ECONOMIC GROWTH EFFECT OF GOVERNMENT EXPENDITURE ON EDUCATION

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Abstract: Education is a key area of public life and its function is to provide highly qualified human capital. The development of the field of education is directly dependent on the funds allocated for training, research and innovation. The spread of the COVID-19 epidemic crated many social and economic problems that national governments are expected resolve quickly and effectively by finding rational solutions. Education is one of the areas of strategic importance for overcoming the consequences of the pandemic. It is an important part of the public sector in which education, training and acquisition of knowledge and skills take place.[1]

Keywords: education, GDP, expenditure on education, SRD, funding.

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Introduction

Globalization and the dynamically developing information and communication technologies lead to significant changes in the business environment and, hence, in the labour market and the requirements for qualification, knowledge and skills to be acquired by university students. As early as in March 2020, when the global COVID-19 pandemic was

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officially acknowledged and measures to contain and stop the spread of the virus were introduced (Проданов & Станимиров, 2020), the schools and universities had to adapt quickly to this situation, which actually turned out to be a catalyst for these processes and boosted the fourth industrial revolution – digitalization. This increased the need for continuous development of the digital competences of the employees of both private and public sector companies and for changes in the educational processes in higher schools. Therefore, the object of this research is education and in particular higher education. The subject of research is the cost of education and transfers from the state budget to higher education as a factor for economic growth. The aim of the study is to establish whether, despite the force majeure nature of the COVID-19 pandemic, long-term economic growth (as a generator of GDP) and the growing share of education expenditure in GDP (as a generator of labour and competences and a direct beneficiary of budget transfers) are factors for successful sectoral adjustment and overcoming the consequences of the pandemic. In the specific case for Bulgaria, it is especially important to emphasize that the strategic multi-year partnership of the MES with Microsoft, the development of distance learning technologies in higher education within its new regulatory framework of 2021 (MOH, 2021) and the significant public and private investment in broadband network infrastructure and Internet connectivity enabled the adaptation of the educational system from in-class to online learning in a very short period of time. All this is a logical function of the conservative government policy (Захариев & Димитров, 2015) in the field of public finance (Петев, 2021), the accumulation of reserves to implement government's measures and the derogation of fiscal constraints within the EU, which led to effective support for education, the economy and the social services during the crisis.

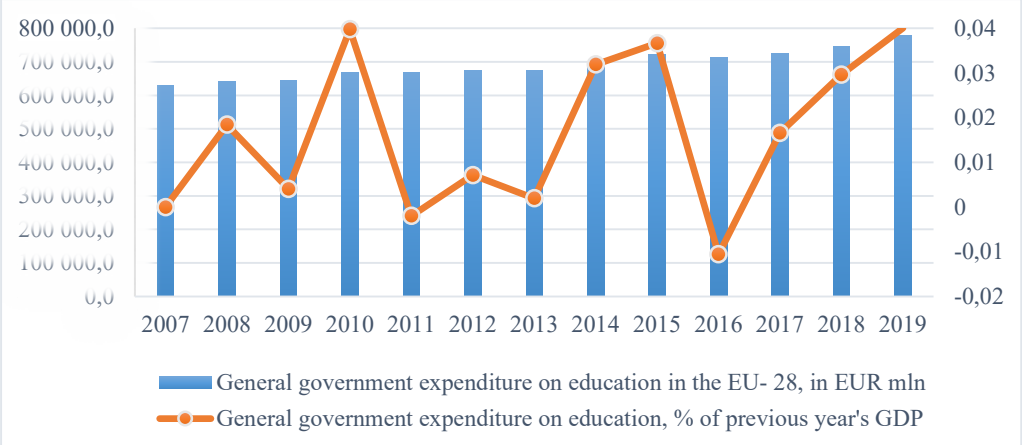
1. An analysis of education spending and the state budget transfers to state-owned higher schools

In the conditions of the global and unprecedented crisis, the role of the central government as an economic agent and regulator of the economy is becoming even more important and noticeable. Its fiscal policy, mainly in terms of taxation and government spending, is one of the key instruments for government intervention. Therefore, we can claim that government spending is an important factor that has an impact on economic activity. Government spending in the form of recovery measures, as well as the marked decline in economic activity over the past year, have proved to be a major challenge for governments to maintaining fiscal stability. (Zahariev, Radulova, Aleksandrova, & Petrova, 2021).

