Digital Competencies and Career Orientation in the 21st Century: Hungarian Labor Market Approach

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Abstract

With the support of the''Közösen a Jövő Munkahelyeiért Alapítvány'' (=Together for Future Workplaces Fund) our 2016 research aims the pursuit of finding answers for the relation of labor market and digitalization, the labor market role onto the new generation and the factors regarding professional career. The labor market goes through a radical change among others due to the unstoppable technical development. Digitalization expanded the over-segmented labor market and its competency needs even more. It also has an impact on the more strongly occurring generation problems. From our point of view the gap has never been so deep among those active generations who are working at the same place. The cause behind the change is simple: The industrial society had been gradually replaced by the information society, which has been followed by the knowledge-based society, that entirely alters interpersonal communication. Internet facilitates the acquirement of information, however, it changes the nature of relationships and induces never seen generational problems. Our research topic is to analyze digital competency and labor market relationship from the aspect of lifelong learning career orientation.[1] The current study displays certain crucial details of the previous assessment.

Justification and Field of the Research

In 2000 the European Council in Lisbon defined new objectives for the European Union. According to this, the European Union should seek to become the world's most competitive and dynamic knowledge-based economy, which is capable of sustainable development by providing higher employment, better workplaces and stronger social cohesion. In order to reach this goal, such an education and training system has to be ensured, which corresponds to the requirements of a knowledge-based society and needs of an employment with higher standards. One of the main components is to encourage the acquirement of basic skills. The European Council in Lisbon called upon all states, and the Council and Commission to elaborate the ''European Framework for New Basic Skills'' regarding the *lifelong learning concept*, which should contain all necessary skills on the fields of *info-communication, technologies*, foreign languages, entrepreneurship and social relations.

According to *the European framework for key competences for lifelong learning,* a key competency is the transferable, multifunctional unity of knowledge,

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skills and attitudes, which is inevitable for self-fulfillment and -development, social integration and employability. Key competences should be acquired during compulsory education and training.[1] In the future within the concept of lifelong learning, all kinds of education should be based on these competences. Amongst the eight key competences *digital competency* is the self-confident and critical use of electronic media during work, free time and communication. This competency is strongly related to logical and critical thinking, a high-level of information management and developed communication. The skills in connection with the application of info-communication technologies should contain the browsing, evaluation, storage, creation, presentation and transfer of multimedia based information, and the ability to engage in internet communication and networks.

Digitalization alters all segments of society and economy, therefore, it apparently influences work and employment. Digital technology could increase prosperity onto an unprecedented level, and boost the quality of workplaces and employment in Europe. However, these opportunities are also carrying risks, which is apparent in all sectors of the economy, as well as the service industries. According to the official data of the European Commission there are significant bottlenecks in the acquirement of skills: It has been estimated that 47% of the workforce in the European Union had insufficient digital competences, however, there are striking differences among the countries.[2] This would not only abolish job opportunities, but also the structural shortage of workforce could obstruct the development of digital economy, which could have a detrimental impact on the EU's competitiveness without a proper solution.

Labor market competences from the employee's aspect comprehend those fundamental traits, which are necessary for work. From the employers' point of view competency-fitting can be defined as follows: The assignment of competences to the organization and job in order to reach a proper level of performance. From a labor market perspective, a key competency is considered to be relevant, if it is necessary during work, therefore, it is obligatory – as previously referenced – for having a proper job, and working efficiently. From this point of view all key competences are important for the individual, but only in a different, job dependent way.

Territorially we have examined four Hungarian counties with different capabilities, namely Baranya, Bács-Kiskun, Zala and Somogy. According to our plans the target groups were pupils/education institutions, employees/unemployed individuals (at a sector level), in agriculture, industry, commerce, service, education and sanitation sectors. From an economic, sectoral and age group distribution it is possible to derive the relationships and the most important influential factors between the labor market and digital competences in a lifelong learning context. In order to establish the research experimentally, 30 interviews have been prepared with authentic professionals concerning the research topic. In the context of age group studies 450 individuals have been addressed, while at a sector level 50-50 employers were involved.

1. Zsolt Nemeskéri - Iván Zádori: Globális képzés és a munka világa. A munka világa és a munkáltatói hatalom, Munkatudományi és munkajogi kutatók előadásai műhelykonferencia, Pécs, PTE FEEK, 2015. május 12., konferencia-előadás (2015)

2. http://ec.europa.eu/priorities/digital-single-market/docs/dsm-factsheet_en.pdf.

The Content of the Research

− The place and role of digital competences in the competency structure.

− The social and economic determination of digital competences.

− The relationship of labor market, career and digital competences.

