Andragoške studije, issn 0354–5415, broj 1, jun 2024, str. 141–160
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UDK 378:37.016(497.11)(497.2)
doi: 10.5937/AndStud2401141P

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Development of Competency-Based Education in Higher Education Institutions in Serbia and Bulgaria (Non-EU/EU): Conceptual and Statistical Framework with Empirical Findings

Abstract: This paper aims to assess how key competencies for the 21st century are planned and systematically integrated into the educational systems of the Republic of Serbia and the Republic of Bulgaria, both state and private universities. The research questions asked within the conducted quantitative regarded the key competencies and their development during university studies. The research sample consisted of final-year students from two private and one state university (n=252), selected through purposive sampling. The study identified the key competencies that are most developed throughout the course of study, with respondents studying in EU countries reporting a stronger sense of readiness for the labor market. The factor analysis results, based on principal components analysis (PCA) and factor rotation using Oblimin rotation (delta=0), confirmed the division of skills into two distinct groups of components. Students with more developed research skills demonstrated a greater ability to manage information, while self-motivation to work increased their ability to learn, organize and plan, that is, the quality of the knowledge acquired by these students was higher, better interconnected and more applicable in practice.

Keywords: higher education, key competencies, Serbia, Bulgaria, factor analysis

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Razvoj obrazovanja zasnovanog na kompetencijama u visokoškolskim ustanovama u Srbiji i Bugarskoj (van EU/EU): konceptualni i statistički okvir sa empirijskim nalazima

Apstrakt: Cilj ovog rada je da se utvrdi kako se ključne kompetencije za 21. vek ciljano planiraju i sistemski ugrađuju u obrazovne sisteme Republike Srbije i Republike Bugarske, uzimajući u obzir privatne i državne univerzitete. Kvantitativno istraživanje sprovedeno je sa istraživačkim pitanjima vezanim za ključne kompetencije i njihov razvoj tokom studiranja u obrazovnoj ustanovi. Istraživački uzorak obuhvatio je studente završnih godina, odabrane namernim pristupom, sa dva privatna i jednog državnog univerziteta (n=252). Utvrđene su ključne kompetencije koje se najviše razvijaju tokom studija. Ispitanici koji studiraju u EU osećaju se spremnijim za tržište rada. Rezultatima faktorske analize, koji su zasnovani na analizi glavnih komponenti (PCA) i rotaciji faktora korišćenjem Oblimin rotacije (*delta*=0), podržana je podela veština na dve grupe komponenti. Studenti sa razvijenijim istraživačkim veštinama imali su veću sposobnost upravljanja informacijama, dok je samomotivacija za rad povećala sposobnost učenja, organizovanja i planiranja, odnosno kvalitet sadržaja koje studenti usvajaju bio je bolji, povezaniji i lekše primenjivi u praksi.

Ključne reči: visoko obrazovanje, ključne kompetencije, Srbija, Bugarska, faktorska analiza

Introduction

The aim of this paper is to establish how key competencies for the 21st century are planned and systematically incorporated into the educational systems of the Republic of Serbia and the Republic of Bulgaria, both private and state universities. It was thus necessary to define which socio-emotional and key competencies were involved. The following key competencies were chosen for analysis: Creativity/innovation (C1), Critical thinking (C2), Ability to solve problems (C3), Ability to make decisions (C4), Flexibility and adaptability – the ability to adapt to new situations (C5), Cooperation – the ability to work in a team (C6), Communicativeness (C7), Oral and written communication in a foreign language (C8), Basic computer skills (C9), Ability to manage information – gather and analyze information from various sources (C10), Research and inquiry – research skills (C11), Ethical commitment and orientation (C12), Ability to apply knowledge in prac-

tice (C13), Leadership ability – leadership and responsibility (C14), Appreciation of diversity and multiculturalism (C15), Initiative and self-management (C16), Ability to learn (C17), Ability to organize and plan (C18), Ability to criticize and self-criticize (C19), Self-motivation to work (C20).

The prosperity of each country rests on its citizens' readiness to prepare, as much as possible, for the challenges of the 21st century, primarily related to increasing globalization, technological development, and other contemporary turbulences giving rise to uncertainty. One certainty in the coming decades is the further development of uncertainty itself. One response to this is the need to establish an education system that will effectively improve the intellectual contingent of young people and thus prepare them for work and competitiveness in the 21st century. Ever-evolving economic, social, and technological changes have already led to the rapid transformation of the broader social environment, which is becoming more dynamic and demanding in terms of new skills necessary for achieving business goals effectively.

Changes in the manner of job delivery have given rise to the need to redefine the education model to help young people develop essential competencies enabling them to perform future life roles more smoothly and meaningfully. Therefore, societies must recognize the chance to establish a direction through education that will serve as the foundation for improving the quality of life, work, and opportunities required for acquiring new skills over the long term. In this process, educational strategies, as well as educational institutions, play a central role in the intellectual shaping of human potential and preparation for future active learning.

