

# EDUCATION AND TRAINING AS COMPETITIVENESS ENHANCERS: THE PORTUGUESE CASE

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## Abstract

A nation requires the contribution of several factors to be able to achieve sustained levels of economic development over time. Economic competitiveness is generally seen as a valid index to judge a country's economic prosperity level. Several studies emphasize that, against the backdrop of a growing and highly globalized and competitive world economy, a competitiveness strategy oriented towards technological science and innovation is critical for increasing the competitiveness of countries and achieving long-term sustainable growth [Chankseliani & McCowan, 2021]; (Doğan, 2016)]. Thus, one of the most important and differentiating indicators of a nation's success is the qualification of its population, which is reflected in the degree of sophistication, decision-making ability, and strategic vision of its leaders and elites. Education, skills, labour efficiency and technological innovation are key aspects of economic development, leading to greater competitiveness and better capacity to create wealth in the economy and higher income levels. Based on the Global Competitiveness Index developed by the World Economic Forum, focusing on the evolutionary behaviour of a group of 40 countries (top 20 most competitive and the European Union countries), between 2008 and 2017, this paper aims to determine whether a correlation can be established between the competitiveness of countries and the education and training indicators of societies. The results reveal that, to different degrees, there is a quantifiable relationship between education and training (during the active life) of the labour factor and the competitiveness of economies, which will be reflected in the level of development of nations, the creation of wealth, and the establishment of high and sustainable levels of social welfare.

**Keywords:** *Education, knowledge, training, competitiveness, economic development.*

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## 1. Introduction

Competitiveness and consequently economic growth are desired by any country. Several authors point out that under the conditions of a highly globalised and competitive world economy, the competitiveness strategy oriented towards technological science and innovation is crucial for increasing the competitiveness of countries, but also for achieving long-term sustainable growth [(Secundo et al., 2020); (Doğan, 2016); (Mazzucato et al., 2020)]. Korez-Vide & Tominc (2016) conclude that efficiency-oriented countries have made greater progress in several pillars of competitiveness, which is reflected in their economic growth. The World Economic Forum (WEF) has developed an index that assesses the competitiveness of nations, based on the factors that determine economic growth and development and tries to explain why some countries are more successful than others in creating economic growth and income (WEF, 2008). In 2018, the WEF updated the model, including new concepts and new methods of data collection. The Global Competitiveness Index 4.0 provides new insights into factors that have grown in importance with the 4th Industrial Revolution: human capital, innovation, resilience, and agility (WEF, 2017).

Sahlberg (2006) concludes that instead of competition between education systems, networking, deeper cooperation, and open sharing of ideas at all levels are essential if the role of education in economic competitiveness is to be enhanced. On the other hand, Gyimah-Brempong et al. (2006) determine that all levels of human capital creation, including higher education, have a positive and statistically significant effect on the growth rate of per capita income, particularly in developing countries. Kruss et al. (2015) analyse the importance of education, skills, labour efficiency, technological innovation, and more sophisticated production for economic development. Training is one of the important predictors of the competitiveness of nations, i.e., excellent performance in the continuous

development of human capital is essential for nations to achieve high performance at the economic level. Pelinescu (2015) considers that growth focused on intelligence, sustainability, and inclusion, cannot be achieved without a relevant contribution of skills, knowledge, or value of people, commonly known as human capital. Several studies seek to assess the impact of education and training in a country on the country's economic growth and competitiveness [(Na, 2021); (Popkova & Zmiyak, 2019)].

## 2. Methods

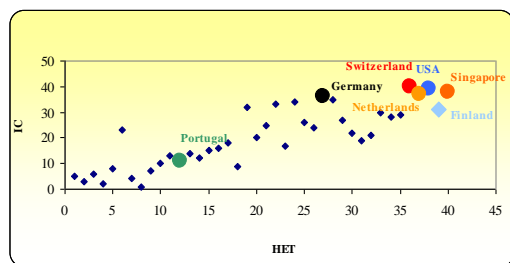
To test the existence of a relationship between competitiveness and education, the methodology adopted consisted of developing correlation analysis models (Pearson's coefficient) for each year of the period under analysis and a multiple regression model for the last year in which there is available data. With this methodology, it was intended to understand the evolution of the values of the correlations over the period under analysis, with a particular incidence in 2017. The values associated with the variables included in the models were the inverted values of the rankings of the indexes of forty countries related to the Competitiveness Index (CI), Higher Education and Training (HET), Quality of Educational System (QES), and Extension of Staff Training (EST). Through this model, it would be possible to get data that would allow perceiving and quantifying the degree of the relationship between the independent variables (HET, QES, and EST) and the dependent variable (CI).

## 3. Discussion

The values of all the correlations indicate that the variables are associated with each other, although the impact of the independent variables is not the same over the years under analysis. Thus, the correlations between HET and IC, on the one hand, and between EST and IC, on the other, show reduced variations during the period 2008-2017, but both are always within the range of strong positive correlations of the Pearson coefficient scale. On the other hand, the correlations between QES and IC have a wider variation, that is, in some years, this coefficient fell within the range of moderate positive correlations, thus being variable with the least impact on competitiveness behaviour. This statement is confirmed by the systematic presence of the countries at the top of the rankings we adopted as independent variables among the ten most competitive countries: Switzerland, USA or Singapore.

