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DIGITAL SKILLS AND EMPLOYABILITY IN THE KNOWLEDGE ECONOMY

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ABSTRACT

Digital skills have become one of the key prerequisites for employability in the knowledge economy, as they affect productivity, innovativeness, and individuals' ability to adapt to technological change. This paper aims to examine the relationship between digital skills and employability in the knowledge economy, taking into account the role of adaptability and lifelong learning as additional predictors of employability. The empirical study was conducted on a sample of 98 respondents in the Republic of Serbia, using a structured questionnaire based on the DigComp framework for digital competence. The results indicate that digital skills have a statistically significant and positive effect on employability, while adaptability and lifelong learning also make independent contributions to explaining employability. The findings confirm that sustainable employability in the knowledge economy depends on a combination of technical competencies, adaptive capabilities, and readiness for continuous learning throughout the working life. The paper highlights the need for systematic development of digital skills through education, training programs, and active labour market policies to support inclusive employability under conditions of digital transformation.

Keywords: *digital skills, employability, knowledge economy*
JEL classification: *J24, O33, I26*

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INTRODUCTION

The knowledge economy refers to an economic and social model in which knowledge, innovation, and intangible resources represent the main sources of productivity and competitiveness (Powell & Snellman, 2004). In such an environment, the labour market is shifting away from routine and physically intensive jobs toward occupations that require analytical thinking, problem-solving, information processing, and continuous learning. Digital technologies particularly the internet, mobile platforms, cloud computing, and artificial intelligence accelerate this transformation by reshaping modes of production, communication, and management, as well as the structure of demand for occupations and skills.

Over the past decade, *digital skills* have moved from the domain of an "additional advantage" to that of basic literacy for work and social participation. They encompass a wide range of competencies, from basic skills (e.g. device use, information search, electronic communication) to advanced skills (e.g. data analysis, programming, cybersecurity, and the use of digital tools for process and project management). In this paper, the terms *digital skills* and *digital competences* are used as closely related synonyms, with operationalization based on the DigComp framework. Through DigComp, the European Commission emphasizes that digital competence is not only technical but also cognitive and ethical; it includes information literacy, communication and collaboration, digital content creation, safety, and problem-solving (Vuorikari et al., 2022). This broad understanding is important because the labour market increasingly demands not "pure IT" profiles but workers who are able to apply digital tools within their respective fields, such as education, healthcare, finance, logistics, marketing, the public sector, and manufacturing.

Employability is commonly defined in the contemporary literature as an individual's ability to obtain employment, retain it, progress within it, and, when necessary, successfully transition to a new job (Yorke, 2006). In the knowledge economy, employability is increasingly associated with a portfolio of skills and adaptability, and less with formal qualifications as the sole signal of labour market value. Human capital theory (Becker, 1964) provides a classical framework for understanding this relationship, as investment in skills increases productivity, which is reflected in the labour market through higher employment prospects, more stable employment, and higher earnings. However, under conditions of digital transformation, the nature of human capital is changing: it is no longer sufficient to acquire knowledge "once and for all"; instead, continuous upskilling is required, as technological standards, platforms, and work processes evolve rapidly (Autor, 2015).

Research on technological change indicates that digitalization has a dual effect. On the one hand, it creates new jobs and increases productivity; on the other hand, it alters the structure of occupations and may deepen inequalities. The well-known thesis of *skill-biased technological change* suggests that technology increases demand for highly skilled labour and rewards individuals who possess relevant skills (Acemoglu & Autor, 2011). Consequently, digital skills function as a "complementary" category: they enhance the value of cognitive, creative, and social competencies while also providing individuals with access to a broader range of jobs, including remote work and participation in the global labour market.