− The preparedness of occupational guidance service providers (services) by facilitating the labor market opportunities of the X, Y, and Alpha generation, e.g. those who possess digital competences.

− Learning and knowledge in the digital age; the available opportunities of cultural learning, the new forms of non-formal and informal education.

− The aspects of employee/employer digital competences in the field of agriculture, industry, education, sanitation and financial services.

− The expected interaction of labor market and digital competences up till 2025.

Ex ante Evaluation

Knowledge society is based on knowledge, information and its availability. Consequently, knowledge society as information society is responsible for producing, distributing, disseminating, using a handling information, which is an essential economic, political and cultural activity. In economics the related term is *knowledge economy*, which implies that value is generated through the economic exploitation of intellect. Information forms a basis for technological development, and had an essential role in the industrial society as well, however, by now it has become a separate value. Information society is centered around the information processing technology. The half-life (the period within it becomes obsolete) of "valid information" is decreasing in a considerably (to a yearly, monthly rate*). Its basic requirement is lifelong learning, which* requires a more increasing mobility among the different fields of knowledge, instead of just acquiring one profession.

Knowledge based economy indicates such an economic structure, in which the production, promotion and exploitation of knowledge-intensive goods and services have a decisive role. According to new economic trends, knowledge gradually has become the most important production factor since the last decades, by this obtaining a key importance in economic growth and development. In an economic-social sense the knowledge based society provides better, higher and more balanced living standards, which adjusts better to the needs of (demand oriented) individuals, moreover, facilitates the use of innovative products and services. Today there is a wide theoretical and empirical consensus on the decisive influence of human capital, research and development (R&D), technological development and innovation on the complex productivity of production factors, and through this on economic growth.[3]

In the information society knowledge and information has definitely become the basis of economy and production. Therefore, the sooner produced, obtained, analyzed, utilized and by products and services incorporated information leads to economic potential and competitive advantage. Consequently, the information producer, proprietor and distributor becomes much more significant in production. Thus the person with informational literacy has to be considered as a more competitive individual, since he/she can access all necessary information quickly and cost-

3. Gusztáv Bágerr (ed. 2008.): A tudásalapú gazdaság és társadalom. Állami Számvevőszék Fejlesztési és Módszertani Intézet Budapest

effectively, moreover, he/she is able to analyze and synthetize his/her knowledge, and use it in a creative and ethical way henceforth. According to 21th century competency related models it can be stated, that digital and informational literacy cannot be considered as something sold by its definition and relation to other competences. However, continuous transformation makes its examination increasingly difficult. Nevertheless, it is inevitable that all approaches comprehend a holistic point of view, in which 21th century related skills and abilities can be defined as umbrella competences.[1]

Lifelong guidance is a complex activity, which allows individuals of all ages to assess their abilities, competences and interests at any point of their life; in order to carry out rational educational, training and occupational decisions, moreover, to be able to manage their career regarding learning, work and other areas of life, where they can utilize or acquire these skills or competences.[2] Concerning *the relations of labor market, career and digital competences,* digital competences have a key importance in lifelong learning. The smooth transition *from school into the world of work* is one of the most important conditions regarding social integration. This often determines the individual's social position, labor market status in a long run, therefore it is important both economically and socially that the young people who are finishing their education would appear professionally prepared on the labor market, their acquired knowledge should be in accordance with the technological requirements, moreover, they should also possess an appropriate level of professional qualification and convertible knowledge, which meet labor market needs.

Compared to the *past the preparation and coaching has become considerably much more* **complex**. In the field of education there were many reforms/alterations carried out in the last decade and a half, however, the intermediate and expert level of vocational training structure met employer demand only partially. The cooperation between the actors who are interested in education and employment has not improved, conflicts have not dwindled, which has resulted in the remaining of tensions between supply and demand sides, which come to surface time-varying in a different intensity. Measures which should be introduced in order to support young individuals to find a job, should aim the strengthening of relations between the world of work and education-training. Such way they could facilitate the entrance of young individuals coming from the different levels of education into the labor market, and their adjustment to the varying demand. According to empirical data employment rate grows proportionate to the obtainment of knowledge and qualification, and even the indicators of equal opportunities have become better.

According to the *KSH's (= Hungarian Central Statistical Office) congruency analysis regarding employment and qualification,* it turned out that employment demand can widely vary in connection with the different qualifications. For certain qualifications so called specializations are required (e.g. electronic engineer, chemical

1. Dóra Egervári: A XXI. század társadalmi jelenségei az információtudomány tükrében – avagy az információs társadalom, az információs műveltség és az információs kompetenciák összefüggései. In: Tudásmenedzsment, Vol. 10 2009. 1. pp. 98–105.

