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THE IMPACT OF DIGITALIZATION ON YOUTH EMPLOYMENT IN KAZAKHSTAN

This research inspects the effects of digitization on the youth employment in Kazakhstan, trying to assess how the development of digital infrastructure relates to the labor market outcomes from 2014 until 2023. The analysis uses secondary data obtained from the Bureau of National Statistics in Kazakhstan focusing on five key indicators: youth employment rate (YUR), investment in ICT as a part of GDP (ICTI), Internet penetration (% of population) (IP), education level (TEL), and urban labor market participation rate (ULMP).

To identify the digital factors affecting youth employment, the study used descriptive statistics, correlation analysis, and multiple regressions. The result turns out that among those various digital factors, the most significant predictor of youth employment is Internet penetration. It also correlated negatively with the youth unemployment rate, as shown in $r = -0.939$, $p < 0.001$. The higher the access to the Internet, the more probable it was for a young person to find a job or acquire skills plus participate digitally.

On the contrary, ICT investment and TEL were positively correlated to urban labor market participation. These variables were not shown to have an immediate and significant effect on youth employment, however. These findings also underline the need for a more holistic approach to digitalize infrastructure with education and skills development.

This study finds that increased internet access and digital literacy programming offer real potential for a significant reduction of youth unemployment in Kazakhstan. Results thus provide critical evidence for

policymakers, educators, and industry players in pushing for at inclusive digital transformation strategies resulting in equitable access to employment in the digital economy. Future studies should look into causal mechanisms, sectoral impacts, and geographical differences for a more granular understanding of digitalization and youth employment complexities.

Keywords: Digitalization, Artificial intelligence, ICT investments, youth employment, Internet penetration.

Introduction

Rapid digital technology has changed labor markets worldwide, patterns of employment everywhere, and, thereby, created several challenges and opportunities for youth employment. Digitalization is the third pillar of economic modernization for Kazakhstan, specifically affecting labor markets by digitizing everything the country resorts to in modernizing its economy. Thus, while the country has engaged in a digital economic transition, understanding how digitalization influences youth employment is critical when putting appropriate labor policies and inclusive economic growth into practice.

Difficulties in youth unemployment represent a major socio-economic malaise in Kazakhstan. Young people experience various barriers to entry and retention in the labor market. One possible solution that digital transformation poses promises is to open more work with less physical boundaries and provision for skills development. In part, however, it threatens to pull the job market apart, cause digital exclusion, and worsen the income distribution. Hence, the inquiry into the association between digitization and youth employment is not only timely but also much required for evidence-based policy formulation.

By virtue of this intersection, it is relevant that two key global phenomena are tackled: the digital transformation of economies and persistent youth unemployment. This mostly deals with prosperity as a result of digitalization, but it is little acknowledged when it comes to the developing world's implications for youth employment-the case for Kazakhstan, for example. Thorough research was performed in the developed world, and there are still numerous gaps in their understanding with respect to how the concept applies to transitional economies.

Digital modernization by Kazakhstan is driven by government initiatives such as the "Digital Kazakhstan" program, which targets improved quality of life through initiatives focused on enhancing digital infrastructure and building linkages between innovation and improved quality of life through technology. Increased internet access, ICT investments, and improved telecommunications infrastructure will not yield clear impacts on youth employment. This research is, therefore, filling that gap: the effect of such digital indicators as internet penetration,

ICT investment, education levels, and labor market participation on the youth employment outcome from 2014 to 2023.

The theoretical significance of the study is to boost the evolving discourse on the relation of digitalization and labor markets. It was established in previous cases that digital technologies bear the potential to reshape employment dynamics [1, p. 4]; [2]. However, the specifics of how digitalization induces influences on youth employment in developing economies have remained elusive. The experience of Kazakhstan serves as a model for advancing understanding in this regard with respect to transitional economies.

