

BUILDING A KNOWLEDGE ECONOMY: ARE HUNGARY'S EDUCATIONAL REFORMS THE RIGHT APPROACH?¹

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ABSTRACT: *Technology and global connectivity are leading to accelerating dynamics of the global economy. One of the underlying driving forces is the increasing importance of immaterial resources. This has exhaustively discussed under keywords such as “knowledge economy” or the increase of “knowledge intensity”. The following paper discusses the appropriateness of the youngest reforms in Hungary’s higher education system against the background of a modern knowledge economy. It focuses on higher education and presents preconditions, goals and the institutional framework of a “dual approach”. It briefly treats the current situation in Hungary regarding key aspects of its competitiveness and summarizes the recent policy critically.*

Keywords: *Competitiveness, Knowledge-Economy, Education Economics, Dual Studies, Vocational Education and Training*

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INTRODUCTION

In the last decades, extensive research has underscored the highly dynamic changes of the global business environment. Technology and global connectivity are leading to accelerated processes (see Dobbs et al. 2014; Werr, Greiner 2008). Immaterial resources are getting more important (Pawlowski, Edvinsson 2012, 14). Since immaterial resources have been identified as the perhaps most decisive driving force of the global economy, keywords such as “knowledge economy” (see Arvanitidis & Petrakos 2011) or the increase of “knowledge intensity” within businesses (see e.g. Smith 2002) increasingly determine the discussion of topics concerning competitiveness. Putting it another way: What, if not *knowledge* could be make firms, nations or regions more competitive? Advantages in knowledge are undoubtedly the key factor of competition. For the situation today it is determinative, that competing companies, and hence nations, face a never recognized pace of change. Therefore, the research concerning the problem of competitiveness focused on the role of knowledge in modern economies: “Knowledge is perhaps the most critical competitiveness factor. As countries move up the economic scale, the more they

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thrive on knowledge to ensure their prosperity and to compete in world markets.”(Garelli 2006, 610).

According to this, *education* always has been a central topic of competitiveness research. Within the European Union education is – according to the principle of subsidiarity – a *national* challenge, and there are significant differences. Especially the Eastern European candidate countries of 2004 still show a noticeable backlog regarding several economic indexes. Provided that the global economy is accelerating and provided that immaterial resources – knowledge – are increasingly important, there is a lot to do for national governments to acquire and manage the appropriate knowledge, or: to build a modern “knowledge economy”. This article discusses the appropriateness of the youngest reforms in Hungary to acquire and manage the background for the development of a modern knowledge-economy. As explained later, Hungary has already achieved a respectively high knowledge intensity. The more knowledge-intensive an economy, the more important are higher qualifications. This article focuses accordingly on tertiary, especially on higher education. An assessment of the situation in Hungary seems obvious because the higher education system faces reforms which are driven actively by the industry and brought out by policy makers with explicit reference to questions of national competitiveness. The explicit ideal is the German model which promises a more appropriate development of immaterial resources by integrating training on the working place and class room teaching: the so-called “dual” approach. This article presents briefly preconditions, goals and the institutional framework for implementing a dual approach in the Hungarian higher education system.

As a first step the first section explains the theoretical basis and discusses the role of education, especially higher education related to the viewpoint of national competitiveness. With this background, the second subsection comments on the dual approach as a “magic bullet” for the problems and gives some short notes on paradigms for Hungarian policy. The second section briefly treats the recent situation in Hungary regarding key aspects of its competitiveness. The third section focuses on the current reforms in the Hungarian higher education system. After a short comment on the actual institutional background the second subsection presents the new “dual approach” in higher education. The fourth section critically summarizes the current policy referring to the basis presented in sections two and three and gives a short outlook for further considerations.

1. COMPETITIVENESS AND KNOWLEDGE. SOME REMARKS.

1.1 National Competitiveness and Global Knowledge Economy

First of all we have to draft our understanding about competitiveness regarding firms and nations explicitly. The last decades have shown a vast amount of literature regarding the topic of competitiveness (see e.g. Nijkamp & Siedschlag 2011; Mitschke 2008): “There are no agreed definitions of competitiveness and the term seems to mean different things to different people — some may stress a country’s low costs or the level of its exchange

rate, others a country's technological or even its growth rate" (Boltho 1996, 2). For our perspective it is important to point out that competitiveness should not be confused with particular aspects of economic performance. It rather provides a framework "(...) how nations and enterprises manage the totality of their competencies to achieve prosperity or profit" (Garelli 2006, 607). Referring to the principle of subsidiarity and focusing on the unit of *nations* we take the holistic definition provided by Garelli (ibid., 608) as a starting point:

"Competitiveness of nations is a field of Economic theory, which analyses the facts and policies that shape the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people."

The increasing complexity of products and markets gives us a hint of the importance of *knowledge* in modern economies in the broadest sense. The knowledge economy index (KEI) of the World Bank Institute illustrated clearly, that the higher a country's ability *to use knowledge* for economic development, the higher the economic outcome measured in GDP per capita (see World Bank 2012).³ The structure of the KEI, which ranks the average of the performance of a country in four pillars of the "knowledge economy framework" – economic incentives and institutional regime, education and human resources, the innovation system and ICT – (see Chen & Dahlmann 2005) is feasible. The simplicity of the key argument behind it – the more the knowledge, the more the money – is impressive. Several scholars have broached the issue that knowledge is increasingly important, moreover, there is emerging a new economic structure, the knowledge economy (see Arvanitidis & Petrakos 2011, 15f.).⁴

But – regarding the claim for competitiveness – whether a country provides an environment which is beneficial for knowledge to be used in an economically reasonable sense is a different question: What exactly is the knowledge which can be the basis for value creation? And who is responsible – which knowledge should be provided by nations, which is the knowledge the firms should create? At first sight these seem to be unsolvable questions, because competition is a discovery procedure which discovers and creates *unpredictable* knowledge (Hayek). If we take in account the aspect of Garelli's definition of competitiveness that nations face the task of generating (more) *prosperity* for their people by providing an appropriate *environment* we get a hint of the task sharing between policy makers and firms. The World Competitiveness Yearbook (IMD 2015) gives a sound reference for both poles. But "there is no single 'recipe' for competitiveness" (Garelli 2006, 609). It must be emphasized here that in an economic world with open barriers nations need to develop their *respective comparative advantages*. Hence nations need to adapt wisely both to international division of labor and their internal economic, cultural and political conditions.

