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Differentiated Education financing in the organisation for economic co-operation and development (OECD) countries

José F Rivas-Vilchis[1*], Javier Rodríguez-Lagunas[2], Moisés S Castañeda-Ramírez[1]
[1] Department of Health Sciences, Metropolitan Autonomous University, Iztapalapa, México
[2] Department of Sociology, Metropolitan Autonomous University, Iztapalapa, México

Abstract
Inequalities in financing for education at different levels are persistent both over time and between countries. However, their magnitudes, evolution, and main drivers are inconsistent between jurisdictions. We compare education financing at different educational levels in ten OECD countries. Three groups of countries, all members of the OECD, were compared: i) the four Latin American countries in OECD, ii) four countries with high educational and economic development, and iii) two countries with an intermediate level of development in the European Union. For each country, the gross domestic product per capita, the human development index, and the Gini index were considered as indices of economic development and were correlated with educational financing figures. In general, the indices of economic and human development had a highly negative correlation with the levels of educational financing. We find that the financing levels correlate with other parameters, such as the Gini index and the results in school performance of various parameters.

Keywords: Organisation for economic co-operation and development, tertiary education, gross domestic product, gini index, human development index, educational financing

Introduction

OECD: The countries within the OECD are grouped together because their economic infrastructure is fundamentally more extensive than that of countries that don't participate directly in the OECD. In the OECD, decision-making is carried out by a general body called the Council. This body is chaired by the Secretary-General and is made up of the ambassadors of the member countries and the European Commission. This Council makes decisions by consensus [1].

Wealth of Nations: The wealth of nations goes beyond economic output, and for the global wealth it must be considered natural, human, and produced capital. Many analysts prefer two alternative measures to gross domestic product to compare national income levels, which are Net National Income per capita and Gross National Income [2].

Investment in education: Investment in education as a share of GDP is a measure of the priority that countries give to education, but it does not reflect the resources available within education systems as GDP levels vary between countries. Expenditure per student varies significantly across OECD countries. Colombia, Mexico, and Türkiye spend less than USD 5,000 per student annually, while Luxembourg spends almost USD 25,000 [3]. There are also significant differences in expenditure per student by type of program. On average, across the OECD, annual spending per student is USD 11,400 in general upper secondary education, while it is USD 13,200 in vocational upper secondary education. This often reflects the costs of specialized equipment and infrastructure that are needed in vocational education and training (VET) programs [4].

Education is an asset with intrinsic value, but it also provides people with skills that yield high returns in the future [5, 6]). However, there are differences in educational attainment across countries. On average, across OECD countries, 40% of adults (25-64 year-olds) have a tertiary credential as their highest level of education, another 40% have attained upper secondary or post-secondary non-tertiary education, while 20% have not obtained an upper secondary education. However, differences among OECD countries are significant: more than 50% of adults in Costa Rica, Mexico, and Türkiye lack an upper secondary qualification, while more than 60% of adults in Canada have a tertiary credential [3].

In the current research, we analyze the association between economic indicators and educational indicators of selected OECD countries using empirical data from reliable sources. While many studies explore the relationship between education and health at a conceptual level, we implement an empirical approach by investigating the patterns and relationships between the two sets of indicators.

Methods

Three groups of countries, all of which are members of the OECD, were compared: i) the four Latin American countries, ii) the four countries with high educational and economic development, and iii) the two countries with an intermediate level of development in the European Union. For each country, the gross domestic product per capita, the human development index (HDI) and the Gini index were considered as indices of economic development [7-9]; and were correlated with educational financing figures and educative index PISA.

Results and discussion

Gross Domestic Product (GDP). Most nations focus on the increase in quality of life achieved through increased GDP. Per capita income reflects the level of welfare of each population. So, if per capita income increases it also indicates an increase in welfare [7]. The GDP of the selected countries are shown in Figure 1.

