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Impact of modeling factors on human capital development

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Abstract: The article discusses the importance of the human aspect and characteristics such as the level of education or the availability of sufficient resources are extremely important for the performance process. Innovation is also important for productivity. The aim of this study is to identify the impact of human capital, mainly its educational level, on labor productivity. This is being studied using a quantitative approach along with the empirical evidence that has been given to detect these issues. In addition, in the light of the results of the study, some recommendations can be identified, including the education reform should be linked to national development projects and reform plans for various sectors, as well as the establishment of a national information system and a national labor market and employment database.

Keywords: Labor productivity, human capital, labor, correlation, variables, econometric model.

Human capital development ensures the efficiency and effectiveness of the workforce and, ultimately, improves the overall efficiency of the economy. In particular, productivity is not the ultimate economic goal, but it does serve to improve economic well-being and living standards. With the expansion of globalization and the development of competition in the market, labor productivity has moved more than before to become a decisive component in the competitiveness of the construction industry and thus the profitability of industries in the domestic and foreign markets. Globalization is related to productivity in a variety of ways, including the impact of new technologies, trade liberalization or open economies, and foreign direct investment.

The ability of a republic to improve the growth of its national output over time depends more on the size of its labor force. Nowadays, many countries have integrated across national borders, societies have become larger and more complex, and labor has become more specialized. The high level of labor productivity is possible due to the ability to overcome global trade barriers in comparison with other less efficient countries. The impact of high productivity not only affects the efficiency of the organization as a whole, but also the lifestyle of society through an increase in income per capita. High labor productivity implies lower unit costs and thus the firm's ability to match prices in world markets.

Human capital theory is based on the assumption that the training, education and wages of

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employees increase productivity. A study of the literature indicates that the correct use of human capital has a positive effect on labor productivity and the results of the firm. Education also has a positive effect on job growth. Research shows that investing in human capital is most important for increasing labor productivity and sustainable economic development. Educated workers use new technologies to increase production. Training is also an important part of human capital as it plays an important role in raising wages and labor productivity. According to research, human capital is the main factor that improves the resources of the firm and helps employees to increase their productivity. The performance of a firm is closely related to the wages of employees and the distribution of profits, which greatly improves employee attitudes towards work.

Research shows that work productivity is an essential part of life. It is most often defined as the ability of the factors of production to produce. The importance of the human aspect and characteristics such as the level of education or the availability of sufficient resources is extremely important for the performance process. Innovation is also important to performance. The development of skills and knowledge is an important factor in improving labor productivity. In the 21st century, the continuous improvement of the economy comes at the expense of the improvement of human capital.

Regardless of the measure used, researchers largely agree that the long-term economic growth of countries is ultimately driven by productivity growth. Of course, in the long run, ever more profitable high-income workers place higher demands on everyday amenities in light of the fact that efficiency gains make room for higher wages and more time off. Productivity is usually perceived as a source of growth in people's well-being.

The paper uses a quantitative research method. The aim of this study is to identify the impact of human capital, mainly its educational level, on labor productivity. This is being studied using a quantitative approach along with the empirical data that has been given to detect these issues. According to research, the advantage of adapting and using this method is that the variables will be studied in their actual state of existence, and it will also be convenient for us to establish an empirical relationship between the variables under study.

We carried out an analysis of the missing values. Various tests related to current research such as; Correlation and regression analyzes were applied to the data in order to find out the results necessary to interpret the current study objective. In addition, the Pearson correlation test is used to test for multicollinearity and find correlations between explanatory variables. Also, this study uses regression analysis to determine the relationship between independent and dependent variables.

The software STATA 12 is used to complete the statistical analysis. The generalized method of moments (GMM) is used for hypothesis testing. We present econometric models for hypothesis testing. To study the impact of human capital on labor productivity, the following model is given:

$$〖LP〗_{it}=\alpha+\beta_1 〖(EA)〗_{it}+\beta_2 〖(ED)〗_{it}+\beta_3 〖(ET)〗_{it}+\beta_4 〖(EW)〗_{it}+\beta_5 〖(FP)〗_{it}+\beta_6 〖(WH)〗_{it}+\varepsilon_{it} \quad (2.3.1.)$$

Where, LP - labor productivity;

EA - employee's age;

ED - employee education;

ET - employee training;

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EW - wages of employees;
FP - financial component;
WH - set working hours.

