education policy analysis archives

A peer-reviewed, independent, open access, multilingual journal

Arizona State University

Volume 32 Number 35 July 9, 2024 ISSN 1068-2341

The Funding of Public Basic Education[1] and Educational Results: Review of Foreign Literature and Reflections on the Brazilian Context[2]

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Citation: Silva Junior, W. T., & Alves, T. (2024). The funding of public basic education and educational results: Review of foreign literature and reflections on the Brazilian context. [Translated from the original, *Financiamento da educação básica pública e resultados educacionais: Revisão da literatura estrangeira e reflexões sobre o contexto brasileiro.*] *Education Policy Analysis Archives, 32*(35). https://doi.org/10.14507/epaa.32.8581

Abstract: With the aim of investigating the relationship between the funding of public basic education and the educational results achieved, this study analyzed a pre-selected set of foreign academic works and identified elements that can be used to encourage debate about the Brazilian

[1] For this work, it is important to highlight that, compared to the American model, basic education in Brazil refers to: *Educação Infantil* (Kindergarten), to *Anos Iniciais do Ensino Fundamental* (Elementary School), to *Anos Finais do Ensino Fundamental* (Middle School) and *Ensino Médio* (High School).
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Journal website: http://epaa.asu.edu/ojs/
Facebook: /EPAAA
Twitter: @epaa_aape

Manuscript received: 21/2/2024
Revisions received: 21/2/2024
Accepted: 21/5/2024

model of educational financing. The study used the scoping review technique expanded by elements of the systematic literature of review to analyze the selected foreign studies. The study demonstrated that the availability of financial resources capable of providing an adequate set of inputs, accompanied by an efficient, responsible management process and subject to social control methods, is a crucial requirement for improving educational results and reducing the negative effects generated by low socioeconomic status (SES). It was also observed that although socioeconomic status is an important predictor of educational results, it can be mediated by actions carried out inside and outside school. Additionally, this study demonstrates that educational results need to be measured using indicators other than those obtained through standardized tests, such as: access; school performance; frequency; school dropout; student involvement; completion; progress between stages; improvement in social indicators/social mobility; compliance with the rights provided for in legislation, among others.
Keywords: funding school funding; educational results; quality of education; educational policies; basic education

Financiamento da educação básica pública e resultados educacionais: Revisão da literatura estrangeira e reflexões sobre o contexto brasileiro

Resumo: Com o objetivo de investigar a relação entre o financiamento da educação básica pública e os resultados educacionais atingidos, este estudo analisou um conjunto pré-selecionado de trabalhos acadêmicos estrangeiros e identificou elementos que podem ser empregados para fomentar o debate sobre o modelo brasileiro de financiamento educacional. O estudo empregou a técnica da revisão de escopo, ampliada por elementos da revisão sistemática de literatura, para efetuar a análise dos estudos estrangeiros selecionados. O estudo demonstrou que a disponibilidade de recursos financeiros capazes de fornecer um conjunto adequado de insumos, acompanhada de um processo de gestão eficiente, responsável e submetido a métodos de controle social, é requisito crucial para melhorar os resultados educacionais e reduzir os efeitos negativos gerados pelo baixo status socioeconômico. Observou-se ainda que embora o status socioeconômico seja um importante preditor dos resultados educacionais, ele pode ser mediado por ações realizadas dentro e fora da escola. Adicionalmente, este estudo demonstra que resultados educacionais precisam ser aferidos por indicadores diversos daqueles obtidos por meio de testes padronizados, como por exemplo: acesso; rendimento escolar; frequência; evasão; envolvimento discente; conclusão; progresso entre etapas/elevação de escolaridade; melhoria nos indicadores sociais/mobilidade social; atendimento aos direitos previstos na legislação, dentre outros.
Palavras-chave: financiamento da educação pública; resultados educacionais; qualidade da educação; políticas educacionais; educação básica

Financiamiento de la educación básica pública y resultados educativos: Revisión de literatura extranjera y reflexiones sobre el contexto brasileño

Resumen: Con el objetivo de investigar la relación entre el financiamiento de la educación básica pública y los resultados educativos alcanzados, este estudio analizó un conjunto preseleccionado de trabajos académicos extranjeros e identificó elementos que pueden ser utilizados para estimular el debate sobre el modelo brasileño de financiamiento de la educación. El estudio utilizó la técnica de revisión de alcance, ampliada con elementos de la revisión sistemática de la literatura, para analizar los estudios extranjeros seleccionados. El estudio demostró que la disponibilidad de recursos financieros capaces de proporcionar un conjunto adecuado de insumos, acompañada de un proceso de gestión eficiente, responsable y sujeto a métodos de control social, es un requisito crucial para mejorar los resultados educativos y reducir los efectos negativos generados por el bajo

nivel socioeconómico. estado. También se observó que, si bien el nivel socioeconómico es un predictor importante de los resultados educativos, puede estar mediado por acciones realizadas dentro y fuera de la escuela. Además, este estudio demuestra que los resultados educativos deben ser medidos por indicadores distintos a los obtenidos a través de pruebas estandarizadas, tales como: acceso; rendimiento escolar; frecuencia; evasión; participación estudiantil; conclusión; avance entre etapas/aumento de la educación; mejora de los indicadores sociales/movilidad social; cumplimiento de los derechos previstos en la legislación, entre otros.
Palabras-clave: financiaón de la educación; resultados educativos; calidad de educación; políticas educativas; educación básica

Funding of Public Basic Education and Educational Results: Review of Foreign Literature and Reflections on the Brazilian Context

For more than a century, the relationship between public spending on Brazilian basic education and its educational results has mobilized different domestic political actors[3], with a direct impact on the various stages of the political-administrative cycle of public educational policy. Education, especially basic education, is characterized as an individual right of public interest that must be ensured by the State (Teixeira, 1996), and Brazil established the right to education through meticulous regulation, both in the Federal Constitution and in ordinary laws. However, despite legal guarantees, Brazil has a long history of non-regulation and non-compliance with the standards that establish the right to quality education (Farenzena, 2019), and one of the reasons for this situation is that investment in education[4], as with other social policies, is subject to budget availability (Carreira & Pinto, 2007).

