Available online at www.ijournalse.org

Emerging Science Journal

(ISSN: 2610-9182)

Vol. 9, Special Issue, 2025

"Emerging Trends, Challenges, and Innovative Practices in Education"

Higher Education Determinants and Graduate Employability: Evidence on Structural and Practical (mis)Match

Arbëresha Qerimi [1], Xhavit Rexhaj [1*], Fidan Qerimi [1], Vrullim Buja [1]

[1] *AAB College, Elez Berisha nr. 65, Pristina 10000, Kosovo.*

Abstract

Objective: The purpose of this research is to measure the impact of higher education factors on the employability of graduates in Kosovo and to measure the degree of mismatch between qualifications and labor market demand. *Methods/Analysis:* The research was conducted through a quantitative method, including a sample of 400 graduates, in the period 2019/20 to 2023/24. Data were collected through a structured electronic questionnaire, and the data were processed through SPSS. The reliability and validity of the instrument were tested through Cronbach's alpha and exploratory factor analysis. Correlation analysis, linear regression, ANOVA, the Tukey HSD test, and mismatch indices were used to present the results. *Findings:* The results show that the connection of study programs with the labor market is the factor with the highest impact on employability, while practical experience during studies has the lowest impact. The mismatch index shows that 63.5% of graduates work outside their field of study, 45.0% are over- or underqualified, and 49.5% have a lack of skills. The total mismatch index is 52.7%. *Novelty/Improvement:* This study provides empirical evidence on education-labor market mismatch, offering a solid basis for higher education reforms and public policies. It quantifies structural and practical mismatches shaping employability outcomes.

Keywords:

Employability;
Higher Education;
Labor Market;
Education;
Labor Market Mismatch.

Article History:

Received:	14	December	2025
Revised:	24	March	2026
Accepted:	06	April	2026
Published:	21	April	2026

1- Introduction

Recent developments in labor markets driven by technologies, globalization, and the increasing demand for complex skills have highlighted the importance of graduate employability, which is viewed as the individual's ability to obtain or maintain employment and sustainable career development by mobilizing competencies, skills, and personal characteristics in the work context [1]. Recent studies reinforce the fact that graduate employability is increasingly determined by the structural quality of the higher education system and not just by individual qualifications. The findings highlight that employment outcomes are dependent on coherence between curriculum design, institutional governance, and labor market signaling, underscoring the need for analytical models that link higher education determinants with labor market outcomes [2].

The match between higher education supply and labor market demands has become the focus of education and employment policies in recent years. Employability goes beyond simple employment rates after graduation, since it implies the capacity to acquire, retain, and advance in employment by mobilizing related technical and social knowledge and skills in an organizational context [1, 3].

Numerous studies related to employability prove that the most useful model is built on three pillars related to the individual skills of the graduate (knowledge, skills, and efficiency); institutional processes (programs integrated with

* **CONTACT**: xhavit.rexhaj@aab-edu.net

DOI: http://dx.doi.org/10.28991/ESJ-2025-SIED1-030

practice, work-integrated learning, and cooperation with industry); and labor market analysis (requirements for specific profiles, professional standards, and transition infrastructure) [4]. From a pedagogical perspective, work-integrated learning is not simply an internship but rather a mechanism for designing programs that link learning to real-world situations, influencing the increase in work readiness and competencies related to collaboration, communication, problem-solving, etc., where the inclusion of qualitative elements in this integrated learning is considered a determinant of higher education measurability in employability [5]. These findings align with recent scholarly evidence emphasizing that the quality and structural embedding of work-integrated learning are central determinants of employability in contemporary higher education systems.

The transfer of theoretical aspects into practice has practical and structural challenges, with graduates frequently displaying a mismatch between the competencies required by the labor market and those provided by higher education institutions. On the other hand, bureaucratic barriers, limited institutional capacities, and informal linkages with industry dilute the impact of interventions in the study program curriculum [6]. While practical matching refers to the consistency between a graduate's skills and the demands of the labor market, structural matching relates to mechanisms, policies, and capacities of institutions that make this consistency possible and, at the same time, sustainable; many studies on higher education serve to support this interface by evaluating employability as a concept dependent on the relationships among higher education institutions, the labor market, and the student [2, 7]. Despite the evolution of employability research, gaps in literature remain evident. Recent studies highlight the growing importance of competency-based pedagogies, institutional processes, and student learning experiences in shaping employment outcomes [8, 9]. However, these studies mainly treat employability as a general outcome and do not clearly operationalize the empirical distinction between practical mismatches related to skills acquisition, work-integrated learning, and structural mismatches related to curriculum design, institutional coordination, and labor market demands.

Despite the extensive research on employability, there continue to be significant gaps in the empirical operationalization of educational mismatch. Recent contributions to the literature have underscored the role of integrative learning frameworks and institutional arrangements in shaping graduate employment outcomes while at the same time identifying differences in how these mechanisms are implemented and measured across higher education systems [10]. Moreover, analyses of graduates' employment trajectories indicate that employment outcomes are more related to structured career paths and institutional conditions and less related to academic performance [11]. This research highlights the need for analytical approaches that clearly distinguish between practical mismatch, related to skills acquisition and work-integrated learning, and structural mismatch, related to program design and coordination of the labor market and education, especially in transition economies.

In Kosovo, the alignment between higher education and the labor market remains a structural challenge that directly affects the efficiency of the education system and the country's economic development. The quality of study programs, the inclusion of professional practices, and the links between universities and industry are key determinants of employability, but the lack of institutional coordination has prevented the creation of a functional mechanism that harmonizes educational offerings with real market demands [12].

These shortcomings have led to the creation of persistent mismatches between academic training and market needs. Recent reports indicate that the level of employability of graduates is low due to the lack of practical, digital, and social skills required by employers, which indicates that curricular content does not reflect structural changes in the economy [13].

In this context, employability in Kosovo does not depend only on the level of academic qualification but also on the ability of the education system to prepare professional profiles adaptable to the labor market. The lack of systematic analysis of the relevance of study programs and the lack of sustainable cooperation between education and the private sector continue to create discrepancies that affect the competitiveness of graduates [14].

On this basis, this research analyzes the level of (mis)match between higher education and the labor market by analyzing the impact of academic and institutional factors on the employability of graduates and measuring the vertical, horizontal, and skills mismatch indices.

2- Literature review

Graduate employability is considered a dynamic, complex, and multidimensional construct that includes subjective and objective elements [15-17], making it a political issue in many developed and developing economies [18]. The development of graduate employability involves many stakeholders, such as students, higher education institutions, employers, employer associations, government, etc., but despite the responsibilities of many stakeholders, the literature shows that the responsibility for employability rests primarily with individual students and then with higher education institutions [19, 20]. Therefore, employment has been treated by some universities as a fourth mission in addition to teaching, research, and community service [21].

The successful transition from education to employment therefore depends on many complex factors, such as subject-specific knowledge; the academic performance of graduates; their soft, transferable or generic skills; the match of the

study program with the demands of the labor market; and the reputation of the university, to name a few. Higher education institutions need to integrate the above factors to produce employable graduates, and this can be achieved only by examining the supply factors that affect the employment of graduates [22].

The issue of educational disparity in many European countries is a phenomenon that has aroused great interest, with authors Kalfa & Piracha (2018) emphasizing that training is important but is considered useless if there is no restructuring of the production system because mismatches would be generated in the labor market as a result of an excess of supply with a high level of education or a deficit of qualified demand [23]. The educational mismatch is explained by imperfect information and information asymmetries in the labor market, where graduates invest more in human capital to prove their skills to potential employers. Employers interpret these educational credentials as indicators of skills, knowledge, and productivity when analyzing the market for potential candidates for job vacancies [24, 25].

Another approach in the literature discusses the professional mismatch that arises from the job search process, with competition theory and assignment theory providing indicators of the importance of the structural mismatch between educational supply and demand in the labor market [25]. An inadequate supply of job vacancies for graduates and filling the fields will yield higher results of vertical and horizontal mismatch regardless of their characteristics and will cause performance hindrances due to inadequate filling of positions, regardless of how long they search for suitable job positions [26].

Educational discrepances undoubtedly have consequences, generating problems regardless of whether they feature horizontal or vertical disparities [27], showing that a mix of the skills required and those acquired in education is important for promoting inclusive growth. Uneducated workers have lower incomes than those who are in equilibrium but are more likely than they would be entitled to according to their education, resulting in a situation that is not conducive to personal change and development [28] and ultimately creating inefficiency at work.

Overtraining has a negative effect on the entire economy; workers whose training would allow them to perform tasks better than they are currently doing can degenerate into frustration and a clear lack of motivation, as well as inefficiency in horizontal and vertical mismatches [29]. This level of higher education may provide them with a higher salary than their colleagues do, but it is lower than the salary they would earn if they were working a job in line with their educational level [29]. According to Schweri et al. (2020), horizontal mismatches are often associated with lower wage levels, and this negative effect intensifies the degree of training that an individual has received [30]. Conversely, Humburg et al. (2017) argued that more specialized education can increase the fit between the individual and the job position, positively influencing professional adjustment [31].