The dimension of the digital divide is particularly important in this context. The digital divide is not only a matter of access to the internet and devices, but also of the quality of use, the level of competencies, and the ability to transform digital resources into economic and social benefits (van Dijk, 2006). If certain groups (e.g. older individuals, the low-skilled, the unemployed, and residents of rural areas) lack adequate digital skills, they risk exclusion from new jobs and forms of work, thereby reducing the inclusiveness of the knowledge economy. Moreover, digitalization may lead to labour market polarization, where highly paid jobs requiring complex skills expand alongside low-paid service jobs, while middle-skilled routine occupations decline (Autor, 2015).

Against this background, this paper has three main objectives. The first is to conceptually clarify the notion of digital skills and their structure within the knowledge economy. The second is to analyse the mechanisms through which digital skills affect employability: (1) increasing productivity and work quality, (2) reducing job-search costs and facilitating access to information and networks, (3) enabling transitions into new occupations and sectors, and (4) supporting flexible forms of work (e.g. remote work). The third objective is to highlight the implications for education and labour market policies, as employability in the knowledge economy depends on systemic support for skills development rather than solely on individual motivation.

Given that digital skills are becoming increasingly important across almost all professions, research on this topic has both theoretical and practical significance. The theoretical contribution lies in linking the concept of digital competences with the broader framework of human capital and the knowledge economy. The practical significance relates to the potential for designing interventions aimed at enhancing employability from curricular reforms in education and reskilling and upskilling programmes to cooperation between employers and institutions in developing relevant competences.

LITERATURE REVIEW

In the literature, the knowledge economy is described as a system in which the "production" of knowledge and its application represent the central sources of growth and competitiveness (Powell & Snellman, 2004). Within this model, human capital is a key productive component, as it encompasses the knowledge, skills, and abilities that enable innovation and productivity. Becker (1964) classically argues that investment in education and skills yields economic returns through higher productivity and earnings. However, in the context of digital transformation, human capital is increasingly viewed as "dynamic," since the value of skills depends on the technological context and competences become obsolete more rapidly, which necessitates continuous learning (Autor, 2015).

Employability is frequently used in higher education and labour market policies as an indicator of an individual's "readiness" for work and career mobility. Yorke (2006) emphasizes that employability is not merely an outcome (employment), but rather a set of abilities and attributes that increase the likelihood of successful employment and career progression. In the digital era, digital competence has become one of the central attributes of employability.

The literature on technological change shows that technology does not affect all occupations uniformly. Acemoglu and Autor (2011) explain that technological change often favours skills that are complementary to new technologies, leading to increased demand for highly skilled labour and changes in the wage distribution. Autor (2015) further demonstrates that technology can substitute for routine tasks while increasing the value of non-routine cognitive and interpersonal activities. This is particularly relevant for digital skills, as they enable workers to use technology as a tool for analytical problem-solving and creative work, rather than being "replaced" by technology.

One of the most widely cited institutional frameworks for digital competences is DigComp, developed and continuously updated by the European Commission. In its latest versions, DigComp systematizes digital competences into five domains: information and data literacy; communication and collaboration; digital content creation; safety; and problem-solving (Vuorikari et al., 2022). The advantage of the DigComp framework lies in its broad understanding of digital literacy as a comprehensive set of competences, including critical thinking in online environments, digital identity management, and safe digital behaviour. From an employability perspective, it is important to distinguish between basic, intermediate, and advanced digital skills. Basic skills are a prerequisite for most administrative and service jobs; intermediate skills

are required for “digitalized” jobs that involve the use of specialized software; and advanced skills are associated with ICT professions and roles at the intersection of technology and business (e.g. data analysis, automation, software development). Institutional reports, particularly those by the OECD, emphasize that the development of these skill levels is crucial for productivity and inclusive growth, as skill-related digital divides may limit the economic benefits of digital transformation (OECD, 2019).

The literature identifies several mechanisms through which digital skills enhance employability:

• **Increased productivity and quality of work:**Digital skills enable faster task completion, better work organization, data handling, and more efficient communication. Within human capital theory, this leads to higher productivity and stronger positioning in the labour market (Becker, 1964).