Literature Review

There is broad consensus in academic circles that traditional models of higher education in Serbia do not adequately prepare future graduates to enable them to develop the key competencies needed to effectively achieve goals in the 21st century (Vujičić & Ristić, 2015). The globalization of business relations and the demand for narrowly specialized skills have led to a change in the expectations of employers, requiring of new employees to possess the necessary set of competencies immediately after graduation (Johnstone & Soares, 2014). To meet such expectations, Serbian higher education institutions are obliged to enable the fulfilment of these needs through reform and focus on developing the competencies of future professionals (Williams et al., 2013).

Bulgaria: A competency-based approach to education

By introducing exams based on established state standards that are often aligned with external expectations, Bulgaria prioritizes the application of competency-oriented education. The focus is not on acquiring theoretical-factual knowledge but on developing competencies related to what students can understand and do. The implementation of competency-based education in higher education in Bulgaria is gaining momentum, while teacher training and qualifications have been implemented for over a decade (Velikova, 2022).

By developing competency models and management profiles in Bulgarian companies, which are closely linked to the higher education system, Blagoev (2010) proposes defining sets of management competencies for various fields and hierarchical levels. Additionally, he highlights the importance of maintaining continuity in competency development and updating them periodically to reflect labor market changes and their impact on job performance.

By developing competency models and management profiles in Bulgarian companies, which are closely related to the higher education system, Blagoev (2010) suggests defining a set of management competencies in order to identify models of management competencies for various fields and all hierarchical levels of management. Scholars also highlight/Blagoev also highlights the necessity of maintaining continuity in the development of competencies and periodically updating them to reflect the labor market changes and their impact on job performance.

Bulgaria became a member of the European Union in 2007, but the European Council set the strategic goal of building the most competitive and dynamic knowledge-based economy back in Lisbon in March 2000, although it was accepted that the Union generally had a well-educated workforce (European Council, 2000).

The introduction of a competency-based approach to education in the EU is still ongoing, and a significant part of the activity is aimed at tailoring different levels of education to ever-increasing labor market demands and overall societal needs. Some countries have adopted a competency-based approach to education and reshaped their school systems accordingly. For example, Italy introduced this approach in its secondary schools in 2010, although implementation remains partial, partly due to some teachers' lack of commitment to the competency-based approach (Giaffredo et al., 2022).

The competency-based approach has been partially applied in Bulgaria since 2010, when the National Center for Competence Assessment was created at the Bulgarian Chamber of Commerce (Tomov, 2010). Competency profiles of various professions in accounting (Krasteva-Hristova, 2021), financial control (Dimitrova, 2016), customs control (Petkova, 2019) and other fields have been developed. Pilot projects for the development of key competencies are also implemented in secondary schools and kindergartens (Kachakova, 2021).

The competency-based approach is one of the criteria for the accreditation of higher education institutions in Bulgaria. Master's, Bachelor's, and even Ph.D. curricula contain the mandatory competencies the building of which the relevant courses contribute to. The relevance of the approach in the educational process has led to the implementation of projects and targeted scientific research in various directions and specialties of higher education in Bulgaria. For example, over 50 projects were funded within the "Human Resources Development" 2007–2013 operational program to adapt the curricula and teaching precisely by applying the competency approach. More recently, the Academy of Economics "D. A. Tsenov" Svishtov alone implemented four research projects related to the applicability of the competency approach in the training of graduates in the fields of planning, accounting, insurance, control, etc. However, the impact of the approach on the target groups of these projects has not yet been investigated.

The development of competency-based education within higher education institutions in member countries of the Organization for Economic Cooperation and Development (OECD) is closely tied to educational achievement: the share of 25– to 34-year-olds with higher education increased by an average of 21 percentage points between 2000 and 2021. Slovenia is one of the countries in which tertiary education is the most common, highest level of achievement in this age group, and the labor market benefits of tertiary attainment have proved especially strong during economic crises (OECD, 2022).

Educational institutions committed to equipping students with a set of competencies necessary for the labor market will be recognized as leaders in education and active partners in society's economic development (O'Donoghue & Chapman, 2010).

The new paradigm requires that the teaching model clarifies new meanings and competencies essential for the information age. In building such knowledge, professors and students must work together to understand the needs of the business environment (Kaushal & Ali, 2020; Palali et al., 2018).

Serbia: Education based on labor market needs

Most of the missions defined within higher education institutions in Serbia relate to clearly framed academic disciplines, typically segmented into departments or majors composed of related disciplines. This type of strategy was effective when academic knowledge was the primary factor in shaping professional paths A university degree had long-lasting value at the time of static knowledge. The value of university education, as a concept of source of lifelong knowledge, began to depreciate with changes in work methods, market demands and consumer expectations and as a result of the technological and intellectual development of social conditions (Moore & Morton, 2017).