Increasing the spending on education is a prerequisite for a country's prosperity. An increase of the relative GDP share of public spending on education contributes to improving the welfare of a country. Another key indicator in this field is government spending on research and development. It is instrumental for improving human capital in a country and provides a significant advantage as a means of addressing global macroeconomic challenges (Филипова, 2013).

In recent years, technological advancement worldwide has become another key factor that promotes investments in human capital and in particular in education. Expenditure on education is an important indicator of the development of both the society and the economy of a country. Its dynamics shows the trends in government spending policies.

Figure 1 shows the dynamics of general government expenditure on education in the EU from 2007 to 2019. Throughout this period, its total volume increased by about 23%, or € 150 million. With the exception of 2011 and 2016, in all other years the expenditure on education was rising, i.e. there is a marked trend of increase of public spending on education. Despite its lower growth rate, the steady upward trend in public spending has also led to an increase in its share of the Community's gross domestic product.[2] This means that a significant share of GDP is allocated to investments in human capital and other activities directly related to education. The percentage of GDP of the general government expenditure on education was about 5%, and that of the total general government expenditure was about 10%.[3]



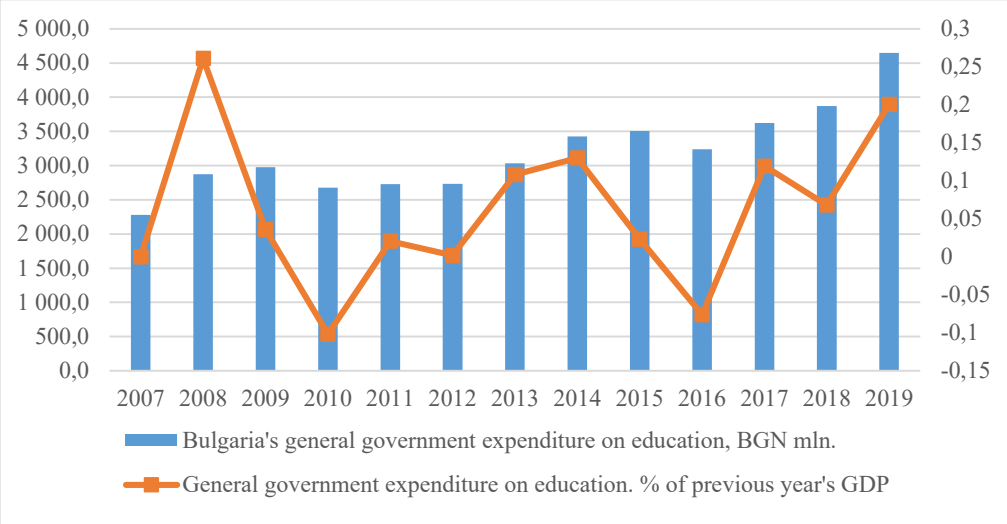
Source: Eurostat and author's calculations.

Figure 1. ***General government expenditure on education in the EU from 2007 to 2019***

[2] According to Eurostat data www.bit.ly/3vrvaDG

[3] According to Eurostat data www.bit.ly/3aMoM1J

Figure 2 presents the dynamics of general government expenditure on education in Bulgaria for the period 2007–2019. In the first years after the crisis, its volume went down to its lowest level in 2010.



Source: Eurostat and author's calculations

Figure 2. ***General government expenditure on education in Bulgaria from 2007 to 2019***

From 2010 until 2015, the volume of government expenditure on education was increasing and then went down again in 2016. Since then and until the end of the reviewed period there was a trend of increasing of government expenditure on education. Education is a long-term investment with a return expected over long periods of time. Naturally, all economic models and policies are always based on GDP as the main indicator of economic activity (Захариев, 2018). Therefore, in order to determine more clearly the trend of government expenditure and its effect on the macroeconomic indicators, the relationship between the rate of change of government expenditure on education and GDP of Bulgaria was investigated.

The relationship between government expenditure on education and GDP (in order to achieve more accurate results, data on the real GDP of Bulgaria was used) is expressed as a correlation coefficient. Its average value over the period was +0.57, which means that there is a directly proportional relationship between the factor and the result, i.e. that an increase of government expenditure on education expenditures leads to an increase of GDP.