In this context *education policy* is a key factor in building the competitiveness of a country. But obviously it is not enough to simply put more money into the education system

³ Last data provided for 2012.

⁴ See e.g. Neef et al. (1998); Burton-Jones (1999); Brinkley (2006).

(see Török 2008).⁵ As value creation gets more complex, prosperity is harder to create. Regarding the dynamics of the world economy, governments face the increasingly serious challenge of reshaping education systems in regard to their structure and content (see e.g. Schlotter et al. 2008; Piopiunik & Ryan 2012; Link 2012). According to the mentioned indexes this seems particularly challenging for Eastern Europe.

1.2 A “dual approach” as magic bullet?

If nations compete in providing a better environment for the use and creation of knowledge, skills or competencies of the *workforce* come into focus. Because of the increasing dynamics it seems to “surprisingly difficult, to make professional education and training fit the needs of the workplace” (OECD 2014, 56). The environment for value-creation has to adapt and if economic change accelerates it seems to be the most feasible challenge to connect the world of work and the world of education more closely (see OECD 2013, 18). In the last years a vast amount of literature documented the need for a closer relationship.⁶ To complete traditional classroom situations with learning in the workplace is an arising demand, more and more economic development seems to outpace traditional education practices. Learning in the workplace provides adaption to complexity: It “...allows young people to develop ‘hard’ skills on modern equipment, and ‘soft’ skills, such as teamwork, communication and negotiation, through real-world experience.” (ibid.).

Soft skills seem to be acquired more easily in workplace situations. But the technology explosion obviously causes a shift regarding the “hard skills” needed. Recent surveys reflect a clear trend towards knowledge in technical domains: “Nearly two-thirds of overall employment growth in the European Union (EU25) is forecast to be in the ‘technicians and associate professionals’ category (CEDEFOP, 2012, cited in OECD 2014, 11).”

In general, the German system of Vocational Education and Training (VET) is one of the most successful models in tertiary education for keeping up with the needs of the employment market (see Hyslop 2012). The “dual approach” well known from the German model of “Berufsausbildung”, which combines learning in the workplace with traditional classroom education seems to be a proper solution to face the mentioned problems. Similar systems have been developed in France, Canada, Australia, Switzerland or Austria (see OECD 2014, 22; Graf 2013). According to several surveys of the OECD, the dual approach is seen to be beneficial for employers by the productive benefit through the work done by trainees (OECD 2014, 57), for employees because of a strong learning environment (ibid., 56) and for nations, because it ensures a better linkage between the labour market and demand (ibid.).

5 A claim of the latest OECD Country Note on Hungary (see OECD 2014C).

6 See e.g. Frank et al. (2007); Etzkowitz (2008); Powell, Solga (2010); McLaughlin & Mills (2011); Graf (2013); Chen & Wu (2013).

However, regarding not only the shift towards more technical and more complex tasks in every day work (see OECD 2013, 6), but also regarding the value added, a *highly* educated workforce is the key factor in a modern economy: higher knowledge intensity and higher education levels are required (see e.g. Tremblay et al 2012, 16). There is an “increasing demand for higher level technical and professional skills” (OECD 2014, 23). “Barro and Sala-i-Martin (1995) found that higher education has the largest effect on growth compared to both secondary and primary schooling” (Arvanitidis & Petrakos 2011, 18). Therefore the shape of *higher education* comes into focus. Not only because it obviously has a greater effect on the knowledge economy, but also because it is traditionally less linked to the “world of work”. This seems to be a core problem. McLaughlin and Mills (2011) called it in her study the “isolation of the sectors”, which is obviously applicable for the new member states.

Undoubtedly the recent economic developments question the traditional university model (see Powel & Solga 2010). Market developments outpace the subjects taught. In addition “many professional, technical and managerial jobs require only one or two years of post-secondary career preparation, and employment growth in this sector is rapid” (OECD 2014, 22; see also Veugelers & del Rey 2014). Therefore, new types of institutions within higher education arise as alternatives to traditional universities in many countries (see Tremblay et al. 2012, 19). Based on the mentioned surveys and considerations regarding the VET System and the shifts in the labour market we assume, that a structural change towards a “dual” model in higher education, similar to the basic principles of the VET-system, could make the knowledge of graduates fit better the needs of the workplace and keep up better with the challenges of the modern world economy.⁷ The general claims of the OECD (2014, 58), that apprenticeship needs to be made an *essential and integrated element* of the vocational program, rather than an optional add-on, seems to be transferable for higher education. Is a “dual approach” for higher education the magic bullet to make higher education system fit the dynamics of the economy? Hungary based its structural reforms in higher education on this assumption. The following sections provide a brief overview.

2. RECENT SITUATION IN HUNGARY REGARDING COMPETITIVENESS AND EDUCATION

The following subsections present a brief overview of the situation of Hungary regarding its competitiveness and higher education system. The first subsection provides a holistic starting point and depicts the concept and ranking of the World Economic Forum as the recently most relevant approach. It highlights the role of immaterial resources as the most important starting point for reforms regarding fostering competitiveness. The second subsection shifts the focus to the respective concrete policy area and briefly highlights the challenges for the Hungarian education system.

⁷ This assumption is underpinned by recent research by Graf (2013) or OECD (2014).

2.1 Competitiveness

There is a couple of different indexes of assessing economic conditions, potentials and outcomes on national or regional level (Booyesen 2002; Freudenberg 2003; Sharpe 2004). Restricting the holistic approach of Garelli to its economic content, the concept and ranking of the World Economic Forum (WEF) provides the perhaps mostly renowned and accepted starting point for considerations regarding competitiveness. It also may provide a sound basis for analyzing the concrete needs of the education system for adaptation. The WEF defines competitiveness as “the set of institutions, policies, and factors that determine the level of productivity of a country” (WEF 2013, 8). Similar to the World Bank’s concept of “knowledge societies”, the World Economic Forum maps its view in the *Global Competitiveness Index Framework*. It is built on a 12-pillar structure, the “12 pillars of competitiveness” (ibid., 4). The twelve pillars are related to three different categories, each representing a subindex for competitiveness: The *basic requirements subindex* is composed of the pillars institutions (1), infrastructure (2), macroeconomic environment (3), as well as health and primary education (4). The *efficiency enhancers subindex* includes the pillars higher education and training (5), goods and market efficiency (6), labor market efficiency (7), financial market development (8), technological readiness (9), and market size (10). The *innovation and sophistication subindex* includes the pillars business sophistication (11) and innovation (12). Each subindex is a key indicator of different types of economies: The *Basic requirements subindex* for “factor-driven economies”, the *efficiency enhancers subindex* for “efficiency-driven economies” and the “innovation and sophistication factors subindex for “innovation-driven economies”. Remarkably, the pillars (4), (5) and (11) refer to the education systems. Innovation (pillar 12) is named as a key factor for knowledge-based economies explicitly. “Business sophistication” focuses on the network effects and sophisticated business practices. In turn, sophisticated business practices require a highly skilled workforce.