In this regard, it is crucial to adhere to the recommendations outlined by the European Training Foundation (2020). According to its findings, Serbia should place greater emphasis on the implementation of the smart specialization strategy. It also needs to continue to increase national funding for research and foster more intense cooperation between industry and academia. The valid industrial development strategy puts an emphasis on replacing the current model of competitiveness, based on cost advantage, i.e. a cheap low-skilled workforce, by a model based on skill advantage, i.e. knowledge-based industries..

Competencies refer to a set of specific knowledge, skills, abilities, values, and behaviors that are necessary to perform tasks or activities well. Numerous studies show that the increase in competencies corresponds to a higher level of productivity or work performance, which distinguishes average task performers from superior ones (Williams, 2019). In addition, Hanushek et al. (2017) argue that competencies cannot be universally interpreted and that they have to be put in a conceptual framework that corresponds to a given situation. Competency is impossible to standardize as a concept because the measurement methodology must be adapted to the specific circumstances. For that reason, the perception of the level of competencies cannot be universal; rather, it must be tailored to the specific needs of education, organizations, workplaces, markets, or the broader social environment.

In that process, Marin and Chitimiea (2020) tried to distinguish between two basic categories of competencies: static and dynamic. Static competencies include natural abilities, emotional stability and intelligence, cognitive capacity, which either limit or release the potential of an individual for further skill development and acquisition of new knowledge. Dynamic competencies include those that can be acquired and effectively applied and are directly related to a particular job or a particular situation. They are linked to the learning and

education process, and can be improved through training or exercise. The concept of dynamic competencies is also related to the concept of lifelong learning, because without upgrading existing knowledge, the overall level of competencies decreases over time. Insistence on increasing competencies through education is one of the main preconditions for the development of flexibility facilitating adaptation to changing organizational and social demands. Education, as a key component of human development, must prepare individuals for the further development of dynamic competencies, by closely linking theory and practice, and making learning a lifelong commitment in response to the growing complexity of market relations.

Any educational approach leading to excellence and increased competencies facilitates the connection between theory and practice through relevant educational approaches. Education, which is primarily oriented to the development of the students' competencies, also contributes to faster economic growth by enabling the more efficient integration of human capital into the workforce and facilitating adaptation to market requirements.

In this manner alone can newly-minted graduates be expected to demonstrate competencies that are closely related to professional needs and can be effectively upgraded by the acquisition of new knowledge. Competency-based education allows organizations to measure very precisely the extent to which formal education aligns with real market needs. The conclusion is that the acquisition of competencies is a cyclical process that begins within educational institutions, in order to prepare students for more efficient participation in the workforce and create a basis for easier further professional development.

Data, Methodology and Stylized Facts

The primary survey was designed to explore the attitudes and opinions of final-year students regarding the development of key competencies for the 21st century during their studies. The following research questions were asked:

Q1. To what extent do students believe they have acquired 21st century competencies during their studies?
Q2. How does the development of these competencies differ depending on the country of study (EU v. non-EU, Bulgaria v. Serbia)?

The data were collected using a survey method. The research sample consisted of final-year students attending two private universities in the Republic of

Serbia, and one state university in the Republic of Bulgaria, selected through purposive sampling. The pilot study included 25 students from each country, while the final sample comprised 137 students from Serbia (n_1=137) and 115 students from Bulgaria (n_2=115), i.e,, the number of respondents totaled 252 (n=252). The data were collected from May 2022 to January 2023.

The questionnaire was divided into two parts. The first part included general questions about the respondent's gender, place of residence, grade point average (GPA), and parents' education levels. In the second part, the students evaluated the 21st century competencies on a scale from 1 to 7, where 1 indicated insufficiently developed and 7 extremely well-developed competencies. Descriptive measures, dispersion measures, symmetry measures and correlation analysis were used to obtain answers to the research questions. Nonparametric techniques were used for hypothesis testing. Cronbach's Alpha coefficients were used to assess the reliability of the competency scale/items. Principal components analysis (PCA) was used to extract the factors followed by oblique rotation of factors using the Oblimin rotation. Factor retention was based on three criteria: Kaiser's criterion (eigenvalues above 1), scree plot inspection, and Horn's parallel analysis using Watkins' software. Data were processed using the SPSS software package.