•**Complementarity with cognitive and social skills:**Technology amplifies the value of complex skills that are difficult to automate, such as critical thinking, creativity, teamwork, and communication (Autor, 2015). Digital literacy allows these skills to be “multiplied” through collaboration tools, project management systems, and content creation platforms.
•**Reduced job-search costs and expanded networks:**Online employment platforms and professional networks broaden access to job-related information and enable faster matching processes. Individuals with stronger digital skills use these channels more effectively, thereby increasing their chances of employment.
•**Career mobility and reskilling:**Under conditions of structural change, digital skills form the basis for reskilling and entry into growing sectors. The OECD (2019) highlights that skills development policies and lifelong learning are essential for preventing long-term unemployment.

Although digital skills can enhance employability, their unequal distribution may deepen social inequalities. van Dijk (2006) stresses that the digital divide encompasses not only access to technology, but also “usage” and “outcome” differences namely, the ability to translate technology into economic and social benefits. In practice, this implies that digital skills development must be accompanied by targeted support for vulnerable groups and the provision of accessible training programmes. A further risk concerns labour market polarization: if digital skills become a filter for access to “better” jobs, individuals with lower skill levels may remain trapped in unstable, low-paid, or informal employment. Therefore, it is essential that education systems and

employment policies orient the development of digital competences toward inclusiveness and regional balance.

The literature emphasizes that digital skills do not emerge spontaneously, but require structured interventions, including curriculum modernization, development of teachers' competences, the introduction of practical projects, partnerships with industry, and lifelong learning programmes. DigComp can serve as a reference framework for defining learning outcomes and assessing competences (Vuorikari et al., 2022). The OECD (2019) further points out that skills development policies should be aligned with labour market needs in order to reduce mismatches between skills supply and demand. Overall, the literature review indicates that digital skills represent a critical determinant of employability in the knowledge economy, while their impact depends on the institutional framework, availability of training opportunities, social inclusiveness, and the capacity of organizations to integrate these skills into work processes.

CONCEPTUAL FRAMEWORK AND RESEARCH MODEL

Based on the preceding literature review, it can be concluded that digital skills have become one of the key determinants of employability in the knowledge economy. The digital transformation of the labour market has led to changes in the structure of occupations and competence requirements, with increasing emphasis placed on individuals' ability to use digital technologies effectively across different professional contexts. However, contemporary research indicates that employability in the knowledge economy does not depend solely on the possession of digital skills, but also on a broader set of adaptive and developmental capabilities. Human capital theory (Becker, 1964) is based on the assumption that investment in knowledge and skills increases productivity and the market value of individuals. In the context of the digital economy, this theory acquires an additional dimension, as the value of human capital is increasingly measured not by formal qualifications, but by the ability to continuously apply and upgrade skills in a rapidly changing technological environment. Digital skills enable individuals to perform work tasks more efficiently, access relevant information, participate in digital networks, and use modern tools for problem-solving, thereby directly enhancing their competitiveness in the labour market.

In addition to digital skills, the literature highlights the importance of adaptability as an individual's capacity to accept changes in work practices, adopt new technologies, and reorganize work habits in line with the demands of the contemporary labour market. Adaptability implies openness to change,

flexibility in professional behaviour, and the ability to respond quickly to technological and organizational innovations. Research indicates that adaptability is one of the key predictors of employability, as it enables individuals to remain relevant and competitive despite frequent changes in the structure of labour demand.

Lifelong learning represents the third key component of the conceptual framework of this study. In the knowledge economy, learning is no longer viewed as a phase limited to formal education, but rather as a process that extends throughout the entire working life. Readiness for lifelong learning enables individuals to upgrade their competences, develop new skills, and adapt to new professional roles. Empirical findings confirm that individuals who actively invest in their own development have greater chances of employment, career advancement, and long-term stability in the labour market.

Drawing on these theoretical and empirical insights, this paper develops a conceptual model in which employability in the knowledge economy is treated as the dependent variable, while digital skills, adaptability, and lifelong learning are considered independent variables. The model assumes that each of these variables has an independent and statistically significant effect on employability, and that their combined effect further contributes to explaining individuals' competitiveness in the contemporary labour market.