Given the limits imposed when competing for a public fund committed to fiscal adjustments in Brazil (Farenzena, 2019), political actors begin to debate, in the foreground, the efficiency in the application of available financial resources. And one of the variables analyzed is the impact that the volume of financial resources invested in public networks has on the educational results achieved. The Brazilian case presents additional difficulties, as it is a country of continental dimensions, with a great diversity of contexts, with little collaborative federalism and different local capabilities, both technical and financial (Alves et al., 2019). Furthermore, there are challenges to face regarding Brazilian legislation which, although it is clear in guaranteeing the right to education, lacks important regulations, as in the case of the Cost of Quality Education per Student (CAQ[5]). Furthermore, it presents concepts that are still in dispute within the normative framework itself, as will be demonstrated below.

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[3] According to Howlett, Ramash and Perl (2013), capitalist-liberal-democratic countries have the following domestic political actors: elected politicians; general public; state bureaucracy; political parties; interest groups; think tanks; media; experts.

[4] This study uses the term "investment in education" to discuss the State's effort to allocate public resources to guarantee the right to education through financing public schools, without restricting the use of this term to the economic category normally used in public finance studies (capital expenditure). This study also assumes that education, in addition to empowering citizens to face the challenges of increasing productivity, is an individual right and a pillar of society's democratic values. In this sense, education is categorized as an investment not only to enable the individual to adapt to the job market, as presupposed by the Human Capital Theory, but fundamentally to allow the full development of the person in their different aspects, including their preparation for the exercise of citizenship, which generates relevant externalities for the entire society.

[5] For the sake of cultural reinforcement of consolidated terms in the Brazilian context, all acronyms and/or abbreviations were kept in Portuguese.

The Federal Constitution of 1988, amended by EC nº 14/1996, establishes in its article 211 that the Union must "... ensure the equalization of educational opportunities and the minimum standard of teaching quality". The constitutional charter also defines that the minimum quality standard must consider "... the appropriate conditions of supply and will have as a reference the Cost of Quality Education per Student (CAQ) agreed on a collaborative basis...". In the same vein, Article 206 of the Magna Carta establishes that the provision of education with "quality standards" is a principle to be guaranteed and in a complementary manner, Article 4 of Law No. 9,394/1996 (Education Guidelines and Bases Law) establishes that minimum quality standards will be guaranteed through the provision of "...essential inputs for the development of the teaching-learning process appropriate to the age and specific needs of each student [...] including furniture, equipment...". However, the absence of adequate regulation prevents the legal text from becoming reality.

The main national sectoral plan on the subject, the National Education Plan (PNE 2014/2024) approved by Law No. 13,005/2014, presents a set of internal tensions when discussing the topic of 'educational quality', since it suggests quality assessment processes based on a polysemic logic in strategies 1.6 and 7.21, and then suggests, in Goal 7, that quality should be assessed based on standardized tests, which shows that the concepts that support the educational quality assessment process are still in dispute.

We have, therefore, that the basic education offered by Brazilian public networks, despite what is determined by the aforementioned normative frameworks, does not offer equal conditions to all students, does not provide essential inputs in terms of infrastructure, does not have full-time vacancies in sufficient numbers, does not offer decent working conditions for education professionals and does not use the Cost of Quality Education per Student (CAQ) as a reference as established by Constitutional Amendment 108/2020, (Alves & Pinto, 2020; Barbosa, 2013; Cardoso & Oliveira, 2019; OECD, 2023; Peres & Capuchinho, 2022).

The difficulties faced by public basic education networks in Brazil due to their evident underfunding, framed by the debate about what educational quality the Nation determined through the constitutional text to be delivered by the State to the Brazilian people, is present in the motivating genesis of this study.

Still regarding compliance with the legal obligations the Brazilian State has towards the population in terms of guaranteeing educational quality, it is important to include in the debate the so-called "thesis of the reserve of the possible". This doctrinal current argues that the implementation of social rights provided for by law must be subject to budgetary planning and the availability of resources (Martins, 2019). As will be discussed below, it is possible to identify that the thesis of the reserve of the possible has been used in Brazil in a way that makes the existential minimum of which the right to basic education is part unfeasible.

If, on the one hand, there is a consensus in the national literature about the need to improve the quality of public basic education in Brazil, on the other, there is enormous controversy about the impact that the expansion of financial resources would have on educational quality. In fact, there is great disagreement about what educational quality is and how it can be assessed.

Regarding the concept of educational quality, for Oliveira and Araújo (2005), the way in which the public provision of basic education in Brazil expanded since the 1920s helps to explain how the concept of educational quality was constructed, considering the problem judged as a priority in each historical moment. Initially, only the availability of vacancies was considered, later flow analyzes were included, and finally learning assessment was incorporated, which could be measured through standardized tests. In this sense, although the results obtained through standardized tests may be relevant in the process of evaluating educational results, they cannot be considered, in themselves, an evaluation process capable of measuring such results (Afonso, 2009). As will be seen

later, there are other variables that need to be considered in the process of evaluating educational results.

Regarding the influence that financial resources have on educational results, an analysis of Brazilian studies on the topic highlights a dispute between antagonistic views. There is a current of thought that considers the existence of financial resources in adequate volumes to be a necessary, although not sufficient, condition for the quality of education (Pinto, 2006; Soares & Clemente, 2013). Another current moves in the opposite direction, arguing that educational quality is not directly related to the volume of available resources, but to the management model for these resources (Diaz, 2012; Souza et al., 2021), and this dissent is also present in the motivating genesis of this work.

In this way, the present study seeks to contribute to this debate based on a review of foreign literature[6], applying the expanded scope review technique using some systematic literature review tools (Mendes-Da-Silva, 2019; Mota De Sousa et al., 2018). Based on the study of a pre-selected set of foreign research, but with care to avoid simplified transpositions, this work aims to analyze how these studies understand the relationship between the financing of public education networks and educational results, seeking to bring elements that may be useful to the debate on the Brazilian model of educational financing.

Two other previous studies were found that also carried out literature reviews and that contribute to this same object of analysis (financial resources x educational results). The first, published in 2007, identified that in foreign literature there is a clear divergence, and that the majority current, led by Eric Hanushek, points to the non-existence of a significant correlation between resources invested in schools and educational results (Nascimento, 2007). The second study, published in 2017, identified the same divergence, but without observing the existence of a current that could be considered the majority. In this second study, it was observed that foreign literature identified a solid relationship between educational results and financial investments when the units of analysis were developing countries (Simielli & Zoghbi, 2017).