The following table 1 depicts the performance of Hungary in the 5th pillar of the Global Competitiveness Index, higher education and training.

Table 1: 5th pillar of the Global Competitiveness Index, higher education and training, Hungary

	Value	Rank/144
Secondary education enrollment, gross %*	101.6	27
Tertiary education enrollment, gross %*	59.6	44
Quality of the education system	3.3	96
Quality of math and science education	4.3	60
Quality of management schools	4.3	66
Internet access in schools	5.4	35
Availability of research and training services	3.9	85
Extent of staff training	3.6	108

Regarding Hungary's rank its obvious, that there is a high need for improvement regarding the quality of its education system. If we consider the category of "math and science education" as an indicator for the quality of the preparation for working in knowledge-intensive areas by means high intellectual requirements, the backlog seems remarkable.

2.2 Challenges for the educational system

Table 2 depicts the 12th pillar of the Global Competitiveness Index regarding Hungary and focuses on innovation. It seems striking, that regarding the interplay of the world of work and the world of academia Hungary stays behind. As far as we assume that the quality of networks and collaboration is decisive for the emergence of an innovation system (see e.g. Cooke 2001), the isolation of these two worlds may be a main course for Hungary's significantly worse rank regarding capacity for innovation.

Table 2: 12th pillar of the Global Competitiveness Index: Innovation, Hungary

	Value	Rank/144
Capacity for innovation	4.0	52
Quality of scientific research institutions	3.3	97
Company spending on R&D	3.2	59
University-industry collaboration in R&D	3.9	48
Gov4888procurement of advanced tech products	3.5	68
Availability of scientists and engineers	3.6	100
PCT patents, applications/million pop.*	0.0	124

Source: Schwab (2014), 11, 208.

However, according to the recent report of the WEF, Hungary is now on the cusp to become an *innovation-driven* economy (see Schwab 2014, 11, 208). From another point of view this means that its economy has to reach a new status of knowledge-intensity. Focusing on "the ability of a nation to create and maintain an environment" (Garelli 2006, 608) and based on the assessment of the WEF this is obviously a concrete challenge for education policy. More concretely: according to the ranking of the WEF, the Hungarian higher education system obviously should move closer to the "world of work".⁸ Considering that, according to the terminology of the WEF, Hungary is in the *transition stage*, its position in row 2-5 in table 1 (highlighted), and in row 1,2,4, and 6 in table 2 (highlighted) seem to be eye-catching: Hungary has a lot of homework in enhancing an appropriate workforce, particularly in knowledge-intense areas.

The results of the WEF are similar to the diagnosis of the European Competitiveness Report (2014, 33) regarding the shares of high skilled labor in the value added in global value-chains. Moreover, the European Competitiveness Report (ibid., 36) reflects the situation

8 Regarding the general debate see Teichler (2009), especially chapter 5.

from another viewpoint: it shows a perceived *mismatch* between skills and duties. Against the background of the high manufacturing share of total value added, which is according to the latest EU Competitiveness Report the fourth highest in the EU (ibid, 22)⁹, the shift to knowledge-intensive and especially technical domains challenges the education system.

But it seems that until now there have been less adaptations: with 4.4% of GDP public expenditure on education Hungary's rate is one of the three lowest among OECD countries (OECD 2014C, 1). Former full OECD country reviews (latest dates from 2008) already reflected the harmful dividing line between the world of work and the world of education. This dividing line is the more harmful the higher the importance of immaterial resources gets. Because if there is a tendency towards a higher knowledge intensity in the global economy, this dividing line may cause outpacing processes and hence a skills shortage, which severely affects a nation's competitiveness. Focusing on the Hungarian VET system, learners spent relatively little time in real work situations and are often not forced to acquire knowledge regarding the latest technical developments. The current system mostly does not ensure the possibility for the learners to adapt to everyday workplace challenges and focuses on traditional classroom teaching style. This is obviously true for higher education in Hungary as well. Efforts of a closer cooperation between institutions of higher education and the industry have been primarily driven by the most important foreign investors and had come into focus of the policy makers only in recent times after an emerging skills shortage had become obvious.

According to this, Hungary faces a double challenge. On the one hand, as recent expert recommendations argue, Hungary has a demanding need to adapt its educational system to come up with the needs of a quickly developing industry and to achieve in this manner the level of an *innovation-driven* economy.

3. RECENT DEVELOPMENTS IN THE HUNGARIAN HIGHER EDUCATION SYSTEM

3.1 Background

Traditionally higher education in Hungary emphasizes theoretical skills. VET has relatively low status and many students are oriented to VET because of poor academic performance (see Kis et al. 2008, 14). Moreover, lecturers of institutions of higher education often do not have industrial, often no practical experience at all, and curricula do not match the expectations of modern industrial employers. According to this employers often claim a lack of soft skills and the ability of graduates to solve problems in teams or independently.

⁹ According to the Competitiveness Report 2014, manufacturing's share of total value added comes to approximately 22%. The OECD economic survey of Hungary 2014, which presents basic statistics from 2012, shows a share of the industry of 30,6% and a share of 64,7 % of the services (see OECD 2014B).

3.2 A dual approach for higher education

Recent reform processes in higher education are linked to the change of government in Hungary in 2010. At present there is no accessible research guiding or assessing the content and structure of reforms.¹⁰ According to this our description in the following refers to the official statements of the government and the respective higher education act as the currently only reliable sources. Between 2010 and 2014 the education system was completely restructured.¹¹ According to this the organizational and financial responsibility for public education now belongs to the state, not to municipal or regional administration. As many other nations, Hungary shows a distinct divide in post-secondary education between vocational education and higher education.