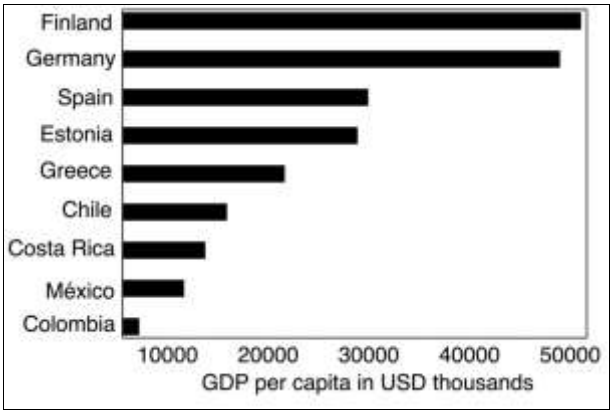

Fig 1: The gross domestic product (GDP) of the selected OECD countries (Self-Elaboration) [7].

It has been shown that education could positively affect per capita gross domestic product (GDP) if it were proxied by mean years of schooling and secondary school student enrolment [10].

Human Development Index (HDI). The HDI recognizes three prettty basic aspects of human well-being. This index is an important complement to the gross domestic product that allows only a one-dimensional development evaluation. The Human Development Index (HDI) covers three areas of human development: i) in the health sector: longevity; ii) education and knowledge; and iii) concerning the economic sector, decent living standards [8].

One indicator of the success of economic development is the Human Development Index (HDI). HDI describes the achievements of economic development in the development of human resources [11].

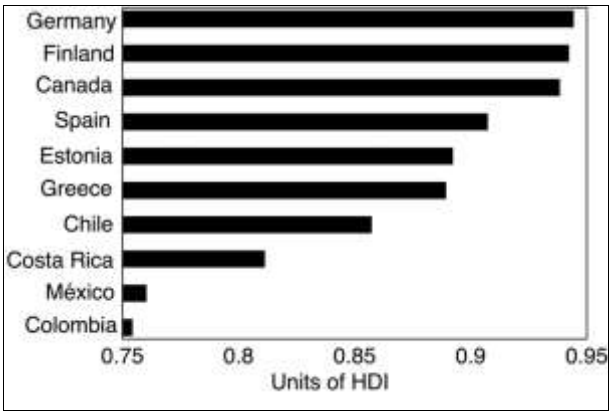

Fig 2: Human Development Index HDI (Self-Elaboration) [8].

The HDI of a country is a measure of its human development along three dimensions. For each dimension, it selected a suitable indicator to represent and capture the essence of that dimension. Recently, adult literacy and combined school enrollment rates for selected OECD countries have been selected as indicators for the knowledge dimension, as an indicator of a healthy life-life expectancy at birth, and as an indicator of standard of living-adjusted GDP [8]. Then, the overall HDI is determined as the arithmetic average of the three indices, each with a minimum value of 0 or a maximum value of 1 [8, 12].

Gini index. Inequality of income distribution also affects poverty levels. Gini index can indicate the level of inequality of income distribution in a region. A lower Gini index value correlates with a higher equity. Inequality in income distribution is measured using the Gini index [9].

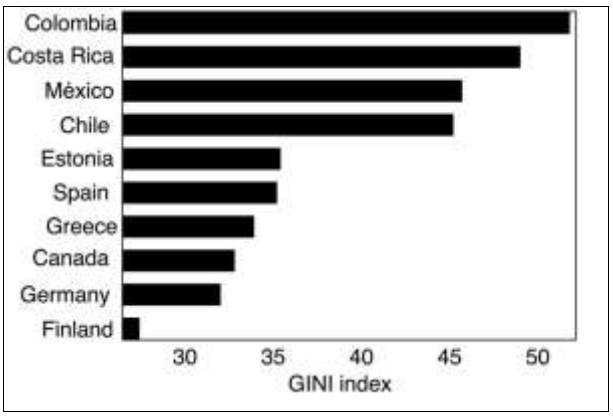

Fig 3: Gini index of the selected OECD countries (Self-Elaboration) [9].

It has been shown that the Gini index has a positive and significant relationship with increasing poverty, which means that any increase in income inequality can lead to an increase in poverty [13].

Expenses in education in OECD selected countries. The government general expenditure on education, that is, the sum of current expenditure, capital, and transfers, that is expressed as a percentage of the total expenditure of a government in all sectors of public expenditure.

