PERSPECTIVES OF VOCATIONAL EDUCATION IN THE CZECH REPUBLIC

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Abstract

The economy of the Czech Republic as traditionally industrial country strongly depends on the growth of industrial production. Consequently there should be a vital interest in well organised and structured vocational education that would prepare and provide suitable labour force equipped with necessary competencies and skills. The paper presents recent structure development of graduates of secondary schools and point out current educational mismatch with expected future demand for the skilled and truly tech literate workforce on labour market. Based on the expectations of future industrial development the paper focuses on the objectives of vocational education with regard to the visions described in the key strategy document issued by the Czech government.

Keywords

Education and Economic Development, Labour Force and Employment, Economic Growth of Open Economies, Education and Training

I. Introduction

Ministry of Education, Youth and Sports (MŠMT) presented year 2015 to be „The year of educational technology". The aim was to make the Educational technology (EdTech) section more attractive. This effort seems to be logic provided that Czech Republic belongs to the top industrial oriented countries in EU. The industrial tradition dates back to the Austro-Hungarian period. The balanced industrial growth is essential for the Czech economy as it contributes with 35 % to its GDP and employees over 40 % of active population MPO (2019). The structure of manufacturing is often blamed for being a big assembly line for car manufacturing. In order to keep the country's competitiveness towards the shift for a modern economy with varied export markets and a big share of high-tech exports there is high time for policy actions aiming to foster productivity of labour force with technical backgrounds, skills and innovation (Tóthová and Sedláková, 2008). In technically backward countries scarcity of workers with relevant education and demonstrated skills constrain growth of the productive formal economy (Švecová, 2000). Skilled and educated workforce increases the ability of the country to innovate and adopt new technologies making the competitive advantages (Aristovnik, 2012).

As the Czech economic structure dictates, the labour market requires well-educated, trained and skilled labour force literate in new technologies. The new jobs will require new competences and large investment particularly in digital skills and entrepreneurial skills in the education training policies and strategies (Mazouch and Fischer, 2011). Vocational skills tend to play an important role in production sectors in industry oriented countries. Anyhow a high degree of flexibility and variation, primarily associated with graduates with graduation with high-level skills and education seems to be preferred for innovative and modern future trends. Learning outcomes, resilient competences, significant proportion of innovation and creativity should be in the forefront of support educational system, rather than half-life knowledge and short-life skills gained by vocational education without graduation (Holzer, 2010). For future

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development of the industrial oriented economy there will be more demand for educated labour force with skills and flexibility, able to adapt to new challenges of technological progress.

Therefore it seems to be important to make a quantitative research of the structure of graduates from upper secondary schools and analyse not only if the structure is compatible with the current requirements for labour force but mainly if the structure of the graduates correspond to the vision of future trends in industrial orientation of the country (Roth, 2007). These kind of information are crucial for making the decisions taken by the authorities regarding the structure of skills and abilities of future workforce respectively human capital that should stand for the competitiveness of the country (Kročil, 2017).

More than aiming at providing quantitative description of graduates from technical disciplines the presented survey traces main features of potential impacts of vocational and other skills training on economic performance and bring new angles on policy approaches of upper secondary education at a given point of time.

The aims of presented research are to

(1) find out if the current structure of the secondary education graduates

(2) reveal the vision and future trends in Czech upper-secondary education.

(3) propose the objectives of vocational education in coming years

These are the main point of the presented paper dedicated to the ability of future workforce to promote innovative capacity and potential. This particular field of study seems to be a bit overlooked as it involves cross sectoral approach and requires taking structural measures by the national authorities.

II. Sources and methods

In the following points there is a brief description of main indicators and the methods employed in order to carry out the research. The survey works with statistical data collected and evaluated in compliance with regulations of Eurostat. The data collection analysis took place in 2019 and consisted of desk research and interviews carried out by country experts from MŠMT, Czech Statistical Office (ČSÚ), National Institute for Education (NÚV) and data platform of the Zlín region – Monitor ZK.

In order to measure the impact on GDP the research works with the industrial production index IPI (measuring the output of industrial economic activities and of the industry in total, adjusted for price effects). It shows the growth rates in different industry groups of the economy in a stipulated period of time. In compliance with regulations of Eurostat the industrial production index covers CZ-NACE sections B, C, D. Annual variation in industrial production as a percentage thus reflects the change in the volume of industrial output as compared to the previous year and reflects future GDP and economic performance.

