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Knowledge and Innovation policies in the Direction of the European Integration

Abstract

Knowledge and innovation have become the key to competitiveness and economic success. In the pursuit of economic competitivenes, the ability to achieve success in the market depends from the labor competitiveness and innovation. Europe realizes an innovation policy as a shared vision with the priority of building a knowledge-based economy. Also, one of the most important determinants of the competitiveness of the workforce is the country's education system. Paper explains the EU activities related to achieving a knowledge-based society and a competitive workforce. The national innovation policies of the EU-member countries are being developed within the global and European development directions, but at the same with regard to the specific characteristics of the national economies, especially to the primary drivers of the technological export breakthrough on the global market. After opening remarks, we propose some theoretical starting points. The next part of the article provides some international comparisons and discusses the situation in the Republic of Macedonia. After receipt of some current problems in Macedonia, the paper ends with suggestions for improving the future situation. The two-level model (national innovation policy and knowledge-based society) seems like the most appropriate approach for Macedonia both with regard to the robustness of the tasks that should be performed in the next development phase and to the going in the direction of the new economic and social changes in EU.

Key words: knowledge, innovation, competitiveness, the European Union, Macedonia

Introduction

When a society becomes knowledge-based, it faces challenges on a variety of levels. How and why knowledge is produced and shared, where it is produced, how knowledge spillovers affect new knowledge creation and parameters of use, changes in strategic decision making in knowledge-based environments and how public policy can and should adapt all are crucial issues. Today, we are living in a chaotic transition period to a new age defined by global competition, rampant change, faster flow of

information and communication, increasing business complexity, and pervasive globalization. The pace of change has become so rapid that it took a different type of firms to be dominant and marked entirely new era of business. The rapid development of the knowledge sphere of the rich countries today is one of the most notable mega-trends in the evolution of human civilization.

In the new economy, the knowledge component of products and services has increased dramatically in importance and has become the dominant component of customer value. The shift to knowledge as the primary source of value, makes the new economy led by those who manage knowledge effectively – who create find, and combine knowledge into new products and services faster than their competitors. More over, the capability to innovate and to bring innovation successfully to market will be a crucial determinant of the global competitiveness of nations over the coming decade. Undoubtedly, there is growing awareness among policymakers that innovative activity is the main driver of economic progress and well-being as well as a potential factor in meeting global challenges. The actualization of the "knowledge and innovation factor" as a solution to the general problems of economic growth is a very important and controversial subject of economic policy in Macedonia.

This paper aims to provide empirical and theoretical analyses of issues relating to creation and use of knowledge and inovation in the knowledge-based economy. First, we provide some theoretical argumentations. Then, we discuss about knowledge and innovation policy as a main strategic tools for achieving growth and competitiveness in the European Union. Last, but not the least, we investigate the past and current situation on this matter in the Republic of Macedonia and then the paper ends with some suggestions for improving its future situation.

v. Theoretical Framework

Knowledge-based economy is one in which the creation and use of knowledge and ideas or inovation have a crucial role in the acquisition of wealth. Even more significant, Europe realizes an innovation policy as a shared vision with the priority of building a knowledge-based economy. Having this in mind, we present some theoretical argumentations behind this concept. Referring to the overall growth of all countries and especially, in addition to the concern of the growth in the economies in transition, EU suggests that if they want to increase their competitiveness, they should develop their competitive advantages at the national level in order to face with competitive pressures, primarily coming from EU countries (Radosevic, 2003).

The role of innovation in the success of the nation and the industry is best introduced and expressed by thefamous economist Michael Porter. Porter used a diamond shaped diagram as the basis of a framework to illustrate the determinants of

national advantage. (Porter 1990, p.73) Porter argues that competition takes place around the creation and assimilation of knowledge and insists that the nation's competitiveness depends on the potential of national industry to innovating and developing. Porter also argues that national success of different countries may be a combination of many factors. He flatly rejects the widespread belief that government policy would like an active exchange rate policy and antimonopoly stimulation of the economy. Instead, he refers to the examples of industries that have succeeded in global level and argues that companies achieve their competitive advantages by innovation activities (Porter 1990, p.74). According to him, the innovation is not only the introduction of new technology (which results in new products), but also it relates to innovation processes and innovation in organizations (eg, new processes within companies). However, he emphasizes that the international dimension - effects of innovation (eg, innovated products) must be placed on the international market. Porter believes that the successful innovations arise when companies are under strong competitive pressures and despite the fact that their innovation activities can run into criticism and great obstacles. The maintenance of competitive advantage is a continuous process of improvement and upgrading because competitors are able to imitate any competitive advantage.