The present work aims to continue this debate, in addition to presenting information that updates it, which would already justify its elaboration. Unlike its predecessors, this study is based on the premise that standardized tests are imperfect instruments for evaluating educational results (Afonso, 2009). For this reason, the mechanism for collecting articles that make up this review used different search terms related to the educational results variable. In this way, it was possible to select studies that evaluated educational results beyond performance measured in standardized tests.

This work uses some of the PRISMA protocol recommendations proposed by Moher et al., (2010), anchored in a structured method of identification, selection and critical evaluation of research, with a view to providing greater robustness to the results presented.

From this introduction, the article is organized into four sections: (i) methodological procedures; (ii) analysis of the results considering the evidence compiled from the selected studies; (iii) discussion of the results seeking to synthesize the findings; and (iv) final considerations, limitations and suggestions for future work.

Methodological Procedures

This section presents the methodological procedures used in the identification and selection of studies that were included in this scoping review, as well as a bibliometric analysis of the selected studies. Considering that the scoping review is limited to presenting the extent of available literature and identifying the scope of the evidence found (Mota De Sousa et al., 2018), and seeking to gain

[6] Considering the objectives of this study, studies carried out outside Brazil were called "foreign literature".

depth, we chose to include elements of the systematic literature review technique, which aims to carry out a qualitative and quantitative analysis of the identified evidence (Mendes-Da-Silva, 2019).

To identify and select the studies that were part of this work, the following eligibility criteria were used (Ames et al., 2022; Moher et al., 2010):

Type of study: scientific articles produced outside Brazil that researched the relationship between the public school funding and their educational results, without limiting the search to studies evaluating educational results;

Exclusion criteria: research outside the educational area; focusing only on higher education; and studies that did not associate the financing and outcome variables;

Topic: the secondary selection of studies was made by reading the titles, keywords and abstracts of studies with potential eligibility;

Research design: empirical studies that presented evidence on the impact that financial resources have (or not) on educational results, and that were classified by the database (Capes Periodicals Portal[7]) into one of the following subjects: *public administration; public finance; education; education finance; education research; education policy; education government policy; equal education; access to education; public school; school district; expenditure; expenditure per student; analysis of education; social science.*

Time cut: not applied;

Language: considering the possibility of authors accessing the original, studies published in the following languages were admitted: English, Spanish and Portuguese;

Publication status: articles published in indexed and peer-reviewed journals;

Search criteria: Capes Periodicals Portal database was consulted based on the access provided by the Federated Academic Community (CAFe) in the database available to the Federal University of Goiás (UFG) during the second semester of 2023. As detailed in Table 1, 11 different search terms were used: *education*; public financing; school financing; money matter; performance; evaluation; quality; efficiency; high school; elementary school.* The choice of search terms considered a horizontal analysis that sought to: delimit the field (education); consider the variables financial resources and results; delimit the scope (basic education). In the vertical analysis, we sought to deepen each variable of the horizontal analysis, allowing us to expand the ability to locate studies. When analyzing the financial variables, we sought to use three different terms used in the two reference studies: *public financing; school financing; e money matter.* Finally, when analyzing the educational results variable, and considering its polysemy, it was decided to use four different search terms: p*erformance*; e*valuation*; q*uality*; e *efficiency*.

As shown in Table 1, the 11 different search terms were combined into seven different query actions, returning 117 works with eligibility potential. Among the 117 studies tracked, only 61 had been peer-reviewed, of which 58 were scientific articles. When evaluating the articles in relation to the subject covered (research design) and considering the classification carried out by the Capes Periodicals Portal database, only 45 were considered eligible, as they all met the language criteria according to the filter available in the mentioned database.

We then proceeded to read the markers: title; key words; summary; of each of the 45 studies considered eligible in this first stage of analysis based on the texts available in the Capes Periodicals Portal database. This second stage of analysis was intended to verify the objective and results of the research, evaluating whether these works present evidence on the relationship between financial resources and educational results, with a focus on basic education. Of the 45 works analyzed, 26 were considered eligible after this second stage of analysis.

[7] Available at https://www.periodicos.capes.gov.br

Table 1

Search Mechanisms Employed

Field Delimitation (Title)	Financial Variable (All Fields)	Variable Result (All Fields)	Scope Delimitation (All Fields)	Studies Identified R**	Studies Identified E***
*education**	*"public financing"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	*"High school"*	3	0
*education**	*"public financing"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	*"Elementary school"*	2	0
*education**	*"money matter"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	*"High school"*	2	1
*education**	*"money matter"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	*"Elementary school"*	3	3
*education**	*"public financing"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	-	41	8
*education**	*"school financing"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	-	33	5
*education**	*"money matter"*	"p*erformance*" OR "e*valuation*" OR "q*uality*" OR "*efficiency*"	-	33	9
TOTAL				117	26

Note: Prepared by the authors; * Use of the prefix "education*" which allows combination with other terms that have the same base; R** – Tracked (*Rastreados*, in Portuguese); E*** - Eligible

Among the 26 eligible works, two were excluded due to duplication, another was excluded because the full text was only available in Japanese, and the last one had to be excluded because the text was not accessible to the CAFe/UFG community. Therefore, 22 articles were selected for the present study considering the proposed methodology. A summary of the study selection process flow can be seen in Figure 1, considering the *Prisma Flow Diagram* model (Moher et al., 2010).