To conduct a comparative study of educational statistics the data sources are based on instruments developed for International Standard Classification of Education (ISCED). ISCED is a framework which allows cross-national comparability of resulting indicators. Based on these methods of classification the proposed survey focuses on category orientation 34 - Upper secondary general education and 35 - Upper secondary vocational education and sub-category 344, 345 - with direct access to tertiary education, 353 - without direct access to tertiary education.

In this study authors use a descriptive approach of EdTech based on the formal definition of technical education defined by Technology agency of the Czech Republic (TACR). Technical and Vocational Education and Training (TVET) is an education and training which provides

knowledge and skills for employment. Technology agency of the Czech Republic (TACR) defines educational technology as the study and practice needed for facilitating learning and improving performance by creating, using and managing technological processes and resources TAČR (2019). The fields of study cover sectors 21, 23, 26, 28, 29, 31-34 as per NACE (industry standard classification system used in the European Union).

The paper starts by quick overview on the macroeconomic situation of the country providing the temporal description of main indicator - the growth development with regard to the industrial production that is considered to be as one of the essential component in terms of the Czech economy. Following chapter describes the current structure of graduates from upper secondary schools in the Czech Republic.

The descriptive part of the study will shed light into the functions and purposes that vocational education policies should fulfil and aim at. The mapping forms the basis for the subsequent purposive qualitative and quantitative analysis of vocational education. The analysis focuses on the main quantitative trends in upper secondary EdTech in the Czech Republic over last 5 years.

III. Economic growth and IPI of the country

The first point of the descriptive part is dedicated to macroeconomic situation of the country. The Czech Republic belongs to that group of EU members that have a stable economic environment. In the OECD annual report stays that the Czech economy is thriving OECD (2019a). Since 2014 there has been a balanced growth, see Figure 1. Internal demand is led by strong household consumption, supported by income growth, and private investment. The Czech Republic's growth model of low wage and high reliance on FDI has been successful in increasing GDP. In 2018 output growth has slightly slowed down to 3 %, in comparison with 4.6 % in 2017 beside another on account of labour supply constraints, and will remain around 2.6 % MPO (2019). Increasing wages and employment keep household consumption and internal demand high. As already stated the low unemployment rate in the Czech Republic owes its success to factory jobs.

The GDP growth in the Czech Republic is considerably influenced by industrial production. The IPI is an important tool for forecasting future GDP and economic performance here. As already stated the IPI seems to be leading indicator of economic performance due to its general importance for Czech GDP growth and its sensitivity to consumer demand. Developments of the GDP growth and the IPI index shows Table 1.

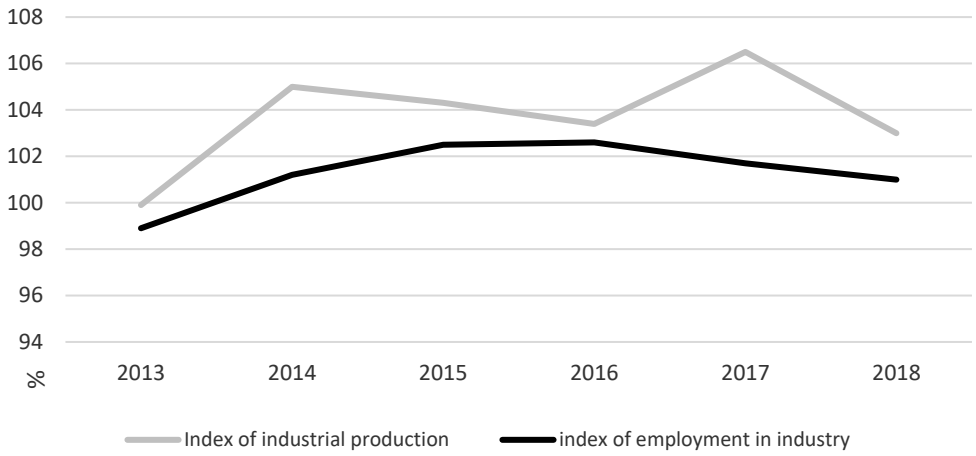
Table 1 GDP growth and IPI index

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
IPI	98,2	86,4	108,6	105,9	99,2	99,9	105	104,3	103,4	106.5	103
GDP growth	2,7	-4,8	2,3	1,8	-0,8	-0,5	2,7	5,3	2,5	4,4	3

