

# Economic analysis of factors associated with education and employment

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## Abstract

The purpose of the research is to determine and analyze the current situation in the Georgian economy, labor market requirements, existing workforce structure, main challenges and trends. Important studies were conducted, within the framework of which market requirements were analyzed, consultations were held with experts in the field, employers, representatives of the Center for the Development of the Quality of Education; The present situation of supply and demand in the educational market is studied and analyzed. Qualitative and quantitative studies were also conducted, within the framework of which the following were identified: the compatibility of higher education programs with the market requirements, the inclusion of practical components in the educational process, the relationship between higher educational institutions and students, and the processes of interaction between education and the labor market. We think that the promotion of professional education will definitely lead us to the desired results, both from the point of view of the economy of Georgia and the general situation in the country. There is simply a need for more involvement from the state and, accordingly, more properly conducted measures, raising the level of awareness in society and creating all the prerequisites in order to change the attitude towards vocational schools as positively as possible. All this will eventually become a contributing factor for improving the level of education or the economic situation. The study concludes with findings and suggestions, which cover the issues facing the Georgian labor market and the labor force demand vision. The examination of the influence of higher education on employment and income in Georgia demonstrates that the investment in higher education yields a discernible return at this point, but the human capital developed in the higher education system is still not being employed efficiently in the country.

## Keywords

economic effect of education, labor market, factors associated with education and employment, importance of professional education for the economy, rate of public return of higher education

## 1. Introduction


In general, the countries have been giving more and more importance to education in the recent period, and accordingly they will pay more expenses for the latter as possible. Why is this happening? The answer is that education is a kind of investment in the creation of human capital. Simply put, the state will pay for the education of a specific person today because it will benefit from this person in the future, it may be performing a specific job, participating in technological progress, introducing innovations or any other form that has a positive impact on the economic and general environment of the country.


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To some extent, differences in education levels can also explain differences in income between countries, but not always. The truth is that a high level of education also indicates a high level of economic development and growth of the country. However, since there are many other factors that have a noticeable impact on the economy, a high level of education alone is not enough to maintain its good condition. Even if we ignore the influence of other factors, it is still an issue that deserves our attention. Having the necessary resources (in this case, we mean a high level of education) does not indicate guaranteed good results, it is necessary to give these resources the right direction and use them effectively.

To better understand the relationship between education and economy, here we can briefly talk about the factors that have been identified by researchers over time and which have a direct impact on the country's economy:

- Education increases the potential for innovation, which creates the basis for economic growth;
- Educated workforce is highly productive (easily assimilates technologies) and therefore contributes to the growth and development of the economy;
- By investing in education, a better environment is created for technological development, which naturally has a positive impact on the increase in labor productivity and, accordingly, on the economy.

Here, as an example, we cite the research of Krueger and Lindahl [1], which meant the creation of such a tool that would make it possible to compare school years with economic growth. The result of this was the following: from one additional year of education, more than 10% gains were received. Despite the shortcomings that accompanied such measurement, it is still possible to create a certain idea about the relationship between education and economic growth.

Also, we can consider the method of Hanushek and Woessmann [2], which was about comparing the quality of education and economic growth by countries. TIMSS and PISA tests were used in the method, and the observation finally showed that high results of the tests indicated an appropriate expression of economic growth in percentages of GDP.

The study of the economic effect of education has become particularly noteworthy since the 1980s and 1990s, due to the wage inequality in different countries. According to international studies on the assessment of individual educational outcomes, for each additional year of formal education, the world average of individual financial outcomes increases by 10% [3]. It is significant that the highest coefficient of economic growth is recorded in the case of countries with low and middle income (10.9 and 10.7 respectively). In high-income countries, the coefficient of growth is 7.4.

It is also worth noting that over the last 12 years, the amount of education gaps has decreased by 0.6%, as access to formal education has increased worldwide and, therefore, the average number of years of formal education (especially in countries with strong economies). This circumstance leads to the strengthening of competition in local labor markets based on the supply of human resources in excess of the existing demand, and also to the proliferation of low-income jobs, which, in turn, lowers the individual financial benefits of education [4]. Therefore, finance for human capital is typically considered as an investment aimed at enabling

individuals to fully participate in economically productive activities in order to make a livelihood [5, 6, 7, 8, 9, 10, 11, 12, 13]. To do this, the student must be transformed from a passive consumer of knowledge into an active creator of knowledge. Continually enhance ability to apply new information to practical situations in order to advance critical technical, financial, socioeconomic, legal, and management procedures; to increase own and society's capacity for economic activity via social responsibility and collaboration [14].

As a result, the article examines the present trends in employment and unemployment in the country, covering industry and age. The labor market's demand component has been investigated, and the key sectors with especially strong economic activity have been identified, which is one of the required criteria for the expansion of employment in these areas.

## 2. Methods

Important studies were conducted, within the framework of which market requirements were analyzed, consultations were held with experts in the field, employers, representatives of the Center for the Development of the Quality of Education; the present situation of supply and demand in the educational market is studied and analyzed. Qualitative and quantitative studies were also conducted, within the framework of which the following were identified: the compatibility of higher education programs with the market requirements, the inclusion of practical components in the educational process, the relationship between higher educational institutions and students, and the processes of interaction between education and the labor market. Furthermore, our research involves an examination of job searchers and jobs listed on the website of a private recruitment agency.