Having calculated the correlation coefficient, we proceeded with the regression analysis. Figure 3 clearly shows that more significant results are obtained by using a polynomial regression model. The results showed that the

values were not statistically significant, i.e. government expenditure on education does not have a very pronounced effect on real GDP. The linear method of regression analysis was then applied. The obtained results are presented in Table 1.

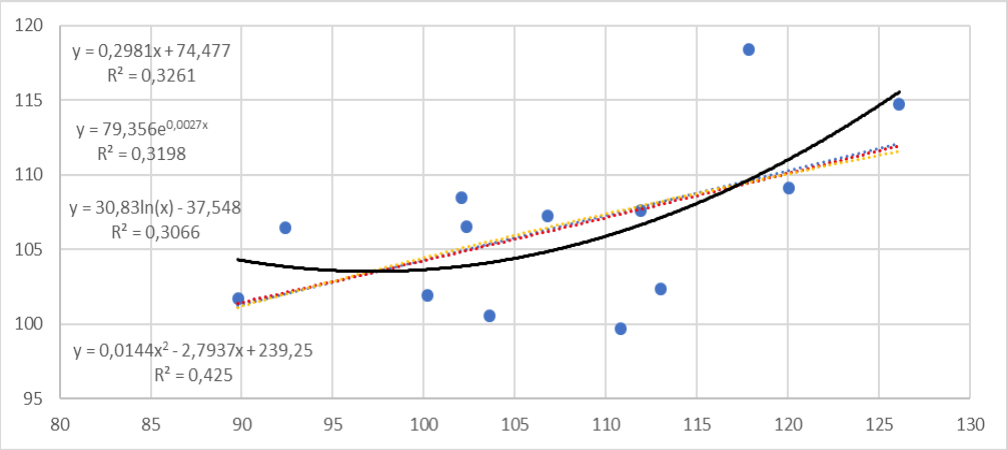


Figure 3. ***Regression analysis models***

In this regression, the correlation coefficient is also +0.57, which shows a positive relationship between the two variables. The coefficient of determination R^2 is 0.32 and shows that the impact of government expenditure on education on the country's GDP is 32%, and the remaining percentages up to 100 are due to other factors that are not included in the model. The value of the parameter *X* is 0.29. This means that an increase of *X* by one unit leads to an increase in the resultant trait by 0.29 units. The coefficient is statistically significant at a significance level of 0.05 (*P*-value = 0.04 < 0.05).

This regression model shows that there is a direct relationship between the dynamics of expenditure on education on the dynamics of economic growth represented by the main macroeconomic indicator – Bulgaria's GDP.

Higher education is the primary provider of highly qualified human capital for the society and the economy. Bulgaria will also need highly qualified personnel who will be able to develop advanced technologies, find effective solutions and meet the needs of the business. The quality of the workforce is a key condition for increasing the competitiveness of enterprises, and hence the economy as a whole. This is why higher education plays a key role for providing highly educated and qualified specialists.

Table 1

Regression model of dependence between Bulgaria's government expenditure on education and real GDP

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.57107
R Square	0.32612
Adjusted R Square	0.26486
Standard Error	4.72524
Observations	13

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	118.86047	118.86047	5.32342	0.0415
Residual	11	245.60641	22.32786		
Total	12	364.46687			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	74.47722	13.94423	5.34108	0.00024	43.78617	105.16830
X Variable 1	0.29810	0.12920	2.30725	0.04150	0.01373	0.58246

The quality of Bulgaria's higher education is a responsibility of the state authorities and the management of the higher schools. Their main task is to prepare universities to meet modern challenges related to obtaining quality higher education, as well as to maintain a high level of research, innovation and ethical standards (Овчаров, 2001). Therefore, they need to be provided with sufficient financial resources aimed at sustainable development and good performance.

The Strategy for Development of Higher Education in the Republic of Bulgaria for the period 2014–2020 (MOH, 2015) sets out priority guidelines and urgent measures for accelerated modernization and internationalization of Bulgaria's higher education.

One of the goals set in the Strategy aims to improve the quality of higher education in the country. This, in fact, shows the indisputable link between quality of education and expenditure on it. Table 2 presents in absolute terms the expenditure (both public and private) on higher education in Bulgaria as well as their relative share as a percentage of the country's GDP.