Source: ČSÚ, own calculations

Strong dependence between IPI and GDP growth is evident. In 2009, year of significant economic decline, the IPI sharply dropped of 13.6 %, warning the Czech economy that was being hit by structural problems. The production took another tumble and the recession repeated in 2011-2012, the IPI fell by 6.7 % in 12 months underlining how a sector that had long been the motor of the Eurozone economy stalled dramatically. Since 2013 the Czech Republic has recorded annual growth till 2016. Strong and positive relation of IPI index and employment in industry is illustrated on the graph Figure 1.

Figure 1 GDP growth and IPI index



Source: ČSÚ, own calculations

IV. Organisation of secondary vocational technology education

Having shown the importance of industry for the Czech economy the descriptive part continues with the brief overview on the organisation of secondary vocational technology education in the Czech Republic. It is provided by secondary technical schools (SOŠ) that correspond to ISCED 354 and secondary vocational schools (SOU) corresponding to ISCED 353. They offer young people experience, skills and competencies needed for performing an occupation or group of occupations or work activities on the labour market. At the same time, they develop general knowledge, skills and key competencies necessary for their private, civic and work life, as well as for lifelong learning. SOŠ present one type of secondary schools which provide initial vocational education and prepare their students for the labour market. Education at secondary technical schools is offered in four-year programmes which are completed by the graduation exam. SOU provide vocational education and prepare for „blue-collar" positions. The education mostly takes place in three-year or two-year educational programmes completed by a final exam or an apprenticeship certificate NÚV (2018).

V. Quantitative analysis of vocational education

In order to carry out the quantitative analysis of the structure of upper secondary graduates the data collected by NÚV serve for presented research. Figure 3 shows the timeline of number of graduates from upper secondary schools in the Czech Republic. As already mentioned the vocational education in the Czech Republic is either concluded by graduation examination: ISCED 354 – 44% of all upper secondary graduates enabling further studies at tertiary education level or graduating without graduation : ISCED 353 – 30%. The latter is intended mainly for direct entry to the labour market. The Table 2 presents the data also for non-vocational upper secondary schools – general upper secondary schools – Gymnazium.

Table 2 Graduates at upper secondary level in the Czech Republic

	2007/08	2010/11	2013/14	2016/2017	2007/08	2010/11	2013/14	2016/2017
Gymnázia (ISCED 344)	34 619	29 069	25 274	22 858	21,62%	20,98%	21,91%	22,53%
Vocational with maturita (ISCED 354)	101 048	85 504	68 832	58 136	63,11%	61,70%	59,67%	57,30%
Vocational without maturita (ISCED 353)	24 445	24 010	21 244	20 466	15,27%	17,33%	18,42%	20,17%
Total	160 112	138 583	115 350	101 460				

Source NÚV, own calculations

The demographic data shows that the number of young people decreases which results also in a declining share of students in vocational education. There has been a strong decline in interest for vocational secondary education with graduation for ISCED 354 – and a slow rise in the interest in general secondary education - Gymnazium. Anyhow for present study the information on increasing ratio of graduates at vocational secondary schools without graduation seems to be significant.

The analysis continues with description of possible impacts on labour market. Following chapter will reveal the consequences.

VI. Impact on the labour market

The fact that graduates of vocational education tend to be less employable and more sensitive to fluctuations between the jobs is supported by a representative study carried out in the Zlín region. Table 3 shows the latest unemployment rates of both graduates with and without graduation.