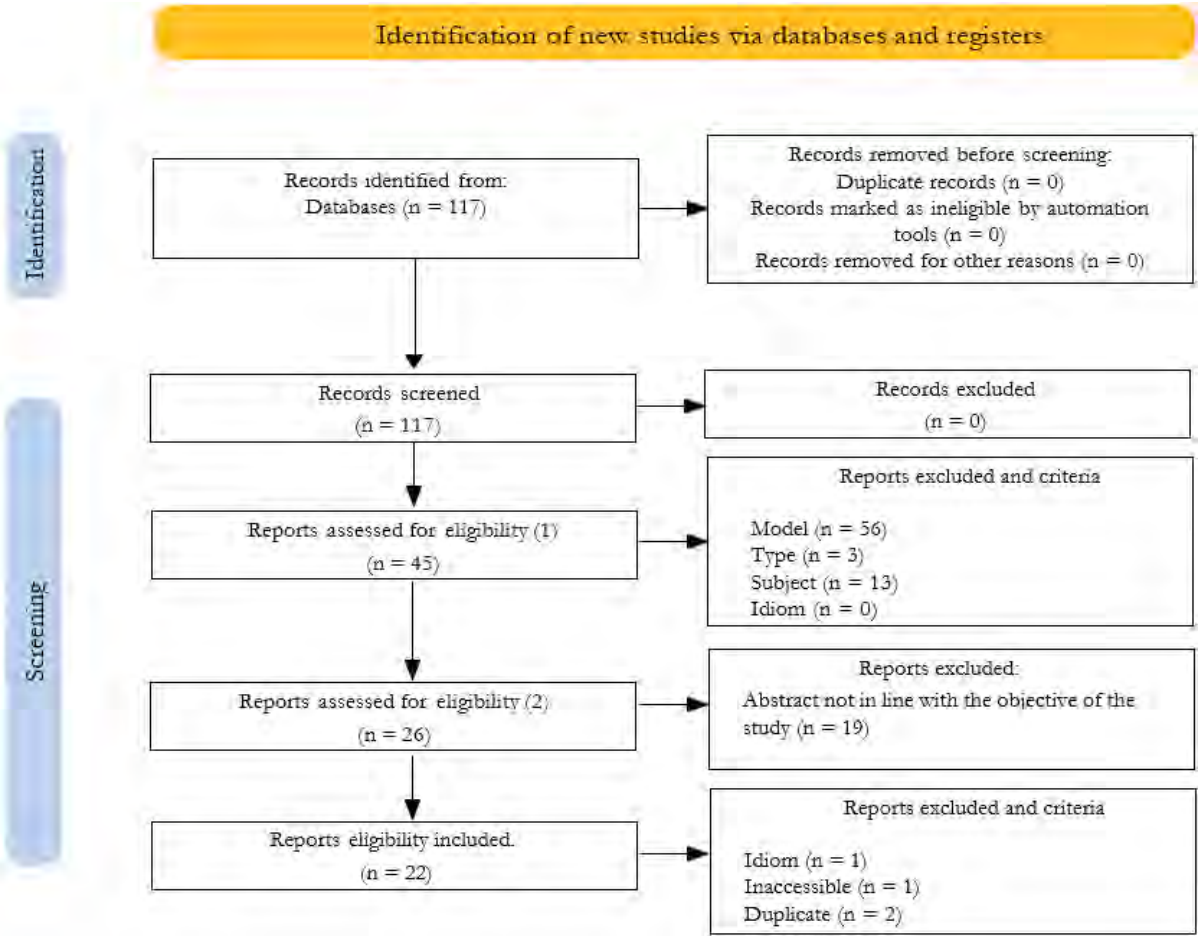
The bibliometric analysis of the 22 selected studies was carried out using R Software through the *Biblioshiny* application (Aria & Cuccurullo, 2017), and demonstrated that the 22 articles were written by 38 different authors, with an average of 1.73 co-authors per document, published between 1977 and 2022 in 18 different journals and used 954 references. The journals most cited by studies are *Journal of Education Finance* and *Economics of Education Review*.

Among the 22 studies, 13 were produced in the United States of America, 3 in the United Kingdom, 2 in Spain, and 1 in Germany, Chile, India and Kenya. The detailed result of the

bibliometric analysis carried out with the R/*Biblioshiny* Software was included in Appendix I of this study.

Figure 1

Work Selection Process Flow: Identification, Selection, Eligibility and Inclusion



Note: Created by the authors based on the *Prisma Flow Diagram* model (Moher et al., 2010)

Results

The selected articles debate the relationship between the public school funding and educational results considering different parameters and contexts, allowing a broad assessment of the researched phenomenon. This results section was prepared from the reading/collection of information from the 22 selected works considering five different analysis variables that are directly related to the objective of this work, as presented in Table 2. In this way, it was possible to deepen the investigation and present a structured synthesis that meets the objectives outlined for this study.

Table 2

Employed Analysis Framework

Object	Analysis variable
1. Educational Results	1.1 Measurement of educational results 1.2 Relationship between educational results and socioeconomic indexes
2. Educational financing	2.1 Efficiency of investment in education 2.2 Calculation of the cost per student and financing models
3. Relationship between educational results and School Funding models	3.1 Impact of public school funding on educational results

Note: Prepared by the authors

The first two analysis variables presented clarify how the selected studies define educational results. The following two variables show how the studies studied debate the issue of financing. Finally, the last variable analyzed meets the central objective of this study and seeks to synthesize the findings found in the selected studies with a view to answering the question: What is the relationship between the public school funding and the educational results obtained?

Measurement of Educational Results

Although most of the selected studies (59%) argue that the measurement of educational results in education networks is carried out through the application of standardized tests to their students, it is noteworthy that another 11 mechanisms for measuring results have been mentioned. It is important to highlight that even among the works that highlighted standardized tests as an important tool for measuring results, it was observed that this assessment model is limited as it is not sensitive enough to capture different learning styles and/or skills acquired by students (Tajalli, 2019). Among those studies that suggested the use of standardized tests under specific conditions, the following recommendations stand out: need to classify results into achievement levels to avoid the average effect (Palardy et al., 2015); recommendation to prioritize the use of this type of test for international comparisons (Schütz et al., 2008); that added value measures are adopted over time, so that the results are used endogenously (Grosskopf et al., 2014; Rauscher, 2020).

Indicators related to student retention and success were also used to measure educational results. Monitoring student attendance (Ruggiero, 2001), the observation of academic performance based on the average of the grades obtained (Lewin, 1997; Rauscher, 2020; Wolf, 2018), monitoring dropout rates (Jha & Parvati, 2008; Lewin, 1997; Ruggiero, 2001), monitoring student engagement based on subjective assessments applied by teachers (Poon, 2020), observing the cycle completion rate, also called graduation rate (Al-Samarrai, 2006; Kang, 2022; Kazal-Thresher, 1993), and monitoring the progression rate between stages, which measures the number of students who completed the primary phase of basic education and proceeded to the secondary phase (Ngware et al., 2007) were used by some of the studies analyzed to measure the educational results achieved.