2. European Lifelong Guidance Policy Network (ELGPN) Glossary. The Hungarian publishing of the ELGPN Glossary was carried out by the Department of Training of the National Employment Fund with the support of the Ministry for National Economy based on the NFA KA 1/2012 Grant Agreement. Budapest, 2013.

engineer), while in case of other jobs a more general knowledge is needed (e.g. service, help desk jobs). Consequently, such an educational system is required, which makes employees able to use their acquired knowledge flexibly in their work. Flexicurity is not only an employment, labor market category, but it also appears in the modern lifelong guidance and service system.[1]

Today most of the young individuals with a specific level of education enter the labor market at the age of 18-23, and based on the current pension regulation we can calculate with an average 42-47 year productive working period per person. Therefore, new entrants have to meet not only the current labor market demands, but also the future demands of the 2020s, moreover, 2040s. Meanwhile globalization entails a continuous technological innovation, the restructuring of the system of production and the alteration of different professions. In this economic-social environment the role of education and learning becomes much more significant. The reason for this lays in the fact that social actors expect from school and adult education at the same time to train such employable citizens, who are able to cope with our complex world, by this contributing to a successful and balanced career. Therefore, it becomes self-evident that instead of career choice a system of lifelong guidance should be established, which should be a complex task from our point of view.[2]

Besides young adults we must also point out the connection *of adults, the elderly generation and the labor market.* According to the demographic prognosis (taking the basic version as a point of reference) of the KSH's Department of Population Sciences the demographic decline continues up till 2020. Expectedly the number of population will drop by 177,000, whilst this amount could even reach one million up till 2050. The unbeneficial progress becomes even worse due to structural transformation, since the aging of society is significant. The number and rate of employable population (between the ages of 15-64) is decreasing even in a higher pace than the whole population. Their number can be estimated as 6.4 million up till 2020, which denotes a 7% decline. This implies together with the previously mentioned facts that the upper bound of the active age is going to be prolonged, the retiring age arises. Therefore, the institutionalized adult education concerns/should concern those generations that are older than usual. Together with the acceleration of technological development such *learning processes appear which aim the retention or improvement of labor market position.* Therefore, theirs is a change in the requirements and learning behavior.

An important part of the research deals with the preparation of occupational guidance services to enhance the labor market opportunities of the digitally skilled Y, Z and Alpha generation. The development of the *European Career Guidance Certificate (ECGC)* began in 2007, which recognizes the formal or informal knowledge, skills and competences of career and occupational guides, and is in accordance with the European supply. The ECGC standards are also important, because they give an opportunity to compare nations, moreover, such competences can emerge, by which it is possible to *characterize the compatible services of the transforming labor market*. That also has to be taken into consideration, that young individuals have a different approach to work,

1. Miklós Lakatos (2015): A képzettség és a foglalkozás megfelelésének (kongruenciájának) elemzése a 2011. évi népszámlálás adatainak felhasználásával Műhelytanulmányok 6. Központi Statisztikai Hivatal, Bp.

2. János Szellő (ed. 2014): Pályakezdő fiatalok munkaerő-piaci esélyei a Dél-dunántúli régióban 2025-ig. Zárótanulmány, PTE, Pécs

moreover, they possess other competences, soft skills, and they have diverse expectations towards public services. These young individuals grow up in a technology- and information-based world, and they can handle this in an intuitive, intelligent manner. Social networks, virtual competency acquisition and multi-tasking are all part of their personal development. Meanwhile, new forms of employment are emerging. The role of occupational guidance services and systems needs to be shifted from classic service provision to facilitation, coaching and conduction, even if the young person is disadvantaged or handicapped.[1]

Digital Economy and Labor Market

According to the European Commission, Europe's digital economy could be able to produce significant revenues in all sectors. *Digital economy does not have a general, "taxative" definition.* It includes knowledge, devices, applications, services, trading and reveneues as well as taxation connected to it.[2] According to the National Infocommunications Strategy, digital economy involves the "development of the ICT sector in a narrow sense of its definition and that of the external and internal information systems of the enterprises using the electronic (commercial, banking, etc.) services of the sector, as well as the incentives to ICT development and ICT-based research-development and innovation activities."[3]

At the same time, digital economy is dependent on the macroeconomic correlations that characterize the specific economic structure. "Nowadays, comparative advantage of a country depends heavily on the level of development in the field of information technology. It is more and more apparent that information technologies are incorporated in production processes and products, and human labor is replaced with robots and computers. The remaining demand on workforce, however, needs specially trained labor."4 According to the IT, Telecommunications and Electronics Association of IT Companies, the spread of electronic systems and IT applications is exponentially accelerating for years, since more and more actors of different sectors tend to decide on digitalizing their production and trade processes due to the availability broadband infrastructure and also as a result of continuous innovation in the market of infocommunication devices and services. This process is unstoppable and irreversible, since it is no longer innovative or experimental in nature, rather it is of an economic nature: businesses using IT solutions consciously and organically are more

1. Strategical document, which summarizes PES 2020 results. The contribution of national employment services to the implementation of EU 2020 goals. Nemzeti Foglalkoztatási Hivatal (=National Employment Office) 2013.