There is also a wide debate in the literature on the relationship between overeducation and job satisfaction. Several studies suggest that there is a negative relationship between these two variables, showing that overeducated employees report lower levels of satisfaction [32]. However, other research fails to prove that individuals with qualifications higher than the requirements of the job necessarily feel lower satisfaction than those employed in positions appropriate to their educational level. This state of professional imbalance can lead to frustration and a lack of motivation, which often degenerate into depressive symptoms and a decrease in individual productivity, ultimately affecting the overall efficiency of the economic system. In this context, McGowan & Andrews (2017) emphasize that the combination of high qualifications with skill mismatch negatively affects labor productivity, although the way in which this impact occurs varies depending on the nature and type of mismatch [27].

2-1- Local Context

One of the most profound structural challenges in Kosovo is the mismatch between higher education and labor market demands. After 2008, Kosovo witnessed a proliferation of higher education institutions, without a detailed analysis of the real needs of the labor market and without functional skills forecasting mechanisms. As a result, this expansion of educational supply was not proportionally matched by the demand for qualified workers, creating a mismatch between graduates and employees [12].

In recent years, three types of mismatches between higher education and the labor market have been identified in Kosovo. Vertical mismatch is the case when the educational level is not in line with the level required by the job position, a phenomenon where many graduates work in professions with lower qualification requirements or are unemployed for long periods of time. This situation indicates that there is an overproduction of academic staff in certain fields and that a lack of demand for professions in technical or scientific fields is evident [12].

Another form of mismatch in Kosovo is horizontal, where the graduate's field of study is not in line with the workplace. A survey by the GAP Institute (2017) reported that more than half of graduates, 54%, work in jobs that do not match their field of study, highlighting a lack of coherence between the content of study programs and the structure of the workforce. On the other hand, the mismatch of skills directly impacts the competitiveness of graduates. Employers report a lack of practical skills, digital and soft skills, and effective communication and problem-solving skills among graduates [13]. This level of mismatch is a result of the technical orientation in teaching and the lack of practices, making the transition from higher education to the labor market difficult.

These discrepancies are related to the imbalance between educational supply and labor market demand, where higher education continues to be dominated by programmes such as economics, law, and social sciences, whereas the labor market actually needs fields such as engineering and technology [33].

Another important aspect influencing the mismatch between higher education provision and market needs is the lack of clear and high-quality demand on the part of industry, which is due partially to the overall low level of development of the labor market. The situation in Kosovo indicates the phenomenon of low-skill equilibrium [34], whereby industry is in search of low-skilled labor, which in turn leaves high-level skills provided by universities in low demand. A notable exception in this regard could be the rising high-tech sector in Kosovo, which is owned mainly by young entrepreneurs and employs young people skilled in using new technologies [35].

3- Research Methodology

This research was conducted through a quantitative empirical approach to analyze the relationship between higher education and the labor market in Kosovo, with reference to the key determinants that affect employability. The research population includes graduates in Kosovo from 2019/2020 to 2023/2024 at all levels of higher education and all types of institutions, according to the Table 1.

Table 1. Research population

Type of university	19/20	20/21	21/22	22/23	23/24	Total
University of Prishtina	6 581	5 152	5 112	4 632	4 286	25 763
Bachelor	4 777	3 870	3 838	3 543	3 081	
Master	1 804	1 238	1 274	1 057	1 175	
PhD		44		32	30	
Regional public universities	3 047	2 400	2 740	2 293	1 726	12 206
Bachelor	2 573	1 981	2 355	1 961	1 438	
Master	474	419	385	332	288	
Private universities	1 726	6 094	5 257	7 665	6 070	26 812
Bachelor	1 520	5 285	4 804	6 881	5 208	
Master	206	809	453	784	862	

Given the large number of graduate students, this study ensures balanced representation of the sample through the Slovin formula to have statistical accuracy. The sample calculation was performed according to the following equation:

$$n = \frac{64{,}781}{1+64{,}781(0.05)^2} = \frac{64{,}781}{1+161.9525} \approx 398.5 \quad (1)$$

On the basis of the above calculations, the sample included 400 respondents, which provides a level of reliability in line with international standards and for social and economic studies. The sample was distributed proportionally according to the size of each institutional group through stratified proportional sampling, which included 159 (39.8%) respondents from the University of Prishtina (UP), 75 (18.8%) respondents from regional public universities (RPUs) and 166 (41.5%) respondents from private colleges (PCs). To ensure proportional representation by field of study, fields with a greater number of graduates, such as medical and health sciences, social sciences and humanities, and economic sciences, have a greater representation in the sample. Since the statistical analyses are based on the effective sample, the expectations are that some of the questionnaires will be incomplete or invalid; therefore, the data collection process has been planned by applying the oversampling strategy. The sample size was determined via the following equation:

$$Gross\ smaple = \frac{n}{1-r} = \frac{400}{1-0.20} = 500 \quad (2)$$

Therefore, in accordance with this planning, 500 questionnaires were distributed, but in the final data analysis, only the questionnaires completed in full were included, maintaining the distribution scheme by field, where they constitute the net sample of respondents. The questionnaires that were excluded from the analysis were questionnaires with missing responses on key research variables, incomplete responses on measurement scales, and logical inconsistencies between responses.

The study instrument was structured in five sections: demographic and academic data, indicators of discrepancies, skills acquired during studies, practical work experience during studies and the connection of the study program with the labor market. A Likert scale was used to measure perceptions, where 1 is strongly disagree and 5 is strongly agree. Practical mismatch is operationalized through indicators such as skill matching and work-related experience, including

skills mismatch and the relevance of practical training to job requirements. Structural mismatch is operationalized through indicators that reflect program- and institution-level alignment with labor market requirements, including vertical, horizontal, and skills mismatch. Employability was conceptualized as a latent construct operationalized using structured self-reported indicators. To avoid potential subjectivity and bias, the questionnaire was administered anonymously, where the reliability of the measurement and the validity of the construct were demonstrated via internal consistency of the instrument and exploratory factor analysis.

To measure the reliability of the instrument, the Cronbach's alpha coefficient was used, where the coefficient $\alpha = 0.816$, indicating that the instrument has internal consistency. The validity of the model was tested through exploratory factor analysis (EFA), where the KMO values = .768, and Barlett's ($p<0.01$), where a unified dimensional structure with strong factor loadings was extracted.

Figure 1 shows the phases of the research:

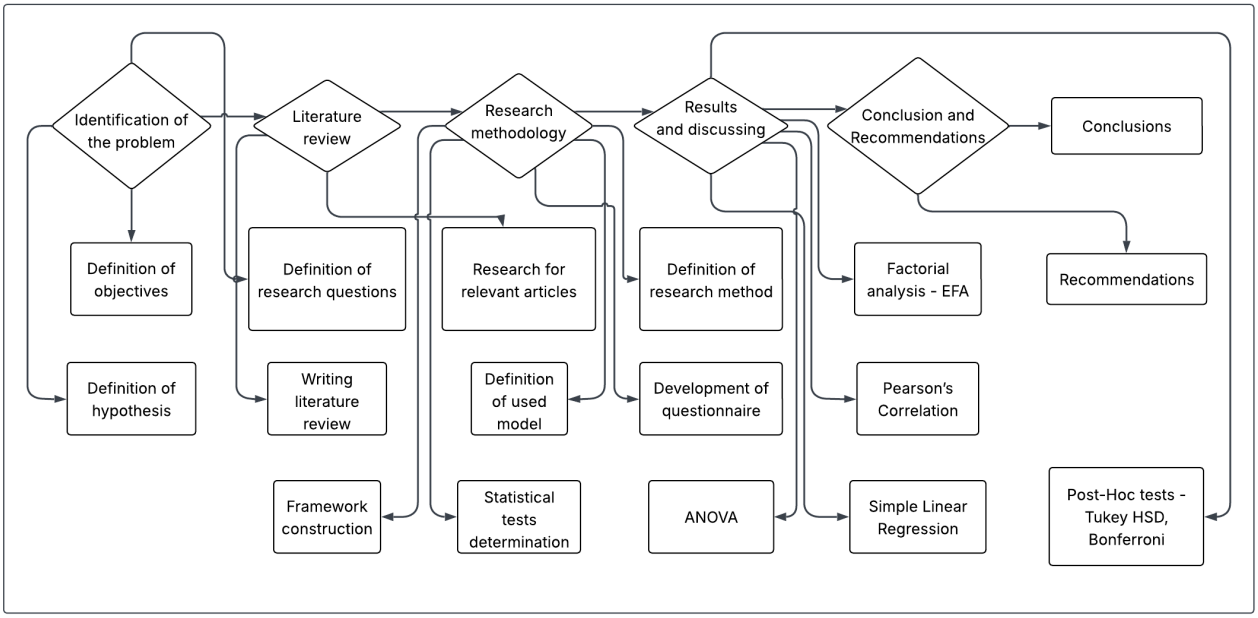

Figure 1. The flowchart of the research

This paper has two objectives:

OB1: To analyze the impact of a set of higher education determinants on the employability of young people in Kosovo.

OB2: To assess the degree of mismatch between academic qualifications and labor market demands.

