



Equity and Education: Philosophies and Measurement

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Abstract

The aim of this article is to analyse the statistical indicators used in research on equity in education in order to show the philosophical assumptions underlying these indicators. To illustrate this, we take Spain's skills indicators in PISA. While equity is an aspirational characteristic of education systems, we must bear in mind that what is understood as equity depends on what is understood as a just society. This question can only be answered from a normative perspective. We will show that quantitative research is often restricted to a few indicators of distributional equity, and thus provides a limited view of equity. It is therefore necessary to incorporate more indicators that reflect other ways of understanding equity, but to do so knowing from what assumptions we incorporate them. We will now review the value assumptions of the statistical indicators most frequently used in the debate on distributional equity in education. We start with the debate around Rawls and distributive equity. We will look at the criticisms made by non-egalitarian liberals, utilitarians and Marxists, mainly. As a result, we will show the parameters by which we can evaluate educational equity according to each of these schools of thought.

Keywords Equity · Education · Indicators · PISA · Competencies · SDG4

1 Introduction

The relationship between equity and education can be treated with different approaches, given the complexity of what is understood by education (Martínez García, 2024), as well as the diversity of existing concepts of what equity is, especially those centred around Rawls (Martínez García, 2017b; Bolívar, 2005). In order to make the research feasible, we will focus the debate on one of the dimensions of education: competences. Specifically, we will focus on the competencies¹ as measured by the *Programme for International*

¹ PISA understands competencies as students' ability to apply knowledge and skills in real-world contexts and to solve problems effectively. PISA does not focus solely on the memorisation of content, but on how

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Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD), taking advantage of the fact that access to its microdata is easy and that it is recognised worldwide. As we shall see, the proposal made here can be applied to other studies, either competency-based, such as the OECD's *Programme for the International Assessment of Adult Competencies (PIAAC)*, or curricular, such as the *Progress in International Reading Literacy Study (PIRLS)* or *Trends in International Mathematics and Science Study (TIMSS)* of the *International Association for the Evaluation of Educational Achievement (IEA)* or the diagnostic tests carried out in Spain by the autonomous communities since the implementation of the Organic Law for the Modification of the Organic Law on Education (LOMLOE) 2/2020.

The aim of this paper² is to show the assumptions about equity that underlie simple and frequently used statistics, in order to be able to use them to make a more rigorous approach to the study of different ways of understanding equity. The main assumption is that, as a product of the so-called technocratic dream, it is not taken into account that statistical operations when applied to social data also imply certain normative assumptions. Such assumptions are usually not made explicit, and this is the main objective of this research. To this end, the article is organised with a didactic purpose, firstly by explaining what is understood by equity according to different philosophical currents. We then proceed to explain how different statistical indicators relate to such equity models. In doing so, we conclude that choosing a statistic to measure inequality is also a way of choosing a philosophical model of equity.

In the first section of this article we explain why we chose competencies as an indicator of education and we review the debate that explains the origin of educational inequalities. Subsequently, we review the literature on the debate about educational indicators and present the extent to which it is possible to relate them to the concepts of equity of the various philosophical currents. Finally, we go on to apply some of the statistical indicators to the PISA data, to show that the selection of certain indicators is not a merely technical decision and implies a commitment to a model of society. Thus, with simple statistical operations, we generate a complex framework for reflection and comparison of educational equity at the international level, while being easily operationalised and replicable in research that operationalises education as a quantitative interval or ratio variable. By clarifying the normative assumptions of each indicator, we improve the public conversation on educational equity.

2 Education: Skills and Inequality

The human capital theories developed from the 1960s onwards related economic growth to the increase in schooling of the population (Becker, 1964). While up to that time the concern for education was common to social reformers of all kinds, with this school of economic thought, it also became fundamental as part of economic development. More or less

Footnote 1 (continued)

students can use what they have learned to deal with complex and relevant situations in their everyday lives (OECD, 2018).

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at the same time, critical currents to these theories emerged, which, among other issues, pointed out that the acquisition of formal schooling was subject to the social, economic and cultural origin of the pupils' families. Functionalist theories (Parsons, 1970) expected this inequality to decrease as societies modernised their economies, but this was not the result observed. Two main families of theories emerged in response to this fact. On the one hand, those that saw this inequality as originating from rational individual decisions of people from different social positions, without the school playing a special role in explaining such inequalities (Boudon, 1973/1983; Lievore & Triventi, 2022).