Creation and use of knowledge is the second relevant factor that has important role in the generation of growth and acqusition of wealth in the globalized societies. General knowledge and education system are becoming one of the most significant factors in the present conditions of the world economy. Today, globalization creates a need, the societies to be based on the knowledge. Key determinant of a knowledge-based economy is human capital, or its essential knowledge, expertise and capabilities. In the traditional industries, most of the jobs require the employees to know to do routine tasks. In the knowledge-based economy, fast changes are forcing workers to acquire new knowledge, expertise and abilities and to upgrade them during their whole working life. Also, one of the most important determinants of the competitiveness of the workforce is the country's education system. Education allows the country to shift the scale of development and tranfer the production of simple products to complex ones. Educated workers more easily accept the new technologies and also develop their own ones.

Barro, Sala&Martin (1995) showed that the level of education of the workforce (measured by years of schooling) and public sector allocation for education is closely linked to the growth rate of real income per capita. High competentent workforce depends from the quality of the education regarding the population. Bassani and Scarpetta (2001) found a high level of cohesion between the increased level of education and economic growth of the country. According to their research, any additional year of education of the population allows individual countries to increase production per capita for 4-7%.

However, the value of formal education should not be overestimated. Most of the researchers agree that human capital is an important determinant of competitiveness and economic development (return on investment in education is higher than the return of any other investment), but not a guarantee of development as the country with the best human capital does not necessarily achieve the best development results. In general, a large number of people with (outdated) academic education is not a true indicator of the competitiveness of the workforce. Workforce can easily be under-educated or unapropriate-educated or some employees may not possess the knowledge necessary for successful economic competition. In the conditions of rapid technological development, school diplomas and academic degrees do not guarantee economic success of individuals or even society as a whole. So the company can not rely only on those who have completed the educational process or on the labor market as the most important source of new knowledge and skills. It is therefore important to develop long- term educational and training programs and adult education, and ensure the participation of the entire population in it.

In many developing and as well in transition countries, existing systems of education are costly and ineffective, but unfortunatly, there is no simple way of improving them. Today employees must be able to create, analyze and transform information, effectively communicate, organize and coordinate business activities. They should develop communication skills and information knowledge as well as ability and willingness to further teaching and training. The biggest challenge for these countries is not only a question of how to gain the hardware, but to provide knowledge and know to use modern technology. Educational systems must not only encourage the acquisition of knowledge and skills related to specific tasks, but rather should be focused on developing the skills of decision making and problem solving, and training for future self-teaching and participation in the education system. The pursuit of competitiveness of the workforce is particularly important to tertiary education because it directly affects the productivity and competitiveness of the national economy and improving life standards (World Bank, 2002). In short, the educational structure of population and employees conformity with the economic needs, is becoming a crucial determinant of competitiveness and economic development.

2. Knowledge and Innovation Policy: Main Strategic Tools for Achieving Growth and Competitiveness in the European Union

In the era of globalization, the growth and development should be achieved through expanding the possibilities of gaining information and using communication technologies, which has led EU to set long-term determinants in order to become the most competitive economy in the world based on knowledge.

The World Bank (World Bank, 2002) proposes many measures in order to assist countries in determining a strategy for transition toward knowledge-based society and economy.

- Economic and institutional systems that provide support for application of existing and acquire new knowledge and enterprise development.
- Educated and skilled population that successfully creates, shares and uses knowledge.
- Dynamic information infrastructure to facilitate effective communication, exchange and process information.
- An effective innovation system of firms, research centers, universities and other organizations that would increase the volume of knowledge in the world, customized and conformity with local needs and facing the creation of new technologies.

The transition to knowledge-based society is the way to join the world of EU global competitors. In 2000, The European Council has adopted the Lisbon Strategy, where the main goals for the next ten years have been set for the purpose of becoming the most competitive and knowledge-based economy in the world, capable of sustainable economic growth, with greater opportunities for employment, better jobs and higher social cohesion.

