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FINANCING OF SCIENCE AND HIGHER EDUCATION IN POLAND

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Synopsis: This paper presents the major changes which have been introduced in the funding of science and higher education in Poland between 2010 and 2011. These changes also affected the functioning of the university, Polish Academy of Sciences, research institutes, and scientific promotion system in Poland.

For many years there was wide discussion about condition of Polish education and the needs for its amendment. As a result, between 2010 and 2011 new acts were adapted, concerning Polish Academy of Sciences, financing of education, establishment of the National Science Centre, establishment of the National Centre for Research and Development, as well as research institutes. The aim of those changes was to achieve higher quality of education, better preparation for a changing economy, increase in the participation of Polish's scientists in major international research projects, and creation of perspectives for Polish universities for sustainable development and permanent increase in research potential [ASSUMPTIONS ... 2009].

One of the key measures in achieving those goals is a mechanisms for efficient functioning of the university, so that more and more funds will be distributed through competitions, and funding from the government budget will depend on learning outcomes and research results.

An important element of the reform was the introduction of pro-quality amendment of stationary grant and the found of support for the best universities, staff and students. A special role is played by the National Center for Science and the National Research and Development Centre.

The tasks of the National Center for Science

Acts of April 30, 2010 regarding the financing principles of science, the National Center for Science and the National Research and Development Centre play an important role in the functioning of the universities, research institutes and scientific development.

The tasks of the National Science Center (NSC), located in Krakow, are presented in the Act of 30 April 2010 (Journal of Laws of 2010. No. 96, item 617). The funding of basic research, including research projects, funding of research equipment, projects for people starting a career in science, international cooperation, must to be regarded as the most important. Center is designed to allocate at least 20% of the funding to support the development of young scientists. Centre is responsible for conducting competition for funding of research projects (previously organized by the Committee for Scientific Research and the Ministry of Science and Higher Education), mainly in the field of basic research, by which we mean the original research experimental or theoretical work undertaken primarily for determining the observed facts, without the direct practical application or use. It may be:

1. funding of research projects (including equipment purchase or development)

2. projects without foreign international co-financing

3. research projects carried out by people starting their scientific careers, including projects concerning creation of a unique scientific workshop and the creation of a new scientific team

4. doctoral fellowships and internships after obtaining the degree of doctor,

5. research projects for experienced researchers for pioneering research projects, including interdisciplinary science, beyond the current state of knowledge.

NCS is also in charge of other task, such as international cooperation, inspiring and monitoring of research funded outside the budget of the country, or information about announced competitions. Overall, the National Science Centre is responsible for promotion of research activities in the field of basic research.

The tasks of the National Research and Development Centre

National Research and Development Centre carries out tasks in the field of applied research, focused primarily on the practical use of the results, support of scientific, technological and innovation policy. The strategic programs of research and development are managed by the Center. The main objective is to co-finance companies which use the research results in practice, commercialization of research results and their transfer to commercial activity. The tasks of the National Research and Development Centre include, among others:

1. supporting the commercialization of research results and development work and their transfer to the economy,

2. initiation and implementation of programs, including research and development work funding and preparations for implementation of research results,

3. initiation and implementation of selected research used to acquire new knowledge,

4. participation in international research and development projects,

5. advertising the projects financed by the Center,

6. popularization of effects of completed tasks,

7. implementation of the tasks assigned by the Minister.

Changes in the financing of higher education and science

Science and higher education are areas in which development is related to the economy and living conditions of the population, they are actions that require high expenditure. Poland is generally perceived as a country with a low level of investment spending on education. The level of expenditures and trends in this area in years 2007 - 2011 are presented in Table 1.