On the other hand, theories more critical of capitalism emerged, which conceived that inequality of opportunity is not only due to the difference in social position between students' families of origin, but also to the class biases of school life (Baudelot & Establet, 1987; Bourdieu & Passeron, 1996; Bowles & Gintis, 1985). These studies showed that the appearance of individual merit and a school neutral to the particularities of the student body, which only recognises merit, is an illusion: the school actually reproduces, as well as legitimises, social inequality. Subsequent research showed that the trend in inequality of educational opportunities tends to be sustained over time (Shavit & Blossfeld, 1993), contrary to the expectations of functionalist theories. More recent research shows more variable results (Fernández-Mellizo Soto, 2015). In the case of Spain, a decrease in inequality of educational opportunities by social origin and gender was observed until the generation born in the 1980s. From this generation onwards, an increase has been detected, possibly due to unintended effects of the Organic Law on the Organisation of the Education System 1/1990 (LOGSE), as it increased the requirements both to achieve the minimum level of compulsory education, by increasing the common core of schooling by 2 years (from 14 to 16 years) (Fernández-Mellizo & Martínez García, 2017), and by placing academic barriers to access vocational training (Martínez García & Merino, 2011). At the international level, a more recent trend of decreasing inequality of educational opportunities has been found (Breen & Müller, 2020).

3 Equity: Different Philosophies

Distributive equity is a criterion for deciding whether one distribution of a good is fairer than another, or who should have priority access to the good, according to a set of criteria. This abstract idea can only take on concrete meaning when it is framed within various schools of thought. The contemporary debate on this question has a seminal point in Rawls' work (1971), and how different schools of thought have responded to his liberal and neo-Kantian proposal.

First, Rawls criticises utilitarians, who believe that human beings are driven by the pursuit of pleasure and well-being, while fleeing from pain and displeasure. This makes all life choices of each person equally valid, since each person has his or her own tastes, and political measures will be fairer to the extent that they generate the greatest utility for the greatest number. Therefore, the evaluation of a policy from this perspective is characterised by measuring the well-being it provides, a measurement in terms of concrete and quantifiable results for the greatest possible number of people (Martínez García, 2017b; Harsanyi, 1985).

But for Rawls, individuals are bearers of inalienable rights. That is why the main criterion of a just society is to guarantee a scheme of maximum freedom for its members. Freedom understood in the liberal tradition as negative freedom (Berlin, 2005), that is, as the absence of external interference with the will of the individual. This should be the main

organising principle of a “well-ordered” society (the principle of freedom). Once freedom is secured, equality of opportunity would be necessary, as well as ensuring the greatest possible welfare for the most disadvantaged people in society (the principle of difference, in two parts). Inequalities would only be tolerable if, when they increase, the welfare of those who are worse off is improved. For Rawls, the principle of equity is based on the assumption that risk aversion is part of human nature. Therefore, if we had to choose which social position we are going to occupy, with a veil of ignorance that does not allow us to know the costs and benefits associated with them, we would prefer a world in which the welfare of the worst-off is as high as possible (technically it is called *maximin*: we only compare the minimum value between distributions, and the distribution with the highest minimum is preferred). In any case, the preference for freedom is greater than risk aversion, so Rawls prioritises the principle of freedom over the principle of difference, i.e. we cannot exchange less freedom for more equality, they are of a different order. Utilitarians consider that the welfare of those who have less should not be put before the greater overall welfare, contrary to Rawls, as they consider that Rawls’ approach could entail losses in the overall welfare of society (Harsanyi, 1975).

For Rawls, the social order must be designed on the basis of fair institutions. Only under these conditions would people negotiate driven by self-interest to achieve primary goods (Echeverry, 2012), among which education could be considered (Moyano, 2021) (Bolívar, 2005). In this context, Rawls is critical of meritocracy because there is no “moral deserving” insofar as the individual characteristics of the subject, including his preferences, are not the result of the will. A good part of the controversies on equity tension two poles: equality of opportunities and equality of results (Dubet, 2005).

Rawls can be considered an egalitarian liberal. There are liberal currents that consider that freedom is incompatible with such egalitarianism, and that therefore, contrary to Rawls’ own claims, he does not take freedom seriously. Nozick (1988) is among the first critics of Rawls in this regard. For Nozick, distributive justice is a process, not an outcome. If property rights are well ordered in a society and individuals are free to exchange whatever they wish in the market (money, time, goods, resources...), the outcome will be just. There is no need to worry about the unequal distribution resulting from the market, since any attempt to compensate for it is an attack on the fundamental principle of liberals: freedom. This is because, in order to change the distribution, it would be necessary to give more power to the state, which would be coercive vis-à-vis individual will. In education, this position would be close to neoliberals like Friedman (1953), who advocate quasi-markets in education. In other words, the state should provide school vouchers to families, families should be free to choose their school, and schools should compete with each other to attract students. In this way, the compulsory nature of education, with the state financing its provision, is balanced with the virtues of the market in the allocation of resources, thus improving the efficiency of schools (Schütz & Woessman, 2007).

In the last decade, even more extreme liberal arguments against the state have gained strength, and these currents have even reached government positions, as has happened in Argentina in 2023, with the presidency of Milei. This current is known as anarcho-capitalism (Ramón Ruiz, 2024); it holds more radical anti-state theses than those of Nozick. While Nozick is in favour of a strong state, but with the minimum powers necessary to guarantee the free market, anarcho-capitalists are against any form of state, any political power over individuals. From this point of view, school should not even be compulsory, because it is a coercive measure. In general, for the various liberal anti-egalitarian currents, inequality encourages effort and growth and we should not worry about inequality, for that is envy, and institutions should not recognise the legitimacy of such a feeling.