At the Lisbon summit, it was expressed a strong view that innovation should be the basic mechanism of the transition to a knowledge-based society (Council of European Union, 2002). Therefore, innovation policy has become one of the main strategic tools for achieving the competitiveness of industry and thus for the maintenance and stimulation of economic growth in the EU. The EU approach to the innovation policy has more aspects. The elements of innovation policy refer to the industrial policy and company policy development, where the emphasis is on small and medium-sized enterprises. This position can be seen in the Lisbon strategy (such cases the Official Document Lisbon Summit of the Council of Ministers), in which it is proposed establishment of a European areas of research and innovation, creating a friendly atmosphere for the establishment and development of innovative enterprises. Likewise, the small and medium-sized enterprises should be the key

drivers of the innovation. As a mean of achieving these goals, EU proposes key link by the creation of the innovation network between companies and financial market, research and development, research and education institutions, advisory services and technological market. The important determinant of the strategic opportunity to strengthen innovation in the EU is evident in the next events. During the summit in Barcelona in 2002, the European Council reviewed progress on the basis of the Lisbon strategy, confirmed the commitment to encouraging innovation and called for research activities which has made a significant stimulation of research and development and innovation activities in the EU (European Commission, 2003). In conclusion, the Council has expanded the requirements for the expenditure dedicated to exploring the formulation and development (goal is for 2010, reach about 3% of GDP, with 2 / 3 of investment should come from the private sector).

Furthermore, EU sent a call for strengthening research business research and development through an integrated strategy that covers the increase in competition, better access to capital for more risky ventures, as well as better protection of intellectual property rights and dissemination of technology. The statement of the Commission on innovation policy in 2003, was also an extension based on the conclusions of the Lisbon strategy (European Commission, 2003). The statement calls for a wider definition of the concept of innovation, with the aim that the policy does not omit the less obvious or less well-known forms of innovation activities. It is also required interaction of innovation policy with other policy areas, eg industrial policy, which should increase the success of the innovation policy.

The key factor for industrial competitiveness is actually stated in the 'Industrial policy of innovation in the enlarged Europe' and is highlighted together with the knowledge and entrepreneurship (European Commission, 2003, 2004). The statement says that the European industry must become more innovative by ongoing installation, training and improving their products, processes and services. It is emphasized that the entrepreneurs need to develop innovations. The Green Paper on entrepreneurship innovation is considered one of the key challenges. (European Commission, 2003).

The strategy is focused on competitiveness and cohesion of the EU by increasing the innovation economy and creating more jobs and better jobs. The implementation and achievement of the strategy should be set in a way that suits the conditions at the national level of the relevant countries. It was agreed that the European Council will meet regularly and discuss implementation strategies and propose measures of its improvement. The process of economic growth and social cohesion in the EU was the subject of discussion at meetings of the European Council in Stockholm in 2001, Barcelona 2002 and in Brussels 2003. (European Council, 2004).

The results at the EU-15 level are mostly positive, but there are big differences between the competitive and technologically leading countries (Finland and Sweden)

and countries (or regions) that are lagging behind them (such as Greece or Italy, it is not) and who are trying to reach an advanced society. The second group did not easy accept most of the technical and technological changes, so there are serious troubles in the adoption and implementation of changes in all segments of society.

In 2002, the Educational Council has aimed to improve education and workforce competitiveness through the adopted Work Program. The program has three primary goals: improving quality and effectiveness of education and training systems in the EU, access to education and training of the entire population and the opening of a broad education and training classes. To achieve different goals women have proposed various measures such as developing skills for the knowledge society, ensuring the general availability of ICT, massive admission to the scientific and technical studies, buliding strong European cooperation, etc.

For all of these goals it is necessarily to keep in mind the future needs of the labor market and to achieve the development of knowledge, expertise and abilities of employees and the rest of the population, necessary for a knowledge-based economy. Countries that have properly prepared their people for active participation in the global knowledge and information economy will achieve substantial benefits and so their population. So the goal - the creation of agile and capable workforce that is willing to take risks, self-reflect, process information and solve problems, team work - is becoming a clear and unquestionable. It is unknown only the way to achieve this. In addition, there is no simple model or a model suitable for all countries.In addition to the concern of the growth in the economies in transition, EU suggests that if they want to increase their competitiveness, they should develop their competitive advantages at the national level in order to face with competitive pressures, primarily coming from EU countries (Radosevic, 2003).