On a practical level, the study also has significant recommendations for policymakers, trainers, and stakeholders in industry. The relationship that prevails between digitalization and youth employment can provide a foundation on which targeted policies could be crafted to influence digital inclusion, skill development, and job creation. For example, if significant results are provided showing that internet penetration reduces youth unemployment, expanding broadband access and digital literacy programs would follow. If ICT investments were found to be attributable to the urban labor market, specific initiatives could be developed to help the youth develop businesses and create jobs via digital means in urban centers.

Youth unemployment remains among the greatest challenges of modernity in Kazakhstan, despite the efforts taken towards a digital revolution. This very development has also been shown to result in substantial regional and socio-economic disparities. While it can be expected that digitalization could be the solution to labor market concerns, the full effect of such on youth employment in Kazakhstan has yet to be recognized in comprehensive studies. The following questions are of critical importance within this knowledge void:

What is the effect of penetration into the internet on the youth employment level in Kazakhstan?

What conditions exist to tell between ICT investments and youth participation in labor markets?

How do education levels and digital skills mediate the relationship between digitalization and employment outcomes?

The study sets out to achieve the following tasks to respond to these queries:

Analyze the relationship between indicators of digitalization (ICT investment, internet penetration, education level, and labor market participation) and youth employment outcomes in Kazakhstan for the years 2014 to 2023.

Identify which of the digital factors most influence youth employment outcomes.

Provide evidence-based recommendations for enhancing digital accessibility to targeted policies for promoting youth employment.

This research adds to the currently existing pool of knowledge through empirical evidence dealing with the effects of digitalization on youth employment in Kazakhstan. It has been established in erstwhile research that digital technologies have the potential of extending a major impact on labor markets, but the findings were on advanced economies and therefore cannot find direct applicability in transitional economies without context-specific analysis. Through this study, with whose analysis the socio-economic and digital landscape of Kazakhstan brings in, invaluable insights will be presented on how digital transformation can help to nibble at certain issues raised concerning youth unemployment.

The significance of integrated development in digital direction was stressed, while the investment in new information technologies should be complemented by initiatives promoting digital literacy and skill development and inclusive economic opportunities.

This will help policymakers, educators, and industry leaders involved in building the above-mentioned environment for sustainable and inclusive growth.

Materials and methods

In this study, quantitative research was adopted to study the effects brought about by digitalization onto youth unemployment in Kazakhstan. The analysis uses secondary data sourced from official statistical documents from the Bureau of National Statistics and the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. In this case, a longitudinal design was employed, extending from 2014 to 2023, considering which trends and relationships between digitalization indicators and youth employment outcomes can be analyzed over time.

This study presents five main variables representing both digitalization and labor market dynamics: youth employment rate (YUR), ICT investment as experienced by GDP (ICTI), internet penetration as of the population (IP), education level (TEL), and urban labor market participation rate (ULMP). These indicators were selected by weighing their pertinence to the objective of the study and the possibility of being sourced from official statistical databases.

Data collection:

The data used in this study were derived from official publications and statistical databases of the Bureau of National Statistics of Kazakhstan. The database consisted of annual observations from 2014 to 2023 on the following major variables:

Youth Unemployment Rate (YUR): It is determined as the rate of employment of people aged 15 to 34 years in the labor force.

ICT Investment (% of GDP) (ICTI): It indicates the proportion of gross domestic product (GDP) going into investments in information and communication technologies.

Internet Penetration (% of Population) (IP): It indicates the percentage of the population with internet access, which gives an idea of digital connectivity.

Education Level (Secondary, Tertiary) (TEL): It is determined as the percentage of the population with secondary or tertiary education.

Unemployment of Labor Market Participation (ULMP): It shows a percentage of the youth who work and who are looking for jobs.

Rate of Computer Users (RCU): An index representing rates of computer users in Kazakhstan.

Analytical methods

The data were collected in raw form from official statistical databases and reports. The following steps were undertaken to prepare the dataset for analysis:

Data Cleaning: Missing values and inconsistencies were addressed using linear interpolation and cross-verification with official reports.

Standardization: All variables were standardized to ensure comparability, especially for percentages and GDP-related indicators.