Studies carried out in developing countries point to the importance of monitoring access to education as a model for measuring educational results. According to these authors, the enrollment rate, which considers the number of students in relation to the population at the appropriate age to attend basic education, should be used as a result indicator (Jha & Parvati, 2008; Lewin, 1997; Ngware et al., 2007).

Other studies measured educational results based on effectiveness markers, such as students' interest in continuing their studies (Kazal-Thresher, 1993), passing higher education admission tests; (Tajalli, 2019), or even the improvement of social indicators related to health and citizenship (Birdsall, 1996). Finally, some studies have proposed that educational results be evaluated based on the capacity of educational networks to meet the objectives set out in current regulatory frameworks. To achieve this, the authors propose that the difference be calculated between established standards, including in terms of inputs, and what is actually delivered to society (Heise, 1995; Kagan, 2003).

In summary, the selected studies presented 12 possibilities in terms of models for measuring educational results: i) results on standardized tests; ii) student attendance; iii) school performance; iv) dropout rate; v) "student engagement" rate; vi) graduation rate (completion); vii) rate of progression between stages (increase in education); viii) net enrollment rate (access); ix) study continuity rate; x) pass rate on higher education admissions tests; xi) improvement of social indicators (health, safety, citizenship, among others); e xii) meeting the objectives set out in legislation.

Relationship between Educational Results and Socioeconomic Indexes

Seeking to identify possible impacts caused by the multicollinearity effect on the financing and outcome variables, most of the selected studies debated the effects that socioeconomic indicators have on educational results. It was observed that to build models that evaluate the impact of financing, it is essential to isolate the influence that variables measured inside and outside the school have on the educational result (Grosskopf et al., 2014).

The selected studies concluded that the socioeconomic status (SES) of students and their families impacts educational results. It was also observed that the expansion (or reduction) of educational resources in public networks has a more relevant impact on the educational results obtained by students from families with low socioeconomic status (Donoso-Díaz et al., 2021; Heise, 1995; Holmlund et al., 2010; Ngware et al., 2007; Schütz et al., 2008).

Although studies point to the existence of a relationship between the socioeconomic status (SES) of students and their educational results, there was dissent regarding the relevance of this impact. Some studies indicate that the *family effect* [8] (or *income effect*) explains only part of the educational results, while factors related to the *school effect* are more relevant. Otherwise, data presented in other studies suggested that SES is a determining variable in calculating educational results (Lewin, 1997). The data showed educational networks with a higher percentage of vulnerable students present worse educational results (Palardy et al., 2015); yet, in schools that accommodate greater socioeconomic diversity by offering an inclusive educational environment, a reduction in the impact of SES and an improvement in educational results were observed (Schütz et al., 2008).

It was also observed that family spending on educational inputs such as the acquisition of books and extra classes, which does not occur in families with low socioeconomic status (SES), has a relevant impact on educational results (Al-Samarrai, 2006; Ngware et al., 2007; Schütz et al., 2008). At the other end, data indicated that low SES is associated with greater health and nutrition challenges, which also impacts educational outcomes (Heise, 1995).

The works that discussed the American educational financing model observed that the socioeconomic status (SES) of school districts has a direct impact on the availability and quality of inputs, with a strong impact on the educational results of the poorest districts (Heise, 1995; Kagan, 2003; Kazal-Thresher, 1993; Ruggiero, 2001; Wolf, 2018). In this context, the difference between the

[8] Although some studies classify exogenous variables (outside school) that interfere in the educational process as the "*income effect*", we chose to call it the "*family effect*". We understand that this classification is broader, and for this reason it is more aligned with the concept of socioeconomic impact presented by the authors here.

average SES of school districts ends up segmenting the educational system itself, which ultimately perpetuates inequality (Kagan, 2003).

Some studies have identified strategies that can reduce the negative impact that socioeconomic status (SES) has on educational results. Schools can, for example, develop projects aimed at vulnerable audiences (Palardy et al., 2015). Increasing preschool enrollment has also been identified as a factor in reducing the impact of low SES (Schütz et al., 2008), as well as the development of actions that seek to involve parents in the educational process of their children (Heise, 1995; Ngware et al., 2007; Poon, 2020; Ruggiero, 2001).

Therefore, the socioeconomic status of students is an important predictor of educational results, but it can be mediated by actions carried out inside and outside the school through the commitment of public resources. In summary, it is possible to state that the SES of students impacts educational results. However, it is also true that increased investment in education can, on the one hand, minimize the SES effect, and on the other, it can impact socioeconomic status. This creates a virtuous cycle (Birdsall, 1996) where investment in education impacts educational results, which improve socioeconomic status and generate further improvements in educational results.

Efficiency of Investment in Education

Most of the selected studies concluded that spending efficiency should be measured considering the results obtained in relation to the volume of resources invested, but without disregarding the socioeconomic status of the students evaluated. The data showed that the efficient allocation of resources can substantially improve the quality of inputs, with a direct impact on educational results (Kagan, 2003; Lewin, 1997). Likewise, it was observed that in cases where the educational investment decision-making process ignored technical arguments in favor of short-term political variables, a loss of effectiveness of investments in terms of educational results was noticed (Al-Samarrai, 2006).

Some studies have associated the efficiency of spending with its ability to reduce inequalities in access to education. In this way, educational spending is more efficient as it allows students with different socioeconomic profiles to achieve the same results (Donoso-Díaz et al., 2021; Schütz et al., 2008). In this sense, efficient educational spending must seek equity even to the detriment of equality (Lewin, 1997).

To analyze the efficiency of educational expenditure, it is important to identify the extent to which each type of expenditure was responsible for the educational results obtained (Kazal-Thresher, 1993). In this sense, it is recommended to use tests that can validate the causal relationship between variables (Holmlund et al., 2010). Finally, to be considered efficient, educational spending needs to be aligned with educational standards and previously established performance goals (Heise, 1995).