It is the explicit aim of the Hungarian government to make education better match the needs of the labor market and to increase the attractiveness of education. One of the key aspects is the closer cooperation between educational institutions and local companies. According to this a cornerstone of the reform is the reorganization of the vocational education and training system corresponding to German standards (see Szigeti 2015b, 4f.). It is notable, that the key arguments for the reorganization of vocational education and training are used for a new, *dual* approach in higher education (see Czomba 2015), too.

The changes forced in the educational system are, first of all, answers to the industrial structure in the light of the “reindustrialization” plans of the government (Czomba 2015; see also the European Competitiveness Report 2014 for the European perspective). According to official statements of the government Hungary plans to increase the share of industrial production in GDP from recently 23 % to 30% (Czomba 2015). This means an increased need for technical degrees, which is underpinned by the results of WEF (Schwab 2014, 11, 208). Hungary seeks to achieve a significantly more adequate workforce in a short time. The improvement in skills should range to the soft skills as well (see Szigeti 2015a, 5).

3.3 Steps towards the German model

The Hungarian policy is frankly guided by German ideals and refers explicitly to the model of the Baden Württemberg Cooperative State University (DHBW) (Szigeti 2015b), a German “Fachhochschule), (originally “Berufsakademie”) which applied the approach of dual studies for almost forty years and advanced to an “University of Applied Sciences” offering Bachelor and Master degree programs according to the Bologna-System (see Graf 2013).

10 Noelke & Horn (2014) provide an excellent study regarding “Social Transformation and the Transition from Vocational Education to Work in Hungary” and focus on the traditional VET-system, not on higher education. However, their statement that “existing studies neither focus on detail on the changing situation of VET graduates nor try to directly measure the role of a specific institutional mechanism, causing the outcomes of VET graduates to change” (ibid., 432) formulates a desideratum for considerations regarding the change of higher education, too. The comparative study of Vasilache et al. (2012) focuses on structure, history and financing of the higher education system and the implementation of the Bologna-Process.

11 Almost all information is accessible only in Hungarian. A good overview in German is provided through the bq-portal (2015) of the German Federal Ministry for Economic Affairs and Energy.

In general, Germany put different models of dual studies into practice and according to the fact that 16 German federal states shape their education policy independently there is a wide range of different, continuously developing forms (see BIBB 2014, 50). A sound orientation is provided by the guidelines given by the German Council of Science and Humanities (Wissenschaftsrat 2013, 9), which differentiates six different patterns or models. Of these only two are dual degree programs in a stricter sense, meaning a designed linkage regarding institutions and content:

- 1) *VET-integrating degree programs* (“Ausbildungsintegrierende Studiengänge”) combine bachelor degree programs with VET-programs at companies. The latter are traditionally supervised by the chambers of commerce, which invigilate the exams for the VET-part and issues the certificates. Students get both a certificate for the VET-program and a university (often of applied sciences) degree. A part of the VET-program can be creditable as a part of the studies. This is mostly practiced for combinations in the field of business (e.g. Bachelor in Business Economics and the VET-based “merchant”), technology (e.g. mechatronics) or informatics.
- 2) *Practice-integrating degree programs* (“Praxisintegrierende Studiengänge”): This model combines degree programs with coordinated forms of apprenticeship. This requires a good fit between the contents taught “in school” and practiced at the company. Due to this, the schedule of the curriculum – semesters, examinations, free time – is differently structured than at regular universities. There are various forms of arranging the time spent at the university or at the company, e.g. alternating months there, as at the Baden Württemberg Cooperative State University (DHBW) or in Bielefeld. Students are paid during their studies by the companies and get an average salary of 869 EUR¹². In contrast to the form of the VET-integrating degree programs dual studies students do not get a VET-certificate at the end of their studies. Students have to apply to the company first before applying at the respective institution of higher education.

The Hungarian approach is obviously oriented towards the second form, but without breaking up the traditional structure of higher education curricula and schedule.

In July 2014 the Hungarian government modified the higher education act to enable a dual approach in higher education. § 108. § 1a defines engineering, computer sciences, agricultural sciences and business or economics (or related subjects) as possible areas of dual studies. This may partly reflect the outcome of the German practice (not the legal regulation) (see BIBB 2014, 51; Wissenschaftsrat 2013, 13), but first and foremost seems to be driven by the needs of the industrial foreign investors. Indeed, the DHBW shows a wider range of subjects; in Germany traditionally VET-based programs as e.g. nurses training are little by little more academic and are hence more and more appropriate for a dual format in higher education. To exclude these subjects may be a short-sighted aspect of the Hungarian reform.

¹² According to the German platform <http://www.duales-studium.de/fuer-schueler-und-studenten/auswertung-der-gehaltsstudie> (accessed October 8, 2015)

The higher education act defines dual studies to be “in step with actual practice” and is possible for both bachelor and master degree courses. Dual degree programs must be designed as full-time programs. The concrete content regarding curriculum, the terms of admission and completion, methods and evaluation of the knowledge to be acquired has to conform with a framework given by the especially created *Council for Dual Education* (“Duális Képzési Tanács”), which accredits the partner companies as well.

The Council for Dual Education is *the key institution* of the reform process and is responsible for setting standards for the dual studies’ outcomes and quality. Its president is – simultaneously – the president of the society of the multinational companies located in Hungary. Two members represent the Ministry for National Economy. The remaining ten members represent the Herman Otto Institute (agricultural development), the universities of Pécs and Győr, the Budapest Business School and the Kecskemét college, the city of Kecskemét, the Petroleum Products Quality Inspection Company, the national chamber of agriculture and the German foreign investor Audi (DKT 2016). It seems debatable, if this composition reflects the needs of all stakeholders.

Based on the new higher education act the council defines the possible areas of dual education, elaborates parameters regarding quality and evaluation for all institutions, organizations and experts taking part in dual education. It qualifies the workshops of the companies and follows up the cooperation between institutions of higher education and the companies taking part in dual studies. As a part of the new higher education strategy the Hungarian government plans that students taking part in higher dual education should reach 8 % in 2020. In January 2015 the council decided to facilitate the first enrollments in dual education in September 2015.

While vocational education and training, as in the German system, mainly addresses youth unemployment, the dual approach in higher education explicitly addresses the demand of the modern manufacturers in Hungary and the political goal to develop a more knowledge-intense economy. One of the main expectations is that graduates of dual studies already have experiences which traditional graduates lack e.g.