On the other hand, we have more egalitarian liberals than Rawls, who share his concern for combining negative liberty with the need for equal conditions of basic goods, such as education, health, labour rights... in order to be able to exercise it. It is worth mentioning Dworkin (1981), critical of Rawls for not adequately considering the initial circumstances of individuals. For him, what is important is the welfare that is achieved according to one's resources and capabilities. He proposes to evaluate whether the existing institutions are fair or not. Inequalities would be fair if we were all equal in conditions and capabilities and these were only a consequence of the way we decide to spend our time at work and leisure, or our income to consume or invest. This is why freedom can generate just inequalities derived from individual responsibility, something that Rawls does not consider.

In the Marxist critique of liberals on this issue, it is worth noting Cohen (1989, 2008), who considers that the debate about equity in capitalism is flawed at its source. Capitalism is incompatible with a just society, insofar as the basis of its foundation is blackmail: the blackmail of those who own the means of production against those who have only their labour power to survive. Therefore, just as a society based on slavery cannot be just, a society based on the blackmail that those who do not sell their labour power to the capitalists cannot survive, is also intrinsically unjust. On the other hand, in the educational debate (Althusser, 2015) stood out for opening a critical line by arguing that the school in a capitalist society is an apparatus of domination, as it contributes to legitimising social inequality and capitalism. His orientation was developed, with substantial revisions, by Bourdieu and Passeron (2009, 1996). These sociologists attributed a more important role to individual agency in decision-making, through the concept of *habitus* (Martínez García, 2017a).

Roemer and Trannoy (2016), following in the tradition of analytical Marxism (like Cohen), after analysing the problem of inequality of opportunity, propose an empirical approach. For Roemer, all inequalities that are not due to effort are unjust. Effort is difficult to measure, but not certain individual attributes (gender, social class, belonging to a minority...), which from a Marxist perspective could be conditioning this effort in a certain direction and with a certain intensity. Given a certain normality in the characteristics between people, it is possible to attribute the differences between groups of people with the same characteristics to social inequalities in the conditions in which they live, while the inequalities within each group would be due to individual differences. Thus, differences on average between middle-class and working-class women could be attributed to class differences, but differences between women within the working class would be due to their individual differences. It may be that not all inequalities between groups are social, as the more conservative currents propose, but in any case, the fact that there are such differences leads us to the obligation to study them in more detail and to fight against them.

We can also take into account feminism (Beltrán et al., 2001/2008). In its egalitarian current, it seeks to ensure that differences in sexual constitution are not linked to a process of generating cultural, social and economic differences, i.e. gender differences. Therefore, from an equity point of view, fairer distributions will be understood as those in which we appreciate fewer differences between male and female persons (OECD, 2015). In the cultural difference current, the approach is to denounce that cultural values associated with masculinity dominate socially. In education, this affects the curriculum. On the one hand, by making women's cultural and scientific contributions invisible and promoting gender stereotypes (Bian et al., 2017). On the other hand, the competitive and individualistic design of education systems is consistent with the values associated with masculinity, but not with femininity (Saygin, 2020). From the point of view of distributive justice, it seems more appropriate to consider equality feminism, as it focuses on the inequality of distributions, a point on which the other currents reviewed in this section also focus.

4 Equity and Statistics: Normative Assumptions for Indicators

In the relationship between philosophical currents and Statistics, has been studied what are the normative assumptions on which apparently neutral statistics rest (Blackorby et al., 1999). UNESCO (2018) has already made the effort to propose educational indicators and relate them to the equity debate, focusing especially on the debate between Rawls and Sen. In this paper, as discussed above, we consider a more pluralistic view of equity, as well as raise objections to some of UNESCO's proposals (Table 1).

In the case of Rawls, we can distinguish the two moments of the difference principle: equality of opportunity and maximin. As an indicator of inequality of opportunity, we can in turn take into account two parameters, which we can calculate by setting educational competencies as a function of social origin, as well as other ascriptive characteristics. We can assume that this function is linear (or transformable to linear, in its reduced form), and therefore approximate it with an ordinary least squares regression. From this regression, the coefficient of determination (R^2) can be interpreted as the percentage by which the set of such characteristics determines the level of competences. We can also opt for the slope of the regression (β), as proposed by UNESCO (2018), but in that case, we would not be able to compare populations in which the variables, even if they have the same metric, have different variances. To avoid this problem, it is better to take the standardised slope (β_{st}), thus normalising the variance to unity. In such a case, if there is only one variable, the coefficient of determination (R^2) is the square of the standardised slope (which is the correlation coefficient). If the objective is to compare the overall effect of a set of variables on inequality of opportunity in two populations, we better take R^2 ; but if the interest is to know the effect of each variable, we better take the standardised slope (β_{st}).