Calculation of the Cost per Student and Financing Models

Most of the selected studies present realities in which the cost per student is calculated considering the available resources, and suggest that the analysis be carried out based on the segregation of cost items, considering the recurrence of the cost (Ngware et al., 2007), and its connection with teaching activities (Ballard & Maiden, 2018). According to the authors, any managerial cost analysis involves the correct distribution of expenses from the financed inputs to the elements resulting from the process.

Some of the studies analyzed, particularly those dedicated to studying the impact of court decisions on the financing of basic education in the United States of America, concluded that the calculation of the cost per student must consider the gap between the educational resources necessary to achieve the goals provided for in legislation and the inputs made available by educational networks (Heise, 1995). In this sense, it is essential to know the minimum cost capable of guaranteeing the

result established in the regulatory frameworks so that the gap between the actual cost and the necessary cost can be calculated (Ruggiero, 2001). This logical model meets the concept of the Cost of Quality Education per Student (CAQ), introduced into the Brazilian Federal Constitution by virtue of Constitutional Amendment No. 108/2020, which was not regulated and faced resistance in the Executive Branch, as the Ministry of Education did not approve the Normative No. 08/2010 CEB/CNE, which dealt with minimum teaching quality standards for public basic education (Farenzena, 2019).

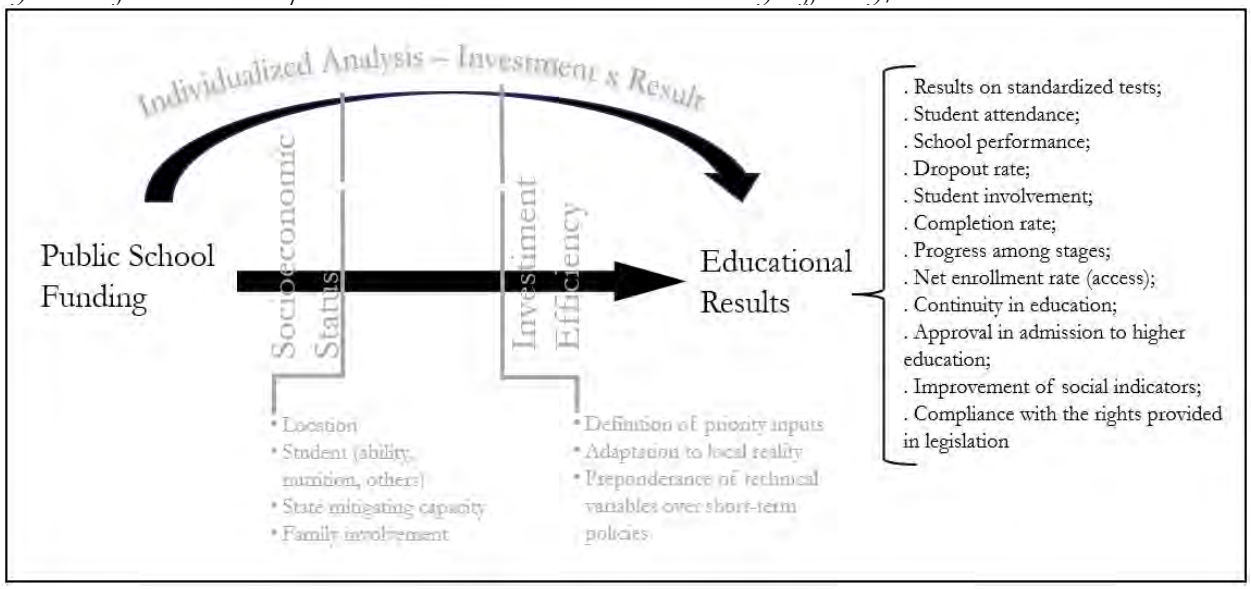
Another issue brought up was the difficulty of segregating costs up to the *enrollment level* (Palardy et al., 2015). Although this level of granularity is recommended for adequate management analysis of costs, it is observed that public records, and their respective controls, are more robust when evaluating the distribution of resources up to the *school level*. Another important difficulty in calculating the cost per enrollment refers to the wide variety of input and output resources that can be accommodated by cost functions (Grosskopf et al., 2014).

Impact of Public School Funding on Educational Results

Figure 2 seeks to summarize the variables considered by the studies analyzed when evaluating the impact of the investment in terms of generating educational results. In summary, the impact of investment in education on educational results is mediated (or crossed) by socioeconomic status (SES) and the efficiency of the investment made. In general terms, the studies analyzed pointed out that the expansion of resources available to education networks can generate different impacts in terms of results depending on the socioeconomic characteristics of students and the governance models used to guarantee the efficiency of the investment made.

Figure 2

Synthesis of the Relationship between Investment and Result Mediated by Efficiency/Socioeconomic Condition



Note: Created by the authors based on the analysis of the selected studies.

Another important variable for the analysis model is the definition of the type of result that should be considered in the evaluation process. As discussed, standardized tests for learning analysis are imperfect instruments for evaluating educational results, and several variables related to educational results need to be analyzed simultaneously.

Another issue highlighted in Figure 2 deals with the need to individually evaluate the relationship between each type of investment and the respective result generated considering the mentioned intervening variables. Which means that the analysis of each result needs to consider the different types of inputs made available from the increase in educational financing.

Approximately two-thirds of the selected studies concluded that the availability of financial resources in sufficient quantity to offer a set of adequate inputs is a fundamental condition for improving educational results. One-third of the studies also explored the fact that the relationship between financial resources and educational results is even stronger when resources applied directly to teaching activities are analyzed, mainly in incentives for teachers.

On another note, there is research that indicates that increased resources are only capable of generating improvements in educational results when used efficiently, using specific inputs and subject to a rigorous institutional governance process (Al-Samarrai, 2006; Kagan, 2003; Ruggiero, 2001). Some surveys have shown that good management of applied resources may have a stronger relationship with educational results than the volume of resources actually applied (Al-Samarrai, 2006; Palardy et al., 2015). Another variable that also has a strong relationship with the educational results achieved, and which would therefore be more relevant than the total volume of public resources applied, is the ability of families to allocate private financial resources to the educational process (Lewin, 1997; Poon, 2020; Schütz et al., 2008), which is related to the socioeconomic profile of the students evaluated.