Empirical Results

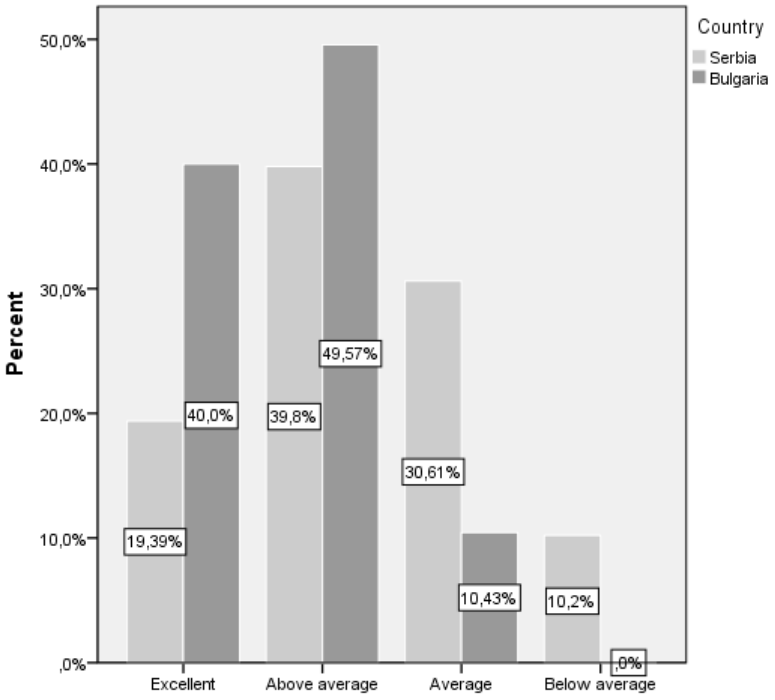
The research results are based on the surveys "Labor Market of the 21st Century and Key Competencies of Human Resources in the Republic of Serbia" and "Labor Market of the 21st Century and Key Competencies of Human Resources in the Republic of Bulgaria". As mentioned, 252 final-year students participated in the research. Of them, 104 (41.3%) were male and 148 (58.7%) were female; 137 (54.4%) were from Serbia, and 115 (45.6%) were from Bulgaria. As shown in Table 1, the largest share of respondents (45.2%) lived in cities and the most common level of education for both parents was secondary school, with 51.8% of fathers and 47.5% of mothers having completed 3 or 4 years of secondary education (for more details see Table 1). As per their academic performance, most respondents (45.1%) had an Above Average GPA, followed by 30.5% with Excellent, 19.7% with Average and 4.7% with Below Average GPAs. Comparison of academic performance by country shows that respondents from Bulgaria performed better: 40% of them had an Excellent GPA and 49.57% an Above Average GPA, whereas 19.39% of respondents from Serbia had an Excellent GPA and 39.8% had an Above Average GPA.

Table 1. Summary of Demographics

				Frequency	Percent
Gender	Male			104	41.3
	Female			148	58.7
	Total			252	100
Place of residence (the place where you live permanently or temporarily)	Village (up to 5,000 inhabitants)			28	11.1
	Town (up to 10,000 inhabitants)			27	10.7
	Small city (up to 50,000 inhabitants)			42	16.7
	City (up to 100,000 inhabitants)			41	16.3
	Large city (more than 100,000 inhabitants)			114	45.2
	Total			252	100.0
Country	Republic of Serbia			137	54.4
	Republic of Bulgaria			115	45.6
	Total			252	100
Average grade during university studies	Excellent			65	30.5
	Above average			96	45.1
	Average			42	19.7
	Below average			10	4.7
	Total			213	100.0
Highest education of parents	Education of parents	Father	%	Mother	%
	Without education (not completed school)	0	0.0	1	0.4
	Elementary school	16	6.4	8	3.2
	Secondary school (3 or 4 years)	129	51.8	119	47.6
	Junior College (3 years of study)	22	8.8	16	6.4
	Bachelor (4 years of study)	41	16.5	60	24.0
	Master (5 years of study)	35	14.1	41	16.4
	Ph.D.	6	2.4	5	2.0
	Total	249	100.0	250	100.0

The chi-square test of independence showed a significant relationship between the respondents' GPAs during studies and country of study, χ^2 (3, n=213)=31.146, p<0.001. *Cramer's V*=0.382, indicating medium effect size (Gravetter & Wallnau, 2012).

The items with the highest average scores were: Ability to organize and plan (Average 5.76, Median 6, Mode 7); Ability to learn (Average 5.76, Median 6, Mode 7) and Ability to solve problems (Average 5.67, Median 6, Mode 6), where each item has outlier data and an interval of 1.5IQR: 2 to 7. The items with the lowest average scores in the respondents' opinion were: Oral and written communication in a foreign language (Average 4.94, Median 5, Mode 7); Leadership ability – leadership and responsibility (Average 5.20, Median 6, Mode 7) and Research and inquiry – research skills (Average 5.27, Median 6, Mode 7).