Table 2

Bulgaria's government expenditure on education

Indicator	2007	2008	2009	2010	2011	2012
Public + private expenditure on education (BGN thousand)	2 609 507	3 327 083	3 389 976	3 103 888	3 206 265	3 200 843
Public + private expenditure on higher education (BGN thousand)	806 322	1 050 418	1 148 202	921 491	988 693	993 766
Share of the expenditure on HE in the total expenditure on education	30.90%	31.60%	33.90%	29.70%	30.80%	31.00%
GDP (BGN. mln.)	63 455	72 790	73 181	74 434	80 714	82 239
Expenditure on HE as a % of GDP	1.30%	1.40%	1.60%	1.20%	1.20%	1.20%
Indicator	**2013**	**2014**	**2015**	**2016**	**2017**	-
Public + private expenditure on education (BGN thousand)	3 472 828	3 759 602	3 704 137	3 838 787	4 282 069	-
Public + private expenditure on higher education (BGN thousand)	1 066 602	1 218 261	1 200 020	1 205 264	1 417 553	-
Share of the expenditure on HE in the total expenditure on education	30.70%	32.40%	32.40%	31.40%	33.10%	-
GDP (BGN. mln.)	81 955	83 885	89 362	95 131	102 345	-
Expenditure on HE as a % of GDP	1.30%	1.50%	1.40%	1.30%	1.38%	-

Source: NSI's information system Infostat and author's calculations.

For the period 2007-2017, the expenditure on education was increasing gradually. In absolute terms, the expenditure on higher education was also rising steadily. After the crisis of 2008-2009, there was a slight decrease in the

volumes of both the total expenditure on education and the expenditure on higher education. The relative share of expenditure on higher education in the total expenditure on education during the period was almost constant and varied between 30 and 33%. The relative GDP share of public and private expenditure on higher education was also relatively constant at about 1.3%. The lowest share of 1.2% was reported in the period 2010-2012 and the highest (1.6%) - in 2009.

Table 3 presents the change in the state budget transfers to budgets of higher education institutions. For the period 2007–2019, along with the increase in the total value of expenditure and transfers from the state budget, transfers to state higher education institutions also increased. Here again there is a slight decline after the period 2008-2009 and then the trend is to increase transfers to higher education. Their relative share in the total expenditure and transfers from the state budget for the analysed period was almost constant at about 2%.

In order to estimate the level of expenditure on higher education in Bulgaria, we should compare it with the levels in other Member States of the European Union. According to Eurostat data[4] (data as of 2017), the relative share in GDP of public spending on higher education within the EU in 2017 was 1.18%. During this period, Bulgaria's government expenditure on higher education was 0.81% of the country's GDP. This can be considered a somewhat positive trend compared to the levels reported by Eurostat for 2015, when public spending on higher education in the EU was 1.23% of GDP, and that of Bulgaria was only 0.65% , which is almost two times lower than the European Union average.

In addition to direct transfers from the state budget to the budget of higher education institutions, there are other funds these institutions have the opportunity to use for scientific research through participation in infrastructure projects, mainly related to creation of software updates and implementation of technological innovations to facilitate the process of digitalization of education.

The emphasis is on the financing and practical implementation of research and development (R&D), as well as on the promotion and comercialization of research results. The results of higher schools' R&D are a key factor for obtaining competitive advantages and create innovations that promote economic growth (Димитрова & Дакова, 2021). R&D provide opportunities for collaboration between science and business. This can be seen as a process in which science creates knowledge and innovations that are used by businesses. Apart from their function to create human capital, universities are an important factor for the creation and practical application of knowledge through implementation of scientific products and innovations in the economy. This, in turn, has a positive effect on the innovation activity and economic growth of an

[4] www.bit.ly/3xyAcjp, retrieved on 19 Apr. 2021.

economy and provides an opportunity to increase its competitiveness (Димитрова, 2020).

Table 3

General government budget transfers to SHS

Indicator	2007	2008	2009	2010	2011	2012	2013
Total expenditure and budget transfers (BGN mln.)	13 772.60	16 346.60	19 534.30	17 879.00	17 425.30	17 690.20	18 298.00
Transfers to HS (BGN mln.)	281.9	346.7	420.3	384.5	333.0	345.2	376.0
Relative share of the transfers to HS	2.05%	2.12%	2.15%	2.15%	1.91%	1.95%	2.06%
Indicator	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	-
Total expenditure and budget transfers (BGN mln.)	19 694.20	19 493.40	21 401.40	21 803.60	23 005.40	24 810.50	-
Transfers to HS (BGN mln.)	375.7	410.2	407.4	419.9	440.7	485.3	-
Relative share of the transfers to HS	1.91%	2.10%	1.90%	1.93%	1.92%	1.96%	-

Source: Data from the Ministry of Finance and author's calculations.