The topic of the research concerns 3 main issues:

1. Demand/supply analysis for selected higher education programs.
2. Determination of labor market requirements and challenges.
3. The importance of professional education for the economy.

This paper presents a study of the economic benefits of higher education (educational return) in the population of Georgia from a microeconomic perspective, in order to evaluate the personal/individual benefits (monetary benefits) of investment in education in the form of years and the impact of higher education on employment opportunities. As we have already mentioned, individual education gains show how much an individual's income increases (or does not increase) according to the number of years spent on formal education. Mincer's "income equality" is considered one of the most common methods for determining this relationship, and variables such as, first of all, the possibility of employment, as well as professional growth and advancement, job stability, the degree of autonomy in the work process, and so on, are used to determine non-monetary benefits [15]. After that, overall, it affects job satisfaction.

### 3. Results and discussion

#### 3.1. The main challenges of the Georgian labor market

In post-communist countries, where economic reforms started relatively late, the restructuring of the labor market took place differently from developed economies, where employment increased in contradictory directions, in particular, requiring high and low qualifications. In Georgia and other post-Soviet countries, the number of medium and low-skilled jobs has increased, and there has been an increase in such activities where there is a high demand for physical skills, for example, construction, the service sector, transportation, wholesale and retail trade. Such transformations of the labor market in post-communist countries led to the devaluation of the quality of education, knowledge and competencies of the largest part of the adult population (credential inflation), considering that post-communist countries (including Georgia) are characterized by a high share of the population with university education [16].

Ultimately, this was reflected in high rates of highly skilled labor force, as the population with higher education diplomas agreed to do low-skilled jobs [17]. At the same time, the workforce of the older generation is not equipped with the knowledge or skills corresponding to the requirements of the modern market, which, in turn, is an expression of the problem of knowledge devaluation. In general, the mentioned part of the labor force remains “downgraded” in the national labor market in workplaces with low productivity, where the possibility of professional development is minimal, and those with lower competences become unemployed [18, 19, 20].

The process of “downgrading” is strengthened by the fact that in post-communist countries the number of university graduates is constantly increasing, which exceeds the country’s economic capabilities. As a result, on the one hand, there is an imbalance in the labor market in terms of demand and supply of labor force, and on the other hand, the aging labor force is being replaced by a new generation, which also accepts low-skilled work. As a result, competition in the existing limited market increases and the aging workforce moves into even lower-level jobs or into the unemployed category.

Overall, an aging or young labor force that does not have modern education and skills hinders the adoption of new technologies in the labor market, the development of innovative work areas and the growth of productivity at the macroeconomic level of the country [21]. This is because a strong, educated workforce has the necessary information, abilities, and skills that potential employers are looking for [22].

Employment of young people is one of Georgia’s major labor market issues. Young individuals aged 15 to 24 in particular stand out as having a very high proportion of unemployment (figure 1). This is determined by several factors. In Georgia, most young individuals in the work field have a higher education, and after finishing their studies, they confront the following sorts of problems:

- 1) There is no demand in the labor market for the professions they have learned,
- 2) The profession they have mastered is a highly competitive profession,
- 3) And/or their credentials and work experience do not fulfill labor market standards. Furthermore, the percentage of frictional unemployment should be included in this group, because



**Figure 1:** Unemployment rate by age groups, data for 2020 and 2021 [23].

young people require longer time to obtain the desired work, taking into consideration a variety of reasons.

In addition, one of the main challenges of the Georgian labor market is demographic aging, which directly affects the distribution of the labor force in the market and creates the need to assess how capable the existing human capital is now or will be in the future to produce tangible or intangible benefits for the country [24].

An aging workforce is associated with declining health, physical and mental capabilities, as well as reduced adaptive behavior to a changing work environment, devaluation of knowledge, and overall, a decline in productivity [25]. Taking into account all these factors, the productivity of the labor force increases, on average, until the age of 40, and then begins to decline. Despite such a generalized reasoning, the international literature also discusses types of activities that have a positive correlation with the aging of the workforce or are not at all related [26, p. 150-152]. For example, in the case of a doctor and a lawyer, labor productivity increases with age; the labor productivity of bank clerks and electrical engineers does not depend on age, however, the productivity of construction workers decreases with age [21, 27].

In jobs that require problem-solving and fast-acting skills, productivity declines with age, while in jobs that prioritize experience and verbal skills, an older workforce maintains high levels of productivity [28]. Acceptable current economic, technological and organizational innovations are also taken into account, which lead to frequent changes in work requirements and due to which the weights of a number of factors determining the productivity of the workforce (physical abilities, mental abilities, level of education, work experience) also change in the modern labor market [29].

It is difficult to say with certainty what impact the rapidly transforming labor market will have on the workforce of different age groups [30]. However, due to the fact that technological development reduces the demand for physical work in the modern labor market, it is expected that the workforce of the older age group will be able to maintain high productivity under innovative management, which will take care of the targeted updating of the knowledge and skills of the workforce, regardless of its age indicators [31].