The research was carried out in all enterprises involved in construction in the Ferghana region. It is difficult to collect data from a large sample, so in this study we used a sampling method. Consequently, a sample of construction companies is selected accordingly. This study is of an intersectoral nature of construction organizations.

The instrumental generalized method of moments (GMM) is used to solve the problem of the endogeneity of building organizations and test the hypothesis, the results are presented in Table 2.3.1. The endogeneity test assumes that the education and training variables of employees are not exogenous because the p-value is less than 0.05, so we can reject the null hypothesis that the variables are exogenous.

In the Table 2.3.2. an additional test is carried out to find out whether the tools used are weak tools; here we are interested in correlation between instruments and endogenous regressors. The statistical value of f is much larger than any of the critical values shown in our table, so we reject the null hypothesis that our tools are weak. Thus, we have good tools in this case.

First of all, we present the results in the table below, and then we will analyze the data in detail. This study uses the Generalized Method of Moments (GMM) method to examine the impact of human capital on labor productivity. GMM techniques are being tested to address the endogeneity problem. When one or more explanatory variables are associated with an error term (μ_it), the problem of endogeneity arises. Omitting variables or measurement errors give rise to the endogeneity problem. The use of proper instrumental variables is associated with the problem of endogeneity, which is associated with endogenous independent variables but is not associated with errors.

Table 2.3.1.
Instrumental Variables Regression (GMM) Results

F value = 244.65
Probability > F regressions = 0.0000
The coefficient of determination = 0.4453
Adjusted R^2 = 0.4321

GMM Matrix Weight: Reliable
RMS error = 0.0401

Labor productivity	Coefficient	standard error	t	P>[t]	95% confidence interval	

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Employee Education	0.251243	0,0032505	3,41	0,0006	0,1821915	0,2249422
Age of employees	-0.285723	0,0003416	-1,23	0,2189	-0,2219923	0,2233327
Employee training	0.106898	0,0000791	3,08	0,0058	0,0703756	0,1200653
Financial component	0.000123	0,0000507	0,19	0,8530	-0,0001024	0,0000965
Working hours	0.049634	0,0005222	3,66	0,0001	0,0005051	0,0015432
Employee salary	0.007454	0,000362	2,49	0,0189	0,0002926	0,0001583
Flaw	0.136476	0,025859	4,01	0,0000	0,081213	0,1758062
Instrumental	Employee education and training					
Tools	The age of employees					

Endogeneity check (orthogonality conditions)

The variables are exogenous

GMM C statistics chi2 (2) = 2.986 (p = 0.0247)

The education of an employee with a coefficient of 0.251243 indicates a positive relationship between the education of an employee and labor productivity. (Table 2.3.1.) In particular, the result shows that a 1.0% increase in the level of education of employees in the construction industry of Uzbekistan leads to an increase in labor productivity by 25.0%. Therefore, education is a more powerful element in increasing productivity. A P value of 0.0006 indicates that the education rate of the employees is significant.

Table 2.3.2.

Summary statistics of the first stage regression

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	Robust F	Prob > F
Staff education	0,3953	0,3850	0,0293	132,87	0,000
Staff training	0,6700	0,6576	0,6566	88,058	0,000

Minimum Eigenvalue Statistics = 45.277

Critical # endogenous

regressors :2

Ho: Instruments are weak # expelled

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tools: 2

2SLS relative bias	5%	10%	20%	30% (not available)
	10	15%	20%	25%
2SLS Size of nominal 5% Wald	7.0	4.58	3.95	3.63
LIML Size of nominal 5% Wald	7.0	4.58	3.95	3.63

As mentioned earlier, a large number of studies have established a positive relationship between employee education and labor productivity. However, the results are quite contrasting, such a positive association was found in the context of small and medium enterprises in the regions of Uzbekistan. However, studies show that employee education increases productivity in small and medium enterprises.