R&D is funded by the state budget, businesses, and other national and foreign sources. Table 4 presents the sources and volumes of R&D funding for higher education for the period 2007-2019.

The average volume of funding from the private sector was BGN 8,100,000 over the period 2007–2019. At the beginning of the period, the share of funds from the public sector was the largest. In the period after 2008 the expenditure from this sector increased and it accounted for the largest share compared to other sources until 2017. The Higher Education and Non-profit Organizations sectors had the smallest share in terms of financing the costs of R&D. In 2009 and in the period from 2013 to 2017, there was no funding from these sectors. Over the analysed period, the Foreign Sector provided a large part of the R&D funding and in 2018 and 2019, the largest share of funding for R&D expenditures came from this sector.

Table 4

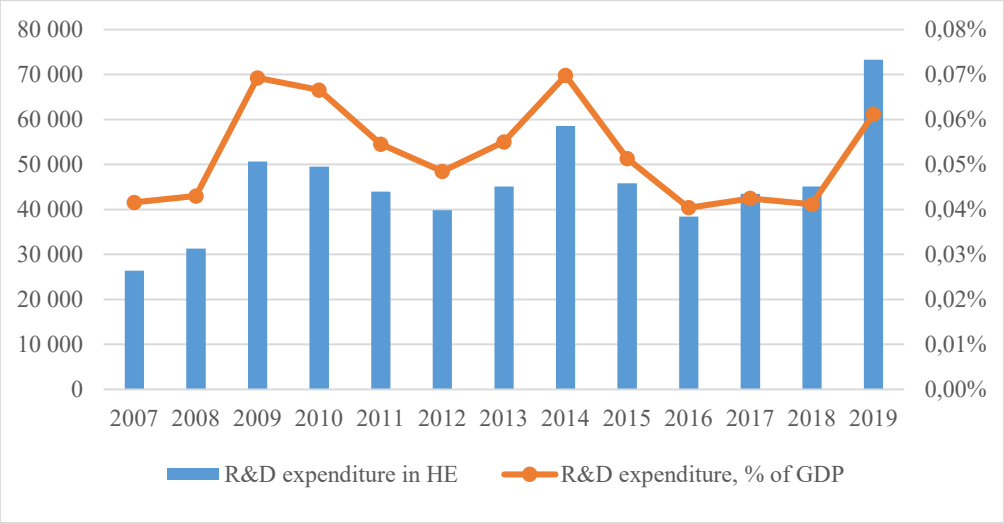
Structure of R&D expenditure in higher education by sources of funding (in BGN thousand)

Source of financing	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Businesses	5 167	5 472	11 075	8 231	7 018	7 822	5 997
Public sector	10 318	14 652	25 910	28 417	26 343	19 108	26 359
Higher education	2 350	1 117	..	1 688	292	736	..
Non-profit organizations	181	180	..	176	497	193	..
Foreign	8 372	9 873	10 899	11 034	9 846	12 007	12 218
Source of financing	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**-**
Businesses	8 417	10 447	8 271	9 567	8 693	9 187	-
Public sector	26 584	19 371	16 399	17 571	17 623	27 934	-
Higher education	..	..	..	..	247	626	-
Non-profit organizations	..	..	..	..	536	218	-
Foreign	23 363	15 550	13 359	16 008	18 042	35 329	-

Source: NSI's information system Infostat.

The overall trend of R&D expenditure in the Higher Education sector for the period 2007-2019 was to increase. Despite the decrease in the post-crisis period in 2008-2009, R&D expenditure gradually recovered their upward trend. The largest volume of almost three times the volume of R&D expenditures at the beginning of the study period was reported in 2019. One of the reasons for this increase is that the government adopted a policy to stimulate R&D and at the same time allowed other funding opportunities. Despite the increase, from 2007 to 2019 the expenditure as a percentage of GDP remained very low (below 1%.) This level is well below the 3% level[5] set by the EU as well as the target level of 1.5% set in the National Reform Program. One of the reasons for the low investment activity may be the insufficient interaction between science and business. The trend is illustrated in Figure 4 below.

