

## EDUCATION AND EMPLOYMENT RATE IN ROMANIA

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**Abstract:** *Education can improve economic development. Starting from this assumption, the purpose of this study is to examine and understand the Romanian education system. To illustrate this aim, we have applied cluster analysis for a sample of 41 forty-one counties and we have used seven variables (Enrolled Population, Employment rate, Gross domestic product, ClassRooms, Classroom Teachers, School workshop and Education Units). One of the more significant findings to emerge from this study is that counties such as Cluj, Iasi, Timis, Constanta and Prahova presents the highest number of school workshops and classroom teachers, while also underlining the existence of the best-performing economies – in terms of GDP and Employment rate.*

**Keywords:** *education; employment; Romania; cluster; development.*

**JEL classification:** *I21; A20; E23; C38.*

### 1. Introduction

For Romanian education system the end of the communist era meant a lot of transformations. The reforms attempts over the last 27 years generated by the instability of the political class affected the Romanian education system. A confirmation of the problems facing by Romanian education system is: the results obtained at the annual national assessments and at the baccalaureate, the dropout rate, the enrolment rate and so on. This paper will focus only on Romanian education system.

According to Eurostat (2016), education is a key component of the Europe 2020 strategy. The target is to reduce „the share of early leavers of education and training to less than 10% and increasing the share of the population aged 30 to 34 having completed tertiary or equivalent education to at least 40% by 2020”. (European Commission, 2014).

We have organized the rest of the paper in the followings way: *Section 2* presents a literature overview of the main education determinants, *Section 3* describes the methodology used and our database. In the *fourth section* we discuss the results to finally conclude (*Section 5*).

## 2. Literature review

Romania allocates one of the lowest GDP percentages to the education system, while Denmark, Sweden, Finland, Malta, Belgium and Cyprus was reported the highest public expenditure on education, according Eurostat database.

Because of his prominent role in human life, education and system education of a country represent a persistent concern not only for the government, policy makers, and mass-media but also for the specialists in the field. There are a lot of studies which analyse the role of education for the economic growth, the dropout rate, the enrolment rate, the quality of education, the importance of education for the individual and for the whole society, the link between education and labour market, and the key role of education in poverty reduction, the infrastructure of education, the teaching staff.

„The two very basic reasons for expecting some link between education and economic growth” (Stevens and Weale, 2004) are: the rise of the living standards because of education and the level of income which depends on the level of education. The three mechanisms through which education may affect economic growth are highlights by Hanushek and Woessman (2010): „education can increase the human capital indispensable in the labor force; education can increase the innovative capacity of the economy; education can facilitate the diffusion and transmission of knowledge needed to understand and process new information and to successfully implement new technologies devised by others”. Badea (2011), Khattak et. al. (2012), Okilov (2012), Barro (2013), consider education not only a goal, but also a factor which influences the prosperity of a country and focuses on human capital as a determinant of economic growth, including education.

All the opinions regarding the importance of education for the economic growth converge to the fact that „education plays an increasingly important role in preparing new labor market entrants for the workforce and providing skill upgrading throughout the working career” (Karoly, 2010).

An important determinant of the school results is the infrastructure of education and the teaching staff. The basic element necessary to ensure access to education is the infrastructure of education. A school classroom must be a proper space to learn. According to Mureşan and Gogu (2012) „the lack of an adequate infrastructure and competences has a negative influence especially on the research activities”. A key role in the educational process has the human resources, especially the teaching staff, because great teachers help create great students. According to Hasan and Dolgun (2016) „the most important school-related factor influencing student achievement is an inspiring and informed teacher”. Moreover, Ciumas and Muresan (2016), explain in a qualitative research on a survey on Romanian students that „teachers have the possibility to steer their instruction activities towards fulfilling the students’ expectations”.

## 3. Methodology and data

The authors propose seven variables (Enrolled Population, Employment rate, GDP, ClassRooms, Classroom Teachers, School workshop and Education Units) to understand the Romanian education system. As you can see, Table no. 1 contains information regarding all variables from our sample.