Table 1 - Expenditure on higher education and research in Poland, 2007-2011

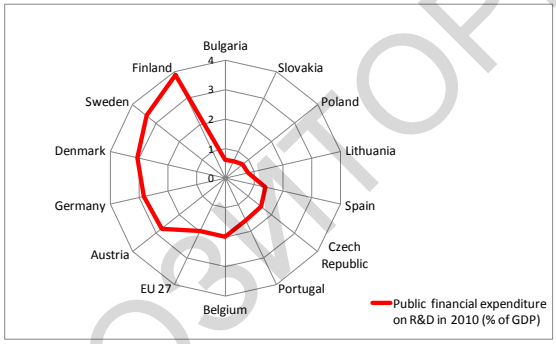
Expenditure on higher education and research in Poland, 2007-2011				
Years	Higher education		Research	
	Share of public expenditure in GDP	in mln PLN	Share of public expenditure in GDP	in mln PLN
2007	0,93	10 844	0,57	6 673
2008	0,88	11 191	0,60	7 706
2009	0,88	11 851	0,67	9 070
2010	0,71	11 792	0,74	10 416
2011	0,67	12 082	0,77	11 678

Source: Own study based on: *Education Institutions and their finances;* Polish Central Statistical Office 2012 and *Science and Technology*; Polish Central Statistical Office 2013.

In years 2007-2011 growth was recorded in Poland's internal expenditure on higher education and research and development (R&D). The value of these investments in 2011 reached 12 billion PLN on higher education and nearly 11.7 billion PLN for research.

Poland compared to other European Union member states cannot be distinguished as a leader in the field of interest of research development, expressed by the expenditure. Figure 1 presents comparative analysis of expenditure share in GDP in selected EU countries.

According to Eurostat data, the internal expenditures devoted to research in Poland in 2010 accounted for 1.6% of the expenditure of all EU countries. According to preliminary data for 2011 show that the intensity of R&D in Poland in relation to the EU-27 is lower by 1.26 percentage points. In 2010, as in Poland, the rate did not exceed 1% in Romania, Cyprus, Latvia, Bulgaria, Slovakia, Malta and Lithuania. Sweden and Finland (respectively 3.42% and 3.87%) spend the highest rate on R&D. In those countries, research and development, is largely financed by the private sector (2.33% and 2.72%). For comparison, in Poland the financing of R&D by the private sector is 0.2%.



Source: Eurostat Research and development Expenditure, by sectors of performance % of GDP Govemment sector

Figure 1 - The share of expenditure on education in GDP in selected EU countries in 2010

Conclusion

1. Research institutes and universities in Poland waiting for significant adjustments that aim to increase their competitiveness and quality of conducted research.

2. The role of government in the distribution of funds for specific research units will decline, contribution provided by the government will decrease, greater importance will be related to parametric evaluation obtained individually or collectively, and obtained funds under grants and national and international projects.

3. The legislature seeks to support the most scientifically creative centers and scientists. This may be right approach, however, raises concerns, in the case of

scientific institutions that are highly rated and strongly financed can preserve the existing structure of science. Leading National Research Centers may form polish 'elite university' competitive to European.

4. The level of expenditure on higher education and R&D in relation to gross domestic product in Poland is one of the lowest in the European Union. In industrialized countries, research and development is funded primarily by the private sector (Sweden 2.33% of GDP). In Poland, the figure is 0.2% of GDP.

LITERATURE

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ТЕХНОЛОГИЗАЦИЯ УЧЕБНОГО ПРОЦЕССА КАК ФАКТОР ПОВЫШЕНИЯ ЕГО ЭФФЕКТИВНОСТИ

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В рамках современного образовательного пространства технологизация учебного процесса рассматривается как один из факторов оптимизации образовательной среды. При оценке эффективности учебного процесса, в том числе и в высшей школе, наряду с общепринятыми критериями все чаще используют такой показатель, как *степень его технологичности*.

Идея технологизации обучения возникла еще в I половине XX в. Именно тогда педагоги-новаторы высказали мысль о необходимости технологизации учебного процесса с целью повышения его эффективности. Однако технологизацию они понимали очень узко, сводя ее к процессу технизации, т.е. широкому использованию в учебном процессе технических средств обучения. В реальной педагогической практике такое понимание технологизации сохраняется до сих пор, несмотря на то, что современная педагогическая наука понимает этот процесс более широко и рассматривает технологизацию и технизацию как относительно автономные, хотя и взаимосвязанные между собой процессы.

Технологизация учебного процесса предполагает его *ориентацию на конечный результат, подчинение всего процесса обучения поставленным целям и задачам*. *Основным показателем технологичности* учебного процесса является взаимная согласованность и взаимное соответствие всех его уровней,