The relationship between variables can be described according to the framework on Figure 2:

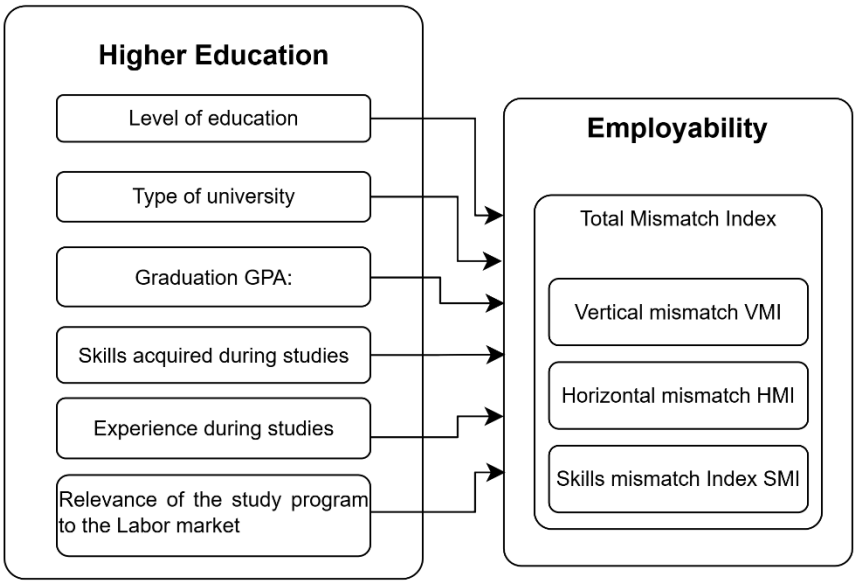

Figure 2. Framework of the research

The data were collected during the period March–June 2025 by distributing the electronic questionnaire through the alumni offices at the respective universities. The data were analyzed through SPSS software by conducting various statistical tests.

The suitability of the data for factor analysis was measured via the following formula. This formula is used to calculate the Kaiser–Meyer–Olkin (KMO) sampling adequacy measure coefficient, which indicates how well the variables are related to each other to justify the application of factor analysis [36]:

$$\mathrm{KMO} = \frac{\sum\sum r_{ij}^2}{\sum\sum r_{ij}^2 + \sum\sum q_{ij}^2} \quad (3)$$

where, r_{ij}= correlation between variables i and j; q_{ij}= partial correlation between variables i and j.

Principal component analysis is used in factor analysis to determine the percentage of variance explained by each component relative to the total variance of the data [37]:

$$\text{Explained Variance} = \frac{\lambda_i}{\sum\lambda_i} \times 100 \quad (4)$$

where, λ_i= eigenvalue of the component; $\sum\lambda_i$= sum of the eigenvalues for all the components.

The correlation coefficient is used to measure the strength and direction of the linear relationship between two quantitative variables. This calculation is performed via the following formula [38]:

$$r = \frac{\sum(x_i - \dot{x})(y_i - \dot{y})}{\sqrt{\sum(x_i - \dot{x})^2 \sum(y_i - \dot{y})^2}} \quad (5)$$

where, x_i, y_i= variable values X and Y; $\dot{x}, \dot{y}$= their averages.

The following formula is used in the simple linear regression model, which predicts the value of a dependent variable on the basis of an independent variable. Therefore, through this model, we estimate the linear relationship between two variables and measure the influence that the independent variable has on the dependent variable [39]:

$$Y = \beta_0 + \beta_1 X + \varepsilon \quad (6)$$

where, Y= dependent variable; X= independent variable; β_0=intercept; β_1= regression coefficient; ε= error term.

The Tukey HSD test was used after a significant effect was identified in the ANOVA. This test indicates which groups have significant differences between them, a test that allows for pairwise comparisons of group means while maintaining the overall level of reliability [40]:

$$\mathrm{HSD} = q \times \sqrt{\frac{MS_{within}}{n}} \quad (7)$$

where, q= critical value from the Tukey table; MS_{within}= average variance within groups; n= sample size in each group.

The following formula was used to calculate the horizontal skill mismatch-HSM, which measures the percentage of graduates who work outside their field of study in relation to the total number of graduates who are employed. When the HSM value is high, it indicates a significant horizontal mismatch where the education system does not adequately prepare profiles that are in line with the demands of the labor market. In contrast, a low HSM value is an indicator of good coherence between the field of study and the profession [41]:

$$\mathrm{HSM} = \frac{N_{out\_of\_field}}{N_{total}} \times 100 \quad (8)$$

where, $N_{out\_of\_field}$= number of graduates working outside their study field; N_{total}= total number of employed graduates.

The following formula is used to measure the vertical mismatch index, which measures the percentage of graduates employed in jobs that match their educational level. Through this indicator, we can determine whether employees are overqualified or underqualified for the jobs they perform. When the VMI is high, we understand that employees are not in jobs that match their education, indicating inefficiency between educational supply and labor market demands, whereas a low VMI is an indicator of an efficient labor market where the educational level matches job demands [42]:

$$VMI = \frac{N_{overqualified} + N_{underqualified}}{N_{total}} \times 100 \quad (9)$$

where, $N_{overqualified}$= graduates whose education level exceeds job requirements; $N_{underqualified}$= graduates whose education level is below job requirements.

To measure the skill mismatch index, it was calculated via the following formula, which measures the percentage of employees who do not possess the skills necessary to perform their job effectively [43]:

$$SMI = \frac{N_{skills\_gap}}{N_{total}} \times 100 \quad (10)$$

where, N_{skills_gap}= number of graduates reporting insufficient skills or training needs; N_{total}= total number of employed graduates.

The overall mismatch index (OMI) is measured through the following formula, representing a common indicator of the mismatch between education and the labor market. The OMI integrates three mismatches: horizontal (HSM), vertical (VMI) and skills (SMI), which provides an overall picture of the level of mismatch between the educational preparation of graduates and the real demands of the labor market [44]:

$$\text{TMI} = \frac{\text{HSM}+\text{VMI}+\text{SMI}}{3} \quad (11)$$

4- Results and Discussion

Among the 400 graduates who were part of the research, 49.5% were female and 50.5% male, indicating an almost proportional gender distribution. This distribution eliminates the possibility of gender bias in terms of perceptions of employability and mismatch. Among these respondents, 55% were graduates at the bachelor's degree level, 36.8% at the master's degree level and 8.3% at the PhD level. This distribution is consistent with the structure of higher education in Kosovo, where most graduates are at the bachelor's degree level. With respect to the distribution of graduates in terms of type of institution, 39.8% graduated from the University of Prishtina, 18.8% graduated from Regional Public Universities (Mitrovica, Peja, Prizren, Ferizaj, Gjilan and Gjakova), and 41.5% from private higher education institutions. This balanced distribution between public and private universities is an indicator of the increase in the number of students in private higher education institutions during the last decade. The results of academic performance (GPA) reveal a high concentration of graduates with a tendency toward lower performance. With respect to the field of study, the most represented fields are medicine, social sciences, economics and law, whereas the least represented fields are agriculture, environmental sciences, sports and recreation.

According to the results of the study, the private sector is identified as the employer with the highest percentage of graduates, an indicator of the pronounced tendency toward employment in the private sector and less in the public sector, whereas online employment is identified as a new growing category.

Table 2. Demographic data

	Variable segmentation	N	%
Gender	Female	198	49.5
	Male	202	50.5
Level of education	Bachelor	220	55
	Master	147	36.8
	PhD	33	8.3
Type of university	Public - University of Pristina	159	39.8
	RPU	75	18.8
	Private	166	41.5
GPA	6.00 - 6.99	136	34
	7.00 - 7.99	112	28
	8.00 - 8.99	92	23
	9.00 - 10.00	60	15
Field of study	Sport and recreation	13	3.3
	Computer Science and Information Technology	37	9.3
	Engineering and Architecture	19	4.8
	Economic Science and Business	51	12.8
	Social and Human Sciences	63	15.8
	Medicine and Health Sciences	106	26.5
	Legal Sciences	42	10.5
	Education and Teaching	30	7.5
	Arts and Design	27	6.8
	Agriculture and Environmental Sciences	12	3
Employer	Public Institution	111	27.8
	Private Enterprise	154	38.5
	Non-Governmental Organization	43	10.8
	International Organization	39	9.8
	Online Employment	53	13.3

Figure 3 presents the perceptions of graduates regarding the dimensions addressed, such as employability, motivation, program relevance to the labor market, work experience during studies, and skills acquired during studies. The results show mainly positive trends but with differences across dimensions, revealing the pedagogical and structural challenges of higher education in Kosovo. Perceptions about employability are mainly positive, but a significant portion declare uncertainty about employment opportunities or their ability to compete in the market. This shows that even though higher education contributes to academic preparation, the dynamics of labor market change are increasingly rapid, creating a mismatch between the diploma and labor market requirements. Motivation, as a mediating variable in the relationship between higher education and employability, constitutes a psychological factor with a significant impact on the way individuals acquire knowledge, develop professional skills, and use these capacities in the labor market. In the context of this research, motivation is not treated as a direct determinant of higher education or employability but as a mediating variable that influences the strength and direction of the relationship between higher education benefits and employment outcomes.

The results show a positive trend toward intrinsic motivation, where graduates perceive professional development as a continuous process, self-improvement and not simply as a continuation of studies. In the case of Kosovo, where the connection between studies and employment is not always direct, motivation fills the institutional gap by acting as an individual impetus to achieve professional achievements.

Regarding the connection between study programs and the labor market, this component is perceived as partial, where despite some declaring the relevance between the compatibility of the study program with the demands of the labor market, some remain skeptical, indicating structural gaps in the way higher education cooperates with the labor market.

One of the most sensitive aspects of the education system is work experience during studies, where a significant number of graduates do not follow professional practices, whereas the rest declare experiences that are not related to the field of study. This situation affects the connection between higher education and employment, which explains the fact that many graduates face difficulties in finding a job or in adapting to a professional environment's demands. Although the perception of the skills acquired during studies is mainly positive, it is not complete, since graduates show confidence in the benefits of higher education in the development of basic skills but also point to gaps in practical and technical skills, which are required by the labor market. This result is indicative of the fact that study programs are more oriented toward building theoretical and basic skills and less toward applicable skills and competencies.