- Specific knowledge regarding *applying* the subjects taught
- Ability to work autonomously
- Ability to work in teams
- Trained to work effectively
- Practical knowledge regarding company and working culture

The conception of dual studies is based on explicit expectations towards the economy and the society shown in table 3.¹³

¹³ The information of the following subsection are drawn from information given by the Hungarian Ministry of Human Capacities and recently accessible only in Hungarian.

Table 3: *Expectations of Stakeholders in Hungary*

Expectations of the <i>economy</i>	Expectations of <i>society</i>
<ul style="list-style-type: none"> • The theoretical basics acquired during the semesters have to be put into practice at the partner companies immediately • Learning at the working place should provide deepening of specific competencies • Students should acquire the latest knowledge of the industry in their working places 	<ul style="list-style-type: none"> • The student's knowledge should respond to the demands of the employers to ensure a quicker return on investment • Institutions of higher education have to match the demands of the employment market • Employment rates should improve among students with dual degrees

Source: Szigeti (2015a, 4f.).

According to this framework the *Council for Dual Education* framed responsibilities of the companies taking part in dual studies:

- Long-term commitment to the partner institutions and the concept of dual studies
- Partner companies have to ensure expert support
- The entrance examination takes place both at the institutions of higher education and at the companies, independent of each other
- During internship the partner companies provide excellent conditions
- Students draw wages based on a contract with the company

Only companies qualified by the council are allowed to take part. Regarding processes and content the *Council for Dual Education* gives concrete prescriptions. Institutions of higher education have to promote their dual degree programs in the same way as traditional programs.¹⁴ That means that students have to apply twice: once to the institution, once to the selected company. Each academic year consists of 48 weeks of which students are supposed to spend 26 weeks at the university, 22 weeks at their company (Szigeti 2015b, 13). Regarding the fact, that according to the new regulation the curriculum of a “dual” degree course has to accord with the traditional version of the course for 90%, the “dual” version means a remarkable higher workload for students.

Dual degrees can be offered based on a collaboration contract between institutions of higher education and companies.¹⁵ The suitability of the partner companies is generally based on an existing regulation, the general prescriptions for internships (230/2012. VIII.28. Kormányrendelet). Among other (formal) criteria the collaboration contracts define the length of the cooperation, the parameters of the entrance qualification, the modes of evaluation of the acquired knowledge, and explicitly define the role of the

¹⁴ In Hungary the enrollment process is centralized by a nationwide application platform (“Felvi.hu”).

¹⁵ Statutory source: 230/2012. (VIII.28.), § 16.

companies within the curriculum and the modes of student evaluation. Institutions of higher education and companies develop curricula together, but only to a certain extent: The “traditional content” of degree programs cannot be modified – but only replaced to an extent of 10%. Generally, the training curriculum has to include 1) the deepening of theoretical knowledge relevant for the tasks at the workplace, 2) a laboratory course, 3) autonomous project work and 4) a part of skills and competence development, e.g. communication-training or project management.

3.4 Participants

In January 2015 the Hungarian *Council for Dual Education* accepted applications of 21 institutions of higher education, which submitted proposals for 30 different types of bachelor degrees. Over all 79 dual bachelor degrees got registered. According to this in September 2015, up to approximately 1000 students will be able to enroll in a dual bachelor degree course.¹⁶ With regard to 72,000 first semester students enrolled in the winter term 2015 overall (FELVI 2015), the share of students in dual degree programs is 1.3%. This is still far below the proportions we can observe at the ideal level of the German DHBW: The DHBW is situated in the federal state of Baden-Württemberg, which has – quite similar to Hungary – approximately 10 million inhabitants.¹⁷ Overall 62702 first semester students have been enrolled in the winter Term 2014/2015.¹⁸ 11644 of them have been enrolled in dual study programs of the DHBW (Geilsdsdf t 2015, 20); this is a share of 18%. It seems a notable fact, that the first launch of dual programs produced a diversity of 30 programs (over all 79 dual bachelor registered degrees in Hungary).

Another striking fact is the different diversity regarding partner companies. The Hungarian institutions contracted with approximately 350 companies as external partners. According to the information given by the Hungarian government one third of the companies are big companies, two third are SMCs (Data according to Szigeti 2015a, see Fig. 1 and 2). The DHBW in Germany may be proud of 25 times more partner companies: 9000.¹⁹

On the level of the federal state of Baden Württemberg the distribution of students in dual degree programs according to subject is quite similar to the situation in Hungary – 43.5% technical degrees, 44.8% Business and Economics, 11.7% Social Sciences/Welfare, likewise the distribution in all of Germany. The following graph gives an overview regarding the distribution of Students according to subject in Hungary for the winter term 2014/2015 and the latest reliable data for the term of 2014 in Germany.

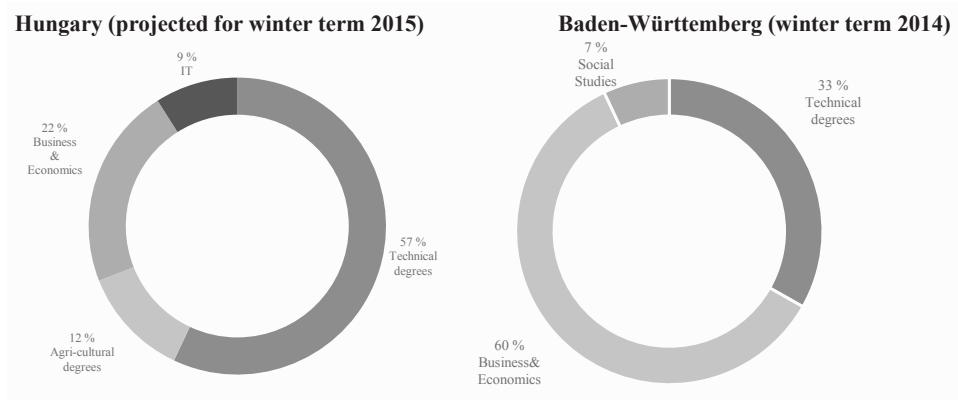
¹⁶ Regarding the actual numbers there is still no official data accessible (23.12.2015).

¹⁷ According to the latest reliable data of the statistical authority: http://www.statistik.baden-wuerttemberg.de/BevoelkGebiet/Landesdaten/bev_altersjahre.asp (accessed October 8, 2015).

¹⁸ According to the latest reliable data of the statistical authority: http://www.statistik.baden-wuerttemberg.de/BildungKultur/Landesdaten/HS_StudentenAkt.asp (accessed October 8, 2015).