Descriptive Statistics: Mean, median, standard deviation, minimum, and maximum values were computed to understand the distribution of each variable.

Transformation: Skewed variables were log-transformed to meet the assumptions of normality for regression analysis.

In the research analysis methods were used: 1) Descriptive statistics to summarize the essential characteristics of the dataset, such as measures of central tendency (mean and median) and dispersion (standard deviation and range). This allowed for insights to be garnered about the trends and variations for digitalization indicators and youth employment rate through the study period. 2) Correlation Analysis to examine the strength and direction of the relationships between the independent variables (ICTI, IP, TEL, ULMP, and RCU) and the dependent variable (YUR), Pearson's correlation coefficient was used. This included the identification of possible multicollinearity issues while offering first-hand insights into significant associations, and 3) Multiple Regression Analysis to assess the impact of digitalization indicators on the youth employment rate.

The following regression equation was employed:

$$YUR_t = \beta_0 + \beta_1 ICTI_t + \beta_2 IP_t + \beta_3 TEL_t + \beta_4 ULMP_t + \beta_5 RCU_t + \epsilon_t \quad (1)$$

where, t is year, β_0 is a constant term and β_i is coefficient of the independent variables, and the last ϵ_t is error terms.

Limitations of the research

Methods applied have shown much promise in building good results into the digitalization and employment nexus, there are certain limitations that they cannot successful anchors:

Sample Size: The dataset consisted only of a ten-year observation (2014-2023), the more years and more significant variables for Kazakhstan weren't available, hence limiting the statistical power of the analyses.

Cross-Sectionality: This study depended on annual aggregated data, so it was not able to grasp short period fluctuations in the levels of employment of young people.

Possible endogeneity: Assume exogeneity for the predictors, but reverse causality and omitted variable bias cannot be ruled out.

The theoretical and literature base for the research paper was academic paper of scholars. The literature table was grouped by the research focus.

Table 1 – Summary of Literature on Digitalization and Youth Employment Policies

Research Focus	Key Themes
Impact of Digitalization on Job Displacement and Creation	– Digital automation replacing the manual job- Fast growing necessity of technical skills [1, p. 4]; [2, pp. 265-266]; [3, p. 1281]; [4 p. 14].
Digital Platforms and Changing Job Market Dynamics	- Automation of CV checking through AI- Increased numbers of tech startups and remote jobs- Flexible job requirements and their insecurity [5, p. 10]; [6, p. 22]; [7, p. 35]; [8, p. 5].
Inequality and the Digital Divide	Inequality on access to digital technology. Disparities in employment [9, p. 310]; [10, p. 220]; [11, p. 1581]; [12, p. 5].
Regional and Policy-Specific Studies	- Regional disparity in job and education opportunities – Response of developing countries to digitalization and its difficulties [13, p. 45]; [14, p. 10]; [15, p. 5].
Lifelong Learning and Cross-Sector Collaboration	Opportunities of continuing learning and training in universities and job places. Negotiation and collaboration between government, private sector, and education [16, p. 3]; [17, p. 748].

The literature gives an appearance to many research gaps concerning the impact of digitization on youth employment. Whereas existing studies have identified the effects of digitization on displaced jobs, skills needed, as well as new job opportunities, little research has been done about how digital transformation impacts socio-economic groups such as rural youth and marginalized communities. Regional disparities remain poorly researched, especially among developing economies outside Central Asia. Most of the studies are focused on short-term transformations and hence lack a longitudinal perspective on either path of career or the quality of jobs. Similarly, there is little empirical evaluation of how well

policies currently address digital skill gaps and whether they lead to equitable employment outcomes. The psychological and social consequences of digitization, such as job insecurity and work-life balance, are underrepresented in literature.

Results and discussion

Descriptive statistics reveal the complete picture of the dataset, including central tendency, variations, and distribution of each variable. Summary statistics for the youth unemployment rate (YUR), ICT investment (ICTI), internet penetration (IP), telecommunications infrastructure (TEL), and urban labor market participation (ULMP) are given in Table 1.