### 3.2. Factors associated with education and employment

Also, the results of the OECD 2016 report on economic structures by education field are interesting. Engineering and construction are associated with higher financial benefits; Social Sciences, Business and Law; Exact, natural and computer sciences. The financial benefits of those educated in the above-mentioned fields are, on average, 10% higher than the benefits of other graduates. As for university graduates in pedagogy, education and humanities, as well as language and arts, their financial benefit is 15% less than the average income [19].

In addition, it is important to observe the distribution in the labor market according to their education. The research results reveal that:

- The share of hired employees with higher education is high in the education system (82%), complex office/administrative (81%) and finance/banking/insurance (86%) fields;
- Employees with school education represent the majority in defense and security (82%), production (57%) and construction (61%);
- Employees with professional education dominate in wholesale and retail trade (38%), as well as in individual services (43%).

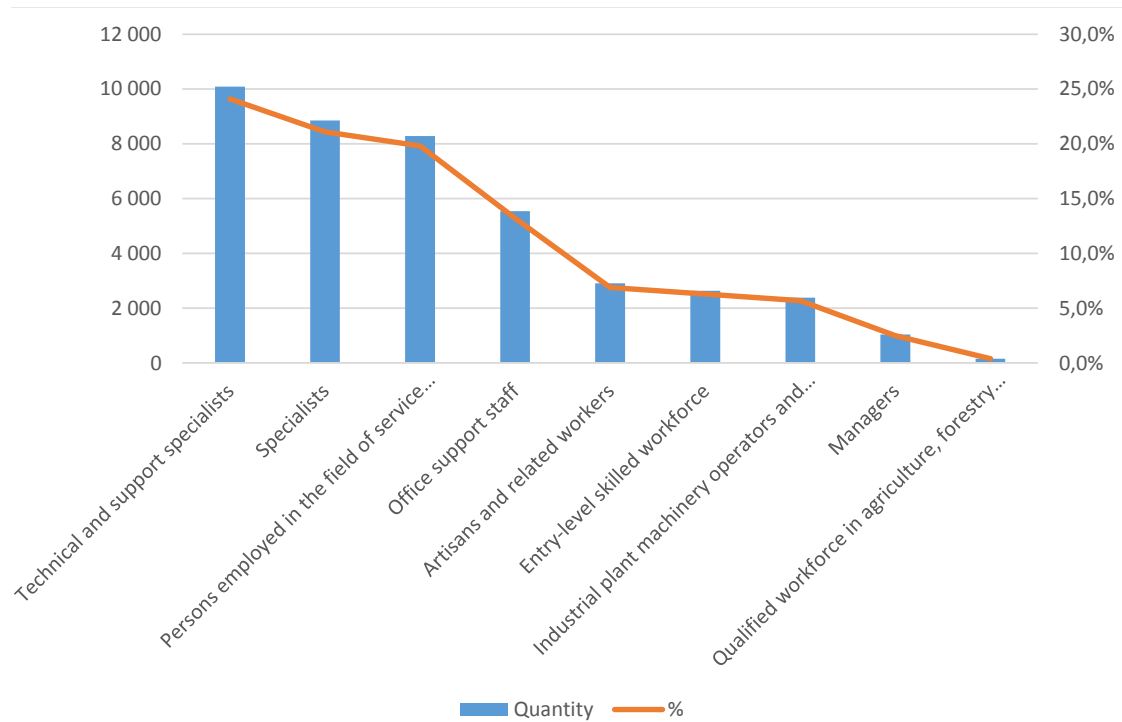
Along with the factors related to education, the factors associated with the employment market are no less important. This refers to the number and types of vacancies in the market [32, 33].

In 2021, according to the results of the labor market demand component survey conducted in Georgia, trade, repair of cars and household items, restaurants and hotels, metallurgical industry, individual services are the economic activities in which employers experience a shortage of personnel [34]. There is a special demand for teachers and healthcare professions in the regions. However, despite the existing differences, there is a demand for accountants, waiters, sales assistants in all regions of Georgia (including Tbilisi). Therefore, our research also includes the analysis of job seekers and vacancies registered on the website of the private employment agency (hr.ge). According to Hr.ge, more specifically, what positions are in demand, is given in figure 2 [35].

Regarding the labor force recruitment problems, the majority of the employing organizations point out that there is a shortage of specific and necessary personnel in Georgia and that the applicants do not have the relevant skills for the job positions. Sales and marketing managers, confectioners, bank cashiers, teachers, journalists and others are among the deficient professions.

According to the ISCO-08 classification [36], the above-mentioned positions are mostly combined in the service and sales, individual service fields, as well as in the category of artisans/related workers and education professionals. Taking this into account, it is interesting to see what field of study graduates predominate in Georgia today and how professional preferences change over time (figure 3).

According to the 2022 data of the National Statistics Office of Georgia, among the undergraduate graduates of both state and private universities, the majority are graduates of social sciences, business and law. These programs have maintained their leading position since 2011. Educational programs related to the field of service and engineering and construction fields in both state and private universities are characterized by an increasing number of graduates. A downward trend is evident in the case of health and social service programs and agricultural education programs.