Such a conceptual framework enables systematic empirical examination of the relationships between key components of human capital and employability under conditions of digital transformation, and provides the basis for formulating the research questions, hypotheses, and methodological approach presented in the subsequent sections.

RESEARCH QUESTIONS AND HYPOTHESES

Based on the defined conceptual framework, the following research questions were formulated:

1. To what extent do digital skills affect individuals' employability in the knowledge economy?
2. Does adaptability have a statistically significant impact on employability in the knowledge economy?
3. Does lifelong learning contribute to individuals' employability in the knowledge economy?

4. To what extent do digital skills, adaptability, and lifelong learning jointly contribute to explaining employability in the knowledge economy?

In line with these research questions, the following research hypotheses were proposed:

• H1: Digital skills have a statistically significant and positive effect on employability in the knowledge economy.
• H2: Adaptability has a statistically significant and positive effect on employability in the knowledge economy.
• H3: Lifelong learning has a statistically significant and positive effect on employability in the knowledge economy.
• H4: Digital skills, adaptability, and lifelong learning jointly have a statistically significant effect on employability in the knowledge economy.

The proposed hypotheses provide the basis for empirical testing in the following section, which presents the research methodology, sample, instrument, and applied statistical methods in detail.

RESEARCH METHODOLOGY

Research Aim and Objectives

The aim of this study is to empirically examine the relationship between digital skills and employability in the knowledge economy, while taking into account the role of adaptability and lifelong learning as additional predictors. Based on the conceptual framework and the proposed hypotheses, the study seeks to provide empirical evidence on whether and how digital skills, i.e. digital competences, contribute to individuals' competitiveness in the contemporary labour market.

In line with the defined aim, the following research objectives were established:
• to identify the level of respondents' digital skills in accordance with the DigComp framework;
• to examine the level of employability of respondents in the knowledge economy;
• to analyse the relationship between digital skills and employability;
• to examine the role of adaptability and lifelong learning as mediating factors in this relationship.

The study was conducted using a quantitative research approach, which was selected due to its suitability for systematic data collection, statistical analysis, and testing of the proposed hypotheses. A survey method was used as the primary data collection technique, implemented through a structured questionnaire. This approach enabled the inclusion of a larger number of respondents and the collection of comparable data on perceptions of digital skills, adaptability, and employability in the context of the knowledge economy.

The empirical research was conducted on a sample of 98 respondents in the Republic of Serbia. The sample included employees from the private and public sectors, young people seeking employment, as well as entrepreneurs and freelancers whose work is largely associated with the use of digital technologies. The structure of the sample allowed for the examination of diverse perspectives on employability in the knowledge economy, taking into account differences in age, level of education, and employment status.

Research Instrument

A structured questionnaire was used as the research instrument, developed on the basis of relevant theoretical assumptions and previous empirical studies in the fields of digital competences, adaptability, and employability. The questionnaire consisted of four thematic sections.

The first section referred to the sociodemographic characteristics of the respondents and included questions on gender, age, level of education, and employment status.

The second section included questions related to digital skills, operationalized in accordance with the European Commission's DigComp framework. Digital skills were measured through the following dimensions: information and data literacy, digital communication and collaboration, digital content creation, safety, and problem-solving.

The third section focused on adaptability and readiness for lifelong learning, which were conceptualized in this study as important independent variables and key skills in the knowledge economy. These dimensions reflect individuals' ability to adapt to changes in the work environment, acquire new knowledge, and continuously develop their professional skills.

The fourth section included questions related to employability, operationalized as the dependent variable. Employability was defined as the perception of one's

own competitiveness in the labour market, the ability to retain employment, and readiness to change jobs or professional direction.

All items in the second, third, and fourth sections of the questionnaire were measured using a five-point Likert scale, where a value of 1 indicated strong disagreement with the statement and a value of 5 indicated strong agreement.