In fact, there is a consensus around the finding that the relationship between public school funding and educational results is influenced by the socioeconomic status of the student and their surroundings. However, this assertion is used on the one hand to defend the thesis that it is not efficient to expand the resources available to public educational networks (Al-Samarrai, 2006; Palardy et al., 2015); on the other hand, this same statement helps to support the thesis that financial resources are particularly important for vulnerable audiences (Donoso-Díaz et al., 2021; Ruggiero, 2001; Schütz et al., 2008; Tajalli, 2019). Poorer regions face more severe environmental challenges and, for this reason, require more robust financial investments capable of mitigating the so-called family effect to achieve established adequacy standards (Ngware et al., 2007; Rauscher, 2020).

Discussion

When evaluating how the foreign literature included in the present study analyzed the relationship between financing and educational results, it is observed that the conclusions are influenced both by the philosophical conception that guides the researcher when choosing the research method and by the characteristics of the sample used. This statement is in line with the findings presented in literature reviews (Nascimento, 2007; Simielli & Zoghbi, 2017), analyzed during the development of this study.

Regarding the impact that methodological conceptions/choices generate on the results, it was observed that when the analysis method used establishes that the educational results variable will be measured using standardized tests, the results point in one direction. On the other hand, when the method used establishes that educational results will be measured based on indicators of permanence and success (frequency, dropout, completion and progression between stages), the results indicate absolutely different conclusions. Additionally, in cases where international standardized tests are used, such as the Program for International Student Assessment (PISA), to evaluate the educational result achieved by a country, there is still an inaccuracy in the analysis caused by the level of aggregation.

On the different results that can be obtained from the methodological choice regarding how to measure educational results, some of the studies indicate that schools are not business organizations; therefore, they cannot have their results measured by counting outputs. In addition to

generating learning, schools impact the environment in which they are located in the most diverse ways, therefore, it is not possible to measure their results as if it were a factory that delivers outputs at the end of the production process. Also for this reason, pre-fabricated analysis categories that seek to evaluate the efficiency of the resulting element without considering the process or the various intervening factors, are incapable of measuring the effective result of the work carried out in schools (Thurler, 1994). Long-term effectiveness markers, normally difficult to measure, can be impacted by good public educational policies, such as, for example, social indicators related to improving the average salary, citizenship formation, public safety and health, etc. This type of social result impacted by the educational process is difficult to count.

The other variable with an impact on the identified results concerns the characteristics of the observed sample, in particular, socioeconomic status (SES). All studies analyzed identified that there is a relationship between students' SES and their educational results. When discussing the importance of financing for improving educational results, adequate financing has an obvious impact on the *school factor* as it can guarantee adequate inputs, which is particularly important for low-SES students. However, educational financing also has an impact on variables that are influenced by the *family factor*, since the financing model of public education networks can be structured to guarantee better educational (and living) conditions for vulnerable students, therefore reducing the negative effect that the *family factor* has on this group of students, such as those related to nutritional issues.

Although it may seem paradoxical, studies have shown that adequate financing starts to reduce its importance in terms of educational results as it exceeds levels considered adequate, and the opposite is also confirmed. This means that financing has a strong impact on educational results in regions of lower socioeconomic status, such as developing countries, where school units do not have the minimum inputs necessary to guarantee an adequate educational process, students are vulnerable and their families do not participate in the children's educational process. At the other end, where students are able to acquire private goods to support the educational process and families follow the work of schools, financing has less impact on educational results.

Another consensus identified in the literature deals with the importance of the efficiency of financial investment so that it is converted into results. This means that it is not enough to spend more, it is essential to invest in inputs and actions that have an impact on educational results. Studies that sought to isolate the impact of different inputs on educational results concluded that financial investments made in actions directly related to teaching activities, especially those linked to the appreciation of teachers, are those that presented a better investment-to-result ratio.

It should be noted that quality education must be considered an individual right of public interest. Therefore, more than seeking to make choices that guarantee good results, it is essential to ensure that these good results can be achieved by everyone, as the reduction of social inequalities needs to be considered as an indicator of the effectiveness of public educational policies.

Finally, still on the issue of the efficiency of educational spending, another analysis variable deals with the alignment of investment with educational standards and legally established performance goals. Monitoring this relationship indicates the importance of the process of construction of normative frameworks by public authorities while at the same time signaling the possibility of increasingly frequent intervention by the justice system on public educational policies.

For Heise (1995), the judiciary, guided by the right to education granted to citizens, has forced the public power (executive and/or legislative) to consider the "logic of necessary resources" to the detriment of the "logic of available resources" when deciding on the volume of financial resources that should be used to support public basic education policies. This model is in line with the "reserve of the possible" thesis that has been applied in Brazil with a strong impact on the right to education of the Brazilian people, especially vulnerable groups.

Seeking to contribute to the debate about the Brazilian financing model, in summary, it is possible to state that the studies that make up this review concluded that the availability of financial resources capable of providing an adequate set of inputs is a crucial requirement for improving educational results and reducing the negative effects generated by the low socioeconomic status unfortunately present in the reality of a large proportion of Brazilian students. However, this investment needs to be subjected to an institutional governance process that can evaluate the effectiveness of these financial expenditures in terms of achieving educational results (analyzed in a broader sense), compliance with regulatory frameworks, and, of course, reducing social inequalities.

Final Considerations

As demonstrated, both in the *mens legis* that inspires the constitution of the main Brazilian normative frameworks, and in research on the Brazilian model of educational financing, there is a clear disagreement when discussing the impact that the financing model (and the volume of allocated resources) has on educational results. Motivated by this dissent, this work reviewed foreign literature with the aim of analyzing how these studies understand the relationship between the financing of public school funding and educational results, and even though no type of model transposition is sought, the results of this study contain information that can contribute to the Brazilian debate on the topic.

Initially, it is important to note that the conclusions of the studies included in this review are strongly influenced by the definition of educational results and the selection of articles carried out. Therefore, any evaluation of results needs to be categorized based on the concepts behind the choice of methodological techniques chosen by the authors. Even so, it was possible to identify that there is a consensus around the fact that adequate financing has an impact on the educational results of vulnerable populations, as this public cannot have access to private resources to support the educational process, as well as having their own living conditions improved, through projects that come from the school.