**Table 1.** Description of the variables used in the cluster analysis

<b>Variable</b>	<b>Variable Description</b>	<b>Code</b>	<b>Source</b>
<b>Enrolled Population</b>	“all children in nurseries and kindergartens and students enrolled in the formal training and educational process during a school/academic year, regardless of the educational form, study programme or age.”(Source:NSI)	<b>EP</b>	NSI
<b>Employment rate</b>	“represents the ratio, expressed as percentage, between the civil employment population and the labour resources.”(Source:NSI)	<b>ER</b>	NSI
<b>GDP</b>	Gross domestic product	<b>GDP</b>	NSI
<b>ClassRooms</b>	the rooms used for educational and training process within school units. It can be used by two or three classes at the most, successively, during a day.(Source:NSI)	<b>CLASS</b>	NSI
<b>ClassRoom Teachers</b>	are the individuals who work in the educational system and teach in the educational and training process. (Source:NSI)	<b>Teacher</b>	NSI
<b>School workshop</b>	School workshop represents a room endowed with devices, instruments, machinery and equipment for school experiments and practical trainings. (Source:NSI)	<b>SW</b>	NSI
<b>Education Units</b>	“represents the administrative educational unit, juridical entity included in National Nomenclature SIRUES, where one or more level of education are functioning and having a single management system.” (Source:NSI)	<b>EDU</b>	NSI

Source: own construction

In order to identify the optimal number of clusters for the current data, a Hierarchical Cluster procedure was compiled for each of the two years taken into account. The variables were standardized before being included in the analysis, so their different measurement scales won't affect the quality of the results. The two analyses concluded, through the usage of their respective dendrogram graphs that the optimal number of clusters should be set to three for both 2006 and 2015.

The analysis was conducted initially on the forty-one counties and the capital city – Bucharest. However, preliminary analyses placed Bucharest in its own cluster. Given this aspect, it was excluded from further analyses due to its behavior as an outlier. The final cluster membership was conducted using the results obtained from the Hierchical Cluster analysis that were injected into two independent K-Means procedures for the years 2006 and 2015.

#### 4. Results

The results of the K-Means procedure for the year 2006 returned the following break-outs. The first cluster contains a total of twenty-two counties, while the second houses an addition eight. The final cluster presents the remaining eleven counties. The composition of each cluster can be observed in the *table 2*.

**Table 2.** The components of cluster analysis for the year 2006

<b>Cluster 1:</b>
<i>Alba, Bistrita-Nasaud, Botosani, Braila, Buzau, Calaras, Caras-Severin, Covasna, Giurgiu, Gorj, Harghita, Ialomita, Ilfov, Mehedinti, Olt, Salaj, Satu Mare, Teleorman, Tulcea, Valcea, Vaslui, Vrancea.</i>
<b>Cluster 2:</b>
<i>Bacau, Cluj, Constanta, Dolj, Iasi, Prahova, Suceava, Timis</i>
<b>Cluster 3:</b>
<i>Arad, Arges, Bihor, Brasov, Dambovita, Galati, Hunedoara, Maramures, Mures, Neamt, Sibiu</i>

Source: own computations according to the results returned by SPSS

In order to have a better understanding of the differences between clusters it is recommended to underline the findings from the Final Cluster Centres. The first cluster houses the lowest Z scores for all the variables considered. As it can be seen in the table2, *Cluster 1* presents the lowest number of school workshops, lowest number of education units and the lowest number of enrolled population. In addition, macro-indicators such as the Gross Domestic Product and Employment Rate also score the lowest levels in these counties.

*Cluster 2*, that includes Bacau, Cluj, Constanta, Dolj, Iasi, Prahova, Suceava and Timis – presents the highest normalized scores for every variables included in the analysis. More precisely, in these counties, in 2006 was present the highest number of school workshops and classroom teachers, while also underlining the existence of the best-performing economies – in terms of GDP and Employment rate.

*The third cluster* houses the remaining counties that distance themselves from the others present in the aforementioned two clusters due to their medium-level results of the normalized scores.

**Table 3.** The results of cluster analysis for the year 2006

<b>Variables</b>	<b>Cluster 1</b>	<b>Cluster 2</b>	<b>Cluster 3</b>
<b>SW</b>	-,65752	1,45880	,25410
<b>ER</b>	-,12241	-,00953	,25175
<b>GDP</b>	-,69404	1,35654	,40151
<b>CLASS</b>	-,72972	1,35854	,47140
<b>Teacher</b>	-,72411	1,48692	,36682
<b>EP</b>	-,74999	1,55784	,36700
<b>EDU</b>	-,68498	1,46106	,30736

Source: own computations according to the results returned by SPSS

The results returned by the K-Means procedure for the year 2015 do not change much the landscape presented by the analysis on the 2006 data.

Major changes can be noted regarding the Cluster 2. Here, from a previous total of eight counties the final number dropped to five. While counties such as Cluj, Constanta, Iasi, Prahova and Timis retained their position as members of the best-performing cluster in terms of proxies for education and economic-based indicators, Bacau, Dolj and Suceava dropped in the third cluster (the group of counties with a medium-level of development for the data considered).

