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Tertiary Education in the Czech Republic and Business Sector, European Trends

Abstract: University education is more often regarded as one of the main tools of the career success (gaining a good job) and one of the best life investments. Nevertheless, we are still unfortunately the example of the country where the increased growth of the percentage of students entering in the tertiary education in the last fifteen years has not until now led to a marked reduction of the existing inequalities. Based on the EU Survey of Income and Living Conditions[1], in the Czech Republic the university education is reached only by 9 % of the youngest age group under 26 years whose father was a manual worker. The expert material applied to the reform of the Czech tertiary education[2] was submitted to the public expert and political discussions. The submitted study is based on this material. This study includes the Czech system of tertiary education in the international context, and reflects the European and world trends of recent years. In the first part, it describes the role of the tertiary education in the Czech Republic. In the second part, it elaborates the question of the implementation of a newly developing collaboration of universities with the application sphere, with the world of work. This refers to a complex interconnection and overlapping between the state administration, national and regional policy, industrial and service sections and universities themselves.

Keywords: tertiary education, Czech Republic, role, challengers, business sector

[1] EU SILC., *EU Survey on Income and Living Conditions*, Brussels 2006.
[2] P. Matějů, a kol, *Bílá kniha terciárního vzdělávání*. Praha 2009.

Tertiary Education in the Czech Republic and its Role

Societies from all over the world face global challenges, such as migration and population diversification, deepening differences between the rich and poor, the emergence and growth of social exclusion and increased criminality. Moreover, they are transforming into knowledgebased societies with economies driven by new discoveries and subsequent innovations. The greatest values originate from creative people and creative work. The modes of getting to know the world and implementing new pieces of knowledge are being enhanced by trends in conjoining rational and creative means of cognition and discovery. Countries that fail will be left with carrying out routine work done by people or machines. Without the healthy development of its educational system, Czech Republic will gradually become an assembly plant of Europe, pressured by long working hours and a deepening decline in real wages.

In this context, the importance of all three main roles of tertiary education is expanded and deepened. In addition to the traditional challenges of quality, efficiency, and equal opportunity, educational activity has to confront new challenges. These include the challenges of maintaining a maximum education across an entire active life (lifelong learning), the ability of both individuals and organizations to learn continuously and rapidly, and the challenges of creativity, initiative and innovation, knowledge of people and society, and the use of soft skills. The direct interconnection between education and research and development is not only an important motor of cognition and innovation in general, but also a main source of the creativity of college and university graduates. The social role of universities not only makes a fundamental contribution to the care and development of cultural heritage, but also an increasingly important direct impact on economic development at the regional and global levels. At the same time, the number and importance of external actors who constantly demand changes in the educational system are increasing. Changes leading to greater flexibility, openness and innovation are the most beneficial.

Post-communist countries, the Czech Republic included, did not undergo a gradual development like other developed countries and many reforms started to be implemented only after 1989. The educational system during the time of the Czech economic transition managed to cope with major challenges posed by modern society in a far shorter time than in traditional democratic countries. In a mere 18 years, tertiary education in the Czech Republic underwent major quantitative and qualitative changes. The number of institutions and students

increased, a large degree of research and development activities was transferred to HEIs (HEI = Higher education institution), self-governance principles were introduced in college and university management, schools started to participate in international cooperation, post-secondary professional schools and private HEIs were established, academic study became structured, etc. These facts were also emphasized several times by international teams of experts, including the OECD team that prepared the study Thematic Review of Tertiary Education: Country Note Czech Republic[3]. The above project was initiated to help OECD member states identify problem in their educational systems and find an optimal model towards which they should strive. The authors of the study note that "the system of [Czech] tertiary education [is] distinguished by high levels of institutional autonomy, academic self-governance and (almost) full public funding of higher education. The key policy approach in this re-building of the system was a return to a Humboldtian model of university education and research, and of the relationship between the state and higher education." However, the experts believe that the existing profile of tertiary education (its structure, mode of financing, etc.) will not be able to meet the requirements for a richly diversified system that would be open to European and global trends and would at the same time fulfil the needs of the development of the Czech Republic in the context of its growing knowledge society.