Major Findings:

Youth Unemployment Rate (YUR): has an average of 4.47 % with a standard deviation of 1.0 %, varying between 3.5 % and 6.6 %. ICT Investment (ICTI): ICTI has a mean value of 0.66, with a small standard deviation of 0.15, suggesting stability among observations. Internet Penetration (IP): This has the highest mean (76.16 %) and standard deviation (18.17 %), demonstrating considerable variability. Telecommunications Infrastructure (TEL): TEL has a mean of 54.11 and a moderate standard deviation of 5.39, thus demonstrating moderate variation. Urban Labor Market Participation (ULMP): ULMP, meanwhile, averages 12.54 %, with a standard deviation of 2.12.
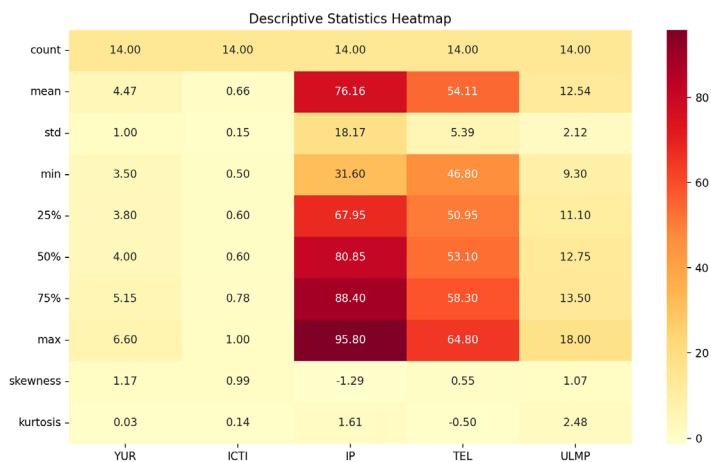

	YUR	ICTI	IP	TEL	ULMP
count	14.00	14.00	14.00	14.00	14.00
mean	4.47	0.66	76.16	54.11	12.54
std	1.00	0.15	18.17	5.39	2.12
min	3.50	0.50	31.60	46.80	9.30
25%	3.80	0.60	67.95	50.95	11.10
50%	4.00	0.60	80.85	53.10	12.75
75%	5.15	0.78	88.40	58.30	13.50
max	6.60	1.00	95.80	64.80	18.00
skewness	1.17	0.99	-1.29	0.55	1.07
kurtosis	0.03	0.14	1.61	-0.50	2.48

Figure 1 – Descriptive statistics of Key variables

Note – complied by the author.

These statistics suggest that while some variables like ICTI are relatively stable, others such as IP display much variability. These differences could affect the outcomes of the subsequent analyses, including correlation and regression.

The correlation analysis indicates the strength and direction of associations between the variables. Key correlations among the variables are illustrated in Table 2.

The highlights of the relationships include:

YUR vs. IP: The strongest negative correlation (r = -0.939, p < 0.001) specifies that higher penetration of the internet is associated with lower youth unemployment. This suggests that digital connectivity aids job access and skill enhancement.

ICTI vs. ULMP: A moderate positive correlation (r = 0.595, p < 0.05) indicates that investment in ICT may help tilt the engagement of the urban labor market.

YUR vs. TEL: A negative correlation (r = -0.536, p < 0.05) infers that with better telecom infrastructure, youth unemployment becomes lesser.
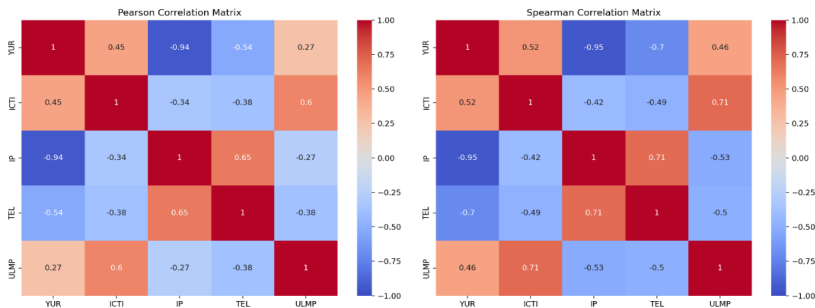