3. Knowledge and Innovation policy in the Republic of Macedonia

During the 90s, the strategies for achieving and maintenance of long-term economic growth in the Republic of Macedonia have disregarded the meaning of knowledge development and innovation activities. Public policy innovations appeared only at the end of the 90s, while the institutional research systems development have not yet been completely restructured. Growth and innovation in this economy generally depends on the setting up research and development, the ability to absorb and spread of technology and demand - today and taking advantage of generated elements. This all together forms a conceptual framework of the national innovation capability. Elements of the national innovation capability are(1) absorption is the potential ability to absorb new knowledge and the adoption of imported technologies. (2) exploring the potential of research and development is not only an important task of generating new knowledge, but also the mechanism for its absorption. (3) expansion is a key

mechanism for the collection of economic benefits from investments in research and development and enjoyment to strengthen absorptive capacity. (4) innovation is the key mechanism that initiates the process of creating wealth in the research and development activities, absorption and dissemination (Radosevic, 2003).

In the world of global competence, the winners are already known, those are the economies whose export is the basis for inovations. Republic of Macedonia, already has the status of candidate member for EU integrations- this status explicitly demonstrates that this kind of EU changes are more than necessary. Thus, facing the magnitude of the changes that have taken place in the European countries, it must be mobilizied all corresponding institutions concerned with organized approach towards knowledge, information, and innovations as key points of the reorganization of the economy and the society, which is neccessary for achieving higher step of the development. Institutionalized research and development decreased during the transition due to declining share of public sector expenditure for research and development in GDP because of the lack of technological improvement in businesses. Funding research and development of the industry varied from region to region, while the intensity of co-operation was given by the industrial structure of the country. Non-industrialization was quite sudden, while there was the increased share of services in the economic structure, crossing the average growth of industrial activities. In general, partial loss of government funds, with weak demand caused the neglect of modernization and restructuring of research and development. Twenty years since the beggining of the Macedonian transition, and still, Macedonia is concerned with the implementation of the reforms that are crucial for appionting to the basic preconditions for market functioning. The indicators of the macroeconomic development, the analysis of the domestic and foreign resources, just confirm the fact that the transitional changes are developing very slowly. This is proved with our struggling behind the European processes, but not only behind them, also struggling behind other EU- member countries in transition.

The most important postulate for turning towards the ongoing changes in the European surrounding is the growth, as a result of the functional market economy. In such an economy, competetion must be based on the qualitative factors of growth. '' The ability of a country to mantain rapid economic growth during a longer period of time is highly dependent of the effectivness by which its institutions and policies are supporting the tehnological transformation and the inventivness of the companies. '' (Popovska, 2007).

The accumulation of problems with the social repercussion, the market environment where the price is still considered as predominant tool for strugle with the competiton and the social environment with its unsufficient institucional credibility, have slown down the development of the Macedonian economy and the implementation of the criteria on which the European market is based. The process of

privatization has led to productivity's reorganization, but not to complete owners transformation, which is noted by the abandoning the classical factors of manufacturing and instead keeping the labour intensive one. The Macedonian production is mostly based on the raw materials, who by definition, produce relatively low-added value in the comparison to the research and tehnologically based manufacturing. The investment ability of the Macedonian economy is on the level that corresponds with the need of intensifying of the process of the economic reconstitution. In the gross domestic product, gross investments have participated with 21,4%, and the investments in fixed assets with 17, 8 %.

The creation of innovations is connected with research and development. Nowdays, the linear innovative process is substituted with interactive innovative process that is based on various factors on the side of the supply and demand. Different actors, institutions, and individuals are contributing in and out of the R&D, by all sorts of activities and through different forms of connection. Cooperation is very important in creating innovations. In innovative societies, the innovative process is mostly dependent on "learning economy". Republic of Macedonia marks extensively lowest level of separating R&D in comparison to other EU- memeber countries in transition (for example, Slovenia, (1%), but compared to the aspirant EU- member Croatia (over 1%). EU has sat the following goal: structural increase in R&D expences in the private sector over 66% in 2010. In EU, the average participation of the business sector is 6,3%(2000). It is also stricking the struggling behind of R&D expences in the business sector in Macedonia. The largest spending is on universities (60,2%). What is surprising is the fact that in the period between 2003-2004 only 2 small, 21 medium and one large enterprise have had R&D investments. The biggest part of the R&D expences in the private sector falls to the production of chemicals, and chemical products and to the production of farmaceuticals. The potential-human resources engaged in R&D, has adversly structure, too. In 2002, on one million citizens in Macedonia, 4 researchers and 69 with tehnical profile (FTE- full time equivalent) are registred, while in Croatia the numbers are 1.904 researchers and 440 with tehnical profile. The percentage of the researchers is the highest in high education (6,1 %), and lowest in the bussiness sector (0.4%).