Demands for reforming tertiary education are also evident from the results of an opinion poll of selected stakeholders carried out as part of preparations for the White Paper[4]. The respondents took a particularly critical stance toward the following areas: the limited ability of higher education institutions to flexibly respond to changes taking place on the labour market and the qualifications required by employers; the imbalance of powers and responsibilities between boards of trustees, administration and academic senates of HEIs; poor conditions for fostering cooperation between HEIs, the business sector and other entities; and inability of HEIs to cooperate with the private sector. Furthermore, there is consensus that the overall development of tertiary education and research carried out at HEIs is not in compliance with the strategic needs of regions and the

[3] J. File, et al (2006), *Thematic review of tertiary education – country note for the Czech Republic. Paris: OECD,* http://www.oecd.org/dataoecd/8/32/37730231.pdf (accesss: 24.10.2013).

[4] Matějů, P. (2007), *Názory expertů na české vysoké školy. Výsledky z průzkumu názorů expertů na vysoké školství* [*The View of Experts on Czech Higher Education: Results of a Expert Opinion Poll on Higher Education*], unpublished document.

Czech Republic as a whole, and that research carried out at our higher education institutions is not state-of-the-art.

Results of a survey of college and university students in 2006 indicate that even students themselves see the situation of higher education in the Czech Republic in a fairly critical way. Over a half of the respondents believe that higher education needs a major reform and only a negligible number think that it does not need any reform.

The proposed major changes to tertiary education in the Czech Republic have to be implemented with respect to numerous circumstances and risks. Competition aminy education providers is on the rise and educational demand is increasingly difficult to meet. Budgetary constraints on public resources will not change much, nor will the global market for highly qualified graduates and academic staff. New generations of students will show a greater interest in the relation between their studies and their relevance for the labour market. Lifelong learning will pose greater demands for the form and content of the education on offer. The response of the whole system and individual universities to these challenges must not put the social and cultural role of universities at risk and must not make them subordinate to the sphere of policy and narrow employer interests. All proposals contained in the White Paper take the above circumstances into account.

One of the most important factors leading to successful educational development is the establishment and long-term maintenance of relations between employers and the whole tertiary education system (in addition to their links to research and development). Employers and the private and public sectors are particularly dependent on the quality and number of graduates who enter the labour market each year. Employer and professional associations hence cannot be indifferent to the situation in tertiary education, and must pay more and more attention to it (see e.g. the document Industry's Strategic Needs for 2008–2011, prepared by the Confederation of Industry of the Czech Republic). In general, employers are beginning to regard the situation of all levels of the educational system as unsatisfactory, and are demanding major changes to it, including tertiary education. These activities have to be seen as one of the key indicators of the responsiveness of stakeholders and the environment to the functioning of the tertiary education system.

It also has to be pointed out that employers' needs can only be fulfilled in a diversifiedsystem of tertiary education in which there is a relatively large segment of institutions providing higher education with a strong professional component

and having very close links with employers and other partners in relevant professional fields. However, a long-term objective of the whole system has to be the quality of graduates' knowledge and skills in general. Carefully designed graduate preparation, directly according to the requirements of individual partners, should be on the other hand implemented by institutions (or their parts) that are closely and professionally linked with those partners, above all in the context of lifelong learning. The is will eliminate the risk of deforming education as such. Along with the increasingly important role of further education, employers should gradually and more intensely cooperate with the tertiary education sector in ensuring the continuous development of the knowledge and skills of their employees.