Table 3: Unemployment rate of both graduate groups in the Zlín region

unemployment rate / year	2016	2017	2018	2019
graduates with graduation	7,31	4,54	2,8	2,87
graduates without graduation	9,84	5,66	3,75	3,75

Source: Monitor ZK, own calculations

For both groups the unemployment rate follow a downward trend. The graduates with lower educational degree tend to report higher unemployment rates. There are several reasons that can give the explanation. The graduate programmes without graduation - ISCED 353 are often seen as a second choice for those who are not able to obtain the level of education with graduation. That´s why the graduates of vocational schools without graduation often lack motivation for the vocational field NÚV (2018). The results of the OECD PIAAC survey confirm that the graduates of non- graduation programmes perform worse in numeracy and literacy than the OECD average, while the Czech graduates from upper secondary education with graduation and from tertiary education score equal to or above the average OECD (2019b). Graduates from vocational education programmes are more unemployed than graduates from general education ISCED 344 - Gymnazium programmes but this is also reinforced by the fact that almost all of them continue in tertiary education and do not enter the labour market at this stage NÚV (2018). Furthermore skilled employees in workplaces help to raise the productivity of low-skilled colleagues Cedefop (2018). Many of the economic effects of different kinds of skills are hard to identify because they are indirect. Skills are not deployed in isolation but have to be combined with other production inputs, such as machinery and equipment before they can make a contribution to economic performance.

So far national unemployment rate has been low for two main reasons (1) assembly plant jobs have been relatively easy to create because they are cheap and government incentives have

made the Czech Republic attractive to global manufacturing companies. (2) Czech business cycle is closely connected to the economic health of the EU OECD (2019b). When Europe is doing well, the Czech Republic does even better. The most obvious risk of workforce on assembly-line jobs with low value added dependence seems to be a matter of concern. Which means that the Czech Republic faces the risk of job losses from automation – job losses of the less qualified workforce – graduates without graduation. This fact is a matter of global concern since the quantitative research displays the increasing number of less qualified graduates.

The results of present paper confirm the survey of the Digital Economy and Society Index (DESI) stating that only 24 % of Czechs have basic digital skills, while the EU average is 31 % European Commission (2019b). This fact accelerates the competencies of disparity between the supply and demand of candidates and force employees to learn new skills, both within the workplace and in educational establishments.

VII. Conclusion

The present survey displayed the current structure of the secondary education graduates and the position of both groups on the labour market. These outcomes must be compared with the anticipated requirements of the workforce. The present research shows the trend of increasing ratio in favour for graduates without graduation. This fact states in the contradiction with the demand of well-educated workforce that is expected to predominate in future. The industrial report predicts a global workforce crisis powered by extreme automation. The 'Fourth Industrial Revolution' will see an increase in workforce automation not to include highly repetitive low-skill jobs, but highly routine medium-skill jobs.

Apparently, this discrepancy seems to present important challenges for the national educational system provided that better skilling is necessary to increase labour productivity and innovation to maintain the competitiveness and to favour upgrading in value added. This was the second point of the present study: to reveal the vision and future trends in Czech upper-secondary education. There is still a plenty of room for better skilling, preparation for involvement in technical innovation activities in the Czech educational system. These factors will be mostly needed in order to upgrade the potential of sharing the benefits of future economic growth based on industry and technology.

In order to improve the quality in modern educational line various initiatives and projects have been developed over recent years but the Czech vocational education system has not undergone any conceptual conversion or transformation process. A comprehensive skills strategy could help to adapt the educational trends to future changes. These have not yet been transformed into a coherent framework with comprehensive methods for producing and interpreting intelligence skills. MŠMT published underlying document Main directions of Educational policy 2030+ that is intended to be a platform for professional debate and create the main visions, priorities and goals of educational policy beyond the year 2030. It is highly considerable to accommodate still growing demand for workers mostly in technical professions with university and upper secondary school education and motivate adequately graduates to participate actively in future development. There should be stronger emphasis on upper secondary education for graduates with graduation and modern upper secondary educational institutions must equip people not only with vocational skills, but also with a broad range of knowledge, skills and attitudes recognized as indispensable for meaningful participation in work and life.

The findings of the presented study come at an important time. The present research indicates that in light of the 2030+ vocational studies development needs the fundamental rethink and transformation to respond to the current and future skills requirements. There is an important message to be aware of for future role of educational institutions in vocational education: they mustn´t exist separately, they must be closely connected with innovative practice strategies and

be constantly involved in research and innovation activities already on the upper secondary level. This must become the future role of vocational education institutions on upper secondary level: to become the power sources on which new innovative challenges rely. The comprehensive national skills strategy could help to adapt the organisation and structure to future changes.

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