Graph 1. Grade Point Average during University Studies

The average score respondents from Serbia gave the development of competencies during studies ranges from 4.82 to 5.59. In their opinion, the best developed competencies are: Basic computer skills (Average 5.59, Median 6, Mode 7), Ability to apply knowledge in practice (Average 5.45, Median 6, Mode 6), Ability to solve problems (Average 5.44, Median 6, Mode 6), while the least developed competencies are Ethical commitment and orientation (4.48), Leadership ability – leadership and responsibility (4.84), Creativity/innovation (4.94). The average score respondents from Bulgaria gave the development of competencies during studies ranges from 4.75 to 6.30. The best developed competencies are: Ability to organize and plan (6.30), Self-motivation to work (6.23), Ability to learn (6.13), for all three items the Median and Mode were 7, while the interval was 1.5IQR: 5 to 7. For respondents studying in Bulgaria, the least developed competencies are: Oral and written communication in a foreign language (4.75), Research and inquiry – research skills (5.50), Leadership ability – leadership and responsibility (5.63). If we look at the total for both groups of respondents, the best developed competencies are: Ability to organize and plan, Ability to learn, Ability to solve problems, while the least developed ones include Oral and written communication in a foreign language, Lead-

ership ability – leadership and responsibility, and Research and inquiry – research skills. Each item (competency), both by group and overall, shows strong to moderate negative asymmetry, all skewness values are less than –0.50. With the exception of Oral and written communication in a foreign language and Basic computer skills, Bulgarian respondents on average rated the development of all other competencies more highly than respondents from Serbia. Here we are able to conclude that respondents from Serbia rated items from the Core skills group more highly (These skills involve introducing young people to new ways of working, thinking, and living in a globalized world. Young people should learn how to use their talents, strengths, and interests to prepare for their careers.). On the other hand, respondents from Bulgaria rated items from the Managerial skills group more highly (These skills focus on the ability to carry out executive tasks within an organization, while also preventing crises and quickly resolving problems when they occur).

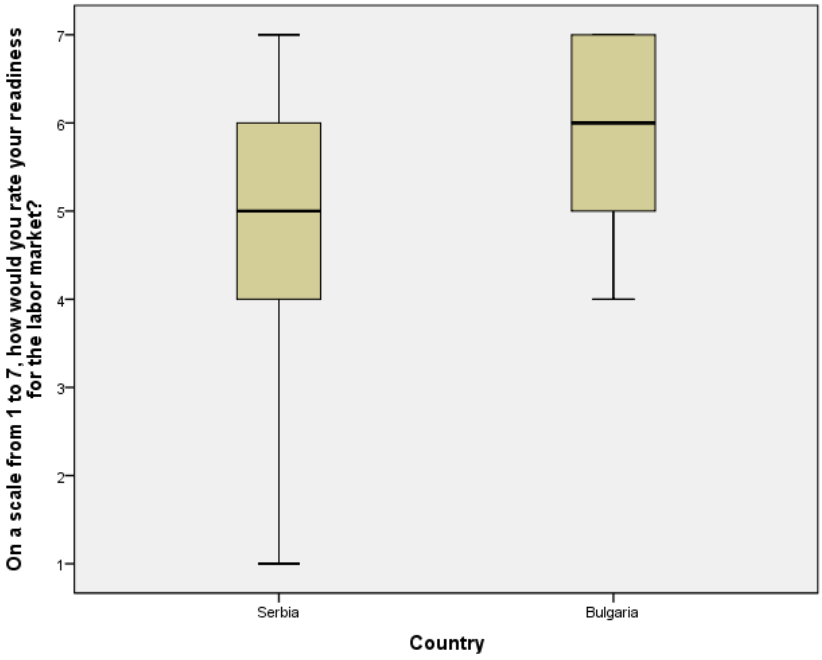
The Kruskal-Wallis Test revealed a statistically significant difference related to the items (from the Core skills group): Creativity/innovation (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=42: Average, Gp4, n=10: Below average), $\chi^2(3, n=213)=9.936$, $p=0.019$) and Critical thinking (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=42: Average, Gp4, n=10: Below average), $\chi2(3, n=213)=9.106$, $p=0.028$) for the four study groups. The highest Mean Rank was for the group of respondents with an Excellent GPA.