**Figure 2:** Vacancies published on Hr.ge by main professional groups, 2020 [34, 35].

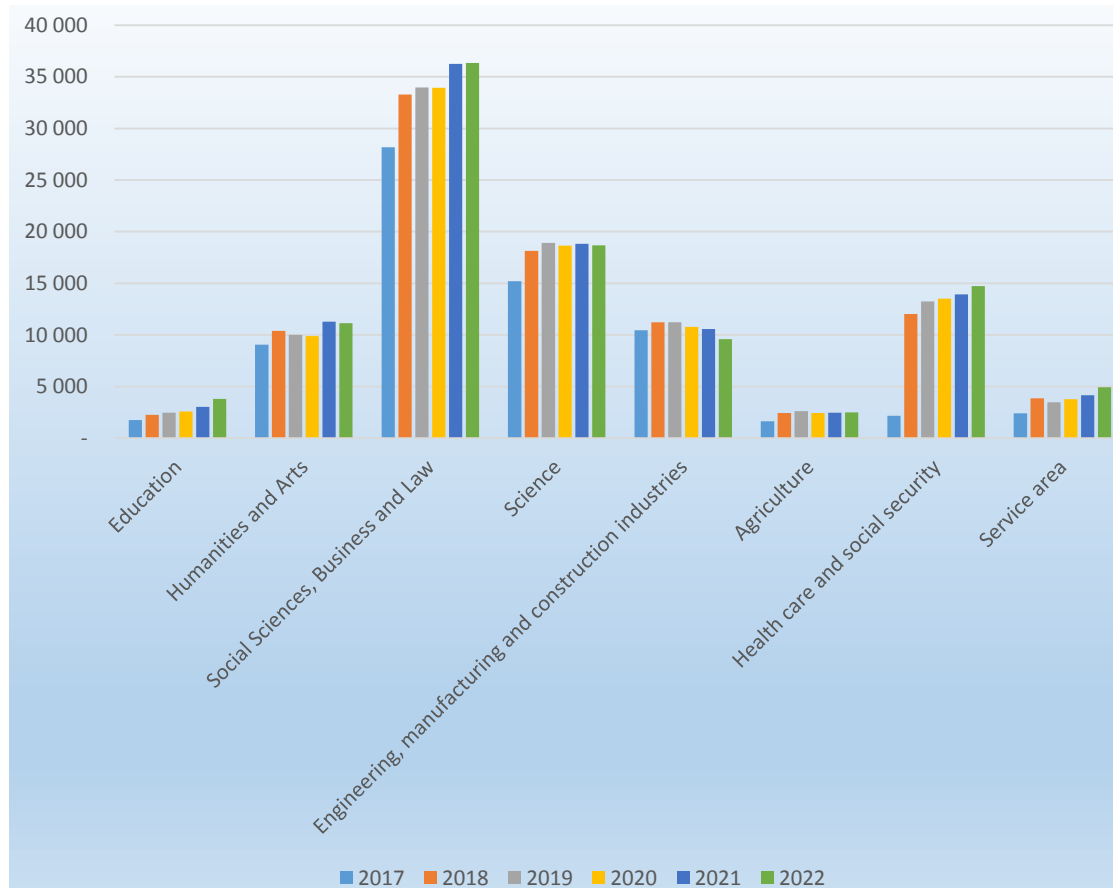
### 3.3. The importance of professional education for the economy

In general, the functioning of the economy is significantly influenced by the level of unemployment. A high level of unemployment can have a very noticeable and negative impact on the economy and, accordingly, on the standard of living of the society [38]. It is associated with low incomes, low incomes in turn indicate deterioration of living standards and reduction of consumption [39, 40]. Reduced consumption naturally also has a negative impact on output: no demand, no supply. The reduced output further increases the ranks of the unemployed, and so endlessly, if it were not for the various measures taken by the state and the fight against the mentioned challenges [41, 42, 43].

Unfortunately, vocational education in Georgia is not in a very good condition, more and more people reach higher education institutions, and less and less people remain in the ranks of those wishing to receive vocational education [22, 44]. This ultimately leads to the fact that we have too many graduates of higher educational institutions in the country, whose employment is physically impossible [45].

What will happen if the number of applicants is properly distributed between professional and higher education institutions? We think that the better the conditions for professional education, the more people will be interested in it, and all this will have a positive effect on the level of unemployment. We are talking about the case when the redistribution of people with higher and professional education will be logical, the demand for vocational schools will increase and there will be a correct match between vacant places and working people [46, 47].





**Figure 3:** Number of students in state higher educational institutions according to programs [37].

However, everything considered is not so simple, since vocational education faces various problems and challenges [48].

If we ignore unemployment (which is quite difficult in the case of Georgia), those professions, which vocational schools provide the opportunity to master, are quite important for the economy. It is good to have higher education, it is good to create the basis of technological progress and to increase the degree of innovation, but all this also requires graduates of vocational education programs.