**Table 4.** The components of cluster analysis for the year 2015

<b>Cluster 1:</b>
<i>Alba, Bistrita-Nasaud, Botosani, Braila, Buzau, Calaras, Caras-Severin, Covasna, Giurgiu, Gorj, Harghita, Ialomita, Ilfov, Mehedinti, Olt, Salaj, Satu Mare, Teleorman, Tulcea, Valcea, Vaslui, Vrancea.</i>
<b>Cluster 2:</b>
<i>Cluj, Constanta, Iasi, Prahova, Timis.</i>
<b>Cluster 3:</b>
<i>Arad, Arges, Bacau, Bihor, Brasov, Dambovita, Dolj, Galati, Maramures, Mures, Neamt, Sibiu, Suceava.</i>

Source: own computations according to the results returned by SPSS

**Table 5.** The results of cluster analysis for the year 2015

<b>Variables</b>	<b>Cluster 1</b>	<b>Cluster 2</b>	<b>Cluster 3</b>
<b>SW</b>	-,57395	1,90479	,28285
<b>ER</b>	-,06200	,12942	,05991
<b>GDP</b>	-,61137	2,13259	,26143
<b>CLASS</b>	-,69277	1,55408	,62795
<b>Teacher</b>	-,70123	1,78740	,55318
<b>EP</b>	-,70287	1,90864	,50946
<b>EDU</b>	-,72468	1,73289	,61563

Source: own computations according to the results returned by SPSS

In addition, the other significant change from the previous decade was registered regarding the Hunedoara County that downgraded from the cluster with the medium-level development to the cluster with the weakest registered performances.

## 5. Conclusions

The results showcase a high stability of the results from one decade (mid 2000s) to another (mid 2010s), as the number of counties in each cluster remains slightly similar. It should be noted that the best-performing in terms of education-oriented indicators remain the components of the second cluster (of 2015), as all of the five counties previously highlighted retained their initial positions. On the downside, Hunedoara County was downgraded from its initial placing, while former Cluster no. 2 members Bacau, Dolj and Suceava scored lower values for the considered indicators, a result that translated into a lower placing than a decade earlier. We should be deeply involved in development of counties because education is the most powerful intangible assets

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## References

1. Badea, L. (2011), "Economic crisis and education. Case study: the Romanian education system", *Equilibrium*, Vol. 6, Issue 3, pp.71-83.
2. Barro, R.J. (2013), "Education and economic growth", *Annals of Economics and Finance*, Vol.14, pp. 301–328.
3. Ciumaş, C. and Muresan, G.M. (2016) *The Motivation Behind Individuals' Decisions For Pursuing A Master Program In Corporate Finance-Insurance*, The International Scientific Conference Globalization, Intercultural Dialogue And National Identity, Arhipelag XXI Press, Tîrgu Mureş, ISBN: 978-606-8624-03-7.
4. European Commission (2014), [Online], available: [http://ec.europa.eu/europe2020/pdf/europe2020stocktaking\\_en.pdf](http://ec.europa.eu/europe2020/pdf/europe2020stocktaking_en.pdf), Brussels.
5. Eurostat (2016), Europe 2020 indicators – education, [Online], available: [http://ec.europa.eu/eurostat/statistics-explained/index.php/Europe\\_2020\\_indicators\\_-\\_education#cite\\_note-1](http://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_indicators_-_education#cite_note-1).
6. Hanushek, E.A. and Woessman, L. (2010), 'Education and Economic Growth'. In: Penelope Peterson, Eva Baker, Barry McGaw, (Editors), *International Encyclopedia of Education*, Vol.2, pp, 245-252, Oxford: Elsevier.
7. Hasan, A and Dolgun A. (2016), "Determining Attitudes towards Pedagogical Teacher Training: A Scale Development Study", *Journal of Education and Learning*, Vol. 5, no.3, pp. 1-9.
9. Karoly, L.A. (2010), *The Role of Education in Preparing Graduates for the Labor Market in the GCC Countries*, Rand Working Paper Series (WR-742).
9. Khattak, N., Rehman, U. and Khan, J., (2012), "The contribution of education to economic growth: evidence from Pakistan", *International Journal of Business and Social Science*, Vol. 3, No. 4, pp. 145-151.
10. Mureşan, M. and Gogu, E. (2012), „Romanian Higher Education Infrastructure and Resources”, *Revista Română de Statistică – Supliment Trim IV/2012*, pp. 155-161.
11. Ochilov, A. (2012), "Education and economic growth in Uzbekistan", *Perspectives of innovations, Economics & Business*, Vol. 12, Issue 3, pp. 21-33.
12. Stevens, P. and Weale, M. (2004), 'Education and economic growth', in Johnes, G. and Johnes, J., *International Handbook of the Economics in Education*, Edward Elgar Publishing LTD, USA.