2. "This scope includes different types of electronic trade, such as all forms of online shopping, webshops, download of electronic books, music, movies and applications. It also includes online advertisements, electronic payment services, cloud-based services as well as 3D printing. The operating model of businesses acting in the digital economy is fundamentally different from traditional operation models, which serve as the basis for international tax laws" (Dániel Rácz: New Challenges of International Taxation: Digital Economy. (Dániel Rácz: A nemzetközi adózás új kihívásai: a digitális gazdaság. http://epa. oszk.hu)

3. National Infocommunications Strategy 2014-2020. www.kormany.hu

4. István Eszes (2013): Digitális Marketing TÁMOP-4.1.2 A1 és a TÁMOP-4.1.2 A2 könyvei http://www. tankonyvtar.hu/hu/tartalom/tamop412A/0007_e4_digitalis_marketing_scorm/adatok.html

efficient and competitive in all fields of industry and economy.1

In Hungary, digital economy provides 20% of the total gross added value of national economy, and provides employment for nearly 15% of all employed persons. In a narrow sense, the infocommunications (ICT) sector provided 8.3% of the exports of the national economy in 2014, and represented 10% of all research and development input in 2013. The presence of large enterprises is predominant in the sector – especially in the ICT processing industry. At the same time, in the ICT service segment, which among others includes software and application developing companies, the role of small and medium-sized enterprises is becoming more and more significant.[2]

According to KSH (Central Bureau for Statistics), the number of internet subscriptions was nearing 7.7 million at the end of the second quarter of 2015. More than 93% of subscriptions are provided by 7 service providers. In the period above, 81% of the internet subscriptions were paid by individuals, while 19% were business subscriptions. Net revenue from internet service provision was HUF 45 billion, which constitutes a 7.4% increase compared to the previous year (2014).[3] The number of subscriptions exceeded 8.4. million at the end of the second quarter of 2016, which means a 10% increase since the same period in 2015. The market concentration is high: over 96% of subscriptions are provided by 10 service providers. 81% of internet subscriptions are paid by individuals, while 19% are business subscriptions.[4]

The Index, indicating the advancement of digital economy and society (DESI), is a complex index introduced by the European Commission Directorate General for Communications Networks, Content & Technology (DG CNECT) in order to track the current evolution and level of digital economy and digital society in EU member states. *The index is structured around five principal dimensions: connectivity, human capital, use of internet, integration of digital technology and digital public services.* Based on Hungary's country profile of 2015, Hungary ranks 20th among the 28 EU member states. During the last year, Hungary made the most advancement in the field of connectivity: fixed broadband services are available to 94% of homes in Hungary, and fast broadband technologies are covering 78% of homes. The rate of internet use is outstanding, 80% of subscribers use social networks, which is the highest in the EU.[5] With a *Human Capital* (digital skills) score of 0.48, Hungary ranks 19th among EU countries, but performs better than the average of

1. Digitális Munkaerő Program. Megoldási javaslatok az informatikus és digitális szakember hiány kezelésére. IVSZ Szövetség a Digitális Gazdaságért. Budapest, September 2016. www.ivsz.hu

2. Magyarország digitális exportfejlesztési stratégiája. Digitális Jóléti Program 30 June 2016. http://www.kormany.hu/download/9/51/d0000/Magyarorszag

3. Statisztikai Tükör Távközlés, internet, televíziószolgáltatás, 2015. II. negyedév KSH Budapest, 11 September 2015.

4. Statisztikai Tükör Távközlés, internet, televíziószolgáltatás, 2016. II. negyedév KSH Budapest, 9 September 2016.

5. „As for the most popular on-line activities, 85% of Hungarian internet users read news, and 80% use social networks.As regards the latter, the use of social networks is the highest in the EU. 47% of internet users listen to music, watch films or play games online, and 52% make video calls. Despite the progress, Hungary still falls well below the EU average regarding internet banking and online shopping. On eCommerce, this is also linked to the supply side, as the percentage of SMEs trading online is also below the average." (Digital Economy and Society Index, 2015. Country Profile Hungary http://nhit.hu/dokumentum/68/DESI_orszagprofil_HU.pdf)

the group of countries with low performance level. In the field of *digital public services*, Hungary achieved the third lowest rank, and performance falls well below its cluster countries.[1] "Of the dimensions analyzed by DESI 2015, the poorest results (0.22) were achieved in the integration of digital technologies by Hungarian businesses. Businesses would need to better exploit the possibilities offered by on-line trading, social media and cloud-based applications."[2] Similar deficiencies were found concerning the use of online public services.[3]

