

A systematic comparative review of teacher–student ratios across continents

Karen Rhede Manulat*

University of Visayas, Cebu City, Philippines

Dr. Regina P. Galigao

Cebu Technological University, M. J. Cuenco Avenue Cor R. Palma St., Cebu City, Philippines

ABSTRACT

In this research, an analysis of the comparative trends of teacher-student ratios on a global scale was carried out in order to analyze the implications of these ratios on education regarding Sustainable Development Goal 4 (SDG 4). This research used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach to select, screen, and analyze relevant literature sources covering research papers and international organizations' reports within the 2010-2025 period. According to the obtained data, the global differences in teacher-student ratios are obvious; thus, developing countries demonstrate higher ratios due to lack of teachers, resources, and high population numbers, whereas developed countries feature relatively low ratios. While it was noted that lower teacher-student ratios contributed positively to classroom interactions and allowed more opportunities for individual approaches, it should be stated that this criterion was not enough to ensure learning effectiveness due to the presence of other factors influencing learning, including teachers' qualifications and available resources. In addition, the research shows that the uneven distribution of teachers leads to educational disparity in different regions and constitutes a persistent obstacle for reaching SDG 4, especially SDG 4.c related to increasing the supply of teachers. Recommendations were made at both national and international levels concerning teacher recruitment, distribution policies, teacher retention, and comprehensive education reform. The problem of the teacher-student ratio in comparative education is an important factor; however, it should be considered in connection with other aspects.

Keywords: Teacher–student ratio, pupil–teacher ratio, educational equity, teacher shortage, SDG 4, global education policy.

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INTRODUCTION

Education has been broadly acknowledged as an essential vehicle for improving individual well-being and building robust and productive nations. Governments around the world have consistently invested in their educational systems to ensure that children are

*Corresponding author / Email Address: kareversity@gmail.com

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provided with adequate and equitable learning opportunities. Among the many indicators used to evaluate the quality of education, the teacher-student ratio, also referred to as the pupil-teacher ratio, has been identified as one of the most significant. Defined as the number of learners per teacher at a given level of education, this ratio serves as a widely recognized measure of how educational resources are distributed across schooling systems (World Bank, n.d.; UNESCO UIS, 2025).

The teacher-student ratio functions as a particularly valuable tool in comparative education because it provides concrete information about how different countries allocate their teaching workforce across various levels of their education systems. A lower ratio indicates that fewer children are assigned to each teacher, thereby increasing the potential for individualized attention, timely feedback, and meaningful teacher-student interaction. Conversely, a higher ratio implies that each teacher is responsible for a larger number of students, which may reduce opportunities for personalized instruction (National Center for Education Statistics, n.d.). Evidence supports the view that lower teacher-student ratios can positively influence the academic learning experience by enabling teachers to attend more closely to individual student needs and foster greater classroom engagement, ultimately contributing to improved learning outcomes (Sparx Services, 2024). However, the relationship between teacher-student ratios and student achievement is not straightforward, as several intervening variables including resource allocation practices and pedagogical approaches can complicate this association (Njoroge et al., 2023). This complexity underscores the need to examine teacher-student ratios not in isolation but in conjunction with the broader contextual and systemic factors that shape educational quality.

The variation in teacher-student ratios across continents is substantial and reflects the deeply unequal distribution of educational resources globally. Wealthier nations tend to maintain lower ratios, partly because higher income levels enable greater investment in teacher recruitment and retention, while lower-income countries frequently face ratios that are considerably higher due to resource constraints and systemic underfunding (OECD, 2025; UNESCO UIS, 2024). This continental disparity highlights the importance of the teacher-student ratio as a lens through which cross-country and cross-continental differences in educational provision can be systematically analyzed and understood. At the global policy level, the significance of this indicator is embedded in Sustainable Development Goal 4 (SDG 4), which calls for inclusive and equitable quality education for all. Target 4.c within this framework specifically aims at increasing the number of qualified and skilled educators worldwide, and it requires the systematic monitoring of indicators such as pupil-teacher ratios to ensure that countries are adequately staffed to meet the learning needs of their student populations (United Nations, 2026; UNESCO, 2025).

Despite the existence of millions of educators across the world, significant shortages of qualified teaching professionals persist in many countries. The result of this disparity is an uneven distribution of teacher-student ratios across continents, which in turn contributes to persistent inequalities in access to quality education. While some countries report ratios of fewer than 15 students per educator, others record numbers as high as 30 or more students per teacher (Teacher Task Force, 2024). These disparities are not merely statistical abstractions; they reflect structural inequities in how educational systems are resourced, governed, and supported, and they carry direct consequences for the quality of learning experiences available to children in different parts of the world. Given the magnitude and the policy relevance of this issue, a systematic comparative analysis of teacher-student ratios across continents is both timely and necessary. Such a review has the potential to identify prevailing trends, explain the sources of cross-continental disparities, and generate evidence-based insights that can inform education reform efforts and support the global achievement of SDG 4.

