were related with no interest to express the view or not enough information of vocational education development trends in the current situation, as well as real liquidation of the enterprise (even if the respective enterprise included in the sample was in the register of enterprises).

TABLE 2 – ENTREPRENEURS VIEWS ON THE NEED FOR CHANGES IN VOCATIONAL EDUCATION IN IECAVA DISTRICT IN APRIL 2013

	<i>Do you find it necessary to introduce innovative approaches in VET in general</i>	<i>Do you support the introduction of work-based learning (dual system) in VET?</i>
Mean	7,64	7,71
Std. Error of Mean	0,428	0,465
Median	8	8
Mode	8 and 10	10
Std. Deviation	2,264	2,462
Variance	5,127	6,063
Range	7	9
Minimum	3	1
Maximum	10	10

Source: Authors calculations based on entrepreneurs survey results. Evaluation scale 1-10, where 1-not important; 10- very important

Entrepreneurs have expressed support on necessity of introduction of innovative approaches to VET, the evaluations were very high, no employers have given the lowest evaluations. Rather similar attitude of employers were on introduction of dual education system or at least it's elements in professional education.

Data of Table 2 indicate that entrepreneurs gave very high evaluations for both the mentioned statements, where the average evaluation was 7,64 and 7,71. Half of entrepreneurs gave evaluation 8 or higher (median), largest share of evaluations for those statements were 8 and 10 (mode). Variability of entrepreneur's evaluations was rather high (standard deviation, variance, standard error of mean). A conclusion can be drawn that on the average there is a high awareness

level among entrepreneurs concerning the need for changes in the vocational education. This implies also the awareness that in enterprises the actual labour force tendencies are manifested, which potentially can be brought into the VET systems only if a close link between the VET providers and employers is secured.

Evaluations of entrepreneur’s attitudes towards the need for professional education/training for their companies in Iecava district are included in Table 3.

TABLE 3 – ENTEPRENEURS VIEWS ON NEEDS FOR PROFESSIONAL EDUCATION/TRAINING FOR THEIR COMPANIES IN IECAVA DISTRICT IN APRIL 2013

	<i>Information on possibilities to train employees</i>	<i>Information on training abroad</i>	<i>Information on distance education programs</i>	<i>Increase of professional competence at work place</i>	<i>Creation of special professional training program</i>	<i>Offer of professional education programs for company</i>	<i>Regular information on distance education courses</i>
Mean	5,93	4,46	5,36	5,50	4,79	5,41	6,12
Std. Error of Mean	0,613	0,569	0,517	0,516	0,540	0,637	0,614
Median	7	4	5	5	5	5	6
Mode	1	1	5 and 8	5 and 7	1 and 7	1	10
Std. Deviation	3,242	3,012	2,738	2,728	2,859	3,308	3,128
Variance	10,513	9,073	7,497	7,444	8,175	10,943	9,786
Range	9	8	9	9	9	9	9
Minimum	1	1	1	1	1	1	1
Maximum	10	9	10	10	10	10	10

Source: Authors calculations based on survey results. Evaluation scale 1-10, where 1-not important; 10- very important

Employers have indicated that they are interested in information on different possibilities for increase of professional competence of their employees, but the views of preferences are wide. Almost all the scale was covered in the statements. The highest evaluations were on “Regular information on distance education courses” – the highest arithmetic mean and mode.

Entrepreneurs survey results confirm that views of entrepreneurs related to professional education/training are highly different, and the average evaluations for different statements differ in a wide range. The highest evaluations entrepreneurs gave for information on distance education courses, the lowest are for information on training abroad: it confirms that they are interested not disturb their production process and imply the use free time for improvement of qualification and skills of the employees in their companies.

IV. CONCLUSIONS

The research had been aimed at studying the role of public administrations and employers in relation to the training of innovation competent labour force in VET systems – in order to secure a better match of the acquired competence and the actual labour market demands.

As a result of the research the following conclusions have been drawn. In the public sector there is a growing awareness among public policy makers that innovation competent labour force needs to be trained also in the VET system, since the labour market needs innovation capable workers at all levels. The growing awareness is manifested both, in the most recent policy planning documents, as well as in interviews with relevant stakeholders. Most experts also hold the view that it is important to strengthen the VET system in relation to innovation. Regarding the proposed innovative approach for Latvia – the introduction of work-based learning – were evaluated highly. The consistency of the experts' answers to all the three proposed statements testify to their confidence on the above mentioned issues.

The empirical research has shown that employers and employers' organisations are also generally well aware of the need for VET innovation, and there is supportive attitude also toward specific innovative measures, e.g., the work-based learning.

At the same time, in the answers by employers to the questions on the training of the employees, a contradiction emerges, since the generally low evaluations for the offered training options testify to the reluctance of the employers to further educate and train their employees. Moreover, the highest score given by the employers to the value of distance education courses represent the pragmatic implications – not let the training interrupt or disturb the production cycle. Consequently, the conclusion can be drawn that the employers for some reason do not value various forms of training (including sessions abroad) as important (or possible) for the competence development of their employees. The reason for this might be the present economic crises (this is only our assumption, since it was not the task of our research to study the motivation of employers). At the same time to some extent this testifies to a systemic problem – lack of incentives and support for employers to be interested and afford continuing education and competence development of their employees to secure an innovative and competent labour force. In our opinion this implies a task for public administrations to review the existing legal framework concerning the labour force training competence updates at companies as well. Consequently, further research is needed on the mechanisms for implementing VET innovation jointly by public administrators and by the relevant social partners.