On the other hand, we can, in turn, relate the maximin criterion to two statistics. On the one hand, the minimum of the distribution of competences. From a Rawlsian perspective, a system in which the minimum of educational competencies among its students is as high as possible would be fairer. Since the minimum of the distribution is not very robust, it is better to take a low percentile, e.g. P_{10} . Strictly speaking, this would be the maximum. Another approach to this problem, with more social relevance, is highlighted in PISA: resilience (Agasisti et al., 2018). In this case, the principle of the best for the worst off is more concrete: the social background of students is taken into account, and the extent to which they achieve high educational attainment is observed, thus going “against their destiny” (OECD, 2011).

As for utilitarianism, by considering that the welfare of each member of the population should have the same weight, regardless of the place in the distribution it occupies (that is, giving the same importance to improving the condition of the richest or the poorest), the important thing is to maximise the competitive outcome of the population as a whole. From a statistical point of view, therefore, this implies that we should look at the mean of the population as a whole, and therefore prefer as the most equitable distribution the one in which the mean (μ) is higher.

As far as Marxism is concerned, its aversion to inequality implies minimising the distance between members of a society, as it understands that in order to be free, people must have a close material situation. As Kolm (1976a, 1976b) points out, inequality aversion leads to a preference for more homogeneous welfare distributions in absolute terms. And it is precisely the variance (σ^2) or its square root, the standard deviation (σ), that measures such homogeneity.

Table 1 Relationship between philosophical currents, equity principle and statistical indicator

Philosophy	Principle of equity	Statistical indicator
Rawls 1 / Dworkin / Roemer	Equal opportunities	R^2, β_{st}
Rawls 2	Maximin	Resilience Indicators of minimum competences (P_{10})
Utilitarianism	More welfare for more people	μ
Libertarianism	Pro market	Institutional design: freedom of choice of school and competition between schools
Marxists	Equality	$\sigma \circ \sigma^2$
Feminists 1	Differences between men and women	Difference in standardised β_{st} between sexes (as interactions in a regression, or comparing between regressions)
Feminists 2	Comparative advantage	Intra-individual competence ratio (see note 2)
Multiculturalist	Difference between immigrants and natives	Difference in standardised β_{st} between natives and immigrants (as interactions in a regression or between regressions)

Source Own elaboration

One attempt to operationalise indicators of inequity focuses on three variables, gender, social class and immigration (Bonal & Scandurra, 2019). On the question of gender, it is usual to opt for the differences observed between girls and boys, *ceteris paribus* for the rest of the non-sex attributes. We propose to refine this method by adding additional information: the relative competence differences (Méndez, 2020). This is a novel way of addressing gender inequalities, as research on this issue tends to focus more on sex differences (Nanni, 2023), rather than comparing sex differences with themselves, and then comparing this intra-sex skill difference in a cross-sex manner. While girls tend to be better at reading literacy (in all countries participating in the test) and boys at mathematics (in almost all countries), the specialisation of each individual should also be taken into account, in a comparative advantage perspective. For example, a person may be above average in reading and mathematics, but compared to him/herself, he/she is better at reading. Therefore, it is to be expected that, despite his or her good results in mathematics, he or she will be more oriented towards areas of reading proficiency. The person, when compared with him/herself, appreciates that he/she is better at one skill than the other, so we can speak of an intrapersonal ratio.³

We believe that this approach is important, because it could be the case that, despite equalising girls in mathematical competence with boys, given that their comparative advantage in reading may be greater, this would not affect their educational or career choices. That is, for girls' and boys' decisions to be equal, it would not only be a matter of girls matching boys in mathematics, but also of boys matching girls in reading. More recent data (PISA-2022) continue to show that differences between students in OECD countries with minimum proficiency in mathematics are larger by socio-economic status and migration background than by gender (OECD, 2021). These differences in socio-economic terms in Latin America directly affect coverage at different levels (Rivas, 2015). As can be seen in this case, gender differences, when taken in a unidimensional way, do not fully cover the problem.

From the point of view of cultural diversity, a simple approach to operationalise is the comparison between natives and immigrants. Once the differences in socio-economic profiles and educational levels of families are controlled for, in a situation of equity there would be no differences between immigrants and natives. Therefore, the beta parameter of the regressions could be a good indicator of equity, as long as the difference between the two groups is zero or close to zero. Care should be taken because in certain contexts, the immigrant category may group together profiles from countries with different levels of development of their education systems. For example, in the case of the Canary Islands (Spain), there is great diversity, as a third of immigration comes from central European Union countries, while a significant proportion comes from Latin America (Martínez García, 2013). In this case, the level of development of the education system in the country of origin is more important for school integration than the fact of speaking the same language (Carabaña, 2013; Level & Dronkers, 2008).