On the one hand, *digital labor market* - like the traditional labor market – is characterized by supply and demand, except that the labor needs to possess digital competences.[4] On the other hand, the market mainly works virtually by utilizing the instruments of the ICT sector. At the same time, the factors affecting the traditional labor market are also valid for the operation of online systems. Availability of the labor market information is essential. Due to the networking typical of the virtual labor market, this information is accessible even faster. *With regard to the classification based on the Unified Classification System of Professions (Foglalkozások Egységes Osztályozási Rendszere, FEOR), it can be said that nearly all professions, except for (simple) professions that do not need trained workforce, necessitate a certain level of digital competence.*[5] *The Hungarian digital labor market is continuously characterized by the lack of professionals*, due to which the market is persistently demand-driven. In particular, there is a definite need for trained and skilled digital professionals. In order to achieve a balanced supply and demand side, multi-faceted mediation mechanisms need to be established between the actors of the labor market. *The evolution of supply and demand on the labor market* is affected by several factors, including the current

1. For example, only 12% of Hungarian family doctors share patient data with each other via electronic means, compared to the EU average of 36%. The same applies to electronic prescriptions: only 2.2% of family doctors send prescriptions to pharmacists by electronic means, which signifies one of the worst rate in the EU.

2. Digital Economy and Society Index (2015. Country Profile Hungary)

3. Digital state: internal IT systems supporting the operation of public institutions, electronic public services provided to people and businesses, as well as other electronic services in the public sphere of interest (e.g. related to healthcare, education, cultural heritage or related to the sharing of public data and information), and the provision of the security background of the services above.

4. Labor market is the set of relationships related to the exchange of workforce under economic conditions in a given period. The demand for labor is the demand of employers signifying the number and composition of employees that the employers wish to employ in a given period. The labor supply represents the number and total of unemployed persons and jobseekers available during the relevant period (János Szellő (ed. 2008): Introduction to the Labor Market, notes DDRMK, Pécs).

5. FEOR: (Simple) professions that do not need trained workforce (Group 9) includes cleaning, maintenance and management of hotels, offices and other buildings; kitchen help tasks and plain food preparation tasks. Additional professions: management and storage of mails, packages and cargo; replenishment of vending machines, meter readings; collection and separation of different wastes; common agricultural, fishing, hunting and trapping tasks; simple tasks related to mining, construction and factory production. Subgroups: cleaning and other similar simple professions, professions regarding simple transport, service and similar activities, plain professions related to industry, construction and agriculture.

economic circumstances, the number, applicability and mobility of workforce, as well as salary and income conditions.[1]

Research Topics and Methodology

Our research is essentially *based on the complexity of the topic,* and includes the determination of the place and role of digital competences within the frame of different competence structures; social and economic aspects of competences; correlations between labor market, career and digital competences; facilitation of labor market opportunities, issues concerning education and knowledge, employees' and employers' attitudes, prognosis of correlations between the labor market and digital competences. *Our assumptions were as follows:*

- Several obstacles arise during the acquisition and development of digital competences, such as the lack of resources, infrastructure and obstructing views.
- The presence of digital competences is already a key factor on the employment market in Hungary, but there are significant differences between sectors in this respect.
- There are generational differences between age groups regarding digital competences, however, this is not inevitably the case.
- The social and economic boosting role of digital competences can only be fulfilled if digital knowledge, practice and skills can be combined into a system.

The research topic and field required a rather complex approach, thus the method focused on comprehensive and significant aspects. Regarding the nature of methods, both primary (empirical) and secondary (documents, data analysis) research was applied. It was important to *examine the scope of concepts*, both with regard to career guidance and the fields of competences, mainly due to the fact that our preliminary surveys revealed several misunderstandings concerning the assessment of digital knowledge and the efficiency of the conscious, well-structured career orientation.[2] Besides, we put emphasis on presenting the situation based on the *analysis of documents,* as well as exploring the opportunities of shaping the future and we also drew conclusions.