However, the Kruskal-Wallis Test revealed a statistically significant difference, for a much larger number of items from the Managerial Skills group for the four groups of GPAs in the studies, namely: Cooperation – the ability to work in a team (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=40: Average, Gp4, n=10: Below average), $\chi2(3, n=211)=8.150$, $p=0.043$), Communicativeness (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=42: Average, Gp4, n=10: Below average), $\chi^2(3, n=213)=9.683$, $p=0.021$), Ethical commitment and orientation (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=40: Average, Gp4, n=10: Below average), $\chi^2(3, n=211)=10.306$, $p=0.016$), Ability to apply knowledge in practice (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=40: Average, Gp4, n=10: Below average), $\chi^2(3, n=211)=8.900$, $p=0.031$), Initiative and self-management (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=40: Average, Gp4, n=10: Below average), $\chi^2(3, n=211)=10.448$, $p=0.015$), Ability to organize and plan (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=41: Average, Gp4, n=9: Below average), $\chi^2(3, n=211)=16.610$, $p=0.001$) and Self-motivation to work (Gp1, n=65: Excellent, Gp2, n=96: Above average, Gp3, n=42: Average, Gp4, n=9: Below average), $\chi^2(3, n=212)=11.817$, $p=0.008$). The highest Mean Rank was for the group of respondents with an Excellent GPA.

This essentially means that students with higher GPAs are better equipped to apply skills from the group of managerial skills, which requires a good and quality education provided by a higher education institution.

Respondents studying in Serbia (non-EU) rated their readiness for the labor market after graduation 4.84 on average, Median and Mode was 5.95% CI: 4.61 to 5.10, while respondents studying in Bulgaria (EU) rated it 5.97 on average, Median and Mode was 6.95% CI: 5.80 to 6.15, and the interval 1.5IQR from 4 to 7.

The Mann-Whitney U test revealed a statistically significant difference in the assessment of readiness for the labor market for respondents studying in Serbia (*Me*=5.0, *n*=137) and in Bulgaria (*Me*=6.0, *n*=115), *U*=4225.00, z= –6.54, $p<0.001$, the size of the effect $r = \frac{z}{\sqrt{N}} = \frac{6.254}{\sqrt{252}} = 0.39$, i.e., it may be concluded that the impact is medium to large (Cohen, 1988). The variable has a higher Mean Rank for respondents studying in Bulgaria.



Graph 2. Readiness for the Labor Market by Country of Study

In Table 2, we observe significant linear relationships ($0.5<r<0.7$) among many items, while the following items exhibit strong linear relationships ($0.7<r<0.9$): Ability to solve problems and Flexibility and adaptability – the ability to adapt to a new situation; Cooperation – the ability to work in a team and communicativeness; Ability to manage information – gather and analyze information from various sources and Research and inquiry – research skills; Leadership ability

Table 2. Correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Creativity/innovation	–																			
2. Critical thinking	0.63	–																		
3. Ability to solve problems	0.62	0.59	–																	
4. Ability to make decisions	0.61	0.57	0.76	–																
5. Flexibility and adaptability – the ability to adapt to a new situation	0.59	0.54	**0.71**	0.68	–															
6. Cooperation – the ability to work in a team	0.50	0.51	0.53	0.60	0.47	–														
7. Communicativeness	0.54	0.47	0.52	0.50	0.44	**0.73**	–													
8. Oral and written communication in a foreign language	0.45	0.43	0.44	0.40	0.40	0.40	0.40	0.35	–											
9. Basic computer skills	0.54	0.46	0.56	0.48	0.47	0.52	0.47	0.55	–											
10. Ability to manage information – gather and analyze information from various sources	0.54	0.54	0.60	0.57	0.60	0.53	0.47	0.46	0.67	–										
11. Research and inquiry – research skills	0.59	0.58	0.58	0.55	0.56	0.52	0.53	0.53	0.60	**0.70**	–									
12. Ethical commitment and orientation	0.59	0.62	0.58	0.60	0.51	0.63	0.61	0.52	0.56	0.66	0.64	–								
13. Ability to apply knowledge in practice	0.63	0.58	0.66	0.61	0.59	0.62	0.51	0.46	0.58	0.57	0.62	0.61	–							
14. Leadership ability – leadership and responsibility	0.54	0.54	0.56	0.63	0.50	0.63	0.64	0.44	0.51	0.54	0.59	0.62	0.66	–						
15. Appreciation of diversity and multiculturalism	0.55	0.60	0.52	0.54	0.47	0.61	0.50	0.54	0.56	0.54	0.56	0.72	0.60	0.58	–					
16. Initiative and self-management	0.54	0.50	0.57	0.62	0.52	0.51	0.51	0.39	0.51	0.59	0.54	0.59	0.63	**0.70**	0.60	–				
17. Ability to learn	0.55	0.49	0.61	0.56	0.52	0.60	0.57	0.40	0.46	0.51	0.52	0.62	0.67	0.59	0.57	0.63	–			
18. Ability to organize and plan	0.48	0.55	0.55	0.62	0.53	0.55	0.54	0.29	0.38	0.53	0.48	0.60	0.53	0.60	0.48	0.58	**0.71**	–		
19. Ability to criticize and self-criticize	0.45	0.56	0.45	0.50	0.46	0.52	0.50	0.31	0.43	0.56	0.42	0.62	0.54	0.58	0.53	0.57	0.58	0.56	–	
20. Self-motivation to work	0.54	0.50	0.50	0.54	0.47	0.59	0.52	0.29	0.39	0.47	0.40	0.60	0.51	0.59	0.56	0.58	**0.70**	0.64	0.65	–

Correlation is significant at the 0.01 level (2-tailed).