³ Denoted by W for women, M for men, li for a person's reading literacy and mi for his or her mathematical competence, we can express the ratio of intra-individual competences as follows: $\frac{\beta_{li}^W}{\beta_{mi}^W} / \frac{\beta_{li}^M}{\beta_{mi}^M}$.

5 Equity and Statistics: A Case Study

Before returning to educational equity, we can look at the indicators proposed by the PISA report (OECD, 2016) in the light of distributional equity theories. To do so, we will take four of them focusing on skills, which appear frequently in the studies and will allow us to exemplify the underlying equity assumptions.

The utilitarian approach invites us to take the average level of skills as an indicator of equity, due to the studies that relate these averages to long-term economic growth, since in itself the level of skills is an indicator of utility. We can affirm that Spain would be at an average level of “utilitarian equity”, without having felt the effect of the crisis (Fig. 1).

For Rawls, the important thing is to improve the situation of the less fortunate, which we could capture through resilience, i.e. the extent to which students from low social backgrounds do well in education (the highest levels of performance in PISA). Let us take the case of Spain in the OECD context to show the relationship between the concepts and how they are measured. As can be seen in Fig. 2, Spain stands out positively in this type of equity, but it is also one of the countries where resilience has grown the most since 2006, despite the crisis, which would require an explanation beyond the scope of this research.

For Dworkin, what is important is that differences are due to individual preferences, not to social constraints, so we could use two indicators of equity. On the one hand, the weight of social origin in educational outcomes (the percentage of variance explained, Fig. 3). This indicator is at OECD average levels, and there are no statistically significant differences with Finland or Denmark, countries with much more economic equality, and it has not changed between 2006 and 2015.

On the other hand, we have the indicator of the gap in educational attainment between students from low and high social backgrounds. From this point of view, Spain is not only one of the most equitable countries in the OECD, but it has also improved during the crisis (Fig. 4).

Marxists are great advocates of absolute equality, so it is reasonable to suppose that standard deviation, an average of how far each individual deviates from the mean, should be a good way of capturing their more radical sense of fairness (Kolm, 1976a). With this

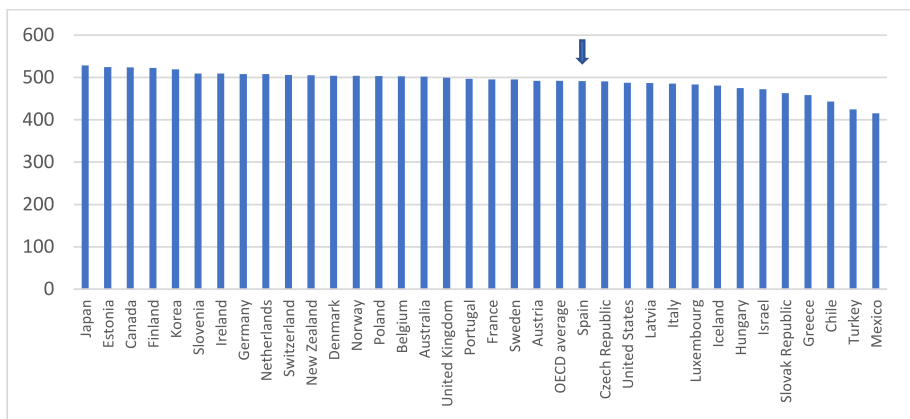


Fig. 1 Utilitarians: average PISA performance (OECD countries). *Source* Prepared by the authors based on data from OECD (2016)

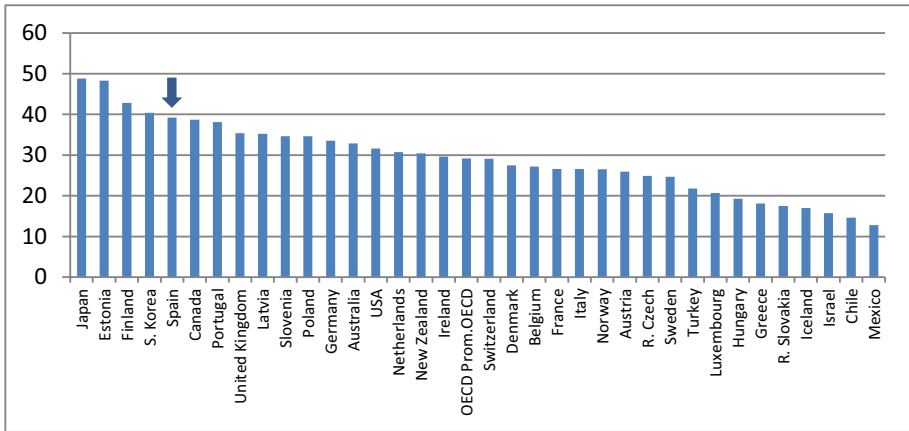


Fig. 2 Rawls: Percentage of students from low social backgrounds achieving good academic results (resilient). *Source* Prepared by the authors based on data from OECD (2016)