In the empirical phase, the queries were applied to examine four geographically different counties: Baranya, Bács-Kiskun, Zala and Somogy. Our target group consisted of students/schools, employees/unemployed persons and employers (on a sectoral level). According to plans, this would have involved the

1. In the macroeconomic sense of the labor market, the workforce supply is the labor supply of all households, and the workforce demand is the demand on the side of all business organizations (basically on a national economy scale). Examining the wage and employment impacts of labor supply and demand in line with the above, it must be presumed that under perfect competitive relations the labor market is perfectly balanced: everyone will immediately find the right job at the established rate of pay and the employers will also find employees immediately if they want to fill a post at the established salary level (István Polónyi (2002): Az oktatás gazdaságtana. Osiris Kiadó, Budapest).

2. Eszter Barakonyi: Pályakezdő fiatalok munkaerő-piaci esélyei a Dél-dunántúli régióban 2025-ig kutatási összefoglaló. In: Zádori Iván (ed.): ALTERNATÍV MUNKAERŐPIAC: FEJEZETEK MUNKATUDOMÁNYI, MUNKAERŐ-PIACI KUTATÁSOKBÓL 2008–2015. p. 399 Pécs: PTE Kultúratudományi, Pedagógusképző és Vidékfejlesztési Kar 11 July 2016.

evaluation of questionnaires submitted by 450 persons, and the participation of a total of 300 employers (50 employers each from the sectors of agriculture, industry, trade, service, education and healthcare) (for the questionnaires see Appendices 2 and 3). We received 304 responses to the employer inquiries, and 401 persons submitted the individual questionnaires. The survey was conducted on Google's online platform with the application of variant analysis.[1]

When processing the questionnaires, a *cross-table analysis was applied,* which examines the correlation between two or more variables. During the analysis we set out to establish whether there is a real connection between two nominal variables. From among the methods of cross-table statistical analysis, Pearson's C*hi-squared test* was considered during data processing, which measures the statistical significance of correlation between two variables, enabling to establish whether there is a statistical correlation between them. Regarding the variables showing correlation, we acquired the information how strongly these variables are associated by using *Cramer's V* coefficient, as it can be applied for any type of cross-table analysis. In case of the coefficient showing the measure of association between two variables, we examined the value between 0 and 1, where zero (0) means that there is no association, and one (1) signifies strong association between the variables. (Sajtos-Mitev 2007) The SPSS statistical data analysis program was used for the cross-table analysis.

Besides the questionnaires, we set out to engage persons (30 persons) who are considered to be experts of their own fields. In the interviews conducted we asked our interviewees how they evaluate the relationship between digital competences and the labor market from the perspective of education and career orientation. We also set out to discover, analyze and evaluate the factors that appear as the demand of different sectors and the requirement of the labor market. Key questions of the interview centered around the following:

1. What is your opinion on the place and role of digital competences in different competence structures?
2. What is your opinion on the importance of digital competences in your area of expertise?
3. Do you agree with the assumption that there are several factors, such as lack of resources, infrastructure and attitude, hindering the acquisition and development of digital competence?
4. What do you think of the circumstances of digital competence acquisition in public education?
5. In your opinion, to what extent are labor market, career and digital competence correlated in today's Hungary?
6. What is your opinion of the preparedness of career orientation services regarding the mediation of digital competences?
7. Do you think that the existence of digital competences is basically dependent on the age group concerned? Does this cause tensions in everyday life and especially at work?
8. Do you agree that digital competences can only fulfill their role in economy and in knowledge-based society if their development occurs within the system of life-long learning?

1. Reasonably, in the survey persons having a form of access to this online platform were involved, i.e. persons without a computer/computer or internet access were excluded from the survey.

Research Results

In the 21st century, the possession of digital competences does not only mean access to and utilization of infocommunication technologies but also the possession of related and appropriate knowledge, skills and attitudes. An EU-wide comprehensive study on digital inclusion and skills conducted in 2014 found that the digital competences of 47% of the Union's population are unsatisfactory, including 23% possessing no digital competences at all.[1] Our research sets out to examine digital competences and career orientation in connection with society, economy, employment policy, labor market and education both on a national level and based on county patterns. Our starting point was that *lifelong guidance* is the combination of activities that enables people, irrespective of their age and at any point in their lives, to measure their skills, competences and interest; to make reasonable decisions on education, training and employment; so that they can manage their individual career choices in the field of education or work as well as in any other areas of their lives, where the above skills and competences can be acquired or utilized. In a broader sense, *digital competence* means the confident, critical and creative utilization of ICT (information and communication technologies) in order to achieve the goals regarding work, employment, learning, leisure, social inclusion and/or participation. Digital competence is transversal key competence, and as such, enables a person to acquire other key competences (e.g. language learning, mathematics, learning ability, cultural awareness).[2]

Our major findings are as follows:

- Major changes and restructuring took place in the labor market after the Great Recession of 2008. As a result of the economic competition partly due to globalization, the over-segmented labor market has been growing in importance. The former supply-based labor market was replaced by a demand-oriented labor market, the main characteristic of which is that besides basic competences some horizontal skills, such as learning ability, social and civil responsibility, sense of initiative and entrepreneurship, cultural awareness, independency and creativity, are valued more and more.
- Considering the Unified Classification System of Profession (FEOR), except for the (simple) professions within the main group of jobs requiring no special training, nearly all professions require a certain degree of digital knowledge, which is, however, not equal to digital competences.
- According to the European Commission Directorate General for Communications Networks, Content & Technology's (DG CONNECT) DESI Index, which is used to measure the development of digital economy and society, Hungary ranked 20th out of the 28 EU Member Countries based on the 2015 country profile. In the course of last year, Hungary managed to make the most progress in the field of connectivity: broadband technologies reach 94% of households, and 76% are provided with high-speed services.
- Availability of devices promoting the acquisition of digital competences has considerably improved over the last years. At the same time, our survey shows that the digital knowledge of citizens are shallow, and in many cases

1. Riina Vuorikari: Becoming digitally competent – A task for the 21st century citizen. http://www.schooleducationgateway.eu/hu/pub/experts/riina_vuorikari_-_becoming_dig.htm

2. Ferrari, Anusca (2013): DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe. Report EUR 26035 EN

it is limited to user skills, therefore it is of low value for the labor market.

- Based on the responses of the persons involved in the survey, the most common way of acquiring digital competencies (56%) is through the duality of school education and self-tuition, whereas more than 20% of competences are totally attributable to self-tuition. E-learning, as a modern form of learning, appears only marginally, for the time being. It is a thought-provoking fact that only 9% of respondents determined formal school settings as the scene of learning – which raises the question whether IT education is appropriate enough.
- 48% of responding employers said that the involvement of the education system in competency building is only partly satisfactory. 26% of respondents found that appropriate work is done in this area by the educational system. 17% believes that education performs well in the field of digital competency building. 9% of respondents chose the category of 'inappropriate' on this issue. According to our investigations, the fundamental problem of education is that both the ICT systems and the change of approach are difficult to be integrated into the daily educational practices. In order to ensure development, more substantial IT education with up-to-date content should be provided both at primary and secondary schools, thus fostering the acquisition of knowledge required by higher education.
- In spite of the results achieved in the field of occupational guidance over the past fifteen years, occupational guidance and career counseling seem to be un-structured and random. The system suffered damage due to the constant reorganization of institutions involved in career guidance (education, labor organization, etc.).
- New methods enhancing lifelong learning and lifelong guidance are difficult to integrate into daily practices. Accessibility of career counseling and the availability of the relevant set of instruments show considerable differences.
- The relationship between digital competences and occupational guidance shows a number of contradictions. On the one hand, a process aimed at developing the ICT scope of occupational guidance has started. On the other hand, there are shortcomings in the occupational guidance activity itself as regards the presentation of the actual content of IT competences, and their relevance to the labor market. As we have experienced, this might be the reason for the current and, sooner or later, persistent labor shortage in this area. The problem calls for professional cooperation with the involvement of policymaking (economy, education, and employment), employers, employees and alternative scientific organizations.
- Nevertheless, there are promising and straightforward state and government strategies and concepts with the common goal to establish for each area of lifelong learning system the resources in infrastructure, staff and facilities necessary for the development of digital skills, constituting the core competences in the context of employability and competitiveness on the labor market.[1]

1. Digital Education Strategy of Hungary. Annex of Government Proposal. Budapest, 30. June 2016 www.kormany.hu

Instead of Conclusion: Digital Competencies and Career Orientation on Labor Market until 2025

Labor market goes through a radical change due to the unstoppable technical development. *Digitalization expanded the over-segmented labor market and its competency requirements even more.* It also has an impact on the more strongly occurring generation problems. The gap has never been so deep between the active generations working at the same place. The new generation has the characteristic of being much less a conformist, rather an individualist.

According to EUROSTAT's projections – among others – on the likely trends in employment, the expansion in employment at a Union level tends to slow down between 2010 and 2020. The average estimated increase of 0.3% constitutes merely one third of the annual rate for employment growth experienced during the period between the millennium and the start of the global crisis. The number of persons employed is expected to peak in 2022 at EU level, and subsequently it will fall by some 15-16 million until 2060. EUROSTAT predicts that *the number of persons employed in Hungary is likely to peak in 2027,* with an expected number of 4 million persons employed. The prognosis then shows a decline of 23% until 2060. This process is clearly linked with the decline in population and has no direct impact on the employment level, which shows an upward trend throughout the whole period of forecast. According to calculations made by the EU, the Hungarian level of employment may increase to 65% by 2020 and to 67-68% by the year 2060.