Figure 2 – Correlation Matrix of Variables

The outcomes put into focus how digital infrastructures determine youth employment outcomes. Internet penetration stands out because it is mainly associated with lowering youth unemployment, and this is consistent with prior studies on digital labor markets [5, p. 2], [4]; [6, p. 45–60].
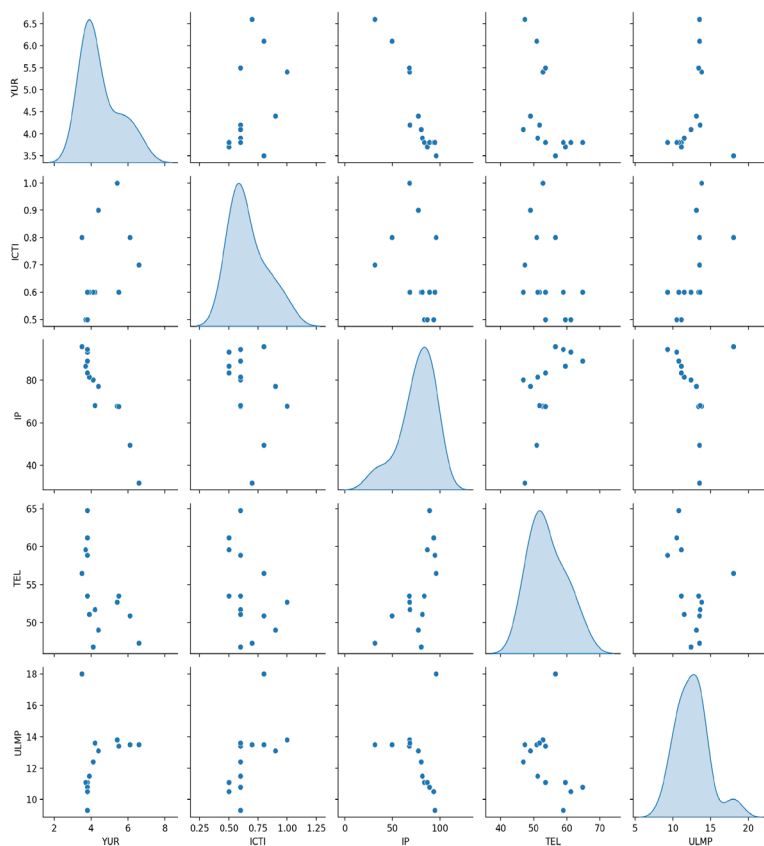
Figure 3 – Scatter plot of variable combinations

The Pearson correlation matrix depicts some strong relationships among a few variables. These associations are confirmed through heatmap and scatterplot visualizations, whereby some variables demonstrate inverse movements compared to others that seem to be in direct proportion to each other. Therefore, this analytical approach gives the consideration of the entire information on the correlations among the economic indicators in the dataset.

The effects of digitalization indicators on youth unemployment have been analyzed by performing a multiple regression with YUR as dependent variable. The results of regression show R-squared: 0.920; this means that model explains 92 % variability in YUR. Adjusted R-squared: 0.885; this demonstrates strong

explanatory power even after adjusting for number of predictors. F-statistic: 25.90 (p < 0.001); this indicates statistical significance of the overall model. Durbin-Watson Statistic: 2.375, suggesting that very few worries exist concerning autocorrelation. Insert Table 3 here: Regression Analysis Results.

Key Influencers of Predictors:

Internet Penetration (IP): The highest predictor (β = -0.949, p < 0.001); increased internet access will reduce the incidence of youth unemployment significantly.

ICT Investment (ICTI): A positive and non-significant effect (β = 0.209, p = 0.107) suggests that though ICT investment is important, it becomes indirect or long-run on unemployment.