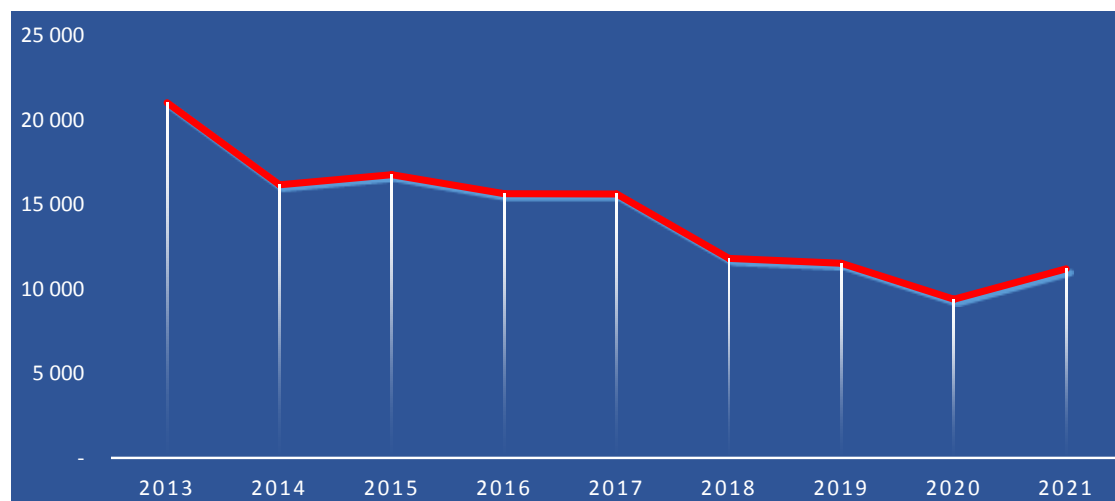
We can cite a simple example to better understand the role of professional education. We know that the state will spend resources on education, on the other hand, the individual also spends money and time on education, but often the costs incurred are more, and the benefits received are less [49, 50, 51]. This may be due to the education system, less effort of the student himself or some other reason. However, the fact that expenses were spent on education at the initial stage does not change. At this time, we reach a situation where the expenses and time spent are in vain.

Vocational education requires (in most cases) less costs and, most importantly, less time. As



for the results, it is entirely possible for a person with a vocational education to have more income, be able to do more work, and therefore benefit the economy and themselves more than a person with a higher education could [52]. Therefore, we believe that professional education plays a very important role in the growth and development of the country's economy, and even more so in the effective distribution of resources (which is naturally accompanied by the improvement of the economy) [53].

Based on the recent (2013-2021) data of the National Statistics Office of Georgia, we can conclude that the number of people enrolled in vocational schools is characterized by a decreasing trend, which is not really good. The number of educational institutions that accepted students for professional programs also decreased. The decrease in the number of students enrolled in vocational schools is shown in figure 4.

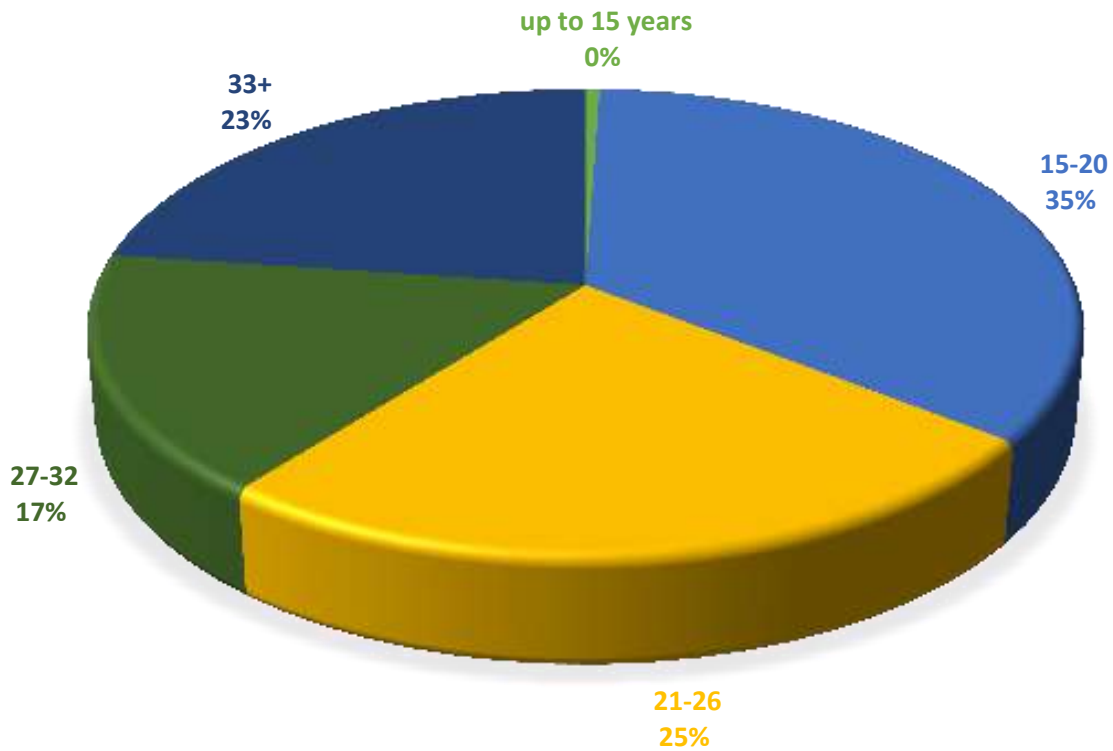


**Figure 4:** Admission of students to professional programs, 2013-2021 [54].

It should be noted that over the years, a large part of the demand for vocational schools of Georgia came from the older population, and this demand from the students was quite small, although recently the situation is changing and by 2021, 60% of the population under the age of 26 will be enrolled in vocational schools. Figure 5 allows us to make the mentioned conclusion, where the data of 2021 on students enrolled in vocational schools, divided by age groups, are presented.