Macedonia lag behind the most of the Central and Eastern European countries and even more the EU in all aspects of national inovation capacity. The level of innovation corresponds with the level of development of the financial system, as well as the degree of competition and macroeconomic stability, or with the share of foreign direct investment. In comparison with the EU-15, Macedonia, expressed some prefered avoidance of risk, lack of finance for research and development, poorly developed links between science or research and business sectors. However, it turned out that most of the transition countries have the common difficulties in the field of innovation policy. Institutional environment for the implementation of innovation

policy is not well coordinated, human and financial resources are scarce, and the potential for companies to absorb knowledge and then apply it is very low. Referring to the new EU member countries (Chezh Republic, Slovakia, Hungary and Poland), it is evident that they are the countries with the highest number of patents registered by residents.(Radosevic, 2003).

The scientists and engineers, along with a relatively well-educated workforce, are the two good starting points of the national innovation system in the countries of Central and Eastern Europe and so as well in the Republic of Macedonia. The national innovation system consists of the measures and program policies, technological infrastructure and the institutional mechanisms of political control. (Popovska, 2007)

Knowledge becomes the most required product in the contemporary world. Knowledge production is development and aquiring of new knowledge. Knowledge transmission is education and development through training of the human resources. Knowledge transfer is dissemination of knowledge, that goes through a lot of actors, structures and institutions, and of which connection, the innovative capability of the economy and the society in general, is dependant on. Republic of Macedonia not only demonstrates extremely concerning level of potential production of its own institutions and individuals, but also it is on one of the lowest position according to the representation of modern forms of tehnology transfer –or among the last countries in the world, taken into the merits of the index of global productivity. Knowledge and innovations hold the ''key'' for succesfull performance on the world markets, because only by them, reorganizaton of the economy can be made in the direction of tehnological intensive and, by rule, highly competetive sectors. In Macedonia, in the period of 2000-2004, high tehnologies have participated only with 1% in the export of the manufacturing sector. Such percentage is registered only in the manufacturing sector in Albania. All the other EU members countries in transition note higer percentage (2004): Estonia– 14%, Hungary– 29% (over the EU percentage), Latvia, Leetonia and Slovakia – %, Romania – 3%, Slovenia 6%, Czech Republic-13%, Poland – 3% and Bulgaria 4%, and in Croatia - 4%. This "result" in Macedonian export can not be justified just with the bad economic conditions inherited from the period before the transiton, but primarily it is a result of the " slowness syndrome" of the transitional changes, i. e the long process of creating basic preconditions for market functioning. To change this position, it should be implemented the following features: higher education and training, effectivness of the markers, quality of the services, skilled labour force, financial funds, and tehnological readiness etc (Popovsk, 2007).

Referring to the general knowledge and education system, we can withdraw the following characteristics. According to OECD (2003), we can specify significant problems of the Macedonian educational system: the lack of emphasis on developing the ability to analyze issues and solve problems, weak links and areas of education and underdevelopment of life learning education. Although in Macedonia, there are a

number of projects regarding the strategy of education, they are still not well implemented or realized, and they are not some significant reforms that have been undertaken on this level.

According to Pecakovska and Lazarevska (2009), "Macedonia has alarmingly low pre-school enrolment rate with serious barriers for expanding pre-school coverage; very high early school leaving (ESL) rates with poor vertical and horizontal transition from one to another education subsystem and ill competence- based curricula reform; disturbingly high percentage of low achievers in reading and low percentage of people with upper secondary education; insufficient tertiary education participation rate with low, but increasing number of MST graduates and very low level of participation of adults in continuous education and training. These attributes suggest continuously poor performance of Macedonian education and training system in the process of accession".

The existing organization of curricula and the way the educational process is placed on provides only passive knowledge and teaching that does not allow Macedonia to acquire highly technical, technological and social knowledge, expertise and skills required in a competitive economy. There is a huge number of compulsory subjects, and a sufficient number of elective as well. Also there is a serious lack of flexibility and low level of local influence on the development of curricula.