Expense per student on educational institutions. Luxembourg stands out as the country with the highest expenditure across all program orientations at the upper secondary level (over USD 26 000 per student), with both vocational and general education receiving substantial funding. In contrast, Bulgaria, Chile, Colombia, Mexico, and the Republic of Türkiye spend less than USD 6 000 per full-time equivalent upper secondary education student [3].

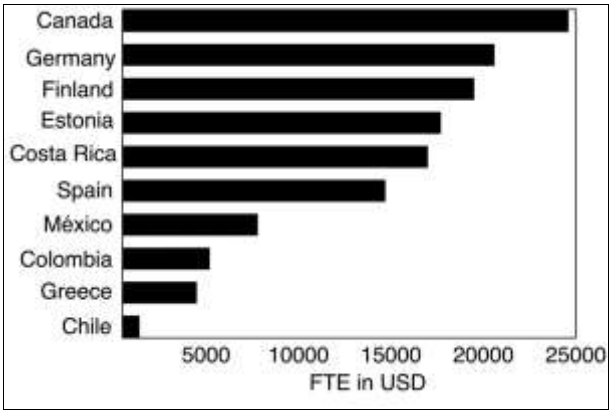

Fig 4: Expenditures per full-time-equivalent (FTE) student at all levels, by Organization for Economic Cooperation and Development (OECD) country of the selected OECD countries: 2019. OCDE 2023 (Self-Elaboration) [14].

Education Expenditures per Full-Time-Equivalent (FTE) Student. Expenditures per FTE student at all levels varied across OECD countries in 2019, ranging from $1,100 in Chile to $24,300 in Canada. Note that expenditures per FTE student reflect the average spent per student, not necessarily the amount spent on each student. Expenditures per student vary at the state and local levels [14].

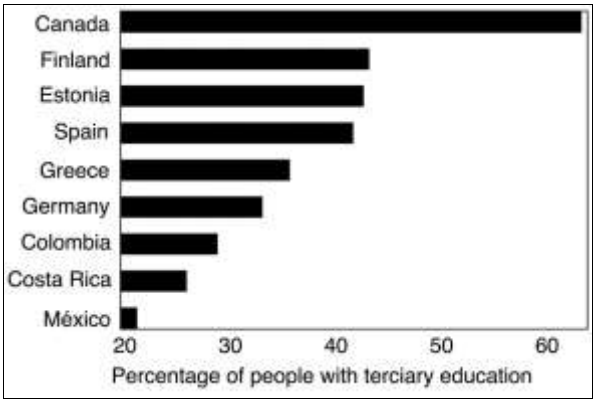

Fig 5: Percentage of people with tertiary education of the selected OECD countries. OCDE 2023 (Self-Elaboration) [3].

Expenditure per student on educational institutions by level of education and programme orientation. The way resources are allocated varies widely from level to level and primarily reflects the structure of the education system. However, OECD countries share characteristics of educational systems such as educational plans, teaching environments, among others, which gives rise to similar spending patterns by students at different levels of education. Thus, OECD countries spend an average of $10,700 per student at the primary level, $11,900 at the secondary level, and $18,100 at the tertiary level.

On average, across OECD countries, expenditure per student in general upper secondary programs is about USD 11,400 compared to about USD 13,200 in vocational programs. Luxembourg stands out as the country with the highest expenditure per student across all me orientations at upper secondary education (over USD 26,000), with both vocational and general education receiving substantial funding. Korea and Switzerland also demonstrate a significant investment in upper-secondary education (over USD 19,000 per student), although no breakdown by me orientation is available. In contrast, Bulgaria, Chile, Colombia, Mexico, and Türkiye spend less than USD 6,000 per full-time equivalent upper-secondary education student [3].

Global Education Standards: PISA

Education is vital to both individual development and societal progress. One tool used to gauge the education quality worldwide is the International Student Assessment (PISA). This tool assesses the knowledge and skills of 15-year-old students around the globe in reading, mathematics, and science. And is conducted every three years by the Organisation for Economic Co-operation and Development (OECD) [15].

Although the United States harbors many of the world's top universities, it may come as a surprise that the nation's PISA scores do not mirror this prestige. The U.S ranks below countries such as Canada, Finland, and Poland, which consistently perform above the OECD average. PISA index of the selected OECD countries is shown in Figure 6 [15].