¹⁹ According to the official statement of the DHBW, see <http://www.dhbw.de/english/dhbw/about-us.html> (accessed October 9, 2015)

Figure 1: *Distribution of students in dual degree programs according to subject in Hungary and Baden-Württemberg*

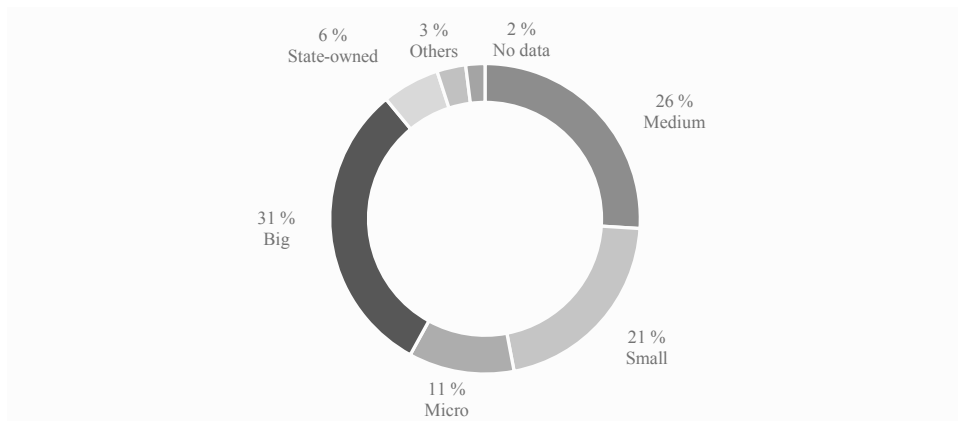


Source: Szigeti (2015b, 19), Geilsdörfer (2015, 20), own illustration.

There is a definitely similar split regarding the main groups of degrees with technical content and in business and economics. The differences between German and Hungarian economic policy is quite clearly depicted by the lack of agricultural degrees in Germany – and reversely the lack of degrees in social studies, pedagogics and health in Hungary. This distribution follows clearly the political goals of the recent government.

To incorporate more small and medium sized companies in the emerging system of dual studies the Hungarian Ministry of Human Capacities is working on a network of “dual studies centres” to give support to new partners (Szigeti 2015a, 13).

Figure 2: *Cooperating companies according to company size*



Source: Szigeti (2015b, 20), own illustration.

It seems important to note, that 12 out of 22 institutions offering dual degrees are *colleges* or, similar to the English term used in Germany “universities of applied sciences”, which have traditionally a practical focus, but less of an academic reputation. 41 of the degree courses are offered by regular universities, 38 by colleges. To pick two examples: The broadest offer among the colleges is made by the Kecskemét College in the south of Hungary, with a clear technical orientation (3 engineering degrees, 1 degree in “technical management”, 1 in technical IT and 1 horticultural engineering). This is obviously driven by the new production plants of German foreign investors such as Mercedes (plant founded in 2012). The University of Miskolc, an institution with a technical tradition, offers the most dual degrees among universities, but shows a broader portfolio than Kecskemét with degrees not only in technical subjects, but also in tourism, management and economics.

Overall, a specialization of the educational institutions is visible, which in each case corresponds to the regional economic structure. According to this, the involvement of companies shows an unsurprising distribution. On average, one degree course is interconnected with four companies. Degrees relating to technical subjects, first of all degrees in engineering, show a much higher participation, on average approximately double as much, partially even more.

4. FIRST CONCLUSIONS, OPEN QUESTIONS AND OUTLOOK

The “...Bologna-Process was designed to make transfer between systems or sectors more seamless for students. The emphasis to date has been on horizontal integration between universities; the creation of vertical ‘seamlessness’ is still only tentative“ (McLaughlin & Mills 2011, 234). The statement is obviously true for Hungary. From this point of view, the current developments are pleasing. At first sight, the reforms seem to be a straight answer to the core problems we recognize when evaluating general surveys of competitiveness. The initiated form of dual studies is not a copy of the German model, but an explicit attempt to transfer its advantages to the Hungarian system. It is neither a completely new form of higher education, nor is the part of internship only a supplement. The commitment of both sides – institutions of higher education and companies are more than a simple ad-on. The idea of a central coordinating institution as the Council for Dual Education is actually expedient – though the concrete realization seems to be questionable regarding its members: why should two companies and only certain institutions of higher education have an official vote to qualify other corporate partners as suitable for dual degree programs or not? This may be only a “teething trouble” but is obviously a weak point in the institutional setting.

Based on the holistic definition of competitiveness and the results of the respective surveys we generally assess the actual reform as a first step in the right direction: Primarily in Hungary, higher education has to get less academic and closer to the world of work. The foreign direct investments of the last years – first and foremost by renowned German companies – confirm the high level of knowledge the Hungarian workforce already has. To top the existing standard of higher education with an added 22 weeks of coordinated

and balanced internship – instead of introducing a completely new form of education – is perhaps less a symptom of the political unwillingness to change a system completely, but rather to raise the bar. To adopt well-tried forms of closer cooperation between institutions of higher education and companies like the German model seems to be an appropriate instrument to prove the willingness to become more than an efficiency-driven economy and to be an active and organic part of dynamic growth. Hungary still does not have a new model. Hungary has taken the first step. If the officially aimed extension of the dual degree format will be successful it will without any doubt be an evolutionary process with an increasing number of partners and a decreasing number of less traditionally designed degrees. But this has to be guided by a smart education policy and wisely developed university strategies.

The *extension* of dual studies is part of the *Council for Dual Education's* agenda. It will be a sensitive task of educational policy to develop the now existing criteria further, namely in tune with the stakeholders of Hungarian industry. With regard to the German ideal a much higher number of partner companies should be involved in the next years – but this will apparently depend on the first experiences. Regarding e.g. the high shares of foreign investors a closer cooperation with the chambers of foreign trade would be advisable. In the long term this may change the composition and functions of the council. If the content of particular degree courses is going to change – and we can safely assume that they are going to change to an extent of more than 10 % – a closer involvement of existing players of the higher education system – as e.g. the Hungarian Accreditation Committee – would be appropriate. But as a first step, the attempt of “raising the bar” seems to be a feasible way to keep up with the increasing complexity of economic development. Of course, the created, or better, extended form of higher education provides no magic bullet to conjure up a knowledge economy. But regarding the existing structures Hungary seems to turn the right screw to make its economy more capable of developing it.