Over the whole career span of a person, the phase of career guidance has increasingly been extended, since the time spent acquiring the education necessary for future employment is longer. It is also important to note that *preparation and getting prepared for one's career is much more complex than it used to be*.

A survey of Hungarian Chamber of Commerce and Industry / Institute for Economic and Enterprise Research reveals that the new (digital) industrial revolution entails significant changes in the labor market.[1] According to the survey, this change can be explained by using the phenomenon of '*skill-biased technological change',* based on which a decline in demand for unskilled labor and a substantial increase in demand for highly skilled workforce is to be expected. In parallel with this tendency, the total automation of certain areas may result in a significant loss of jobs. Considering the technologies existing in Hungary, it is estimated that 12% of jobs could be replaced by means of automation.

As a result of technological development, the skill-based structure of certain industries' labor market undergoes rapid transformation, and the demand for skilled and unskilled labor will change.[2]

1. Fruzsina Nábelek, Anikó Sturcz, István János Tóth (2016): Az automatizáció munkaerő-piaci hatásai. Járási munkaerő-piacok automatizációs kitettségének becslése. MKIK Gazdaság- és Vállalkozáskutató Intézet Budapest

2. „Technological changes can have an impact on employment in two ways: one effect is the so called creative destruction, where technology replaces live work, consequently, labor supply is to be concentrated on other areas instead (i). On the other hand, the workforce thus released is absorped by high-productivity sectors. This is the so called capitalisation effect. Automation has a potential negative effect on the labor market in the case where creative destruction predominates the capitalisation effect. If high-producticity sectors are incapable to absorb the work force released due to automation, a significant future decline in employment might as well be expected. One possible means of enhanc-

The *dual factor of digital economy and employment* and the links between them tend to determine both the economic growth in Hungary and the sustainability of such growth. Who can win the race between education and vocational training and the even faster changing demands of the labor market in a situation where – more often than not – education is not at all aware what the purpose of education should be – given that we cannot even guess the emergence of certain jobs.

In the information society, knowledge and information have become the clear basis for economy and production activities. Consequently, considerable economic potential and competitive advantage can be achieved if we are first to generate, access, analyze, use and include information in the range of our products and services. Thus, the information producer, proprietor and distributor becomes much more significant in production processes. The person with informational literacy has to be considered as a more competitive individual, since he/she can access all necessary information quickly and cost-effectively, he/she is able to analyze and synthetize his/her knowledge, and use it in a creative and ethical way henceforth.[1]

The possession of digital competencies is increasingly becoming a prerequisite for the future success on the labor market. However, the development of these skills is not only the task of IT courses, but the whole educational system requires a comprehensive attitude involving the deliberate use of digital devices and teaching methodology in education, the systematic and constantly up-dated preparation of teachers and trainers of digital pedagogy, the support of teachers' competences by means of digital pedagogy, the digitalization of teaching materials and administration of education alike.[2]

Staff, equipment and technical facilities to support career guidance activities in *educational institutions* are to be further strengthened. On the one hand, the decreasing number of pupils – resulting from the negative demographic trends – would require more thorough, more rational and more effective career guidance. On the other hand, in order to support more informed decision making, the relevant knowledge of career teachers and educators is to be enhanced.

The labor market undergoes radical changes: knowledge-based labor demand (in particular, for young, talented employees) is significantly increasing, whereas labor supply is greatly reduced – which is going to develop intensified competition between employers and, consequently, bring about changes on the supply side of the labor market. *Employers should be prepared to the fact that employees are compelled to spend more and more time on the labor market and at their workplaces.* This is a particular problem for jobs and workplaces involving heavy physical and

ing the capitalisation effect is the improvement of employees' adaptability and flexibility through the promotion of quality education as well as by the relative increase of education expenditure.' (Fruzsina Nábelek, Anikó Sturcz, István János Tóth (2016): Az automatizáció munkaerő-piaci hatásai. Járási munkaerő-piacok automatizációs kitettségének becslése. MKIK Gazdaság- és Vállalkozáskutató Intézet Budapest)

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2. Digital Education Strategy of Hungary. Annex of Government Proposal. Budapest, 30. June 2016 www.kormany.hu

mental strain, where career reorientation would be required. Therefore, *in the context of career guidance,* it is inevitable to develop techniques and methods by means of improving and adapting the elaborated info-communication methods in order to meet the requirements of both young and elderly age groups.

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