[5] One of the priority goals in the "Europe 2020" strategy for smart, sustainable and inclusive growth approved in 2010, is that the volume of expenditure on research and development (R&D) should reach 3% of EU's GDP.



Source: NSI's information system Infostat and author's calculations.

Figure 4. ***R&D expenditure in the Higher Education sector***

The above results lead to the following conclusions:

- Over the period 2007-2019, there were no significant changes in the trend of increase of expenditure on education across the EU, which in an overall increase of GDP. In the period after the 2008 crisis, from 2007 to 2019, Bulgaria's expenditure on education decreased. Negative values were reported in 2010 and 2016. At the end of the study period, the volume of this type of government expenditure doubled compared to the beginning of the period;
- Correlation and regression analysis of the relationship between education expenditure and GDP show moderate interdependence;
- Public and private expenditure on higher education for the study period were rising steadily, and their relative share of GDP for the country remained constant at about 1.3%;
- Transfers from the state budget to the budget of higher education institutions were increasing, and in 2019 they were almost two time the volume in 2007. Their relative share in relation to total expenditure and transfers from the state budget was about 2%;
- The largest share of R&D expenditure, by source of funding, had the Public Sector and the Foreign Sector;
- Despite the increase in R&D spending in the higher education sector for the period 2007-2019, its percentage of GDP remained below the target levels set at European and national level.

2. European funding of education in Bulgaria

The analysis shows that higher education in Bulgaria needs additional financial support. In addition to the available resources at national level, other sources of external funding need to be sought. After Bulgaria's accession to the EU, the main sources of funding are the European funds and programmes.

The higher education institutions in the EU Member States can receive support for the implementation of projects under the operational programmes co-financed by two of the European Structural and Investment Funds - the European Regional Development Fund and the European Social Fund. Closer relationships with the business are also an additional source of funding. Moreover, such relationships are an opportunity for a more intensive exchange between theory and practice and thus students can receive training as close as possible to the actual practice environment.

As a member of the EU, Bulgaria adheres to the European regulatory frameworks, including those related to the development of higher education. One of these frameworks is the Strategic Framework for European Cooperation in Education and Training (Education and Training 2020). It provides opportunities for building good practices in the field of education policy and the exchange of knowledge and practices among the Member States. It puts an emphasis on the need for adequate funding for education systems in order to ensure their adaptability to the changing environment (Европейска комисия, 2020).

The outbreak of the global pandemic in 2020 disrupted and changed the normal life of all people around the world, including of those in the academic circles. This changed the EU goals into new and virtual ones. Due to the available digital educational tools that had already been used in education, the relationship between teachers and learners was not disrupted in full. The pandemic led to a rethinking of priorities and boosting digitalisation in education.

In this regard, the European Commission adopted some strategies to promote, support and develop digitally the higher education. The programs related to e-learning are: Digital Agenda for Europe, Digital Education Action Plan 2021-2027, European Skills Agenda for sustainable competitiveness, social fairness and resilience and the European Education Area by 2025.

At national level, the Strategic Framework for the Development of Education, Training and Learning in the Republic of Bulgaria (2021–2030), the Strategy for the Development of Higher Education in the Republic of Bulgaria 2021–2030 (Terziev, 2020) and the National Strategy for the Development of Scientific research in the Republic of Bulgaria 2017 - 2030, as well as the Ordinance on the state requirements for organizing distance learning in higher

education (enforced on September 1, 2021) were adopted (Zahariev, Ivanova, Angelov, & Zaharieva, 2021).

All these strategic documents are a logical continuation of a sustainable policy of the European Commission and the Bulgarian government to support digital competence and digitalization of the economy. They provide, even in conditions of pandemic social distance, opportunities to continue the processes of education (through online learning) and work (through home office working and teleworking).

Conclusion

The COVID crisis affected all areas of the economy, including education. Undoubtedly, it accelerated the process of digitalization, which led to a radical change in the educational process. It took a very short time for the students and teachers to switch to distance learning and to adapt to the changes in the nick of time. The analysis shows a positive correlation between expenditure on education and the country's GDP. Although the expenditure on higher education at the national level is not sufficient, the lessons from the pandemic crisis only confirm that a positive trend should be ensured with additional resources, including additional funding from European funds and programs, as well as through the widely debated national plan[6] for recovery and resilience.

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CONTENTS