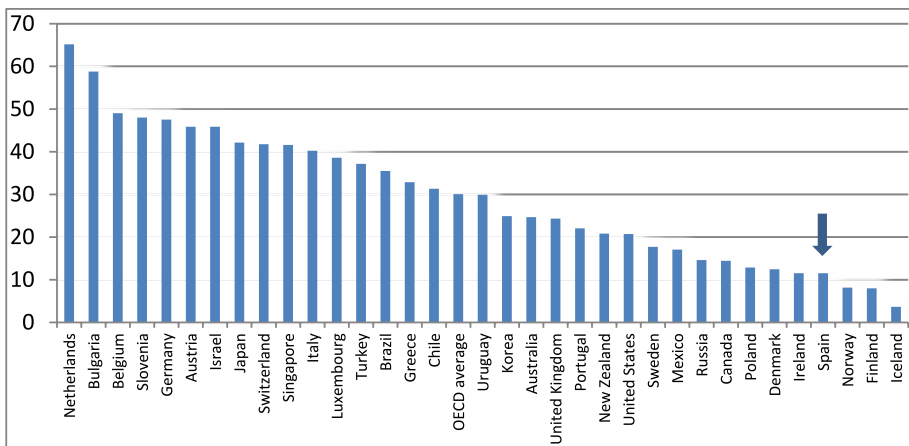


Fig. 3 Rawls / Dworkin (1): R^2 Percentage of explained variance. *Source* Prepared by the authors based on data from OECD (2016)

indicator (Fig. 5), Spain also turns out to be an equitable country, without having worsened with the crisis.⁴

In the case of Spain, we can characterise that the level of equity is due to the above-average performance of students from primary school families, while the level of competences of students from university families is lower.

More research is needed to explain this result, which is compatible with several hypotheses. It could be an imprint of the Guerra Civil (Spanish Civil War) and subsequent exile, repression and contempt for the more educated sectors of the population.

⁴ The standard deviation here is absolute, therefore, it is measured in the same unit as the variable and has no fixed maximum

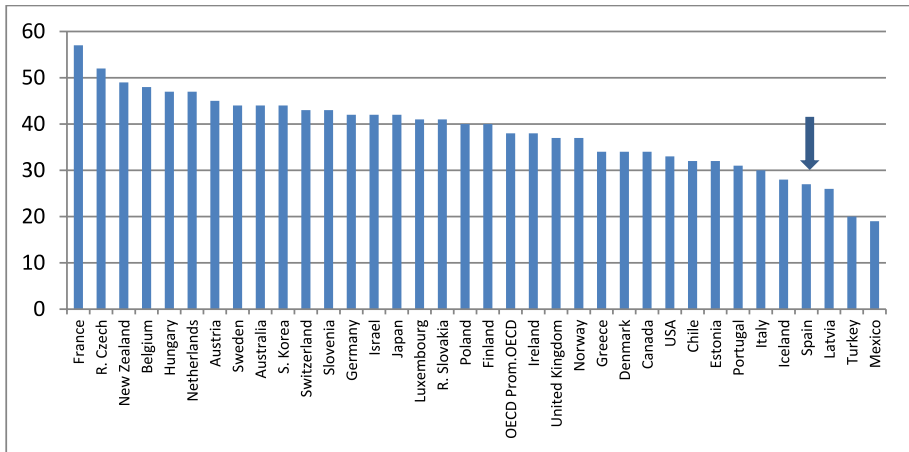


Fig. 4 Rawls / Dworkin (2): distance in score between low and high social backgrounds (difference of β). *Source* Prepared by the authors based on data from OECD (2016)

Graph 5. Marx: standard deviation

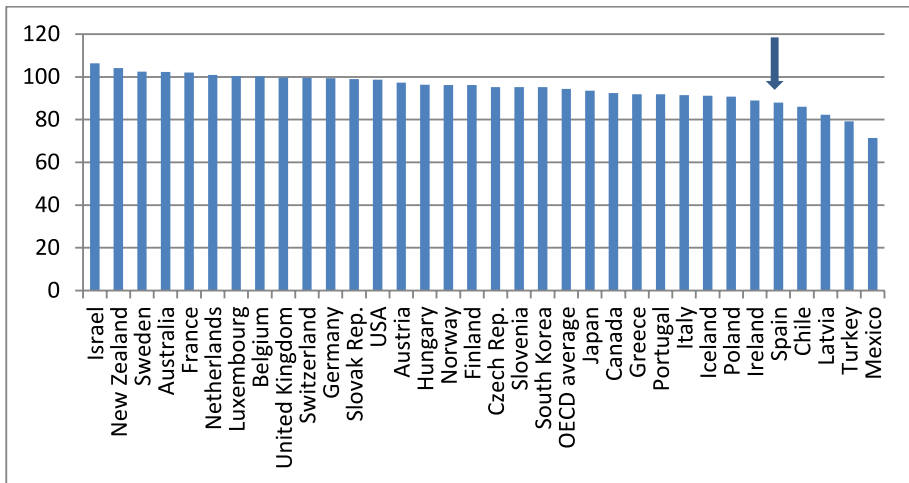


Fig. 5 Marx: standard deviation. *Source* Prepared by the authors based on OECD data (2016)