The similar is the problem with primary and secondary education, because there is a lack of differentiation. Instructional programs are designed to make the young population to continue their education in high school, and not to continue their education in the craft expert and schools. Teaching programs are inadequate. Therefore, for the most capable and motivated students, most of the subjects are too easy, and for those less capable and less motivated quite difficult.

Number of people who graduated in the last decade increased with 4404 in 2003 year to almost 7835 in 2007 year. The largest increase in the number of graduates was recorded in economic and social sciences. However, still there is a great lack of competent managers, macroeconomists, financial analysts, modern, educated leaders and entrepreneurs, experts on international commodity and financial market, experts on public administration, specialized lawyers for work and social law, tax system, international law. The reason for these problems is probably the lack (or weak) connectivity between the market demand and content of educational programs.(State Statistical office, annual report, 2007)

Macedonian educational system slowly moves from a system with classical discipline and teaching methods to a system that meets the needs of democracy with a globally integrated free market. The new sustem should include the concepts like problem solving skills, creativity, communication skills and flexibility. The relevant Macedonian educational institutions must perform specific analysis and implement many changes to their educational system.

An important part of the competitiveness of national economies is actually the level of knowledge and expertise of workers. Macedonia does not have the necessary workforce skills and abilities that must have one modern competitive economy and the education and training systems have not implemented yet the necessary measures to reduce the inneficiencies. Possible EU accession of Macedonia sets further demands to improve the education system. Macedonia workforce must be redirected to the industry and business knowledge-based economic growth and to stimulate innovation, and employees should be able to quickly change jobs, manage them and work environment and to participate in life learning process. Students and employees need to learn to work together, building team spirit, proper social behavior and personal development while allowing inclinations and talents.

Conclusion

Based on the previous arguments for the purpose of this research and after receipt of some current problems in Macedonia, the paper ends with suggestions for improving the future situation.

- Republic of Macedonia has an unsatisfactory level of production, investment, innovation i.e. technological ability of its economy. The lagging behind the other transition economies implies increased complexity of the tasks which Macedonia has to perform within its efforts for gaining EU- membership status. The fast approaching to the phase where the increased efficiency is essential for the growth and the exports, supposes generation of conditions for a competition with new products, new processes, modern marketing, new managerial approach, by generation of creative ideas gradually transforming themselves into "learning organizations".
- The educational system should be changed in the way of providing more different educational opportunities to the participants of all ages, reformed curricula and establishing stronger links with the needs of the economy. It is necessary to improve the ability of solving problems, develop teamwork, increase the learning ability, improve the communication and technical skills etc. The reform of the curriculum should include many instruction manuals for the teachers and teaching materials, changing teaching methods and a new way of measuring educational results. In addition, the selection and training for the profession of vocational education should move into more classes and expand the circle of specialization. The educational system should be flexible and practicable to avoid and reduce early school leaving. We should increase the internal differentiation, finding and providing the informal ways of

acquiring knowledge and skills and improve knowledge of foreign languages.The curricula should systematically analyzed and modernized.

- The pedagogical practices in schools and universities should be changed, so it could help to make disciples and students to become more responsible and to increase their initiatives by system of rewarding. They should be directed to new different ways of analyzing and solving problems by implementing more practical work and case studies.
- The educational system should be based on the decentralized management especially in the field of funding, employment, curriculum, assignments etc. Local authorities and universities should gain more autonomy and responsibility, instead of the Ministry of Education. At the same time, schools and local authorities should develop managerial abilities to effective handling the schools. Schools and universities should be accountable for their results, and their results should be measured as an indicator of the success of the reforms. Increased expenditures for education without proper increased accountability will not give the desired results. Therefore, the Ministry should establish the standards, but the schools should be held accountable for educational results and also have freedom to do it. State has an obligation to determine the proper framework for fostering innovation and accountability of tertiary education institutions and it should develop easier entrance faramework for the private educational institutions on the market. The radical changes in curriculum, materials and pedagogical methods in case of Macedonia will have to conduct intensive training of already employed and new teachers to introduce new teaching methods, teaching materials and methodology for testing. Teachers and teaching should be mandatory and they should be trained to improve teaching methods and procedures, using information and communication technology and expanding their knowledge. These training programs should be interactive so that teachers and educators could each other exchange their ideas and experiences.
- The two-level model (national innovation policy and knowledge policies) seems like the most appropriate approach for Macedonia both with regard to the robustness of the tasks that should be performed in the next development phase and to the takes that result from our going in the direction of the new economic and social changes in EU.

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