We think that the promotion of professional education will definitely lead us to the desired results, both from the point of view of the economy of Georgia and the general situation in the country. There is simply a need for more involvement from the state and, accordingly, more properly conducted measures, raising the level of awareness in society and creating all the prerequisites in order to change the attitude towards vocational schools as positively as possible. All this will eventually become a contributing factor for improving the level of education or the economic situation [55].

In general, we believe that the promotion of vocational education, especially in the case of Georgia, will be one of the means for reducing the unemployment level and for the effective



**Figure 5:** Distribution of students in vocational schools by age, 2021 [54].

formation of the labor market. However, despite the fact that professional education is popular in many countries, the attitude towards it in Georgia is quite negative. The majority of students blindly choose higher education without analyzing the situation and the expected results, and in many cases we come to the expenses incurred on education, whether it is monetary resources or students' labor and time, which is wasted, we mean the case when the expenses incurred on education exceed the benefits received.

#### 4. Conclusions

As can be seen from the above data and their analysis, in the modern labor market there is a greater demand and, accordingly, an abundance of vacant positions in the direction of service and sales, as well as individual services. And the number of graduates is the largest in such educational programs, which in the future involve employment as high-ranking professionals rather than starting work in the field of trade, sales and services (ISCO-08).

Therefore, it will not be an exaggeration to say that there is a real imbalance in the modern national labor market in terms of supply and demand of human capital. On the other hand, this circumstance clearly indicates the weak institutional connection between the education policy and the labor market, which is an important factor determining the high degree of vertical and horizontal mismatch between education and employment.

Summarizing the issues discussed above, we can draw the following conclusion. We have seen that education plays a very important role for each country, it is important both for the country's economy and for the state of the country in general. Based on history and examples of countries, it can be said that differences in the level of education often explain differences in income, which once again emphasizes its important role, although not always, since there are many other important factors that also affect the economy of a country.

The analysis of the influence of higher education on employment and income in Georgia demonstrates that the investment in higher education yields a discernible return at this point, but the human capital, which is created in the higher education system, is still not effectively used in the country. As a result, in addition to increasing state investment in higher education, it is critical to implement other measures to raise the rate of public return on higher education. Possible approaches in this direction include:

- Rationalization of state expenditures on higher education based on empirical data;
- Increasing the compatibility of higher education system outcomes with market requirements;
- Increasing overall income from higher education;
- Increasing access to higher education for vulnerable groups;
- Providing relevant statistics for distribution of employment and unemployment levels according to qualifications;
- Further encouragement of cooperation between the private sector and vocational schools to increase the existing scale of transition to work-based learning. Also, increasing the involvement of the private sector in the process of developing vocational education training programs to ensure compliance of vocational education programs with labor market requirements.

## References

- [1] A. B. Krueger, M. Lindahl, Education for Growth: Why and for Whom?, *Journal of Economic Literature* 39 (2001) 1101–1136. doi:10.1257/jel.39.4.1101.
- [2] E. A. Hanushek, L. Woessmann, *The Knowledge Capital of Nations: Education and the Economics of Growth*, The MIT Press, 2015. URL: <http://www.jstor.org/stable/j.ctt17kk9kq>.
- [3] G. Psacharopoulos, H. A. Patrinos, Returns to investment in education: a further update, *Education Economics* 12 (2004) 111–134. doi:10.1080/0964529042000239140.
- [4] Z. Gia, *Basic Paradigms of Institutional Economics*, Publishing House “Universal”, Tbilisi, Georgia, 2021. doi:10.5281/zenodo.5544934.
- [5] G. Abuselidze, *Financing Higher Education: New Challenges, Incentives and Opportunities*, IOP Conference Series: Earth and Environmental Science 1026 (2022) 012066. doi:10.1088/1755-1315/1026/1/012066.
- [6] O. Erfort, I. Erfort, L. Zbarazskaya, Financing higher education in Ukraine: The binary model versus the diversification model, *International Journal of Educational Development* 49 (2016) 330–335. doi:10.1016/j.ijedudev.2016.03.009.