It could also be due to the lesser need for highly educated families to demonstrate their ability to find good jobs, given their good connections in the labour market, connections that are fostered by their strong presence in the private education sector. Or other hypotheses that could be proposed and explored.⁵

⁵ With the PIAAC data 2011, the gap in reading literacy between adults with primary and university studies (ISCED 97 5a2 and 6) has been studied, and the gaps in Spain are at high levels, so it does not seem that the cause is the lower level of skills of university students compared to the rest of the population.

6 New Avenues of Work Associated with the Operationalisation of Equity

This paper has focused on distributive justice. It is a first approximation to open the debate to the use of other quantitative indicators to approximate other forms of justice. As noted above, we could use data from the PISA report itself to establish the justice of the *cadí*,⁶ i.e. make a decision based on a thorough knowledge of the details of each case, understanding what social harm is being sought to be redressed, and what are the most sensitive means and avoiding the application of general criteria without sensitivity to the context. In this sense, we can take as an indicator the variables oriented to whether the student feels listened to by the teacher.

Although we have approached the more orthodox utilitarianism, through the mean, it is also worth exploring in further research the egalitarian utilitarianism of Nobel Prize winner Amartya Sen, as an additional way of approaching distributive justice. For Sen, the important thing is to equalise capabilities, so that all people have a minimum of capabilities to lead a decent life, given the standard of the society in which they live (Sen, 1979).

His work focuses on exploring the unfair distribution of welfare, and in his empirical research he proposes an index that assesses elements of welfare and economic inequality, with the aim of better investigating poverty (Sen, 1976). We leave open the possibility of transferring his discussion on equity from economic welfare to educational welfare. Sen's concern, to find an index that informs us about the level of minimum capabilities of a population, could be covered by maximin or resilience in the educational context. Sen is thinking about welfare of a more economic kind, but it is not possible to take his index directly to the distribution of educational competencies. While statistically feasible, it is not feasible from a substantive point of view.

One of the indicators Sen uses is the Gini index, which is well established in studies of economic inequality. But there is a difference between economic inequality and inequality of educational skills that cannot be ignored. Unlike income, or other economic indicators, education does not behave as an exclusionary good: the fact that one person can read does not detract from the reading ability of another person (Martínez García, 2017b). Moreover, the Gini index is calculated by differentiating between the observed distribution and the theoretical distribution in which income (or other similar indicator) is equally distributed across the population. But proficiency tests, such as PISA, being designed using Item Response Theory, are normally distributed, so there is no such theoretical situation where the entire population has the same proficiency level. Moreover, given the difference in ability and interest in education, one cannot expect an ideal education system in which everyone has the same level of education. Unlike income, not everyone wants to achieve the highest possible level of education. Therefore, the use of the Gini index in this type of study does not make sense, despite some proponents (Parker et al., 2018; Thomas et al., 1999; UNESCO, 2018). Its use, therefore, does not obey the substantial property of the use of statistics, but is rather a case of abstract empiricism (denounced by Mills, 1959), which uses statistical criteria without paying attention to the congruence between statistical assumptions and the social reality to which they are applied.

⁶ The expression refers critically to a system of administration of justice based on the *Cadí*, a judge, formerly appointed by a ruler, who makes decisions perceived as arbitrary or based on personal interpretations rather than formal procedures.

On the other hand, from nihilist currents, in the sense that any idea of equity responds to power relations, and, therefore, there is no criterion of equity independent of such relations (Lemm, 2013). Fairness depends on a dense knowledge of the social relations in which decisions must be made, as well as the quest to restore the disturbed social order. This view also connects with Christian thought, and the idea of justice as recognition and love, i.e. the search for social balance based on an idea of the common good (MacIntyre, 2013; St. Augustine, 426/2022).

In the equity debate, and in relation to the outcomes that are analysed in the indicators, we must take into account the curriculum, and the extent to which it is loaded with biases, denouncing the commodification of school life, as well as the lack of sensitivity to cultures that deviate from the Western canon (Masson & Eliacheff, 2022; OECD, 2021; Torres Santomé, 2017). In particular, more recently, decolonial sociology has highlighted the extent to which Western countries set Eurocentric measures, indicators and criteria and establish them as the standard by which to compare the rest of the world, passing such criteria off as universal, when they are particular (Castro-Gómez, 2005; Grosfoguel, 2023).