The Velvet Revolution of 1989 ended several decades of political censorship in teaching and interventions in university admissions, restoring academic freedoms. However, hat in itself could not remove the deformation caused by the gradual shift of research to institutes of the Academy of Sciences of the Czech Republic, which occurred after World War II, with the USSR as a role model. University associate professors and professors were perceived as internationally important researchers and teachers, but the small number of those positions did not reach the staffing levels needed to ensure the quality of study programmes for accreditation at many newly established faculties and HEIs. The problem grew even greater after 1999, when the Higher Education Act (No. 111/1998 Coll.) came into effect, which made it possible to establish private higher education institutions. As a result, there has been an increase in so-called "flying professors" – i.e. academics with multiple positions and affiliations, some of which are mere formalities – at public HEIs and departments of the Academy of Science of the Czech Republic. Such professors often serve as guarantors or teach courses at several HEIs and are not permanently based there, except for occasional lectures and consultations. This naturally has an impact on both the quality of education (including the supervision of annual, bachelor's, master's and doctoral theses) and on the quality of their scientific work. At the same time, the existing formal requirements for academic staff actually limit or even eliminate the possibility of attracting well-prepared teachers with practical experience. Furthermore, in part due to low mobility, the Czech Republic still perpetuates a traditional mode of human resource development, in which the academic staff members of tertiary institutions are recruited predominantly from their own graduates.

Already at the end of the 1990s, it was clear that in international comparison Czech academic staff with "advanced" academic titles, such as professors,

were among the podest in the world and the least mobile, both domestically and internationally[5]. Unfortunately, no radical improvement has yet occurred, and the continued unfavourable state of the age structure of academic staff and the very strong age-dependence of individual categories (assistant professor, associate professor, professor) have also been confirmed by recent research[6].

The quality of teaching is also affected by the teaching load of teachers and the class load of students. Over the last two decades, the concurrent use of highly conservative teaching methods and the mass nature of education have led courses to be taught in a far too formal manner, i.e. with overcrowded seminars in which students do not receive the necessary feedback, consultations and ongoing checks of their academic performance. There is also no time for enhancing the qualifications and expertise of teachers at HEIs. However, numerous courses could be conducted more efficiently by experts from the field and the traditional style of teaching should be replaced by a project-oriented approach that highlights related soft skills (management, cooperation and team communication, definition of deliverables, meeting deadlines and quality, etc.).

The internationalisation of study is absolutely insufficient at most schools with respect to the direct interaction of Czech and foreign students (if there are indeed any other foreigners than Slovaks; the existing system is such that that schools make them attend other, institutionbased courses in which they are isolated from the presence of their Czech peers), the use of foreign literature, and the incorporation of study abroad during one's studies. As a result, graduates are not adequately prepared for further studies abroad, for finding employment on the international labour market, or for foreign work environments. Similarly, students only rarely use literature in their original foreign languages, which they should be taught to do. In the best case scenario, high-quality Czech translations are available, but usually students use literature in the form of notes and commentaries written by their professors. This manner of engaging with texts does not compel students to search for information, evaluate it, correctly utilize it, or to present it.

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[5] D. Tollingerová, *Povolání vysokoškolského učitele v mezinárodním srovnání: Česká republika*, Centrum pro studium vysokého školství, Praha 1999.

[6] P. Matějů, A. Vitásková, (2005), *Vybrané výsledky z výzkumu akademických pracovníků veřejných vysokých škol* [*Select Results of Research on Academic Staff at Public Colleges and Universities*], p. 163–188, in: Simonová, N. (ed.). *České vysoké školství na křižovatce. Investiční přítup k financování studia na vysoké škole v sociologické reflexi* [*Czech Higher Education at a Crossroads: Investment Approaches to Financing Studies at Colleges and Universities in Sociological Perspective*], Prague: Institute of Sociology of the Academy of Sciences of the Czech Republic.

The Czech system of tertiary education lacks guarantees and credible projections of the financial resources of individual TEIs, even in the short-term horizon of more than a year. Since the capital investment policy for the development of HEIs is not transparent, it is practically impossible to devise and fulfil the long-term strategic development plans of individual institutions. The fields of study that do not have many opportunities for direct cooperation with industry, but which play a key role in the broader social function of universities (e.g. artistic fields and humanities) are the most sensitive to this.

The aim of the reform is the stabilisation of an open system of autonomous institutions of tertiary education and research and development that independently organize their constituent parts and functions so as to best compete in a competitive regional, national and global environment. In order for the system to operate more efficiently than at present, it is essential to ensure:

- academic freedoms and academic autonomy,
- the openness of TEIs towards external social interests,
- a transparent environment with clearly visible results (successes and failures) of the activities of individual colleges and universities,
- an a healthy competitive environment among tertiary institutions.