Telecommunications Infrastructure (TEL): Positive but non-significantly related (β = 0.152, p = 0.251); thus, emphasizing collateral effects.

Urban Labor Market Participation (ULMP): A tiny negative and non-significant effect (β = -0.062, p = 0.604): so, it has very limited direct influence.

These findings further substantiate that internet penetration plays a vital role in reducing youth unemployment. Nonetheless, TEL and ULMP are not significant and indicates their influence might be due to the mediation of other variables.

The outcomes of this research are very important when it comes to explaining the dynamics that exist between digitalization and youth unemployment in Kazakhstan. The results found in the present study show that the increased development of digital infrastructure, especially with internet penetration, connects closely with decreased youth unemployment. This section discusses the findings in implications, reviews them against available literature, and highlights some areas for policy intervention or further research investigation.

1 The Digital Infrastructure Effect on Youth Unemployment

First, the strongest finding of the correlation and regression analyses has been a very strong negative relationship between internet penetration (IP) and the youth unemployment rate (YUR). The coefficient substantial from IP (β = −0.949, p<0.001) in the regression model indicates that additional access to internet is associated with higher reductions in youth unemployment. So, that everything would match with previous studies referring to the way in which digital platforms transform-job hunting, skill development, and enablement of remote work [5, pp. 2-4; 6, P. 45–46].

This can be explained by increasing remote jobs, online education and improving skills by online courses to get better fit for the job offers in the market. Research findings also support this since digital skills are transitioning into the key competitive elements for youth in the present labor market [3, p. 1280–1282]; [17, p. 2–3].

But while this strong negative correlation shows promise in decreasing incidence of youth unemployment due to digitalization, it also emphasizes the digital divide. Internet access is reputedly insufficient in many regions, and youth without it or digital skills are further endangered to exclusion from these opportunities, as Ragnedda et al (2013) noted in their research. Hence, the advocacy here is towards policies in favor of increased penetration of the internet and digital skills enhancement for the regions that have bad internet coverage or less developed to get computers in schools.

2 The Role of ICT Investment and Urban Labor Market Participation

This positive correlation between ICT investment (ICTI) and urban labor markets participation (ULMP) ($r=0.595$, $p<0.05$) indicates that investing in digital infrastructure would help labor markets transform, particularly those in cities. This is also reminiscent of what has been said in reviewed literature that digitalization creates opportunities for employment in cities [11, p. 1583]; [15, p. 3–5].

However, it does not demonstrate significant effects of ICTI in regression models because its contribution as an independent variable in macroeconomic youth unemployment explanations is either not clear or is affected by other factors such as education and digital literacy or economic condition. This is interpreted in the light of previous findings that show the benefits of ICT investment depend on many supportive complementary factors: human capital development and institutional support [1, p. 4–5]; [4, p. 18–20].

Therefore, even though investment in ICT should be part of sparking improvements, it cannot be separated from other policy initiatives to be accomplished towards developing digital skills and strengthening access to digital platforms and innovation-driven employment. Also, policymakers should ensure that ICT investments would be inclusive and meet individual challenges of youth in urban and rural areas.

3 Policy Implications

Thus, this study has the following crucial policy implications to steer those who are in pursuit of digitally enabled solutions for youth unemployment:

Increase Access to the Internet: There is much justification for increased access to the Internet as a necessary policy priority, especially in unserved areas, given the fact that it inversely correlates with youth unemployment by a big margin. This would require investing in broadband infrastructure, subsidizing Internet access, and making free public Wi-Fi available.

Digital Literacy Promotion: Digital skills training goes hand in hand with enabling young people to take advantage of digital opportunities. It includes making digital literacy an integral part of the education system and vocational training, and it also covers lifelong learning opportunities. This paper recommends

incorporating «Digital literacy» subject to all specializations in schools and universities.

Integrated Digital Strategies: Because of the positive correlation that ICTI shares with TEL, it is recommended that initiatives of digital development should be inter-ministerial in nature. Adopt an integrated approach matching investments in ICT infrastructure with increased collaboration from other sectors and integrated in every step of the way.