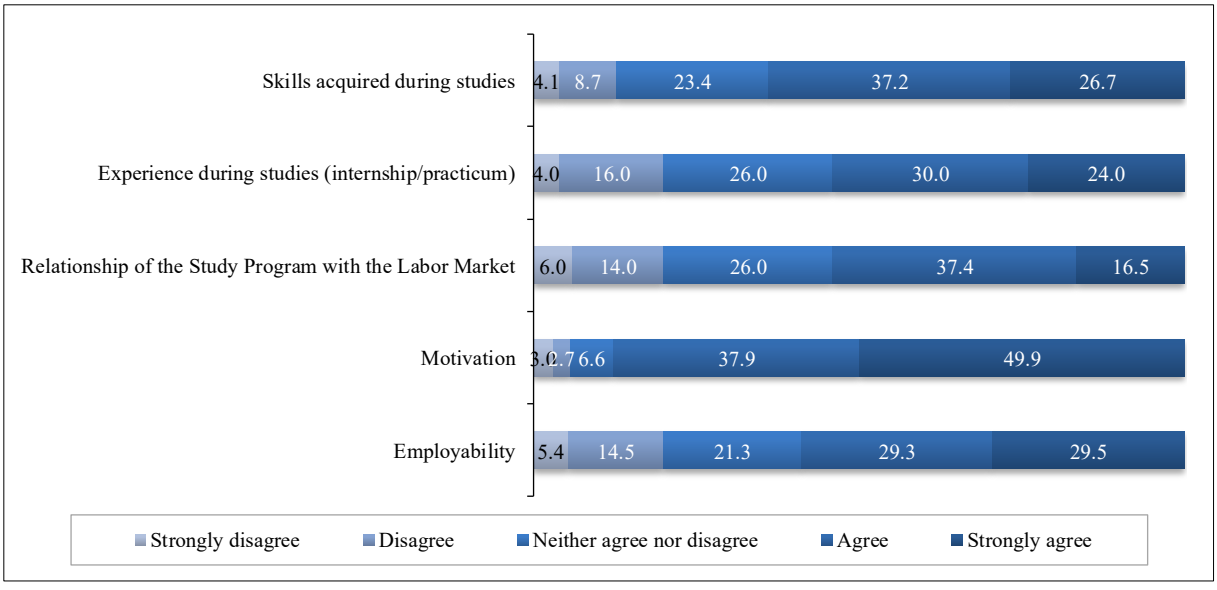

Figure 3. The perceptions of graduates regarding the dimensions addressed

Table 3 presents the results regarding the mismatch between the education obtained and the labor market demand, which highlights deep structural challenges that hinder the integration of graduates into the labor market. Most graduates emphasize that their work is not related to the field of study, indicating a high level of horizontal mismatch. This result proves that the knowledge and skills acquired during the study are not being used in the workplace, reflecting a mismatch between academic programs and labor market requirements.

Many graduates emphasized that they would have had more employment opportunities had they attended other study programs, whereas others were employed in jobs that require a lower level of qualification than their own. A very small number of participants declared that they were underqualified in the workplace. This indicates that labor market needs are not in harmony with the structure of qualifications produced by higher education.

With respect to training to fill the skills gap, half of the graduates stated that they were trained by the employer, and the rest either did not receive any training support or declared a desire to attend training but were not offered the opportunity. In the context of professional practices, most graduates stated that these practices would be a supporting element to facilitate entry into the labor market, an important result that highlights the need to modify curricula to include more practice and cooperation with the industry.

Table 3. The results regarding the mismatch between the education obtained and the labor market demand

Question	Answer	Frequency	Percent
Is your current job related to your field of study?	Yes	146	36.5
	No	254	63.5
Do you think that if you had a different degree, you would have more job opportunities?	Yes	215	53.8
	No	185	46.3
What level of education does your current job require?	Less than a bachelor's degree	30	7.5
	Bachelor	207	51.8
	Master	103	25.8
	PhD	60	15.0
Do you think that your educational qualification is:	Higher than required for this job	156	39.0
	In line with the job requirements	220	55.0
	Lower than required for this job	24	6.0
Has your level of education affected your salary?	Yes, but I receive a lower salary than expected for my level of education	98	24.5
	No, the level of education has had no impact on my salary	230	57.5
	Yes, it has helped me to have a higher salary	72	18.0
Did you receive training from your employer to cover the skills gap?	Yes	202	50.5
	No, there was no willingness to provide support	60	15.0
	No, but I would like to receive training	138	34.5
Do you think that you would have benefited more from professional practice during your studies?	Yes, they would have helped me to get employed faster	291	72.8
	No, I do not think they would make a difference	109	27.3

Before mismatch indices were determined, several factor analyses were implemented to determine the reliability of the instruments and data obtained. The following analyses in Table 4 present the results of the factorial analysis, where the KMO and Bartlett's tests prove the suitability of the data for the implementation of the exploratory factorial analysis. The results of KMO = 0.768 are evidence of the adequacy of the sample where the instrument questions sufficiently share common variance for the formation of latent factors representative of the theoretical dimensions of the research, such as skills acquired during studies, work experience, relationship of the study program with the labor market, motivation, and employability. The results of Bartlett's test of sphericity ($\chi^2 = 750.941$; df = 10; Sig. = 0.000) also show a statistically significant result, where it has been proven that the correlations between the variables are sufficient to prove the use of factorial analysis.

Table 4. KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser–Meyer–Olkin Measure of Sampling Adequacy.		0.768
Bartlett's Test of Sphericity	Approx. Chi-Square	750.941
	Df	10
	Sig.	0.000

The results presented in Table 5, in the Communalities and Component Matrix table, are evidence of a clear dimensional structure, proving that all variables included in the model have a consistent impact on the formation of a common latent factor. The variable relationship of the study program with the labor market presents the highest factor loading (0.849) and the strongest communality (0.722), indicating that this dimension is more integrated in the overall factor structure and has a central role in representing the latent construction that includes employability. Other variables, such as skills acquired during studies (0.813), work experience during studies (0.723), motivation (0.724), and employability (0.720), also resulted in high loadings, indicating good conceptual convergence. These results demonstrate conceptual validity and statistical consistency, indicating that the selected independent variables reliably measure a single latent construct representing the preparation and employability of graduates.

Table 5. Communalities and Component Matrix

Communalities		
	Initial	Extraction
Skills acquired during studies	1.000	0.661
Work experience during studies	1.000	0.523
Relationship of the Study Program with the Labor market	1.000	0.722
Motivation	1.000	0.525
Employability	1.000	0.518

Extraction Method: Principal Component Analysis.

Component Matrix[a]	
	1
Skills acquired during studies	0.813
Work experience during studies	0.723
Relationship of the Study Program with the Labor market	0.849
Motivation	0.724
Employability	0.720

Extraction Method: Principal Component Analysis.

The results shown in Table 6 of the total variance explained analysis clearly reveal a unidimensional structure in the empirical data, confirming the factorial validity and conceptual coherence of the variables and excluding the need for factor rotation. An explained variance of 58.97% indicates a stable and well-centred factorial structure, providing statistically reliable evidence and a solid empirical basis for the interpretation of subsequent inferential analyses.

Exploratory factor analysis and high Cronbach's alpha values support the internal consistency and conceptual validity of the variables included in the model. The factor structure demonstrates that the determinants of higher education emerge as empirically distinct and theoretically coherent dimensions. These dimensions reflect complementary mechanisms through which higher education influences employability. The factor structure strengthens the analytical framework through the validated selection of determinants of higher education and their role in explaining employment as a dependent outcome.

Table 6. Total variance explained analysis

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.948	58.968	58.968	2.948	58.968	58.968
2	0.786	15.723	74.691			
3	0.564	11.278	85.969			
4	0.440	8.794	94.763			
5	0.262	5.237	100.000			

Extraction Method: Principal Component Analysis.

The results of the correlation analysis presented in Table 7 demonstrate positive and statistically significant relationships between all the independent and dependent variables, where each dimension of the model contributes to increasing employability but with different degrees of impact. A strong correlation ($r=.667$; $p<.000$) was identified between the relationship of the study program with the labor market (RSPL) and employability (E), which shows that the greater the compatibility of study programs with the labor market is, the greater the level of employability of graduates. A moderate relationship ($r=.422$; $p<.000$) was found between the skills acquired during studies (SDS) and employability (E), where the development of technical, analytical and interpersonal skills during studies increases the employability of graduates, confirming the importance of education that combines theoretical knowledge with practical competencies. Motivation also had a moderate relationship with employability ($r=.367$; $p<0.05$), which indicates that personal motivation, self-confidence, and commitment affect the improvement of employment opportunities, but the impact is smaller than that of other factors.

Among all the variables, work experience during studies (EDS) showed a weak positive relationship with employability ($r=.315$; $p<0.05$). For practical work experience during studies to have a meaningful impact on employability, it is necessary to establish mechanisms and processes between higher education and industry that will allow its high-quality implementation to have a long-term impact on the development of student skills and competencies.