For this purpose it is desirable to:

- Increase the diversity of the whole system of tertiary education, i.e. broaden the autonomous decision-making of individual institutions about their internal structure and profile, while clearly supporting excellence in all aspects of work;
- Expand the organisational and economic autonomy of individual TEIs so that their internal structure, management and control processes correspond with the selected mission within the system;
- Enhance the national and international mobility of academic staff who perform teaching activities;
- Better define and expand shorter, professionally oriented study programmes (e.g. the expansion of two-year professional programmes and a substantial increase in the overall adaptability of graduates of bachelor's programmes, and hence their professional success; opening up the whole system to rising demand);
- Create conditions for the concentration of state-of-the-art research in research-oriented centres (e.g. faculties or suitable alternatives to higher education research institutes);

- Create conditions stimulating the cooperation of TEIs, oriented towards development and innovation with external partners;
- Involve external actors in the management of individual HEIs commensurate to their type; increase the quality of feedback and support of managerial elements of governance, such as strengthening accountability and efficiency;
- Increase the role of private resources in tertiary education (public resources will be insufficient in other policy areas as well), i.e. strengthen multi-resource financing:
- Create more favourable conditions of cooperation with the business sector; foster greater willingness to participate from both sides;
- Introduce a suitable model of cost sharing on the part of students that would increase the interest of public higher education institutions in the future employability of graduates; also, admit more foreign students;
- Mitigate social barriers in access to higher education, i.e. better utilise the potential of human capital and provide targeted support for talent;
- Create an efficient system of financial aid for students;
- Enhance the overall permeability between and within the levels of the educational system and improve conditions at the level of secondary education (transferability, the preparedness of applicants at all levels of study, aspirations);
- Significantly increase the involvement of TEIs in lifelong learning, whether with or without the direct cooperation of commercial partners.

Cooperation with the Business Sector

For centuries, universities have guaranteed the freedom of thought and inquiry and ensured vital reflections on societal issues and topics. They have always needed academic freedoms and autonomy for this purpose. At the same time, they have always facilitated the intergenerational transfer of knowledge. In addition to this, TEIs (TEI = Tertiary education institution) are gradually being transformed through the key role they play in the production of knowledge and the generation of the innovation potential of society. As tertiary institutions gradually become centres of innovation processes, the direct economic and social impact of their activities changes at the regional, national and international levels. The new status of tertiary institutions cannot be described using any general categories of common processes or procedures. The general services tertiary

institutions provide to society are specific and are formed differently at different institutions by means of concrete regional, economic and political contexts. Since this public service constitutes another major set of university activity alongside education and research, we will use the term "third role" in the subsequent text to denote this function.

The pursuit of the newly emerging cooperation between TEIs and the business sector is a very complex process due to the basic linkages and overlaps between state administration and national and regional policies, industrial and service sectors, and educational institutions. Despite their autonomous status, the relevant actors have become closely interconnected. This web of relationships and links is metaphorically described using the term Triple Helix that was coined in the mid-1990s[7]. Recently, we could observe a number of complex processes in the Czech Republic to this effect, as well the gradual process of linking all the three domains, resulting in mutual interaction that has brought about organisational changes within institutions. New entities have emerged, such as contact centres; technology transfer centres; strategic alliances of enterprises and universities; networks of academic, private and government research institutions; business incubators, etc. These activities are still haphazard and virtually uncoordinated in terms of objectives and effects.

The implementation of projects related to the "third role" must be a natural process resulting from structural, economic and legislative changes, or, possibly, from the use of several general support instruments, rather than from narrow and one-off targeted interventions. As the Czech Republic does not have a transparent classification of publicly funded education and research and development providers according to the type of activity and performance, it is not possible to define common procedures for implementing the "third role" at the level of various types or institutional categories. However, it is possible to formulate and justify principal steps towards supporting and implementing the "third role" of TEIs at the national level in the context of overall tertiary education and research and development reforms.