Conclusions

This study has evaluated the influence of digitalization in Kazakhstan upon the youth about their unemployment experience by paying special concentration to factors like internet penetration, ICT investment, telecommunications infrastructures, as well as participation in the urban labor market, and found evidence confirming that digital connection, especially the internet access, is very central in the reduction of youth unemployment. Further, the very strong negative correlation between internet penetration and youth unemployment rate ($r = -0.939$, $p < 0.001$) as well as the significant negative coefficient in the regression model ($\beta = -0.949$, $p < 0.001$) strongly prove that increased access of the population to digital platforms enrich employment opportunities for young people.

The results from this study confirm the hypothesis that developing digital infrastructure positively relates to youth employment outcomes. This agrees with Bessen (2019) and Heeks (2018), who claimed that digital inclusion promotes skill development, entrepreneurship, and job matching among youths [5, p. 2–4]; [6, p. 45–46, 112–115]. On the other hand, the results indicate that ICT investment and telecommunications infrastructure, while positively correlated with urban labor market participation, do not directly and significantly relate to youth unemployment. This leads to a conclusion where the benefits of digital investments depend on complementary variables like education as well as digital literacy and inclusive economic policies.

On the other hand, this study is scientific proof of furthering the understanding of the relationship between digitalization and labor market results in developing economies like Kazakhstan. Internet access is not only a means of technological development; it is also one of the most important enablers of economic opportunities and social mobility. This research forms part of the wider discussion on the digital economy by underscoring the significance of equitable access to the digital realm, which promotes inclusive growth.

However, it also suggests future research fields. The cross-sectional nature of the study does not allow causal inference, while the small size of the sample ($n = 14$) reduces its generalizability. Longitudinal studies, analysis on the sector, and inclusion of further variables such as education levels and economic conditions

should give a better understanding of how digitalization affects youth employment over the course of time.

In short, this study confirms that the provision of digital connectivity is a very potent measure to reduce youth unemployment in a country, depending on an integrated and inclusive approach to digitalization development. Therefore, while Kazakhstan still is moving through the digital transformation, a very important dimension will be to ensure that young people have the skills, access, and opportunities to participate fully in digital economic processes, which will ensure sustainable and inclusive growth. These findings not only validate existing theories but also enhance the scientific understanding of how labor markets in emerging economies respond to digitalization, providing a basis for future investigation as well as evidence-based policy formulation.

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ҚАЗАҚСТАНДАҒЫ ЖАСТАРДЫҢ ЖҰМЫСПЕН ҚАМТЫЛУЫНА ЦИФРЛАНДЫРУДЫҢ ӘСЕРІ

Бұл мақалада Қазақстандағы цифрландырудың жастар жұмыспен қамтылуына әсері зерттеліп, 2014–2023 жылдар аралығында цифрлық инфрақұрылымды дамыту мен еңбек нарығындағы өзгерістер арасындағы байланыс қарастырылады. Қазақстан Республикасының Ұлттық статистика бюросының екінші деректерін пайдалана отырып, зерттеу бес негізгі көрсеткішті талдайды: жастардың жұмыспен қамтылу деңгейі (YUR), ЖІӨ-нің пайыздық үлесі ретінде көрсетілген АКТ инвестициялары (ICTI), интернеттің халық арасындағы таралуы (IP), білім деңгейі (TEL) және қалалық еңбек нарығына қатысу деңгейі (ULMP).

Зерттеу барысында сипаттамалық статистика, корреляциялық талдау және көп факторлы регрессиялық модельдер қолданылып, жастар жұмыспен қамтылуына әсер ететін негізгі цифрлық факторлар анықталды. Нәтижелер көрсеткендей, интернеттің таралуы жастар жұмыспен қамтылуының ең маңызды көрсеткіші болып табылады, ол жастар арасындағы жұмыссыздық деңгейімен күшті теріс корреляцияға ие (r = -0.939, p< 0.001). Интернетке қолжетімділіктің артуы жұмыс мүмкіндіктерін кеңейтіп, дағдыларды дамытуға және жастардың цифрлық экономикаға қатысуына ықпал етеді.