– leadership and responsibility And initiative and self-management; Ability to learn and Ability to organize and plan; Ability to learn and Self-motivation to work.

All this practically means that students with more developed research skills have greater abilities for managing information, and self-motivation to work, as internal motivation, driven by satisfaction from performing the activity itself, increases their ability to learn, organize and plan, i.e., the quality of the knowledge acquired by these students is higher, better interconnected and more applicable in practice.

Principal Components Analysis (PCA)

Factor analysis (PCA) was conducted to explain the shared variance within the set of competencies, that is, the variability within groups of competencies. The group includes 20 competencies reflecting the students' positive and negative opinions. Analysis of the correlation matrix shows that there are many coefficient values greater than 0.45, indicating that the data were suitable for conducting the analysis.

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.944 and Bartlett's specificity test was statistically significant (Sig=0.000), which indicates the factorability of the correlation matrix, i.e., that the factor analysis was justified. Upon examining the correlation matrix, numerous coefficients were found to be above 0.45, indicating that the data were suitable for this type of analysis.

According to Kaiser's criterion, we observe only components whose characteristic value is 1 or greater. The principal component analysis revealed the presence of nine components with characteristic values greater than 1, namely 11.438 and 1.450, which explain 57.19% and 6.17% of the variance respectively, i.e., they explain a total of 63.36% of the variance. A clear breaking point between the second and third components can be seen on the curve diagram. A parallel analysis was performed to determine the number of factors that should be retained,.

Table 3. Comparison of characteristic values obtained in Principal Components Analysis (PCA) and threshold values obtained by parallel analysis

Number of the component	Generated characteristic value from PCA	Value obtained by parallel analysis	Decision
1	11.438	1.5364	accept
2	1.450	1.4411	accept

The results of the parallel analysis support the conclusion drawn on the basis of the curve diagram, that two factors, whose characteristic values exceed the corresponding threshold value obtained using an equally large matrix of ran-

dom numbers (20 variables × 252 respondents), should be retained for further research. After Oblimin rotation, the components showed a significant intercorrelation (r=0.609). Analysis of the structure matrix indicated good discrimination between the factors. For Component 1 (Managerial skills), the lowest loading factor was 0.671 for the item Flexibility and adaptability – the ability to adapt to a new situation, but it is still higher than the highest load for item Appreciation of diversity and multiculturalism (0.670) of Component 2 (Core skills) to Component 1 (Managerial skills). Component 2 (Core skills) also showed good discrimination: the lowest factor loading (0.698) for item Appreciation of diversity and multiculturalism is still higher than the highest loading (0.695) of item Ability to solve problems Component 2 (Core skills) on Component 1 (Managerial skills).

Table 4. Pattern and structure matrix for PCA with Oblimin rotation of the two-factor solution

Competence	Pattern		Structure		Communalities
	Component 1	Component 2	Component 1	Component 2	
Self-motivation to work	**0.996**	-0.260	**0.829**	0.348	0.754
Ability to organize and plan	**0.894**	-0.107	**0.845**	0.438	0.694
Ability to learn	**0.859**	-0.022	**0.845**	0.501	0.714
Ability to criticize and self-criticize	**0.820**	-0.053	**0.787**	0.447	0.622
Cooperation – the ability to work in a team	**0.689**	0.138	**0.773**	0.558	0.610
Leadership ability – leadership and responsibility	**0.685**	0.191	**0.802**	0.609	0.665
Communicativeness	**0.671**	0.109	**0.738**	0.518	0.552
Initiative and self-management	**0.651**	0.194	**0.769**	0.591	0.616
Ability to make decisions	**0.572**	0.307	**0.759**	0.656	0.636
Ethical commitment and orientation	**0.559**	0.351	**0.773**	0.692	0.676
Ability to apply knowledge in practice	**0.510**	0.417	**0.764**	0.693	0.693
Ability to solve problems	**0.471**	0.447	**0.744**	0.695	0.679
Critical thinking	**0.447**	0.389	**0.685**	0.662	0.564
Flexibility and adaptability – the ability to adapt to a new situation	**0.419**	0.414	**0.671**	0.669	0.558
Oral and written communication in a foreign language	-0.159	**0.874**	0.374	**0.778**	0.621
Basic computer skills	0.058	**0.775**	0.530	**0.811**	0.659