Changes in the actual framework will not be effective without an active approach on the part individual stakeholders. Successful implementation of the "third role" of universities will require that institutions, regions and ministries/ state administration bodies pursue, among other things, the following:

[7] H. Leydesdorff, L. Etzkowitz (1996), *The Triple Helix as a Model for Innovation Studies*, "Science and Public Policy", 25(3), p. 195–203.

a) Major changes in managerial approaches at all levels of strategic management (at universities, in regions, and at the national level) including a real (although implicit and non-formalised) categorisation of TEIs.
b) Patient and thorough analyses of the opportunities and risks in various regions, and the sensitive timing of steps and political decisions.
c) The systematic implementation of a set of principal legislative amendments:
   - Allocation of subsidies for research and development that would be targeted to encourage and facilitate cooperation with the business sector;
   - Changes in the legal status of students in the labour code (including the basic definition of doctoral students in the labour code);
   - Definition of governance structures and powers for TEIs that facilitate the effective institutionalisation and management of commercial relations (including the establishment of organisations providing specific services to be used by one or more R&D institutions);
   - Legislation and rules concerning research results funded from public resources (realistic and reasonable provisions ensuring access to research results "for all under the same conditions" so as not to hinder commercial cooperation);
d) Establishing or strengthening appropriate institutionalised units within TEIs (or regionally shared units) that will lead to the professionalization of knowledge and technology transfer;
e) Incentives for firms to invest in R&D in cooperation with the public sector (at present, companies are often unprepared to respect the real costs on the part of service providers).

The need to change the attitudes of academic staff will constitute a long and complex process. Their professional identity is, to a large extent, rooted in the clear separation of their research work from commercial goals and the commercial use of research results. It is neither appropriate nor desirable to expect a fundamental change in the behaviour of academic staff in general. However, academics in senior positions will be required to exhibit a large set of business skills that lie outside the scope of their traditionally defined roles. Academic staff in a knowledge society should not only be genuine experts in their relevant disciplines, but also increasingly take on the role of project managers with excellent organisational and communication skills.

By using these skills they will be able to "sell" the outcomes of their work quickly and effectively and find new partners, particularly from the private sector,

for their future research work. The same applies to tertiary education graduates who will gradually assume management positionsin the business sector. TEIs must create favourable conditions for this development.

Virtually all of the successful strategies across various countries are based on the same prerequisites. In our discussion, we draw on the research on these practices in 10 countries (Technology Centre of the Academy of Sciences of the Czech Republic 2007):

a) Legislative as well as financial support for the establishment of agencies providing specific services focused on the commercialisation of R&D results, or at least for the professionalization of these activities within the actual institutions;
b) Direct financial and legislative support for the establishment of research teams and positions on the border between public research and development and the business sector;
c) Indirect support for the use of R&D in the form of tax instruments;
d) Public support for clusters and platforms bringing together public R&D institutions and enterprises;
e) Direct state intervention in setting up and funding several centres of excellence dealing with both applied and basic research, as well as the transfer of results and the direct involvement of business partners.

We can consider the sixth prerequisite obvious, and thus not mentioned in the relevant studies:

f) The existence of relatively sound and well-financed tertiary education institutions where basic educational and research activities reach high international standards and are independent of the success of commercial activities in the short run.

None of these points involves direct public funding for TEI "third role" activities. Rather, these points concern either support activities or provisions that can ensure a qualitative and organisational framework for the desired processes.

The first four types of intervention a)-d) are currently being introduced in various forms in the Czech Republic. However, their impact on the tertiary education sector is still very small. The main reason appears to be the insufficient coordination between various ministries and the lack of true centres of excellence. Interventions under e) are envisaged in the Operational Programme Research and Development for Innovation, including the necessary links between supported centres of excellence and educational activities.

In the context of the reform of tertiary education, we should pay particular attention to the last (implicit) prerequisite – f). Only institutions that meet these criteria can invest systematically in commercially viable R&D projects (R&D = Research and Development) implemented with partners as part of their educational practice. It is only on these foundations that a genuine transfer of technology can be achieved repeatedly and over the long term (licences for intellectual property, spin-off s, etc.) and that long term commercial or co-funded projects can be implemented. If we take a realistic view of the resources available in the Czech Republic in the medium term, the reform of the tertiary sector (particularly concerning financing) needs to pay specific attention to the existing achievements in R&D&I (R&D&I = Research, Development and Innovation), including technology transfers and the existing cooperation with the business sector.