Based on the findings, and considering the existing gaps in our educational system due to underfunding, as well as the socioeconomic characteristics of the Brazilian population, the amount invested in public educational policies still has a huge impact on the educational results of Brazilian students. The data found confirm the hypothesis pointed out by Nascimento (2007, p. 126), adapted from Unnever, Kerckhogff and Robinson (2000), that improvements in students' socioeconomic conditions have an impact on educational results, either by impacting school variables, increasing their academic skills, or even improving the student's living conditions.

The fact is that debating whether money matters for improving educational results, analyzed here broadly, only makes sense in rich, less unequal societies, which invest amounts greater than USD PPP 10,000/student/year of primary education, as in the case of Belgium (12,813), Denmark (14,273), Finland (11,212), Germany (11,587), South Korea (13,278), Norway (15,631) or Sweden (13,997); see OECD, 2023). In Brazil, where, according to data from the Organization for Economic Cooperation and Development (OECD), less than USD PPP 3,800/student/year is invested and there is a very high number of vulnerable students, this debate is fundamental, as there is evidence that money matters.

Regarding efficiency in the application of resources in terms of obtaining better educational results, it was observed that investments in variables directly related to activities and teaching, such as investment in teachers, tend to have a stronger relationship with educational results, which can serve as justification for the induction of certain public policies. In the same vein, it is fair to say that the better the governance processes under which the financing models are subject, the better the

investment-result conversion. However, this analysis needs to consider the polysemy of the concept of educational quality.

Brazil is a deeply unequal country, where according to PNAD 2021 data, the median income corresponded to 42% of the average income, which meant that approximately 80% of the population had an income below the average (Medeiros, 2023). In the same vein, inequality becomes evident when one observes that the richest 1% of the Brazilian population earns an income higher than the income achieved by the poorest 50% (Medeiros, 2023). In this context, it is urgent to recognize that investment in quality public basic education is essential to reduce the negative impact caused by low SES that affects a significant portion of our students.

It is obvious that governance models that monitor the effectiveness of public spending are welcome; however, Brazil needs to be convinced that if a good library or a valued teacher are not capable of educating a good student, their absence will certainly make it unfeasible.

Further, we recommend that future literature reviews dedicated to studying the impact of financing on educational results establish previous selections that consider the characteristics of the analyzed sample as well as different variables that can be identified as educational results.

Acknowledgements

We thank professors Nalu Farenzena (UFRGS) and Daniel Cara (USP) for their valuable contributions when analyzing the preliminary version of this study.

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Appendix I

Bibliometric Analysis Result Summary

Timespan	1977 : 2021
Sources (Journals, Books, etc)	20
Documents	22
Annual Growth Rate %	1.59
Document Average Age	14.4
Average citations per doc	23.82
Average citations per year per doc	1.846
References	977

DOCUMENT TYPES	
article	18
book review	1
review	3

DOCUMENT CONTENTS	
Keywords Plus (ID)	31
Author's Keywords (DE)	44

AUTHORS	
Authors	38
Author Appearances	38
Authors of single-authored docs	13

AUTHORS COLLABORATION	
Single-authored docs	13
Documents per Author	0.579
Co-Authors per Doc	1.73
International co-authorships %	0

Annual Scientific Production

Year	Articles
1977	1
1995	1
1996	1
1997	2
2001	1
2003	1
2006	1
2007	1
2008	2
2010	1
2014	1
2015	1
2018	3
2019	1
2020	2
2021	2

Annual Percentage Growth Rate 1.59

Top manuscripts per citations

		DOI	Paper	TC	TCperYear
1	SCHÜTZ G, 2008,	10.1111/j.1467-6435.2008.00402.x		249	15.562
2	BIRDSALL N, 1996,	10.1016/S0272-7757(96)00028-3		76	2.714
3	HOLMLUND H, 2010,	10.1016/j.econedurev.2010.06.008		50	3.571
4	POON K, 2020,	10.1016/j.ijedudev.2020.102175		44	11.000
5	GROSSKOPF S,2014,	10.1093/aepp/ppu007		34	3.400
6	RUGGIERO J, 2001,	10.1093/cep/19.3.268		22	0.957
7	AL-SAMARRAI S, 2006,	10.1002/jid.1190		17	0.944
8	KAGAN J, 2003,			9	0.429
9	HOWARD VB, 1977,	10.2307/2966775		5	0.106
10	NGWARE MW, 2007,	10.14507/epaa.v15n24.2007		4	0.235

Total Citations per Country

	Country	Total Citations	Average Article Citations
1	GERMANY	249	249.00
2	UNITED KINGDOM	67	33.50
3	USA	65	9.29
4	KENYA	4	4.00
5	SPAIN	0	0.00

Most Relevant Sources

	Sources	Articles
1	ECONOMICS OF EDUCATION REVIEW	2
2	JOURNAL OF EDUCATION FINANCE	2
3	AERA OPEN	1
4	APPLIED ECONOMIC PERSPECTIVES AND POLICY	1
5	ASIAN DEVELOPMENT REVIEW	1
6	CONTEMPORARY ECONOMIC POLICY	1
7	EDUCATION ECONOMICS	1
8	EDUCATION POLICY ANALYSIS ARCHIVES	1
9	INDIAN JOURNAL OF HUMAN DEVELOPMENT	1
10	INTERNATIONAL JOURNAL OF EDUCATIONAL DEVELOPMENT	1

Most Relevant Keywords

	Author Keywords (DE)	Articles	Keywords-Plus (ID)	Articles
1	POVERTY	2	EDUCATIONAL DEVELOPMENT	3
2	SCHOOL FINANCE	2	ACADEMIC PERFORMANCE	2
3	ACADEMIC EXPECTATIONS	1	EDUCATION	2
4	ACADEMIC PERFORMANCE	1	EDUCATION POLICY	2
5	ACHIEVEMENT	1	PUBLIC SPENDING	2
6	CHARTER SCHOOLS	1	RESOURCE ALLOCATION	2
7	CHILE	1	STUDENT	2
8	COST FRONTIER APPROACHES	1	ACADEMIC-ACHIEVEMENT	1
9	EDUCATION	1	ASIA	1
10	EDUCATION FINANCE	1	CHINA	1

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Volume 28 Number 35 July 9, 2024 ISSN 1068-2341