Table 7. Correlation analysis

	SDS	EDS	RSPL	M	E
SDS	1	0.507**	0.603**	0.555**	0.422**
EDS	0.507**	1	0.515**	0.458**	0.315**
RSPL	0.603**	0.515**	1	0.430**	0.667**
M	0.555**	0.458**	0.430**	1	0.367**
E	0.422**	0.315**	0.667**	0.367**	1

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

Note: SDS = skills acquired during studies; EDS = experience during studies; RSPL = relationship of the study program with the labor market; M = motivation; E = employability.

Before performing linear regression, the conditions that prove the reliability of the model were tested. According to the Kolmogorov–Smirnov and Shapiro–Wilk normality tests, the data showed a normal distribution (Sig>0.05), and the linearity between the independent and dependent variables was also tested, where the relationship was positive and linear, fulfilling the basic conditions for performing regression. The multicollinearity test results of VIF<5 and tolerance> 0.2 also show a lack of overlap between the independent variables, ensuring that all factors contribute independently to the model. Autocorrelation was also tested, where the Durbin Watson values for all variables were in the range of 2.108--2.259, a result that confirms that the residuals are independent and randomly distributed.

Referring to the Table 8, the RSPL variable, which is the relationship of the study program to the labor market, has the greatest impact ($\beta = 0.398$; $R = 0.667$; $R^2 = 0.445$; $t = 17.871$; $p < 0.001$), where 44.5% of the variance in employability is explained by the relationship between the study program and the labor market. This result shows that the relevance of study programs and the cooperation of higher education with industry are the main determinants of professional training and more seamless employability.

Next, the SDS variable, which is the skill acquired during studies, had a moderate impact ($\beta = 0.270$; $R = 0.422$; $R^2 = 0.178$; $t = 9.277$; $p < 0.001$), explaining 17.8% of the variance in employability. This result indicates that the technical and soft competencies developed during studies affect graduates' ability to enter the labor market. The motivation variable (M) also has a moderate effect on employability ($\beta = 0.236$; $R = 0.367$; $R^2 = 0.135$; $t = 7.865$; $p < 0.001$), explaining 13.5% of the variance in employability.

The variable with the smallest impact in the model is work experience during studies (EDS) ($\beta = 0.172$; $R = 0.315$; $R^2 = 0.099$; $t = 6.621$), where only 9.9% of the variance in employability is explained by EDS. Practical work experience during studies likely does not affect preparation for the labor market, possibly because of the lack of well-developed and structured professional practices and sustainable partnerships between higher education institutions and industry. These data point to a possible superficial approach by most HEIs and industry toward work-based learning experiences only to meet the Kosovo Accreditation Agency standards and monitoring procedures.

Table 8. Regression results

Variables	β	R	R Square	Adjusted R Square	t	Sig.	Std. error	Durbin Watson
SDS	0.270	0.422	0.178	0.176	9.277	0.000	0.029	2.231
EDS	0.172	0.315	0.099	0.097	6.621	0.000	0.026	2.259
RSPL	0.398	0.667	0.445	0.444	17.871	0.000	0.022	2.108
M	0.236	0.367	0.135	0.132	7.865	0.000	0.030	2.150

Note: SDS = skills acquired during studies; EDS = experience during studies; RSPL = relationship of the study program with the labor market; M = motivation.

The results in Table 9 of the analysis of variance show statistically significant differences in employability depending on the type of university and the academic performance GPA of the graduates. The result $F(2,397) = 6.377$; $p = 0.002$ shows that there is a statistically significant difference in employability between graduates from public institutions and those from private institutions. With respect to academic performance, the results $F(3,396) = 9.688$; $p < 0.001$ show a statistically significant difference in the level of employability according to the average grade of the graduates. According to this result, students who have a higher average grade perceive themselves as having greater potential to enter the labor market, which is compatible with their professional profile.

The results of the ANOVA prove that employability is affected by the institutional characteristics of higher education institutions, as well as by the individual performance of graduates. These findings indicate that sustainable preparation for the labor market requires a combination of individual and institutional qualities, where higher education institutions must offer up-to-date and practically oriented study programmes, whereas students must demonstrate academic commitment and high levels of achievement.

For the results of the correlation between education level and employability, the ANOVA results revealed a nonsignificant correlation, with p>0.05.

Table 9. Variance analysis

		Sum of Squares	df	Mean Square	F	Sig.
Type of university	Between Groups	3.144	2	1.572	6.377	0.002
	Within Groups	97.853	397	0.246		
	Total	100.997	399	t		
GPA	Between Groups	6.906	3	2.302	9.688	0.000
	Within Groups	94.091	396	0.238		
	Total	100.997	399			

The post hoc Tukey HSD test was used to identify which groups differed between them and to assess the validity of the observed effects, the results of which are shown in Table 10. The results show a statistically significant difference (Sig. = 0.01 and 0.04 < 0.05), where the differences in employability between public and private institutions are not random. The average number of graduates from private institutions is M=3.68, and that from public institutions is M=3.45--3.54, indicating that graduates from the private sector of higher education are better positioned in the labor market than graduates from the public sector of higher education are. This finding shows that the institutional characteristics of higher education have a strong impact on employability.

With respect to academic performance (GPA), the results of the Tukey HSD test (Sig. = 0.12; 0.85; 1.00 > 0.05) reveal that, in terms of the perception of employability, which is dependent on academic performance, no statistically significant differences are identified. Although the trend of the averages shows a slight increase in employability with increasing academic performance, this difference is not statistically significant. According to the results, the employability of graduates is more influenced by institutional factors than by academic performance, highlighting the importance of structure, practical orientation and interinstitutional collaboration in effectively preparing graduates for the labor market.

Table 10. Post hoc Tukey HSD test

Type of university		N	Subset for alpha = 0.05	
			1	2
Tukey HSD [a,b]	RPU	75	3.45	-
	Public – UP	159	3.54	3.54
	Private	166	-	3.68
	Sig.		0.01	0.04

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 116.974.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

GPA		N	Subset for alpha = 0.05		
			1	2	3
Tukey HSD [a,b]	9.00 - 10.00	60	3.37	-	-
	6.00 - 6.99	136	3.53	3.53	-
	7.00 - 7.99	112	-	3.59	-
	8.00 - 8.99	92	-	-	3.79
	Sig.		0.12	0.85	1.00

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 91.287.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

4-1- Measurement of the Mismatch Index

On the basis of the results obtained from the graduates' perceptions regarding their studies and alignment with labor market requirements, the discrepancies between variables were calculated to determine mismatch indices that would serve for comparison of these indicators both nationally and internationally. Four indices were used to measure the degree of mismatch between education and the labor market, namely, horizontal mismatch (HSM), vertical mismatch (VMI), skill mismatch (SMI), and the overall mismatch index (OMI).

Horizontal Mismatch: is an index that measures the degree to which graduates work outside their field of study. According to the results, 146 graduates declared that their work was related to their field of study, and 254 graduates declared that their work was not related to their field of study.

The following equation measures the level of horizontal mismatch, where according to the results, 63.5% of graduates work outside their field of study. This high level of mismatch indicates that study programs are not oriented toward meeting the real needs of the labor market, making it necessary to review study programs and strengthen the links between higher education and the labor market.

$$\mathrm{HSM} = \frac{\mathrm{N_{out}}}{\mathrm{N_{total}}} \times 100 = \frac{254}{400} \times 100 = 63.5\% \quad (12)$$

Vertical Mismatch: an index that measures the degree to which graduates are overqualified or underqualified for the job they are doing. According to the results, 156 graduates declared that their qualifications were higher than the job requires, 220 were in line with the job, and 24 had lower qualifications than the job requires. The overall mismatch consists of 39% overqualification and 6% underqualification, with the remaining 55% showing levelled qualification with the demands of the workplace. The vertical mismatch index, according to the equation below, shows that 45% of graduates are overqualified or underqualified for their job and that only 55% have a match between their qualifications and the job. This vertical mismatch result is indicative of a lack of balance between academic supply and labor market demand, a common result in labor markets that are in transition where professional structures do not follow the pace of labor market development.

$$\mathrm{VMI} = \frac{\mathrm{N_{over}+N_{under}}}{\mathrm{N_{total}}} \times 100 = \frac{156+24}{400} \times 100 = 45.0\% \quad (13)$$

Skills Mismatch Index: an index that measures the percentage of graduates who declare a lack of skills in their work or the need for additional training. According to the results, 198 graduates declared that they lacked skills because of the lack of training provision. Accordingly, 49.5% of graduates stated a lack of skills and needed additional training to meet the requirements of the workplace. This result indicates that almost half of the graduates did not feel prepared in professional terms, reflecting gaps in practical and technical skills that were not acquired during their studies.

$$\text{SMI} = \frac{N_{\text{skill\_gap}}}{N_{\text{total}}} \times 100 = \frac{60+138}{400} \times 100 = 49.5\% \quad (14)$$

Overall Mismatch Index: The above indices, which are also calculated via the equation below, show that 52.7% of graduates face an overall mismatch between their academic qualifications and their jobs, a high level of mismatch confirming the systematic gap between higher education provision and labor market demands. These results indicate that higher education in Kosovo still does not provide sufficient skills and competencies for quality and sustainable employment.

$$\text{OMI} = \frac{\text{HSM}+\text{VMI}+\text{SMI}}{3} = \frac{63.5+45.0+49.5}{3} = 52.7\% \quad (15)$$

5- Discussion

The mismatch between higher education and the labor market is considered a universal phenomenon that affects both developed and developing economies. According to the results of this research, there is a high degree of functional and structural mismatch, where according to the findings, 63.5% of graduates work outside the field of study, 45% of them are under- or overqualified, and 49.5% lack skills or need additional training. Based on the calculated results of horizontal, vertical and skills mismatch, the average overall mismatch index is 52.7%, positioning Kosovo at a comparable level or higher than some OECD and EU countries.