Studies by Uzbek scientists have revealed a positive relationship between the impact of education of employees on labor productivity, as in other studies of foreign countries. The general findings show that employee education has a positive effect on labor productivity. Other scholars have studied the impact of employee education on productivity. The research period is from 1994 to 2020, the sample consists of Swiss construction companies. Their findings show that the education of employees has a positive effect on productivity. The data obtained indicate a positive relationship between workers' education and labor productivity.

Our simulation analysis showed that employee training also has a high coefficient of 0.106898, which tells us that a 1.0% increase in investment in training will result in a 10.0% increase in labor productivity. A p-value of 0.0058, which is less than the confidence level, indicates the coefficient is significant.

A large number of studies show the relationship between employee training and work performance and find a positive relationship between the two variables. . Using the overall data and the GMM estimator, their results suggest a positive relationship between employee training and work performance. Their results show that employee training has a positive impact on productivity. However, when they use the linear model, the results turn negative.

The variable "Worker's age" with a coefficient of -0.285 indicates that it has a negative relationship with labor productivity. However, this association is not statistically significant, as shown by the p value. The financial participation variable and labor productivity have a negligible relationship, as evidenced by the p-value. This finding also indicates that variable hours of work and labor productivity are positively related. The positive sign tells us that working time increases labor productivity. This is odd in our analysis. The result shows that a 1.0% increase in working hours increases labor productivity by 4.9%. The p-value is 0.0001, which is significant. The employee's wage rate is 0.007454, which tells us that wages have a positive and significant impact on labor productivity. Wages play a very important role in determining labor productivity. The p-value is 0.0189, which is significant.

Human capital is the main factor that increases the resources of the firm and helps employees to increase their productivity. Human capital includes training, education, and the level of knowledge, skills, and abilities that improve the performance of a firm. Therefore, modern and developed countries

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make huge investments and take initiatives to increase human capital. The education system, health care, food quality and the environment distinguish the developed countries from the underdeveloped ones. The development of human capital ensures the efficiency and productivity of the workforce and will ultimately improve the overall efficiency of the economy. The importance of the human aspect and characteristics such as the level of education or the availability of sufficient resources is extremely important for the performance process.

In Uzbekistan, a significant number of measures (for example, large investments in education, focusing on education, training programs and formal attention to the reputation of educational services) have already been implemented. However, our results show that these policies should be continued and strengthened. In addition, in the light of the results of the study, some recommendations can be identified, including the education reform should be linked to national development projects and reform plans for various sectors, as well as the establishment of a national information system and a national labor market and employment database. Finally, encouraging young people to vocational education and training through a long-term educational policy and strategy in which incentives are a key element.

The STEP study brings together evidence-based evidence and practical experience from fields ranging from research on determinants of development and early childhood learning outcomes to experience in reforming vocational education systems and labor markets

In our opinion, five areas of policy action are recommended to improve the skills of the current and future workforce in Uzbekistan:

1. Getting children right from the start by expanding access to early childhood development programs that are critical to equipping all children with the cognitive and non-cognitive skills that lead to high productivity and flexibility later in working life.
2. Ensuring learning for all students by modernizing curricula and improving the quality of teaching to strengthen the link between education and cognitive and non-cognitive skills.
3. Building the job-oriented skills demanded by employers through the implementation of selected active labor market programs with a particular focus on discouraged workers and increasing the proportion of women in the workforce, as well as encouraging companies to provide training for their workers.
4. Stimulating entrepreneurship and innovation by increasing access to quality higher education for motivated students, which can ensure that graduates of higher education have skills valued in the labor market and that investment in higher education pays off.
5. Ensuring that the skills offered are in line with the demand of employers by improving the information systems of the labor market that can increase its efficiency by expanding information about vacancies for job seekers and obtaining jobs through the mechanism of signaling the required skills of workers that meet the modern requirements of the digital economy in the construction industries.

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