Best practices from abroad can be taken into account in the process of preparing and implementing policy interventions. One common practice consists in introducing agency services for supporting the transfer of technology and knowledge. In the countries under review, the interventions focused on entities established by R&D institutions, or possibly by regional authorities (e.g. there is a special law that enables TEIs to set up agencies providing specific services; there are regional technology centres in Denmark, and regional centres for technology services in Ireland). Interventions also focus on the establishment of state agencies that take various forms (e.g. Technology Clinics and the TUPAS Funding service in Finland, the National Institute of Technology Management in Ireland, and the VINNOVA state agency in Sweden). The policy (supported, among other sources, from the Operational Programme Enterprise and Innovation) has so far been implemented in the context of support for innovation in small and medium enterprises. However, with respect to the need for technology transfer, the policy lacks long-term stability in terms human and economic resources. The funding of projects in the Czech Republic is needlessly bound to the accumulation of capital assets and the short term start-up of operations of the companies concerned (the Prosperity programme in the Operational Programme Industry and Enterprise). This means that, at present, we have several relatively well-functioning units, but have unclear prospects.

Another type of support consists in joint research teams made up of companies and public research and development institutions. In the foreign experiences examined (The experience of English companies with a similar focus suggests that roughly eight years are necessary for stabilising the level and scope of services - e.g. Isis Innovation in Oxford or Cambridge Enterprise), this support involves

interventions for creating platforms for setting up joint technology infrastructure of public R&D institutions and companies (e.g. the Innovation Consortiums scheme in Denmark). Moreover, the interventions focus on the creation of interdisciplinary research and development teams across a wide spectrum of institutions (e.g. the Interdisciplinary Research Teams and Industrial PhD Initiative in Denmark, Industry Led Research Networks in Ireland), on direct funding of R&D implemented jointly by public and private sectors (e.g. so-called "innovation vouchers" in the Netherlands, the SBIR and STTR programmes in the USA), and on supporting the continuous mobility of human resources between the public and private sectors (e.g. Knowledge Transfer Partnership in the UK). This function is embedded in the National Innovation Policy of the Czech Republic for 2005-2010. However, only parts of the policy concerning support for R&D&I in SMEs have so far been implemented. The impact on the activities of public R&D institutions can be seen, above all, in the areas of traditional cooperation between enterprises and technical universities (defectology, metrology, testing etc.). A broader scope of opportunities should be offered within intervention of the Operational Programme Education for Competitiveness.

In many countries, tax incentive conditions for cooperation between the public and private R&D sectors are modified on a continuous basis (In Denmark, they even attempted to increase the deductibility level up to 150% in some types of projects).In the Czech Republic, this type of support is incorporated in the documents on the planned reform steps of the Ministry of Finance. The taxpayer (as a legal entity) should have the opportunity to support the implementation of R&D projects and deduct the relevant amount from their taxed income up to a specific multiple (a specific amount) of the actual costs of the R&D project and the valid tax rate in the current tax year, combined with a multiple of the increase in R&D expenditures compared to a given moment in time, and later in comparison with the prior tax period. Tax allowances will also be allowed for purchasing research from tertiary education institutions. Moreover, emphasis will be placed on whether or not the assets generated by means of R&D and the related yields are allocated in the territory of the Czech Republic (For details see "Reform of Income and Property Tax¨ on the website of the Ministry of Finance).In its proposed form, we can expect a very positive impact on the implementation of the Lisbon process in the Czech Republic.