Montt (2017) reported that the level of horizontal mismatch in some countries, such as South Korea, Italy, and the UK, reaches up to 50%, whereas countries such as Germany, Finland and Austria have mismatches of less than 30% [45]. These findings demonstrate that even economies with advanced education systems do not achieve full alignment between the supply of higher education and the demands of the labor market. In relation to these findings, Kosovo is positioned with a higher level of mismatch, surpassing countries that have structural challenges such as Italy or the UK. This situation in Kosovo shows that the problem of mismatch stems not only from the overall level of economic development but also from the weaknesses of the system in terms of the connection and alignment between higher education and the labor market.

Another author who addresses these issues is Morgado et al. (2016), who emphasize that, in 2008, there was a large variation between European countries in terms of vertical mismatch [46]. Countries that have integrated vocational training systems, such as Denmark, Slovakia and Portugal, have shown lower levels of vertical mismatch, whereas the UK, Italy, Switzerland, Romania and Estonia have shown high levels. A comparison of these findings with the findings of Kosovo by the GAP Institute (2020) revealed that the percentage of over- and under qualifying countries is 21.2%, placing Kosovo on par with other countries in southern and eastern Europe [14]. However, our study shows that the over- and underqualification of graduates is 45%, with a horizontal mismatch of 63.5%, which exceeds even the scores reported by transition economies. In 2020, the GAP Institute identified a vertical mismatch of 42.2% of total employment for Kosovo, where overqualification dominates in the elementary and service professions. Similarly, the horizontal mismatch resulted in 54% [14], a somewhat closer match with the still higher (63.5%) results of this study. This difference in results is explained by the fact that the focus of this research was on higher education graduates, focusing on a single education subsector where the mismatch between the offer of higher education and the demands of the labor market is more prominent owing to the very nature of higher education and its proximity to the labor market, whereas the GAP Institute focused on all levels of education and employment. In addition, the results of the GAP Institute (2020) refer to data from an earlier period, whereas this study analyses current labor market trends and university provisions.

If we compare Kosovo with Spain, according to Felgueroso et al. (2023), Spain accounts for approximately 25--35% of the employed with higher education [47], whereas Kosovo presents a higher percentage of the mismatch exceeding the European average and shows that this problem is directly related to the offer of higher education and the lack of mechanisms to anticipate market needs and trends.

6- Conclusion

According to the results of the research in Kosovo, the employability of graduates is influenced by interrelated academic, institutional and individual factors, where the most prominent influence is the interface of the study programs with the labor market and the practical orientation of higher education provision. Statistical analyses confirmed that there is only a partial match between higher education and the labor market, reflecting structural challenges in the functioning of the education system and its adaptability to real market demands.

The findings showed that the alignment of programs with the labor market represents the most prominent factor in employability, since graduates who have followed programs oriented toward practice and close cooperation with the labor market display a higher level of professional aptitude. The skills acquired during studies and personal motivation are important complementary factors, whereas practical work experience during studies has the lowest impact on employability, making it necessary to build higher-quality and more consolidated professional practices and training aligned with labor market absorption capacity, needs and trends.

In the context of the institutional aspect, graduates from private universities have higher levels of employability than do those from public universities do, indicating that institutional characteristics of higher education, such as the organization of studies, the practical orientation of programs, and links with industry, have an impact on employment. Despite this, academic performance did not result in a significant effect on employability, indicating that a high average grade is not a guarantee of easier integration into the labor market since employers' value practical skills, professional flexibility and experience more than theoretical results do.

The most important finding of this research is related to the measurement of the degree of mismatch between higher education and the labor market, where 63.5% of graduates work outside their field of study, 45% are over- or underqualified for the positions they have, and 49.5% of them lack skills or need additional training to meet job requirements.

These results served to determine the overall mismatch index, where 52.7% of graduates in Kosovo faced some form of functional or structural mismatch. This high level of mismatch is indicative of the fact that the transition from higher education to the labor market is a deep systemic challenge, as higher education in Kosovo is failing to produce the profile of competencies that the labor market requires.

6-1- Limitations and Directions for Future Research

The limitation of this research is that the empirical analysis does not analyze the impact of external shocks such as the COVID-19 pandemic, as well as its economic consequences, since the population definition is determined only based on graduates in the last five years, not considering the specific labor market conditions during the pandemic period. As a result, deviations in employment opportunities, recruitment methods and forms of work during this period may be indirectly reflected in the employability results and mismatch indices. Future research that addresses the same phenomenon could address this limitation by applying longitudinal designs, including time controls or other variables, enabling more precise identification of the impact of the pandemic or other macroeconomic disturbances that may affect the employability and mismatch of graduates.

The use of self-reported data to measure employability may involve perception bias and social desirability effects, despite measures taken to reduce objectivity. Future research could address this limitation with objective labor market data, or even employer-based assessments, to strengthen employability measures.

Another limitation of this research is that work experience during studies was measured only in terms of its presence without distinguishing its quality, duration or relevance to the field of study. Future research could address this limitation by differentiating work experience according to its structural integration into study programs, duration and compatibility with study programs to better identify its differential effects on employment.

7- Recommendations

The recommendations of this research are categorized according to interest groups in such a way as to directly influence the reduction in the mismatch between higher education and the labor market.

7-1- For the Ministry of Education

- A national strategy for the alignment of higher education with the labor market should be drafted, and institutional mechanisms for coordination between higher education, respective ministries/agencies, and employers' organizations should be determined.
- To develop an integrated mechanism for skills forecasting (the Kosovo skills intelligence platform), which will determine the institutional and analytical framework for forecasting labor market demand according to professional profiles and necessary skills, as well as for orienting the higher education offer in accordance with these demands.
- Incentivize funds that support joint projects between higher education institutions and the labor market, with the aim of building custom-made training programmes, promoting innovation, and training young people in sectors where graduate profiles and required skills are lacking.

7-2- For Higher Education Institutions

- To develop an organic model and structure to conduct continuous review of study programs through direct consultations with industry and labor market representatives to ensure that program content is in line with labor market requirements.
- The capacity and interest of business partners should be supported to engage jointly with universities in collaboration initiatives that serve to lower the level of mismatch between academia and industry.
- To reduce skills mismatch, mandatory professional internships and applied forms of teaching should be enabled as necessary components of studies.
- To establish functional career offices that cooperate with industry to provide professional orientation, training and employment mediation for active students and graduates.

- To establish mechanisms to track graduates, where the goal is to analyze employment trends and measure the effectiveness of study programs.
- The cooperation between chambers of commerce and professional organizations, including the private sector, should be strengthened in the process of creating study programs and providing training from these collaborations.

7-3- For Employers

- Develop organizational strategies and mechanisms to utilize university expertise as the most efficient channel to build own capacity, integrate innovation and enhance performance.
- Increasing the number of structured professional internships in cooperation with HEIs to offer students work experience during their studies.
- Creating collaborative agreements with HEIs to enable the acceptance of students in internships and implementing joint supervision to monitor progress in their professional development.
- The mutual communication between HEIs and the labor market should be strengthened by creating a sustainable local and national cooperation network.
- Supporting HEI initiatives for fairs, mentoring programs and employment platforms by offering active participation and real recruitment opportunities

7-4- For Students and Graduates

- Increasing personal awareness for continuous professional development by attending training, various certifications and supplementary courses to increase competitiveness in the labor market.
- Increasing participation in career platforms that help build connections with employers to increase employment opportunities.
- Creating a proactive approach to the labor market where students and graduates analyze market demands and adapt their competencies to be more easily employed.

8- Declarations

8-1- Author Contributions

Conceptualization, A.Q. and F.Q.; methodology, F.Q. and X.R.; software, A.Q.; validation, F.Q., X.R., and A.Q.; formal analysis, A.Q.; investigation, X.R.; resources, X.R.; data curation, F.Q.; writing—original draft preparation, A.Q.; writing—review and editing, A.Q. and F.Q.; visualization, F.Q.; supervision, X.R.; project administration, A.Q.; funding acquisition, A.Q. All authors have read and agreed to the published version of the manuscript.

8-2- Data Availability Statement

The data presented in this study are available in the article.

8-3- Funding

This project has received funding from the European Union's Horizon Europe research and innovation program under grant agreement No 101177428 (EDU-LAB – European youth in education and in transition to the labor market). The project aims to strengthen evidence-based higher education reform and foster cooperation between academia, labor market actors, and policymakers across Europe. More information is available at: https://www.edu-lab-project.eu.

8-4- Acknowledgements

The authors would like to thank the Project Development Office at AAB College for its administrative and technical support throughout the research process.

8-5- Institutional Review Board Statement

Not applicable.

8-6- Informed Consent Statement

Informed consent was obtained from all subjects involved in the study. Participation was voluntary, and all data were collected anonymously.

8-7- Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

9- References

[1] Eimer, A., & Bohndick, C. (2023). Employability models for higher education: A systematic literature review and analysis. Social Sciences and Humanities Open, 8(1), 100588. doi:10.1016/j.ssaho.2023.100588.

[2] Phusavat, K., Ongkunaruk, P., & Anussornnitisarn, P. (2025). Gaining insights into the employability of university graduates: implications from the students' inputs. Studies in Higher Education, 1–19. doi:10.1080/03075079.2025.2531841.