- [7] R. Fernández, R. Rogerson, Education finance reform and investment in human capital: lessons from California, *Journal of Public Economics* 74 (1999) 327–350. doi:10.1016/S0047-2727(99)00046-8.
- [8] M. Gradstein, M. Kaganovich, Aging population and education finance, *Journal of Public Economics* 88 (2004) 2469–2485. doi:10.1016/S0047-2727(03)00065-3.
- [9] C. Christou, M. Haliassos, How do students finance human capital accumulation?: The choice between borrowing and work, *Journal of Policy Modeling* 28 (2006) 39–51. doi:10.1016/j.jpolmod.2005.07.006.
- [10] W. W. McMahon, Education Finance Policy: Financing the Nonmarket and Social Benefits, *Journal of Education Finance* 32 (2006) 264–284. URL: <http://www.jstor.org/stable/40704293>.
- [11] S. M. Dougherty, The Effect of Career and Technical Education on Human Capital Accumulation: Causal Evidence from Massachusetts, *Education Finance and Policy* 13 (2018) 119–148. doi:10.1162/edfp\_a\_00224.
- [12] F. Lozano R., Evaluating An Alternative To Finance Higher Education: Human Capital Contracts In Colombia, *Revista de Economía del Rosario* (2009). URL: <https://www.redalyc.org/articulo.oa?id=509555113001>.
- [13] L. Yang, B. McCall, World education finance policies and higher education access: A statistical analysis of World Development Indicators for 86 countries, *International Journal of Educational Development* 35 (2014) 25–36. doi:10.1016/j.ijedudev.2012.11.002.
- [14] G. Abuselidze, O. Mohylevska, N. Kompanets, L. Iushchenko, Modern concepts and methodological recommendations for teaching economic disciplines: tasks of the course “Digital Management of Transport Infrastructure”, *Transportation Research Procedia* 63 (2022) 2759–2766. doi:10.1016/j.trpro.2022.06.319, x *International Scientific Siberian Transport Forum – TransSiberia 2022*.
- [15] J. Mincer, *Schooling, Experience, and Earnings*, volume 2 of *Human Behavior and Social Institutions*, National Bureau of Economic Research, New York, 1974. URL: <http://www.nber.org/books/minc74-1>.
- [16] O. Kupets, Skill mismatch and overeducation in transition economies, *IZA World of Labor* (2015) 224. doi:10.15185/izawol.224.
- [17] G. Abuselidze, L. Davitadze, Analysis of the necessity and efficiency of the HEI diploma holder professional retraining needs in Adjara Autonomous Republic, *E3S Web Conf.* 224 (2020) 03015. doi:10.1051/e3sconf/202022403015.
- [18] O. Kupets, Education in Transition and Job Mismatch: Evidence from the Skills Survey in Non-EU Transition Economies, *The Journal of Comparative Economic Studies* 11 (2016) 117–150. URL: [http://www.ces.kier.kyoto-u.ac.jp/jces/11\\_jces\\_2016/9%20Kupets.pdf](http://www.ces.kier.kyoto-u.ac.jp/jces/11_jces_2016/9%20Kupets.pdf).
- [19] OECD, *Education at a Glance 2016: OECD Indicators*, OECD Publishing, Paris, 2016. URL: <https://www.oecd-ilibrary.org/content/publication/eag-2016-en>. doi:10.1787/eag-2016-en.
- [20] E. Hanushek, For long-term economic development, only skills matter, *IZA World of Labor* (2017) 343. doi:10.15185/izawol.343.
- [21] C. E. Shekhar Aiyar, X. Shao, *The Impact of Workforce Aging on European Productivity*, IMF Working Papers, International Monetary Fund, 2016. URL: [https://www.imf.org/-/media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/wp/2016/\\_wp16238.ashx](https://www.imf.org/-/media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/wp/2016/_wp16238.ashx).
- [22] G. Abuselidze, L. Beridze, Financing models of vocational education and its impact on