In the case of the feminism of difference, we can take into account variables such as the competitiveness of the educational system, since it is an institutional design that reflects masculine values, to the detriment of feminine values. Also, the need to produce new indicators that vindicate the cultural pattern associated with women, which is traditionally assigned a devalued role compared to the male pattern, instead of aspiring to the dissolution of cultural differences between men and women, which may mean that feminine cultural values are in decline. From this point of view, more importance should therefore be given to a school that is more attentive to cultural forms traditionally associated with women. For example, it has been observed that competitive models of evaluation lower girls' performance (Arias et al., 2023). Or the occupation of the leisure space in schools, which favours male uses, such as football, leaving girls on the sidelines (IPA Espanya et al., 2011).

Indicators showing discrimination based on LGTBIQ+ membership (McBrien et al., 2022; Trujillo, 2022) are urgent, as several countries are orienting their policies towards greater recognition of this diversity. The most controversial issue is around transgender people and biological interventions on minors (operations, hormone treatments...) (de Lora, 2020).

Another element to take into account in the construction and analysis of indicators that allow us to guarantee equity is disability and functional or neurological diversity. Although the major statistical operations such as those seen in this research do not directly address this issue, this does not mean that we should not reflect on the model of equity with which these people should be treated in the education system. The 2030 Agenda proposes that they should be fully integrated into regular classrooms, and that segregation of any kind should be ended, but not all families share this approach, and some consider that segregated treatment is better.

These visions of equity, as presented in this section, broaden the reflection on distributive justice as those presented above. The fact that they are not taken into account damages to a certain extent the legitimacy of large quantitative evaluation operations as instruments for reflecting on educational problems, given that, if we do not have the indicators, we will only be able to approach the issue of equity in speculative terms.

In this way, by broadening the focus of the equity debate, it contributes to a more complex view of the educational reality, moving away from those critics who consider that PISA or studies of this type are dominated by an economic mentality, typical of the human capital theory, aimed at improving the competitiveness of the economy, by focusing

so much on competencies, leaving aside other fundamental expected results of the education system.

7 Conclusions

Equity is a fundamental objective of any education system, but this is decided differently depending on what is meant by a just society. Often this discussion is hidden under the technocratic dream of indicators, falling into the technocratic trap of believing that some statistical parameter is capable by itself of overcoming this debate on social values. In this paper we have shown that one statistical parameter is not better in itself than others for assessing equity, as each statistical operation is connected to a different concept of equity. Choosing one or another parameter to assess equity is not a technical operation, it is a political operation. The mean is better for utilitarians, the R^2 or the β of the regressions for egalitarian liberals, as well as the minima of the distribution, or the standard deviation for Marxists.

This avoids two problems closely related to the technocratic dream: thinking that by using statistics you can shy away from the debate on the model of society, and assuming that different types of statisticians are interchangeable, ignoring the set of assumptions they imply about how the social order is structured.

It is necessary to recognise that this debate cannot be settled by science. Neither statistics nor sociology can say which is the best indicator of equity, as that would be tantamount to taking sides with one school of thought to the detriment of the others. However, science has the unavoidable functions of knowledge transfer to society, social innovation and development, analysis, diagnosis and recommendation for public policies. In this sense, it also has the responsibility to separate the uses, which can be extremely perverse with respect to the very idea of equity, from the technical specifications and philosophical implications of each indicator we consider to measure it. It is the task of science to point out the coherence between the philosophical concept and its evaluation, not to choose the best philosophical concept.

It is necessary to clarify in order to understand, and this is the proper scientific task; not to leave philosophy aside, so that it is implicit, but to include it in the debate. By not making the philosophical burden of the techniques used explicit, the aim is to solve the problem of equity as if it were a technical problem. This operation of double negation seeks to legitimise, at best, a philosophical position through a technical disquisition, when it is not the result of ignorance.

This is why educational research should perhaps offer a multiplicity of statistical indicators of equity while clarifying the philosophical criteria they imply. Not to take sides, but to display the various ways of understanding equity, without supplanting one in favour of another on the basis of technical criteria, when the debate is normative.

Each indicator is loaded with philosophical assumptions, some are irreducible to others, and it is therefore not advisable to apply dimensionality reduction techniques to these indicators together or to construct a composite index with several of them. Instead, it is advisable to use each indicator separately, making explicit the equity model underlying the statistical operations. This avoids falling into abstract empiricism and confusing them with a number that silences the evaluative debate.

On the other hand, a deep understanding of the nature of education and distributive justice leads us to avoid the use of the Gini index. Unlike rent or income, we cannot

redistribute educational competencies from the most advanced to the furthest behind, in order to equalise the distribution of competencies. The impossibility of this operation demonstrates the senselessness of using such an index when studying the distribution of education.

Here we have concentrated on showing the valuational burdens of the different indicators used to measure equity and, consequently, for the design of public policies that seek to promote it. In this way, we hope to contribute to improving the quality of the debate between philosophy and science, as well as to encourage a more transparent and honest debate on educational equity in the media and in the definition and implementation of public policies. In an international context of attack on science and universities, it is essential to make the normative assumptions of research explicit.

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