[3] Herbert, I. P., Rothwell, A. T., Glover, J. L., & Lambert, S. A. (2020). Graduate employability, employment prospects and work-readiness in the changing field of professional work. International Journal of Management Education, 18(2), 100378. doi:10.1016/j.ijme.2020.100378.

[4] Okolie, U. C., Nwosu, H. E., & Mlanga, S. (2019). Graduate employability: How the higher education institutions can meet the demand of the labour market. Higher Education, Skills and Work-Based Learning, 9(4), 620–636. doi:10.1108/HESWBL-09-2018-0089.

[5] Fenton, D. (2025). Defining Common Elements of Quality Work-Integrated Learning with a Literature Review. SAGE Open, 15(4), 21582440251357683,. doi:10.1177/21582440251357683.

[6] Tight, M. (2023). Employability: a core role of higher education? Research in Post-Compulsory Education, 28(4), 551–571. doi:10.1080/13596748.2023.2253649.

[7] Finch, D. J., Peacock, M., Levallet, N., & Foster, W. (2016). A dynamic capabilities view of employability: Exploring the drivers of competitive advantage for university graduates. Education+ Training, 58(1), 61-81. doi:10.1108/ET-02-2015-0013.

[8] de la Rosa, M., Schmitz, F. M., Tekian, A., & Guttormsen, S. (2025). Enhancing institutional processes and student experience in higher education through Journey Mapping: A systematic review. Review of Education, 13(3), 70100. doi:10.1002/rev3.70100.

[9] Pérez Zúñiga, R., Martínez García, M., & Oliva Ibarra, F. E. (2025). Employability and its relationship with the competency-based approach, teaching methodologies, and assessment in higher education: a systematic review. Frontiers in Education, 10, 1703144. doi:10.3389/feduc.2025.1703144.

[10] Curto-Reverte, A., Peguera-Carré, M. C., Cobos-Rius, H., & Vidal-Marti, C. (2025). The role of work-integrated learning in the European Higher Education Area: A systematic review. Review of Education, 13(3), 70114. doi:10.1002/rev3.70114.

[11] Portocarrero Ramos, H. C., Campos Trigoso, J. A., Cruz Caro, O., Reina Marín, Y., Maicelo Guevara, J. L., Sánchez Bardales, E., & Chávez Santos, R. (2025). Career paths and university education: factors that determine the employment status of university graduates. Frontiers in Education, 10, 1664249. doi:10.3389/feduc.2025.1664249.

[12] Brancatelli, C., Marguerie, A., & Brodmann, S. (2020). Job Creation and Demand for Skills in Kosovo: What can we Learn from Job Portal Data? World Bank, Washington, D.C., United States. doi:10.1596/1813-9450-9266.

[13] European Training Foundation. (2022). Skills mismatch measurement in ETF partner countries: Final Report. European Training Foundation (ETF), Torino, Italy. Available online: https://www.etf.europa.eu/sites/default/files/2022-08/Skills%20Mismatch%20Measurement_final%20report_EN.pdf (accessed on March 2026).

[14] GAP Institute. (2020). Mismatch between education and occupation – Survey results in Kosovo. GAP Institute, Pristina, Kosovo. Available online: https://www.institutigap.org/documents/35811_mismatchbetweeneducationandoccupation.pdf (accessed on March 2026).

[15] Römgens, I., Scoupe, R., & Beausaert, S. (2020). Unraveling the concept of employability, bringing together research on employability in higher education and the workplace. Studies in Higher Education, 45(12), 2588–2603. doi:10.1080/03075079.2019.1623770.

[16] De Vos, A., Jacobs, S., & Verbruggen, M. (2021). Career transitions and employability. Journal of Vocational Behavior, 126, 103475. doi:10.1016/j.jvb.2020.103475.

[17] Mainga, W., Braynen, M. B. M., Moxey, R., & Quddus, S. A. (2022). Graduate Employability of Business Students. Administrative Sciences, 12(3), 72. doi:10.3390/admsci12030072.

[18] Ayala Calvo, J. C., & Manzano García, G. (2021). The influence of psychological capital on graduates' perception of employability: the mediating role of employability skills. Higher Education Research and Development, 40(2), 293–308. doi:10.1080/07294360.2020.1738350.

[19] Clarke, M. (2018). Rethinking graduate employability: the role of capital, individual attributes and context. Studies in Higher Education, 43(11), 1923–1937. doi:10.1080/03075079.2017.1294152.

[20] Cheng, M., Adekola, O., Albia, J., & Cai, S. (2022). Employability in higher education: a review of key stakeholders' perspectives. Higher Education Evaluation and Development, 16(1), 16–31. doi:10.1108/heed-03-2021-0025.

[21] Pereira, E. T., Vilas-Boas, M., & Rebelo, C. F. C. (2020). University curricula and employability: The stakeholders' views for a future agenda. Industry and Higher Education, 34(5), 321–329. doi:10.1177/0950422220901676.

[22] Fenta, H. M., Asnakew, Z. S., Debele, P. K., Nigatu, S. T., & Muhaba, A. M. (2019). Analysis of supply side factors influencing employability of new graduates: A tracer study of Bahir Dar University graduates. Journal of Teaching and Learning for Graduate Employability, 10(2), 67–85. doi:10.21153/jtlge2019vol10no2art801.

[23] Kalfa, E., & Piracha, M. (2018). Social networks and the labour market mismatch. Journal of Population Economics, 31(3), 877–914. doi:10.1007/s00148-017-0677-5.

[24] Cortadas-Guasch, P. (2024). Analysis of the factors determining educational mismatches: evidence from the Catalonian employment insertion surveys. International Journal of Manpower, 45(10), 77–95. doi:10.1108/IJM-09-2023-0540.

[25] Albert, C., Davia, M. A., & Legazpe, N. (2023). Educational mismatch in recent university graduates. The role of labour mobility. Journal of Youth Studies, 26(1), 113–135. doi:10.1080/13676261.2021.1981840.

[26] Baert, S., Cockx, B., & Verhaest, D. (2013). Overeducation at the start of the career: Stepping stone or trap? Labour Economics, 25, 123–140. doi:10.1016/j.labeco.2013.04.013.

[27] McGowan, M. A., & Andrews, D. (2017). Labor Market Mismatch and Labor Productivity: Evidence from PIAAC Data. Skill Mismatch in Labor Markets, 199-241. doi:10.1108/S0147-912120170000045006.

[28] Nieto, S., & Ramos, R. (2013). Non-formal education, overeducation and wages. Revista de Economía aplicada, 21(61), 5-28.

[29] Nieto, S., & Ramos, R. (2017). Overeducation, Skills and Wage Penalty: Evidence for Spain Using PIAAC Data. Social Indicators Research, 134(1), 219–236. doi:10.1007/s11205-016-1423-1.

[30] Schweri, J., Eymann, A., & Aepli, M. (2020). Horizontal mismatch and vocational education. Applied Economics, 52(32), 3464–3478. doi:10.1080/00036846.2020.1713292.

[31] Humburg, M., de GRIP, A., & van der Velden, R. (2017). Which skills protect graduates against a slack labour market? International Labour Review, 156(1), 25–43. doi:10.1111/j.1564-913X.2015.00046.x.

[32] Petrizzi, R. S., Sánchez Ollero, J. L., & García Pozo, A. F. (2015). Desajuste educativo: Situación actual e implicancias en el sector hotelero del Noroeste argentino. Estudios y Perspectivas en Turismo, 24(3), 470-492.

[33] Government of the Republic of Kosovo. (2024). Employment strategy – Kosovo 2024–2028. Government of the Republic of Kosovo. Available online: https://kryeministri.rks-gov.net/wp-content/uploads/2024/07/Employment-Strategy-2024-2028.pdf (accessed on March 2026).

[34] Sissons, P. (2021). The local low skills equilibrium: Moving from concept to policy utility. Urban Studies, 58(8), 1543–1560. doi:10.1177/0042098020915859.

[35] IREX. (2024). ICT sector overview: Workforce demand and supply. International Research & Exchanges Board (IREX). Available online: https://opendatakosovo.org/wp-content/uploads/2024/08/Overview-of-the-ICT-Sector-Workforce-demand-and-supply.pdf (accessed on March 2026).

[36] Kaiser, H. F. (1974). An index of factorial simplicity. Psychometrika, 39(1), 31–36. doi:10.1007/BF02291575.

[37] Jollife, I. T., & Cadima, J. (2016). Principal component analysis: A review and recent developments. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 374, 2065. doi:10.1098/rsta.2015.0202.

[38] Pearson, K. (1896). VII. Mathematical contributions to the theory of evolution.—III. Regression, heredity, and panmixia (P. R. S. L. Ser, trans.). Philosophical Transactions of the Royal Society of London. Series A, Containing Papers of a Mathematical or Physical Character, 187, 253–318. doi:10.1098/rsta.1896.0007.

[39] Rodríguez del Águila, M. M., & Benítez-Parejo, N. (2011). Simple linear and multivariate regression models. Allergologia et Immunopathologia, 39(3), 159–173. doi:10.1016/j.aller.2011.02.001.

[40] Tukey, J. W. (1949). Comparing Individual Means in the Analysis of Variance. Biometrics, 5(2), 99. doi:10.2307/3001913.