Though the institutional approach seems to need an improvement, the first participation numbers reflect that the reforms meet the needs of the stakeholders. This is clearly reflected by the regionally differing participation of partner companies and the respective portfolio of offered dual studies. Definitely, the further process of the reform will have a heavy impact on the task sharing, reputation, scientific and educational profiles as well as on the financing of colleges and universities. From this point of view, first and foremost universities will face the necessity of a greater change. To enhance the *respective comparative advantages* education policy will have to follow up closely the employability of the graduates and should measure the satisfaction of both sides carefully and nationwide. In the long term, improvements regarding Hungary's capacity for innovation, the availability of scientists and engineers, the quality of scientific research institutions (now arguably increasingly benefiting from cooperation and new possibilities for shared R&D-projects) and skill-mismatch should be recognizable. But this will take several years. Regarding the until now perceived degree of “isolation of the sectors” (McLaughlin & Mills 2011) in Hungary the briefly described means to interconnect them are promising to ensure “the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people” (Garelli 2006, 608).

For scientific reasons unfortunately, Hungary did not take part in revealing studies such as AHELO (see Tremblay et al. 2012) or PIAAC (see OECD 2013). It is hence, additionally, a scientific desideratum to follow up the measurable results of the reforms closely – for example regarding the development of skills and competences (see e.g. Shavelson 2010, Winther & Achtenhagen 2009) or the satisfaction of employers and employees (e.g. Gensch 2014). There are several unnoticed, but especially for a transformation economy highly relevant aspects such as vocational identity (see e.g. Klotz et al. 2014), or the dynamics of curriculum reforms (see Acedo 2013). Finally, integrated support of scientific and multidisciplinary monitoring would be a desirable ad-on of the process itself.

REFERENCES

Books, articles, studies

- Arvanitidis, Paschalis A. & Petrakos, George (2011). Defining Knowledge-Driven Economic Dynamism in the World Economy: A Methodological Perspective. In Nijkamp, P. & Siedschlag, I. (Eds.), *Innovation, Growth and Competitiveness. Dynamic Regions in the World Economy* (pp. 15-39). Heidelberg: Springer.
- Barro, R. J. & Sala-i-Martin, X. (1995). *Economic Growth*. New York.
- Boltho, A. (1996). The assessment: International competitiveness. *Oxford Review of Economic Policy*, 12(3), 1–16.
- Booyesen, F. (2002). An overview and evaluation of composite indices of development. *Social Indicators Research*, 59(2), 115–151.
- Burton-Jones, A. (1999). *Knowledge capitalism: business, work, and learning in the new economy*. New York: Oxford University Press.
- Brinkley, I. (2006). *Defining the knowledge economy*. London: The Work Foundation.
- Chen, C., Wu, Y. & Wu, W. (2013). A sustainable collaborative research dialogue between practitioners and academics. *Management Decision*, 51(3), 566–593.
- Chen, D. H. C. & Dahlman, C. J. (2005). The Knowledge Economy, The KAM Methodology and World Bank Operations. *The World Bank Institute Working Paper*, No. 37256.
- Cooke, P. (2001): Regional innovation systems, clusters and the knowledge economy. *Industrial and Corporate Change*, 10(4), 945–974.
- Dobbs, R., Ramaswamy, S., Stephenson, E. & Viguierie, S. P. (2014). *Management intuition for the next 50 years. McKinsey Quarterly, September 2014*. http://www.mckinsey.com/insights/strategy/management_intuition_for_the_next_50_years (accessed August 18, 2015).
- Etzkowitz, H. (2008). *The Triple Helix. University-Industry-Government Innovation in Action*. New York: Routledge.
- European Competitiveness Report (2014). *Helping firms to grow. Commission Staff Working Document. SWD2077 (final)*. Luxembourg: European Commission.
- Freudenberg, M. (2003). Composite indicators of country performance: a critical assessment. OECD Science, Technology and Industry. *Working Papers*, 2003/26. Paris: OECD Publishing.
- Garelli, S. (2006). Competitiveness of Nations: The Fundamentals. In IMD World Competitiveness Center (Ed.), *IMD World Competitiveness Yearbook* (pp. 607–618). Lausanne: IMD Publishing.

- Geilsdörfer, R. R. (2015). *Jahresbericht der Dualen Hochschule Baden-Württemberg 2014/2015*. Stuttgart.
- Gensch, K. (2014). Dual Studierende in Bayern – Sozioökonomische Merkmale, Zufriedenheit, Perspektiven. *Studien zur Hochschulforschung*, 84. München.
- Graf, L. (2013). *The Hybridization of Vocational Training and Higher Education in Austria, Germany, and Switzerland*. Opladen, Berlin, Toronto: Budrich UniPress Ltd.
- Hyslop, A. (2012). Lessons from the German Dual System. *Techniques*, 87(8), 40–45.
- IMD International (Ed.) (2015). *World Competitiveness Yearbook*. Lausanne.
- Kis, V., Ferreira, M. L. & Zwick, Th. (2008). Learning for Jobs. *OECD Reviews of Vocational Education and Training*. Hungary. OECD Publishing.
- Klotz, K., Billet, S. & Winther, E. (2014). Promoting workforce excellence: formation and relevance of vocational identity for vocational educational training. *Empirical Research in Vocational Education and Training*, 6(6). <http://www.ervet-journal.com/content/6/1/6> (accessed August 18, 2015).
- Link, Susanne (2012). Developing key skills: What can we learn from various national approaches? *EENEE Analytical Report 14*.
- McLaughlin, P. & Mills, A. (2011). Combining vocational and higher education studies to provide dual parallel qualifications. *Journal of Further and Higher Education*, 35(2), 233–245.
- Mitschke, A. (2008). *The international competitiveness of nations. The Influence of National Competition Policy on the International Competitiveness of Nations: A Contribution to the Debate on International Competition Rules*. Heidelberg.
- Neef, D., Siesfeld, T. & Cefola, J. (Eds.) (1998). *The economic impact of knowledge*. Boston: Butterworth-Heinemann.
- Nijkamp, P. & Siedschlag, I. (Eds.) (2011). *Innovation, Growth and Competitiveness. Dynamic Regions in the World Economy*. Heidelberg.
- Noelke, C. & Horn, D. (2014). Social Transformation and the Transition from Vocational Education to Work in Hungary: A Differences-in-Differences Approach. *European Sociological Review*, 30(4), 431–443.
- OECD (2013). *Skilled for Life? Key Findings from the Survey of Adult Skills*. OECD Publishing.
- OECD (2014). *OECD Reviews of Vocational Education and Training. Skills Beyond School. Synthesis Report*. OECD Publishing.
- OECD (2014B). *OECD Economic Survey Hungary*. OECD Publishing.
- OECD (2014C). *OECD Country Note Hungary. Education at a Glance*. OECD Publishing.
- Pawlowski, P. & Edvinsson, L. (2012). Auf den Spuren des Intellektuellen Kapitals – Ansätze der IC Forschung und Praxis. In Pawlowski, P. & Edvinsson, L. (Eds.), *Intellektuelles Kapital und Wettbewerbsfähigkeit. Eine Bestandsaufnahme zu Theorie und Praxis* (pp. 11–37). Wiesbaden.
- Piopiunik, M. & Ryan, P. (2012). Improving the transition between education/training and the labour market: What can we learn from various national approaches? *EENEE Analytical Report No. 13*.
- Powell, J. J.W. & Solga, H. (2010). Analyzing the nexus of higher education and vocational training in Europe: a comparative-institutional framework. *Studies in Higher Education*, 35(6), 705–721.
- Shavelson, R. J. (2010). On the measurement of competency. *Empirical Research in Vocational Education and Training*, 2(1), 41–63.
- Smith, K. (2002). What is the "Knowledge Economy"? Knowledge Intensity and Distributed Knowledge Bases *INTECH Institute for new technologies discussion paper series. Paper Series*, 2002-6.