АКТ инвестициялары мен телекоммуникациялық инфрақұрылым (TEL) қалалық еңбек нарығына қатысумен оң байланыста болғанымен, олардың жастар жұмыспен қамтылуына тікелей және елеулі әсері анықталған жоқ. Бұл қорытындылар цифрлық инфрақұрылымды дамыту бағдарламаларын білім беру және дағды қалыптастыру бастамаларымен үйлестірудің маңыздылығын көрсетеді.

Зерттеу қорытындысы бойынша, интернетке қолжетімділікті кеңейту және цифрлық сауаттылықты дамыту Қазақстандағы жастар арасындағы жұмыссыздықты айтарлықтай төмендете алады. Бұл нәтижелер саясаткерлерге, білім беру ұйымдарына және салалық көшбасшыларға цифрлық экономиканың мүмкіндіктерін кеңінен пайдалану үшін тең қолжетімділікті қамтамасыз ететін инклюзивті цифрландыру стратегияларын әзірлеу бойынша құнды ұсыныстар береді. Болашақ зерттеулер себеп-салдарлық байланыстарды, салалық ерекшеліктерді және аймақтық айырмашылықтарды зерттеуге бағытталуы керек.

Кілтті сөздер: Цифрландыру, Жасанды интеллект, АКТ инвестициялары, Жастарды жұмыспен қамту, инитернеттің таралуы.

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ВЛИЯНИЕ ЦИФРОВИЗАЦИИ
НА ЗАНЯТОСТЬ МОЛОДЕЖИ В КАЗАХСТАНЕ

В данной статье исследуется влияние цифровизации на занятость молодежи в Казахстане, с акцентом на взаимосвязь между развитием цифровой инфраструктуры и результатами на рынке труда в период с 2014 по 2023 год. Используя вторичные данные Бюро национальной статистики Казахстана, исследование анализирует пять ключевых показателей: уровень занятости молодежи (YUR), инвестиции в ИКТ в процентах от ВВП (ICTI), проникновение интернета (% населения) (IP), уровень образования (TEL) и уровень участия в городском рынке труда (ULMP).

В исследовании применяются описательная статистика, корреляционный анализ и множественная регрессионная модель для выявления наиболее значимых факторов, влияющих на занятость молодежи. Результаты показывают, что проникновение интернета

является наиболее значимым предиктором занятости молодежи, демонстрируя сильную отрицательную корреляцию с уровнем безработицы среди молодежи (r = -0.939, p < 0.001). Более широкий доступ к интернету способствует увеличению возможностей трудоустройства, приобретению навыков и участию в цифровой экономике среди молодежи.

Хотя инвестиции в ИКТ и телекоммуникационную инфраструктуру (TEL) положительно коррелировали с участием в городском рынке труда, их прямое и значительное влияние на занятость молодежи не было выявлено. Эти выводы подчеркивают важность интегрированных стратегий цифровизации, сочетающих развитие инфраструктуры с образовательными программами и инициативами по развитию навыков.

Исследование заключает, что расширение доступа к интернету и продвижение цифровой грамотности могут значительно снизить уровень безработицы среди молодежи в Казахстане. Полученные результаты предоставляют ценные рекомендации для политиков, образовательных учреждений и лидеров отрасли, подчеркивая необходимость инклюзивных стратегий цифровой трансформации, обеспечивающих равный доступ к возможностям трудоустройства в цифровой экономике. Будущие исследования должны сосредоточиться на изучении причинно-следственных связей, отраслевых особенностей и региональных различий, чтобы глубже понять сложные взаимосвязи между цифровизацией и занятостью молодежи.

Ключевые слова: Цифровизация, Искусственный интеллект, Инвестиции в ИКТ, Занятость молодежи, Проникновение интернета.