[41] Allen, J., & van der Velden, R. (2001). Educational mismatches versus skill mismatches: Effects on wages, job satisfaction, and on-the-job search. Oxford Economic Papers, 53(3), 434–452. doi:10.1093/oep/53.3.434.

[42] Levels, M., Van Der Veldeny, R., & Alleny, J. (2014). Educational mismatches and skills: New empirical tests of old hypotheses. Oxford Economic Papers, 66(4), 959–982. doi:10.1093/oep/gpu024.

[43] McGuinness, S., Pouliakas, K., & Redmond, P. (2018). Skills Mismatch: Concepts, Measurement and Policy Approaches. Journal of Economic Surveys, 32(4), 985–1015. doi:10.1111/joes.12254.

[44] Sekine, A., & Tsuruga, T. (2018). Effects of commodity price shocks on inflation: A cross-country analysis. Oxford Economic Papers, 70(4), 1108–1135. doi:10.1093/oep/gpy015.

[45] Montt, G. (2017). Field-of-study mismatch and overqualification: labour market correlates and their wage penalty. IZA Journal of Labor Economics, 6(1), 2. doi:10.1186/s40172-016-0052-x.

[46] Morgado, A., Sequeira, T. N., Santos, M., Ferreira-Lopes, A., & Reis, A. B. (2016). Measuring Labour Mismatch in Europe. Social Indicators Research, 129(1), 161–179. doi:10.1007/s11205-015-1097-0.

[47] Felgueroso, F., Doménech, R., Arellano, A., García, J. R., Jansen, M., & Viola, A. (2023). Observatorio trimestral del mercado de trabajo – Boletín No. 6. Fundación de Estudios de Economía Aplicada (FEDEA), Madrid, Spain. Available online: https://documentos.fedea.net/pubs/ap/2023/ap2023-18.pdf (accessed on March 2026).

Appendix I: Questionnaire

Determinants of graduate employability in Kosovo

Dear Participant,

Thank you for your time and willingness to participate in this study.

This questionnaire is part of the research titled "Determinants of Graduate Employability in Kosovo: An Empirical Analysis of Academic and Practical Characteristics and Structural Mismatches with Labor Market Requirements", which aims to analyze the impact of higher education on youth employability in Kosovo.

All collected data will be treated with full confidentiality and will be used exclusively for research purposes. Your responses are of particular importance in identifying existing gaps between the skills acquired during studies and the real demands of the labor market.

Your participation will contribute to the development of better strategies for aligning the education system with labor market needs. Completing this questionnaire takes approximately 15 minutes.

Thank you for your valuable cooperation.

If you have any questions or suggestions, please contact us at: qerimi.arberesha@gmail.com

Sincerely,

The Research Team

---

1. Gender

a. Male

b. Female

2. What is your level of education?

a. Bachelor

b. Master

c. Doctorate

3. What type of university did you study at?

a. Public - University of Prishtina

b. Public - Universities (Mitrovica, Peja, Prizren, Ferizaj, Gjilan and Gjakova)

c. Private

4. What was your average graduation grade?

a. 6.00 - 6.99

b. 7.00 - 7.99

c. 8.00 - 8.99

d. 9.00 - 10.00

5. What is your field of study?

a. Computer Science and Information Technology

b. Engineering and Architecture

c. Economics and Business

d. Social Sciences and Humanities

e. Medicine and Health Sciences

f. Law

g. Education and Teaching

h. Arts and Design

i. Agriculture and Environmental Sciences

j. Sports and Recreation

k. Other

6. Your employer is:

a. Public Institution
b. Private Enterprise
c. Non-Governmental Organization
d. International Organization
e. Online Employment

7. Is your current job related to your field of study?

a. Yes
b. No

8. If no, what are the reasons? (You may choose more than one)

a. There were no job opportunities in my field
b. The salary was higher in another field
c. I was employed in a different profession during my studies
d. I developed skills in another field through practical work
e. My education did not prepare me for the labor market
f. Other

9. What profession were you employed in during your studies?

_____

10. Do you think that if you had another degree, you would have more employment opportunities?

a. Yes
b. No

11. What level of education does your current job require?

a. Less than Bachelor
b. Bachelor
c. Master
d. PhD

12. Do you think that your educational qualification is:

a. Higher than required for this job
b. In line with the job requirements
c. Lower than required for this job

13. Has your level of education affected your salary?

a. Yes, but I receive a lower salary than expected for my level of education
b. Yes, it has helped me to have a higher salary
c. No, my level of education has not affected my salary

14. The skills you acquired during your studies help you in your current job:

a. Not at all
b. Slightly
c. Moderately
d. Significantly
e. Fully

15. Which of the following skills did you lack when you started your first job after graduation? (You can choose more than one option)

a. Job-specific technical skills
b. Communication and presentation skills
c. Teamwork skills
d. Use of technology in my field
e. Knowledge of business and management practices
f. None - I felt fully prepared

16. **Were you trained by your employer to address skill gaps?**
    a. Yes
    b. No, there was no willingness to support
    c. No, but I would like to be trained

17. **Do you think you would have benefited more if professional practice had been part of your studies?**
    a. Yes, it would have helped me get hired faster
    b. No, I don't think it would have made a difference

18. **Skills Acquired During Studies** (*Select one level of agreement for each statement*) *Scale: 1 - Strongly Disagree | 2 - Disagree | 3 - Neutral | 4 - Agree | 5 - Strongly Agree*
    a. My studies equipped me with the professional knowledge and skills needed for the labor market (1, 2, 3, 4, 5)
    b. My study program included practical projects and laboratories that supported my professional development (1, 2, 3, 4, 5)
    c. My studies helped improve my communication and teamwork skills (1, 2, 3, 4, 5)
    d. I developed analytical and problem-solving skills during my studies (1, 2, 3, 4, 5)
    e. The university offered opportunities for innovation and creativity through industry-related projects (1, 2, 3, 4, 5)

19. **Work Experience During Studies** (Internship/Practicum) (*Select one level of agreement for each statement*) *Scale: 1 - Strongly Disagree | 2 - Disagree | 3 - Neutral | 4 - Agree | 5 - Strongly Agree*
    a. I completed at least one internship or professional practice during my studies (1, 2, 3, 4, 5)
    b. The internship I completed was related to my field of study (1, 2, 3, 4, 5)
    c. The internship helped prepare me for the labor market (1, 2, 3, 4, 5)
    d. My university provided support in finding internship opportunities (1, 2, 3, 4, 5)
    e. I had access to labor-market-related training during my studies (1, 2, 3, 4, 5)

20. **Alignment of Study Program with the Labor Market** *(Select one level of agreement for each statement) Scale: 1 - Strongly Disagree | 2 - Disagree | 3 - Neutral | 4 - Agree | 5 - Strongly Agree*
    a. My study program was updated and aligned with labor market requirements (1, 2, 3, 4, 5)
    b. The university cooperated with companies to provide employment opportunities for students (1, 2, 3, 4, 5)
    c. Lecturers integrated labor-market case studies into academic courses (1, 2, 3, 4, 5)
    d. My study program included essential soft skills relevant to the labor market (1, 2, 3, 4, 5)
    e. My education adequately prepared me for labor market demands (1, 2, 3, 4, 5)

21. **Motivation** *(Select one level of agreement for each statement) Scale: 1 - Strongly Disagree | 2 - Disagree | 3 - Neutral | 4 - Agree | 5 - Strongly Agree*
    a. My motivation to learn and develop skills positively influenced my ability to find suitable employment (1, 2, 3, 4, 5)
    b. I feel more employable when I continuously pursue opportunities to improve my knowledge and skills (1, 2, 3, 4, 5)
    c. My self-confidence and intrinsic motivation were key factors in taking initiative in job applications and interviews (1, 2, 3, 4, 5)
    d. My engagement in building a professional network was directly related to my motivation for career advancement (1, 2, 3, 4, 5)
    e. Personal satisfaction and a sense of professional fulfilment motivate me to seek better employment opportunities (1, 2, 3, 4, 5)

22. **Employability** *(Select one level of agreement for each statement) Scale: 1 - Strongly Disagree | 2 - Disagree | 3 - Neutral | 4 - Agree | 5 - Strongly Agree*
    a. I found employment within six months after graduation (1, 2, 3, 4, 5)
    b. My current job is related to my field of study (1, 2, 3, 4, 5)
    c. My study program was suitable for labor market requirements (1, 2, 3, 4, 5)
    d. I needed additional training after graduation to meet job requirements (1, 2, 3, 4, 5)
    e. The university equipped me with entrepreneurial skills to create self-employment opportunities (1, 2, 3, 4, 5)
    f. The process of finding a job was easy for me (1, 2, 3, 4, 5)
    g. I applied to more than five job positions before becoming employed (1, 2, 3, 4, 5)
    h. Employers value work experience more than academic degrees (1, 2, 3, 4, 5)
    i. Networking and personal contacts helped me find a job (1, 2, 3, 4, 5)
    j. My salary is appropriate for my education level and skills (1, 2, 3, 4, 5)
    k. My current job offers opportunities for professional advancement (1, 2, 3, 4, 5)
    l. My job is stable and long-term (1, 2, 3, 4, 5)
    m. There is a lack of job opportunities for young graduates (1, 2, 3, 4, 5)
    n. Competition for employment in my field is very high (1, 2, 3, 4, 5)
    o. I experienced difficulties finding a job due to skills mismatch (1, 2, 3, 4, 5)
    p. Employment in Kosovo is based more on personal connections than on meritocracy (1, 2, 3, 4, 5)