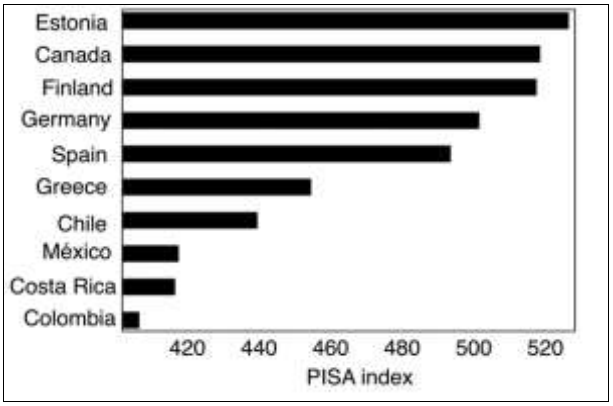

Fig 6: PISA index of the selected OECD countries (Self-Elaboration) [1, 5].

Discussion

The financing of education is a fundamental issue in educational planning. However, most analysts and government officials discuss the cost and financing of education primarily in economic and technical terms, and ignore political, social, and cultural factors. These issues are largely discussed in technical terms, and the political and social context in which education takes place is set aside. [6].

The investment in education that led to the massive educational expansion of the 1960s and 1970s in developing countries did not yield the expected results, mainly because this educational expansion was not accompanied by comparable economic growth. In this way, urban unemployment also reached sectors of the population with a high educational level [17].

As upper-secondary or post-secondary non-tertiary education has become critical for participation in modern economies, the share of those with below upper-secondary education has declined, albeit unevenly. Among younger adults (25-34-year-olds) [3]. Among OECD countries, these percentages are highest in Costa Rica (46% of young men and 37% of young women) and Mexico (43% of young men and 43% of young women). Otherwise, only 2% of 25- 34 year-olds in Korea have not attained an upper secondary education.

Correlations: The linear correlations between economic and educational variables are shown in Table 1.

Table 1: The correlation coefficient between economic and educational index in OECD selected countries.

	HDI	Gini index	Tert % GDP	PISA	FTE
GDP per capita	0.8933	-0.8704	0.1780	0.8758	0.8060
HDI	-----	-0.9247	0.1557	0.8981	0.6240
Gini index	-----	-----	0.1076	-0.8966	-0.5824
Tert % GDP	-----	-----	-----	0.1139	0.0609
PISA	-----	-----	-----	-----	0.7257
FTE	-----	-----	-----	-----	-----

GDP per capita= gross domestic product per capita. HDI= human development index. Gini index= measure of income inequality. HDI= summary measure of human development. Tert % GDP= expense in tertiary education as percentage of gross domestic product. PISA= international assessment that measures 15-year-old students' reading, mathematics, and science literacy. FTE= expenses for full-time students.

The analysis of the correlation indices showed: for the GDP per capita a high and positive correlation with the HDI (0.8933), and a high and negative correlation with the Gini index (-0.8704). The PISA index showed high positive correlations with the GDP (0.8758), the HDI (0.8981) and negative with the Gini (-0.8966). The Gini index showed a highly negative correlation with the PISA index (-0.8666) and the HDI (-0.9247). It is interesting to note that the PISA index is weakly correlated with the percentage of people with tertiary education. Otherwise, except for Greece, Mexico is the country that invests the least percentage of GDP in tertiary education. Mexico has a PISA performance of 79.2% compared to Estonia, the country in the sample with the highest performance.

It was found that the expansion of higher education with an increase in the workforce employed with higher education promotes economic growth, while the contraction of the workforce employed with higher education reduces economic growth. Furthermore, the expansion of high-tech industries and public spending on education are now known to significantly stimulate economic growth [18].

Conclusion

We find that the differentiated financing levels correlate with other parameters such as the Gini index and the results in school performance of various parameters. In the current market conditions, there is a close relationship between investment in education and the economic growth (development) in a country. These investments are one of the areas forming the human capital of both individual regions and a country as a whole. it was found that education growth and economic growth have a positive impact upon each other. Achievements in education imply an increase in work efficiency and remuneration; at the social level, poverty reduction and increase in the population's standard of living.

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