Dependent variable:
•employability in the knowledge economy

Independent variables:
•digital skills
•adaptability
•lifelong learning

Statistical Data Analysis Methods

The collected data were processed statistically. The following statistical methods were applied in the analysis:
• descriptive statistics to describe the basic characteristics of the sample and variables;
• Cronbach's alpha coefficient to assess the internal consistency of the applied scales;
• correlation analysis to examine relationships between the independent variables and employability;
• regression analysis to examine the individual and joint effects of digital skills, adaptability, and lifelong learning on employability in the knowledge economy.

The applied methods enabled systematic and comprehensive testing of the proposed hypotheses, as well as methodological consistency between the theoretical framework and the empirical findings.

RESEARCH RESULTS

The results of the empirical study are presented in accordance with the proposed research hypotheses (H1–H4) and the defined conceptual model. The analysis was conducted on a sample of 98 respondents, using descriptive statistics, reliability analysis, correlation analysis, and regression analysis.

Descriptive analysis indicates that respondents, on average, report a moderate to high level of digital skills. The highest mean values were recorded in the

domain of digital communication and collaboration, while slightly lower values were observed in the areas of digital content creation and digital safety. This distribution suggests that respondents most frequently use digital technologies for communication and information exchange, whereas more advanced digital skills or competences are less developed.The reliability of the applied scales was assessed using Cronbach's alpha coefficient. The obtained values indicate satisfactory internal consistency for all scales ($\alpha > 0.70$), confirming that the instrument reliably measures digital skills, adaptability, lifelong learning, and employability.

To test hypothesis H1, correlation and regression analyses were conducted between digital skills and employability. The results show a statistically significant and positive relationship between these two variables, indicating that respondents with higher levels of digital skills also report higher levels of employability. Regression analysis further confirms that digital skills have a significant predictive effect on employability in the knowledge economy, thereby supporting hypothesis H1.

In order to test hypothesis H2, the relationship between adaptability and employability was analysed. The results reveal a statistically significant and positive association between these variables. Respondents who demonstrate higher levels of adaptability tend to feel more secure in terms of job retention, finding new employment, and professional mobility. Regression analysis confirms that adaptability is a significant predictor of employability, thus supporting hypothesis H2.

Hypothesis H3 was tested by analysing the relationship between lifelong learning and employability. The findings indicate that respondents who are more willing to continuously acquire new knowledge and skills report higher levels of employability. Statistical analysis confirms that lifelong learning has a significant and positive effect on employability in the knowledge economy, thereby supporting hypothesis H3.

To examine the joint contribution of the independent variables to explaining employability, multiple regression analysis was performed. The results show that digital skills, adaptability, and lifelong learning jointly have a statistically significant effect on employability in the knowledge economy. These findings indicate that employability depends on a combination of technical competences, adaptive capabilities, and readiness for continuous professional development. On this basis, hypothesis H4 is confirmed.

Overall, the research results clearly demonstrate that digital skills, adaptability, and lifelong learning represent key determinants of employability in the knowledge economy. Each of these variables makes an independent contribution, while their combined effect further enhances individuals' competitiveness in the contemporary labour market.

CONCLUSION

The aim of this paper was to examine the impact of digital skills, adaptability, and lifelong learning on individuals' employability in the knowledge economy. Based on the theoretical framework and the empirical findings, it can be concluded that all three variables represent key components of contemporary human capital.

The research results confirm that digital skills significantly contribute to employability, while adaptability and lifelong learning also have independent and statistically significant effects on individuals' ability to adjust to the demands of the modern labour market. In this way, employability is confirmed as a dynamic construct that depends on a combination of knowledge, skills, and individuals' developmental capacities.

The theoretical contribution of the study lies in the empirical validation of a model that considers digital skills, adaptability, and lifelong learning as key independent predictors of employability in the knowledge economy. The practical implications point to the need for education systems, employers, and employment policy makers to devote equal attention to the development of digital competences, the strengthening of adaptive capacities, and the promotion of a culture of lifelong learning throughout the entire working life.

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