Competence	Pattern		Structure		Communalities
	Component 1	Component 2	Component 1	Component 2	
Research and inquiry – research skills	0.154	**0.735**	0.602	**0.828**	0.701
Ability to manage information – gather and analyze information from various sources	0.295	**0.586**	0.652	**0.766**	0.642
Creativity/innovation	0.397	**0.476**	0.657	**0.718**	0.615
Appreciation of diversity and multiculturalism	0.428	**0.437**	0.670	**0.698**	0.754

Table 4 presents the two-factor solution for competency items. We can see each item has a strong loading on just one factor, while numerous variables have high loadings on both components. The main items for Component 1 (Managerial skills), whose factor loadings exceed 0.70, are: Self-motivation to work, Ability to organize and plan, Ability to learn, Ability to criticize and self-criticize. For Component 2 (Core skills), the main items are: Oral and written communication in a foreign language, Basic computer skills, Research and inquiry – research skills, Ability to manage information – gather and analyze information from various sources and Creativity/innovation.

The results of this analysis support the division of skills into two groups of components. The first group of components is nominally related to static competencies and can be defined as an individual's innate cognitive capacity to effectively manage and understand different forms of behavior. The second group of components is recognized as the equivalent of dynamic competencies, whose capacity depends on the influence of external forces to ensure a high level of their applicability by the individual.

Discussion and Conclusion

The research shows that respondents with different character traits or personality characteristics tend to develop different competencies. By character, we refer to the set of traits that distinguish a person and are manifested in their interaction with others, oneself, the performance of their roles and tasks, and social norms. Character mainly refers to the social side of personality – the moral principles governing relationships with others. Students with higher academic achievements (better grades) studied at a state university, with respondents studying in Bulgaria (EU) reporting better development of Managerial skills during their studies. On the other hand, respondents from Serbia (non-EU) reported stronger develop-

ment of Core skills during their studies. In general, the respondents indicated that the competencies they had developed the most during their studies were: Ability to organize and plan, Ability to learn, Ability to solve problems, while higher education institutions were the least successful in developing Oral and written communication in a foreign language, Leadership ability – leadership and responsibility and Research and inquiry – research skills. Respondents studying in Bulgaria (EU) felt much more prepared for the labor market after completing their studies than respondents studying in Serbia (non-EU).

Students with more developed research skills were also better at information management, while self-motivation to work increased their ability to learn, organize and plan, that is, the quality of the knowledge acquired by these students was higher, better interconnected and more applicable in practice.

The Oblimin rotation of the two-factor solution revealed two distinct groups of competencies. The first group of components is nominally related to static competencies and can be defined as an individual's innate cognitive capacity to manage and understand various forms of behavior. The four strongest competencies in this group were Self-motivation to work, Ability to organize and plan, Ability to learn, and the Ability to criticize and self-criticize. The analysis of the answers gives indicative results showing that the respondents **possess strong internal capacities for learning**, which is a key prerequisite for the further development of their knowledge, skills and competencies. In this respect, the existing structure is being upgraded with factors of self-motivation, as well as responsibility, additionally strengthening the students' basic potential for acquiring new knowledge efficiently.

The second group of components is recognized as the equivalent of dynamic competencies, whose capacity depends on the influence of external forces to ensure a high level of their applicability by the individual. Such components can be defined as development-oriented and must be encouraged by factors promoting incremental growth in the individual's overall skillset. This research found that these aspects are the most pronounced in the areas of Oral and written communication in a foreign language, Basic computer skills, Research and inquiry – research skills, Ability to manage information – gather and analyze information from various sources and Creativity/innovation.

By integrating competency research, one of the paper's goals was to reduce the gap between student expectations, delivered education, and labor market demands. Faculties should adapt r their educational profiles –to better meet the y students' aspirations for developing essential competencies, which will enable their effective participation in the workforce. This research is expected to stimulate future studies that will examine the impact of educational programs on the development of the students' competencies and encourage improvements in higher education.

Limitations

This study has several basic limitations. They primarily relate to the number of higher education institutions involved in the research. Although the number of participants in this research met the criteria of relevance, a larger sample size would provide a more comprehensive view of the overall state of higher education in Serbia and Bulgaria. In addition, inclusion in the research of faculties in other regions of both countries would lead to new insights into how education affects the development of student competencies. This would allow for systematizing the effects of educational programs by region, as well as enable a comparative analysis between the regions. As per the development of student competencies, this would enable the integration of private education outcomes at the country level.

Another possible direction of research would be to extend the study to other countries trying to incorporate the competency-based approach at various education levels and highlight differences and good practices that can be useful in the development of education policies.

One aspect not initially addressed in the survey but recognized during the analysis was the type of secondary school the respondents had attended – whether they graduated from a general high school or a vocational school. These data would provide insights into which competencies were more strongly developed by respondents who had graduated from high school and which by those who had attended a vocational school and, if so, which one.

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