ARE WE EQUALLY DIGITAL? A COMPARATIVE ANALYSIS OF ONLINE JOB ADS IN THE V4 COUNTRIES

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1 INTRODUCTION

Digitalisation is one of the most influential processes of our time, fundamentally reshaping the economy, the labour market and our daily lives. It is not just a technological development, but also a profound social and economic change that brings with it new opportunities, but also serious challenges. This is a particularly important issue today, as global competition, the rapid flow of information and the pressure of automation are forcing both companies and individuals to adapt to the digital environment. Digitalisation is significantly changing the expectations placed on employees. Routine, repetitive tasks are increasingly being taken over by software and algorithms, while creative, problem-solving, collaborative and digital skills are becoming more valuable. It is important that employees develop their IT skills, learn how to use new platforms and tools and are open to lifelong learning. Those who can keep pace with technological developments can remain competitive in the labour market, while others can easily be displaced.

In this study, we seek answers to two research questions. Our first research question is whether there are differences or similarities in terms of digital skills between occupations in the V4 countries (Czech Republic, Hungary, Poland, Slovakia). Our second research question is whether there are patterns in digital skills between economic sectors in the V4 and EU27 countries.

2 MATERIAL AND METHODS

To answer our research questions, we collected data from the CEDEFOP website (https://www.cedefop.europa.eu/en/tools/skills-online-vacancies). CEDEFOP is the European Union's decentralised agency for vocational education and training. It supports EU policy makers in the development and implementation of VET policy. It monitors trends in the labour market and acts as a bridge between the world of learning and the world of work. Skills-OVATE is a joint project of CEDEFOP and Eurostat. Skills-OVATE provides information on job vacancies and the skills required by employers based on online job advertisements (OJA) in 27 EU countries and five other European countries. The data is collected from thousands of sources, including private job portals, public employment service portals, recruitment agencies and company websites. The database contains millions of job advertisements per year and is updated quarterly. Skills-OVATE classifies skills based on ESCO version 1.2.0 and occupations based on ISCO-08. In ESCO v1.2.0, the classification of skills follows a hierarchical structure.

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In our study, we used data for the year 2024. The last data download was in June 2025. We downloaded occupational and sectoral data for the EU27 countries in Excel. In the case of occupations, the download was at four-digit ISCO depth. We were unable to download data for the wholesale and retail trade sector. After downloading the data, the database was sorted and cleaned. Our database contained four types of quantitative data. To make them comparable across countries and sectors, we created four indicators in the form of ratios. These were:

1. the share of digital OJAs in total OJAs;
2. the share of digital skills in all skills;
3. the number of skills per OJA;
4. the number of digital skills per digital OJA.

The analyses were carried out using MS Excel and SPSS. Pearson‘s correlation coefficient was used to calculate the correlation. In our cluster analysis, we included the four indicators we developed as variables and aimed to categorise occupations and sectors into clusters by country. We performed a hierarchical cluster analysis using the Ward method. The number of clusters was determined using a dendrogram. As we worked with more than two variables in each case, we used descriptive statistics to characterise the clusters.

3 RESULTS

To answer our first research question, we can say that for all four indicators there is no significant difference between the four Visegrad countries. So the ratio between digital ads and digital skills is almost the same, and the job ads published in 2024 contain almost the same number of skills and digital skills in one ad. For the first three indicators mentioned above, the V4 countries lag behind the EU average. This means that employers in the Visegrad countries post significantly fewer digital job advertisements, expect fewer qualifications and include fewer digital skills in them, or at least specify them in the job advertisements, than the EU average. We were also able to identify occupations in all four countries and in the EU27 that behaved identically in terms of digital expectations over the period analysed.

We analysed the four indicators above by country and by sector, forming clusters. The first cluster comprises sectors where OJAs contain relatively few qualifications and require fewer digital skills, such as construction, agriculture and education. The second cluster comprises sectors in which companies expect a relatively high number of qualifications, but the number of digital skills can be considered average, such as the finance and insurance sector. The third cluster includes sectors where OJAs are relatively short and contain few skills, but the number of digital skills is high, such as the infocommunications sector. There were also several sectors that were placed in different clusters in different countries, such as arts, entertainment and recreation, technology, engineering and R&D activities and property activities.

4 CONCLUSIONS

Digitalisation is not just a technical development, but a profound change in social and economic structures. Individuals and organisations that are able to adapt to this new world can gain a competitive advantage in the long term. This is why digitalisation is such an important topic today: not only the success of the present depends on it, but also that of the future. Digitalisation poses a twofold challenge for companies. On the one hand, they need strategies to effectively integrate digital technologies into their processes and, on the other, they need to ensure that their employees have the right knowledge and skills. The corporate culture must also adapt: Flexible working, the transition to remote working and data security issues are all factors that require a new mindset.

In our study, we sought to answer two research questions using four indicators based on data from the CEDEFOP database. Based on the statistical analyses performed, we found that there are no significant differences between the four V4 countries in terms of the number and proportion of qualifications and digital skills listed in job advertisements, but differences can

already be observed when compared to the EU average. In the sectoral analysis, we conducted a cluster analysis for all four countries and the EU27. We identified the sectors that fall into the same cluster in the Visegrad countries and the sectors that do not show the same patterns.

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