Schlotter, M., Schwerdt, G. & Woessmann, L. (2008). The Future of European Education and Training Systems: Key Challenges and their Implications. *EENEE Analytical Reports No. 3*.

Sharpe, A. (2004). Literature review of frameworks for macro-indicators. *CSLS Research Report, 2004-03*.

Schwab, K. (Ed.) (2014). *The Global Competitiveness Report 2014-2015. Full Data Edition. World Economic Forum*. Geneva.

Teichler, U. (2009): Higher Education and the World of Work. Conceptual Frameworks, Comparative Perspectives, Empirical Findings. *Global Perspectives on Higher Education No. 16*. Rotterdam, Taipei.

Török, Á. (2008). Tudomány vagy versenyképesség? Tudomány és versenyképesség! *Pénzügyi szemle, 3*, 549–570.

Tremblay, K., Lalancette, D. & Rosevaere, D. (2012). *Assessment of Higher Education Learning Outcomes. Feasibility Study Report. Volume 1 – Design and Implementation*. OECD Publishing.

Vasilache, S., Temesi, J. J., Dima, A. M. (2012). Higher Education Reforms in Eastern Europe. A Hungarian-Romanian Case Study. *Management & Marketing. Challenges for the Knowledge Society, 7(2)*, 295–322.

Veugelers, R. & del Rey, E. (2014). The contribution of universities to innovation, (regional) growth and employment. *EENEE Analytical Report No. 18*.

Winter, E. & Achtenhagen, F. (2009). Measurement of vocational competencies – a contribution to an international large-scale assessment on vocational education and training. *Empirical Research in Vocational Education and Training, 1*, 85–108.

WEF (Ed.) (2013). *World Economic Forum. Insight Report. Rebuilding Europe's Competitiveness.. In Corporation with Roland Berger Strategy Consultants*. Genf: World Economic Forum.

Werr, A. & Greiner, L. (2008). Collaboration and the Production of Management Knowledge in Research, Consulting, and Management Practice. In A. B. Shani et al. (Ed.), *Handbook of Collaborative Management Research* (pp. 93–117). California: Thousand Oaks.

Wissenschaftsrat (Ed.) (2013). *Empfehlungen zur Entwicklung des Dualen Studiums*. Mainz.

Statistical sources

FELVI (Ed.) (2015). *A 2015-ös általános felvételi eljárás – gyorsjelentés*. http://www.felvi.hu/felveteli/ponthatarok_rangsorok/jelentkezok_es_felvettek/15A_felvettek_gyorsjelentes (accessed October 8, 2015).

Statistical authority of Baden-Württemberg, vital statistics: http://www.statistik.baden-wuerttemberg.de/BevoelkGebiet/Landesdaten/bev_altersjahre.asp (accessed October 8, 2015).

Statistical authority of Baden-Württemberg, statistics regarding school enrollment: http://www.statistik.baden-wuerttemberg.de/BildungKultur/Landesdaten/HS_StudentenAkt.asp (accessed October 8, 2015).

Statutory sources

Kormányzati rendelet 230/2012. (VIII.28.), accessible online: http://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=A1200230.KOR (accessed August 18, 2015).

Internet sources

Bq-portal (Ed.) (2015). *Berufsbildungssystem Ungarn*. <https://www.bq-portal.de/de/db/berufsbildungssysteme/1931> (accessed August 18, 2015).

Czomba, S. (2015). *Az ipar a magyar gazdaság motorja*. <http://www.kormany.hu/hu/nemzetgazdasagi-miniszterium/munkaeropiaci-es-kepzesi-allamtitkarsag/hirek/az-ipar-a-magyar-gazdasag-motorja> (accessed August 18, 2015).

DKT (Ed.) (2016): *Duális képzési tanács*. http://www.kormany.hu/download/2/08/90000/DKT_tagok.pdf (accessed July 7, 2016).

DHBW (Ed.) (2015). *About Us*. <http://www.dhbw.de/english/dhbw/about-us.html> (accessed October 9, 2015).

Duales Studium (Ed.) (2015): *Die duales-studium.de Gehaltsstudie*. <http://www.duales-studium.de/fuerschueler-und-studenten/auswertung-der-gehaltsstudie> (accessed October 8, 2015).

Szigeti, Ádám (2015a). *A felsőoktatási duális képzések 2015. évi indítása*. <http://www.csmkik.hu/hu/letoltes/38171/801c> (accessed August 10, 2015).

Szigeti, Ádám (2015b). *A duális képzés bevezetése a felsőoktatásban*. http://www.bgf.hu/tartalmak/Szigeti-Adam_A-dualis-kepzes-bevezetese-a-felsooktatásban.pdf (accessed August 18, 2015).

World Bank (Ed.) (2012). *Knowledge Economy Index (KEI) 2012 Rankings*. <http://siteresources.worldbank.org/INTUNIKAM/Resources/2012.pdf> (accessed August 10, 2015).