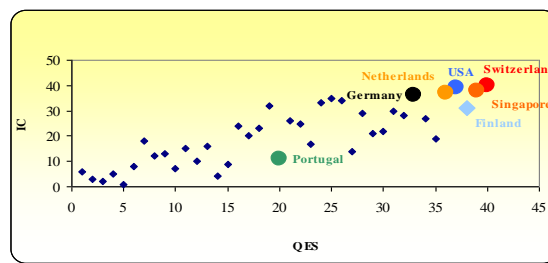
Using the scatter plot of the correlation between HET and CI rankings (Figure 1), the difference between Germany and the remaining four most competitive countries is evident, being outperformed by nine countries with lower competitiveness indices. The data for Portugal confirms the model's correlation, with an association between the values for HET and the country's position in the CI ranking. However, it should be noted that Portugal's performance in HET is better than in countries with higher CI rankings, such as Malta, Poland and, mainly, Luxembourg. When we analyse the scatter plot representing the correlation between the SQ and the CI (Figure 2), we notice that, among the five most competitive countries, Germany is, once again, the one that loses more ground to the top, being again overtaken by Finland, Ireland, and Canada. In this indicator, Portugal performs quite well, clearly above the most competitive countries, such as Spain, France, Luxembourg, Austria, and Japan.

Figure 1. High Education and Training and Competitiveness.



Source: Authors' elaboration based on WEF (2008-2017)

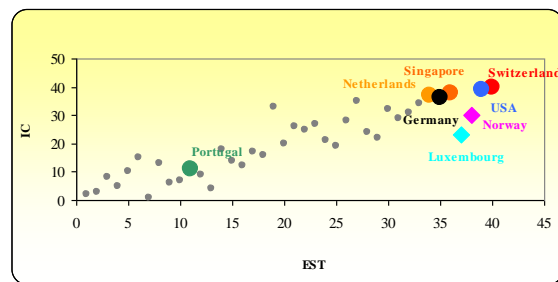
Figure 2. Quality of Educational System and Competitiveness.



Source: Authors' elaboration based on WEF (2008-2017)

Finally, the scatter plot relating to the correlation between the EST and the CI (Figure 3) is clear in demonstrating the top 5 disruptions by the meddling of two countries with lower competitiveness rankings (Norway and Luxembourg), taking Germany and the Netherlands out of the top five for EST. Finland, which stands out in the other two indicators, has a lower performance in the EST than the seven countries highlighted in the chart and is even surpassed by Sweden. In this indicator, Portugal has its worst performance, being surpassed by countries with a lower CI such as Slovenia or Cyprus.

Figure 3. Extension of Staff Training and Competitiveness.



Source: Authors' elaboration based on WEF (2008-2017)

#### 4. Conclusions

From the analysis of the correlations carried out, the relevance of education and training in the competitiveness of each country is perceptible, although there are differences in the weight of each of the indicators, as well as in the performance of each country. While Switzerland, the USA, and Singapore are consistently among the top five countries in terms of HET, QES and EST (Which helps to explain why they are the countries with the highest Competitiveness Index in 2017) it is possible to find in the same indicators the presence of countries (for example, Finland) that show better performances. Another conclusion that we can draw is that the values of the coefficients point to a greater impact of the EST on CI, with the weakest indicator being the QES, an indicator that has no statistical relevance in the regression model. In other words, the best performance of the country among the analyzed rankings is precisely in the QES, whose impact on the CI is weaker than it would be with any other of the indicators. For this analysis, we must bear in mind that these data refer to 2017, when Portugal reached only the 42<sup>nd</sup> place in the Competitiveness Ranking, starting to recover from falling two years in a row (from 36<sup>th</sup> in 2014 – then the best ranking to far – to 38<sup>th</sup> in 2015 and 46<sup>th</sup> in 2016), the 17<sup>th</sup> more competitive country in the European Union, below Lithuania and above Italy.

#### References

- Chankseliani, M., & McCowan, T. (2021). Higher education and sustainable development goals. *Higher Education, 81*(1), 1-8.
- Doğan, E. (2016). The effect of innovation on competitiveness. *Istanbul University Econometrics and Statistics e-Journal, 24*, 60-81.
- Gyimah-Brempong, K., Paddison, O., & Mitiku, W. (2006). Higher education and economic growth in Africa. *The Journal of Development Studies, 42*(3), 509-529.
- Korez-Vide, R., & Tominc, P. (2016). Competitiveness, entrepreneurship and economic growth. In *Competitiveness of CEE Economies and Businesses* (pp. 25-44). Cham: Springer.
- Kruss, G., McGrath, S., Petersen, I. H., & Gastrow, M. (2015). Higher education and economic development: The importance of building technological capabilities. *International Journal of Educational Development, 43*, 22-31.
- Mazzucato, M., Kattel, R., & Ryan-Collins, J. (2020). Challenge-driven innovation policy: towards a new policy toolkit. *Journal of Industry, Competition and Trade, 20*(2), 421-437.
- Na, K. (2021). The effect of on-the-job training and education level of employees on innovation in emerging markets. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(1), 47.
- Pelinescu, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance, 22*, 184-190.
- Popkova, E. G., & Zmiyak, K. V. (2019). Priorities of training of digital personnel for industry 4.0: social competencies vs technical competencies. *On the Horizon, 27*, 138-144.
- Sahlberg, P. (2006). Education reform for raising economic competitiveness. *Journal of Educational Change, 7*(4), 259-287.
- Secundo, G., Ndou, V., Del Vecchio, P., & De Pascale, G. (2020). Sustainable development, intellectual capital and technology policies: A structured literature review and future research agenda. *Technological Forecasting and Social Change, 153*, 119917.
- WEF (2008-2017). *The Global Competitiveness Report*.