V. REFERENCES

- Baartman, L.K.J, de Bruijn, E.** Integrating Knowledge, Skills and Attitudes: Conceptualising Learning Processes Towards Vocational Competence, *Educational Research Review*, Volume 6, Issue 2, 2011, Pages 125-134.
- Bennett, B., Bruncker, D. & Hodges, R.,** 2004. Innovation, Economic Growth and Vocational Education and Training. In: S. Dawe, ed. *Vocational Education and Training. Research Readings*, Australian National Training Authority, pp. 68-83.
- Billett, S.** Learning through Work: Exploring Instances of Relational Interdependencies, *International Journal of Educational Research*, Volume 47, Issue 4, 2008, pp. 232-240.
- Boom, A.** (2005). Firms' investments in general training and the skilled labour market. *Labour Economics*, Volume 12, Issue 6, 781–805.
- Brauer, K., Eugster, B.** Effects of Training and Assessment in Vocational Education and Training(VET): Reflections on the Methodology of Assessing the Development of Self-regulation, *Studies in Educational Evaluation*, Volume 32, Issue 3, 2006, Pages 243-261.
- Concept** „Raising the Attractiveness of Vocational Education and Training and Involvement of Social Partners to Secure the Quality of Vocational Education” (confirmed by the Order of the Cabinet of Ministers of 16.09.2009, Nr 629), also available at http://izm.izm.gov.lv/upload_file/prof_konsepcija_ar-MK-rik-629.pdf, (accessed 10.02.2013)
- Courvisanos, J.** “Political Aspects of Innovations,” *Research Policy*, vol. 38, pp. 117-1124, 2009.
- Education and Training for the Period 2011-2020, 2011**, European Union, also available at http://ec.europa.eu/education/vocational-education/doc/bruges_en.pdf (viewed 16.04.2013).
- European Centre for the Development of Vocational Training**, 2012, Europe's Skill Challenge, Lagging Skill Demand Increases Risks of Skills Mismatch, Briefing Note
- Guidelines** “Optimisation of the Vocational Education Institutions' Network 2010 – 2015” (confirmed by the Order of the Cabinet of Ministers of 6.01.2010, Nr 5), also available also at <http://izm.izm.gov.lv/nozares-politika/izglitiba/profesionala-izglitiba/7187.html> (accessed 10.02.2013)
- Innovation Priorities for Europe.** Presentation by J.M.Barroso to the European Council of 4 February, 2011.
- Kearney, G.,** (2004). “How Businesses Innovate Today and What that Means for the Workforce”, in *Vocational Education and Training. Research Readings*, S. Dawe, Ed. Australian National Training Authority, pp. 58-67.
- Keller, A., Semmer, N.K.** Changes in Situational and Dispositional Factors as Predictors of Job Satisfaction, *Journal of Vocational Behavior*, Volume 83, Issue 1, August 2013, Pages 88-98
- Koudahl, P.D.,** *Vocational Education and Training: (VET): Dual Education and Economic Crises*, *Procedia – Social and Behavioral Sciences*, Vol. 9, 2010, pp. 1900 – 1905.
- Lundvall, B.A. and Borrás, S.** “Science, Technology and Innovation Policy”, in *Innovation Handbook*, J.Fagerberg, D.C.Mowery and R.Richard, Eds. Oxford: Oxford University Press, 2005, pp. 599-631.

- McGrath, S.,** Building New Approaches to Thinking about Vocational Education and Training and Development: Policy, Theory and Evidence, *International Journal of Educational Development*, Volume 32, Issue 5, September 2012, Pages 619-622.
- McGrath, S., Lugg, R.** Knowing and Doing Education and Training Reform: Evidence, Learning and the Policy Process, *International Journal of Educational Development*, Volume 32, Issue 5, September 2012, Pages 696-708.
- McGrath, S.,** Vocational education and training for development: A policy in need of a theory? *International Journal of Educational Development*, Volume 32, Issue 5, September 2012, Pages 623-631.
- OECD/CERI Study of Systemic Innovation in VET.** Systemic Innovation in the Danish VET System. Country case study report – 3. OECD 2008.
- Results of the empirical research on European Social Fund project** „Research of Needs of Iecava Municipality for Realisation of EU and other Financial Institutions Co – Financed Projects and Activities” are available on Iecava municipality webpage <http://www.iecava.lv/page/621>
- Ruth, K. and Deitmer, L., 2010,** The Relationship between Technical and Vocational Education and Training and Innovation. *International Encyclopedia of Education (Third Edition)*, pp. 423-428
- Rycroft, R.W.** (2006). Time and technological innovation: Implications for public policy. *Technology in Society*. Volume 28, Issue 3, 281–301.
- Sharif, N.** Emergence and Development of the National Innovation Systems Concept, *Research Policy*, vol. 25, pp. 745 – 766, 2006.
- The Bruges Communiqué on Enhanced European Co-operation in Vocational Education and Training for the Period 2011-2020, 2011,** European Union, also available at http://ec.europa.eu/education/vocational-education/doc/bruges_en.pdf (viewed 16.04.2013).
- Trends and Challenges in Demand-Side Innovation Policies in Europe.** Thematic Report 2011 under Specific Contract for the Integration of INNO Policy Trend Chart with ERAWATCH (2011-2012), Technopolis [group], 26 October 2011 Authors: Kincsö Izsak & Jakob Edler
- Tynjälä, P.** Perspectives into Learning at the Workplace, *Educational Research Review*, Volume 3, Issue 2, 2008, Pages 130-154.