Clusters and technology platforms are soft interventions that support the establishment of umbrella associations of enterprises and R&D representatives in the public sector. Apart from traditional clusters focusing on joint ventures of

private firms, the acquisition of raw materials, the provision of consumer services, etc, associations are being set up that share technology infrastructure and human resources for research and development, but also for innovation in general. In the Czech Republic, such interventions were made possible as part of the Operational Programme Industry and Enterprise. So-called technology platforms are far more important, in which private and public R&D institutions can share a broad spectrum of laboratory devices, testing rooms and, possibly, semi-operational units. This type of intervention is also supported via the EU Framework Programmes. The technology platforms scheme was also discussed in detail as part of the Operational Programme Enterprise and Innovation. However, a number of aspects concerning this type of support appear to have been omitted from the materials that are currently in use. From the perspective of TEIs, it would be desirable to reach similar effects through an appropriate selection of projects within the Operational Programme Research and Development for Innovation.

Many countries have witnessed direct state intervention and concentrated support leading to the establishment and operation of several field-specific or regional centres of excellence. Examples include the Leading Technological Institutes scheme in the Netherlands, The Christian Doppler Research Association in Austria, and the VINN Excellence Scheme in Sweden. In the Czech Republic, the opportunity is opening up to carry out similarly successful interventions, particularly via the Operational Programme Research and Development for Innovation. These opportunities could be relevant for a wide range of institutions and their organizational units within prioritised fields of research. Such interventions will only be fully effective if a balance is struck between support for excellence at the level of applied basic research and support connected to the training of global elites for R&D and applied research at the level of so-called regional R&D centres. At the same time, we should carefully monitor the standards for the financing of the revitalisation and development of public R&D units in the City of Prague that are not eligible for funding from operational programmes.

Conclusion – chosen recommendations:

- Extensively transfer to HEIs the responsibility and competency for selecting the structure and internal governance of their economic management, human resources and duality controls, including the content and form of education activities (this competency of selection will presumably not

apply to Institutes of Professional Education, whose management bodies will be more strictly defined by law).

- Require a standardised evaluation of teaching quality by students and by means of objective indicators (e.g., the success of graduates, peer review of the knowledge and skills of graduates, the teaching methods and approaches used, etc.) as a Fundamentals basis for evaluating the quality of an institution, or its organisationally autonomous segments, for the purposes of financing and accreditation.
- During evaluations, take into account the development of students' soft skills, their attained knowledge and skills in individual programmes of study, and possibly involve expert practitioners in educational activities.
- Create a public information system on HEIs and the results of study (online) that will provide detailed standardised information not only about schools, but also about individual fields of study at those schools.
- Pursue an extensive internationalisation of study; changes in the concept of education related to active knowledge, skills, and excellence at the international level should be supported in large part by project schemes financed by the Operational Programme Education for Competitiveness.
- The new concept of financing tertiary education and R&D institutions must lead to a diversification of sources so that it facilitates the establishment of centres of tertiary education that would be stable in terms of financial and human resources and that would focus on applied basic research as well as the direct transfer of technology and knowledge.
- The existing centres for the support of technology transfer (whether units within R&D institutions or independent entities) should be evaluated for their actual performance. Instruments should be introduced to provide select centres with public support and thus ensure their stability for at least 6–8 years. Possibly, this infrastructure should be complemented (not replaced) by a government agency with central operations.
- The financial components of interventions of a), b), and d) are being prepared as part of the Operational Programmes Enterprise and Innovation and Education for Competitiveness. The experience of similar programmes abroad should be analysed in detail and the potential of sectoral programmes at the ministry level and operational programmes should be utilised in 2009–2015.

- Direct incentives for companies to cooperate with the public R&D sector should be introduced in the Czech Republic in the form of so-called "innovation vouchers" that have worked well in the Netherlands.
- The existing proposal of the Ministry of Finance to modify the tax system concerning indirect support for the services of the public R&D sector should be implemented.
- The impact of the existing support for clusters and technology platforms should be evaluated. Long-term public support should be provided to boost their functions that are related to R&D carried out through cooperation between the public and private sectors. Possible synergies between the Operational Programmes Enterprise and Innovation and Education for Competitiveness should be assessed carefully, including an analysis of experiences of similar programmes abroad.
- Interventions within the first and second priorities of the Operational Programme Research and Development for Innovation should be focused primarily on the development of several large centres with extensive expert and application capacities[8] (Matějů, P. a kol, 2009).

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