- the economy: Problems and perspectives, SHS Web Conf. 66 (2019) 01001. doi:10.1051/shsconf/20196601001.
- [23] National Statistics Office of Georgia, Employment and Unemployment, 2023. URL: <https://www.geostat.ge/en/modules/categories/683/Employment-Unemployment>.
- [24] D. Checchi, *The Economics of Education: Human Capital, Family Background and Inequality*, Cambridge University Press, 2006. doi:10.1017/CBO9780511492280.
- [25] M. Mourshed, D. Farrell, D. Barton, *Education to Employment: Designing a System that Works*, Technical Report, McKinsey Center for Government, 2012. URL: <https://www.mckinsey.com/industries/education/our-insights/education-to-employment-designing-a-system-that-works>.
- [26] K. C. Gray, E. L. Herr, *Workforce Education: The Basics*, Pearson, Boston, 1997.
- [27] P. Brown, D. Ashton, H. Lauder, G. Tholen, *Towards a High-Skilled, Low-Waged Workforce? A Review of Global Trends in Education, Employment and the Labour Market*, volume 10 of *SKOPE Monograph*, ESRC Centre on Skills, Knowledge and Organisational Performance (SKOPE), 2008. URL: <https://ora.ox.ac.uk/objects/uuid:2e94e90e-e0f9-4b52-b5ba-2b18d92abfb8>.
- [28] S. Curtis, J. Williams, *The reluctant workforce: Undergraduates' part-time employment*, *Education + Training* 44 (2002) 5–10. doi:10.1108/00400910210416192.
- [29] M. Attaran, S. Attaran, D. Kirkland, *The Need for Digital Workplace: Increasing Workforce Productivity in the Information Age*, *International Journal of Enterprise Information Systems (IJEIS)* 15 (2019) 1–23. doi:10.4018/IJEIS.2019010101.
- [30] K. De Meulenaere, C. Boone, T. Buyl, *Unraveling the impact of workforce age diversity on labor productivity: The moderating role of firm size and job security*, *Journal of Organizational Behavior* 37 (2016) 193–212. doi:10.1002/job.2036. arXiv:<https://onlinelibrary.wiley.com/doi/pdf/10.1002/job.2036>.
- [31] L. Chawla, D. F. Cushing, *Education for strategic environmental behavior*, *Environmental Education Research* 13 (2007) 437–452. doi:10.1080/13504620701581539.
- [32] J. C. Witte, A. L. Kalleberg, *Matching Training and Jobs: The Fit Between Vocational Education and Employment in the German Labour Market*, *European Sociological Review* 11 (1995) 293–317. doi:10.1093/oxfordjournals.esr.a036365.
- [33] M. A. Somers, S. J. Cabus, W. Groot, H. M. van den Brink, *Horizontal mismatch between employment and field of education: Evidence from a systematic literature review*, *Journal of Economic Surveys* 33 (2019) 567–603. doi:10.1111/joes.12271.
- [34] Ministry of Economy and Sustainable Development of Georgia, *Analysis of the labor market of Georgia*, 2021.
- [35] HR.ge, *Vacancies, CV database*, 2023. URL: <https://www.hr.ge/>.
- [36] The ISCO team, *ISCO - International Standard Classification of Occupations*, 2010.
- [37] National Statistics Office of Georgia, *Higher Education*, 2023. URL: <https://www.geostat.ge/en/modules/categories/61/higher-education>.
- [38] D. R. Hale, L. Bevilacqua, R. M. Viner, *Adolescent Health and Adult Education and Employment: A Systematic Review*, *Pediatrics* 136 (2015) 128–140. doi:10.1542/peds.2014-2105.
- [39] T. Johnson, *Returns from Investment in Human Capital*, *American Economic Review* 60 (1970) 546–560. URL: <https://ideas.repec.org/a/aea/aecrev/v60y1970i4p546-60.html>.

- [40] A. Sichinava, M. Chikava, S. Veshapidze, D. Sekhniashvili, N. Pailodze, Realities of internationalization of higher education in Georgia, *PRADEC Conference Proceedings 2* (2013) 95–98. URL: <https://www.researchgate.net/publication/338459165>.
- [41] P. M. Romer, Increasing Returns and Long-Run Growth, *Journal of Political Economy* 94 (1986) 1002–1037. URL: <http://www.jstor.org/stable/1833190>.
- [42] G. S. Becker, N. Tomes, An equilibrium theory of the distribution of income and intergenerational mobility, *Journal of Political Economy* 87 (1979) 1153–1189. doi:10.1086/260831.
- [43] T. W. Schultz, Investment in Human Capital, *The American Economic Review* 51 (1961) 1–17. URL: <http://www.jstor.org/stable/1818907>.
- [44] A. Wolf, Review of Vocational Education – The Wolf Report, 2011. URL: <https://www.gov.uk/government/publications/review-of-vocational-education-the-wolf-report>.
- [45] G. S. Becker, Investment in Human Capital: A Theoretical Analysis, *Journal of Political Economy* 70 (1962) 9–49. doi:10.1086/258724.
- [46] S. Billett, *Vocational Education: Purposes, Traditions and Prospects*, Springer, Dordrecht, 2011. doi:10.1007/978-94-007-1954-5.
- [47] A. Fuller, Vocational Education, in: J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences*, second ed., Elsevier, Oxford, 2015, pp. 232–238. doi:10.1016/B978-0-08-097086-8.92091-9.
- [48] V. Kovalchuk, S. Maslich, L. Movchan, Digitalization of vocational education under crisis conditions, *Educational Technology Quarterly* (2023). doi:10.55056/etq.49.
- [49] B. A. Weisbrod, Education and Investment in Human Capital, *Journal of Political Economy* 70 (1962) 106–123. doi:10.1086/258728.
- [50] D. Card, A. B. Krueger, Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States, *Journal of Political Economy* 100 (1992) 1–40. doi:10.1086/261805.
- [51] S. Dessus, *Human Capital and Growth: The Recovered Role of Education Systems*, The World Bank, 1999. doi:10.1596/1813-9450-2632.
- [52] L. Clarke, C. Winch (Eds.), *Vocational Education: International Approaches, Developments and Systems*, Routledge, London, 2007. doi:10.4324/NOE0415380607.
- [53] G. Zoidze, Importance of Euro-Atlantic Integration: Democracy, Security and Economic Development, *Three Seas Economic Journal* 2 (2021) 1–7. doi:10.30525/2661-5150/2021-3-1.
- [54] National Statistics Office of Georgia, *Professional Education*, 2023. URL: <https://www.geostat.ge/en/modules/categories/60/professional-education>.
- [55] P. Domadenik, D. Farčnik, F. Pastore, Horizontal Mismatch in the Labour Market of Graduates: The Role of Signalling, Discussion Paper 7527, Institut zur Zukunft der Arbeit, 2013.