Statement of the problem

Teacher-student ratio has been considered one of the significant metrics regarding the quality of education since it determines the number of pupils per teacher and the level of instructional assistance provided in classrooms (National Center for Education Statistics, n.d.). Lower teacher-student ratios generally create better opportunities for personalized instruction, whereas high ratios are associated with overcrowded classrooms and insufficient support for learners. Nonetheless, the relationship between teacher-student ratio and student performance depends on other variables including educational standards, available resources, and financial conditions (OECD, 2024). Worldwide, there are numerous differences in teacher-student ratios attributable to diverse socioeconomic conditions, population growth rates, and education policies, with many developing nations facing higher ratios due to teacher shortages and insufficient financial resources, in contrast to more developed states that maintain lower ratios (OECD, 2025; UNESCO, 2024). This issue is further compounded by a global teacher shortage, with estimates indicating that roughly 44 million more teachers are required by 2030 to meet the demands of global education (Teacher Task Force, 2024). Despite the availability of international data collected by organizations such as UNESCO and the OECD, research synthesis on the comparative analysis of teacher-student ratios across continents remains insufficient, with most existing literature fragmented and concentrated on individual countries or regions. These disparities are directly linked to the attainment of SDG 4, particularly Target 4.c, which is concerned with ensuring an adequate supply of qualified teachers and improving indicators such as the pupil-teacher ratio. In light of these considerations, this study aims to address the following research questions.

1. What do available studies and statistics reveal about teacher-student ratios across different continents?
2. What are the differences in teacher-student ratios across continents and what underlying factors account for these differences?
3. What are the effects of teacher-student ratios on education quality and equity in relation to achieving SDG 4, particularly Target 4.c?

METHODOLOGY

This study employed a systematic review research design guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The systematic review approach is designed to identify, select, and synthesize available research related to a particular issue, with the primary goal of reducing bias in the results obtained and ensuring high levels of validity and reliability. The PRISMA approach was selected because it provides clear guidelines on how a systematic review should be conducted, specifying the steps to be followed in searching for sources and evaluating them for potential inclusion in the review.

Data for this study were collected from reputable academic databases and international organizations to ensure the quality and reliability of the sources consulted. The databases and websites used included Google Scholar, Scopus where accessible, Web of Science where accessible, the UNESCO Institute for Statistics, the OECD Education Database, and the World Bank Data portal. The search was focused on studies published between 2010 and 2025 to

ensure that the review incorporated updated and contextually relevant information. The keywords and keyword combinations employed in the search process included "teacher-student ratio," "pupil-teacher ratio," "class size and learning outcomes," "teacher shortage global," "comparative education teacher ratio," "education inequality teacher supply," and "SDG 4 teacher indicators." Boolean operators, specifically AND and OR, were used to refine the search results and ensure comprehensive coverage of the relevant literature, for example by combining "teacher-student ratio" with "comparative education" to narrow results to cross-contextual studies.

To ensure that only relevant and high-quality studies were included in the review, a set of clearly defined inclusion and exclusion criteria was established prior to the commencement of the selection process. Studies were included if they focused on teacher-student ratio or pupil-teacher ratio, involved comparative or cross-country analysis, were peer-reviewed journal articles, institutional reports, or official publications, were published between 2010 and 2025, were written in English, and were sourced from recognized organizations such as UNESCO, the OECD, or the World Bank. Studies were excluded if they were unrelated to teacher-student ratio, constituted opinion pieces or blog articles without empirical evidence, focused exclusively on a single school without broader contextual relevance, were identified as duplicates across databases, or lacked accessible full text.

The study selection process adhered to the four sequential stages prescribed by the PRISMA framework: identification, screening, eligibility, and inclusion. During the identification stage, studies relevant to the research were located using the chosen keywords across the selected databases, and additional sources were identified by examining the reference lists of the initially retrieved studies. In the screening stage, irrelevant materials were filtered out based on a review of titles and abstracts, and duplicate records were eliminated. During the eligibility stage, the full texts of the remaining studies were analyzed against the established inclusion and exclusion criteria, and those that were directly relevant to teacher-student ratio and comparative education were retained. In the final inclusion stage, the studies that met all criteria were incorporated into the review and used to synthesize findings regarding patterns and trends in teacher-student ratios across continents.

Information from the selected studies was meticulously extracted and organized using a data extraction matrix. The specific information extracted from each study included the names of the authors and the year of publication, the country or region in which the study was conducted, the research design and methodology employed, the data sources used, the key findings pertaining to teacher-student ratio, and the implications identified for educational quality and SDG 4.

Thematic analysis was adopted as the primary method for synthesizing the results obtained from the selected studies. The themes that emerged from the data included global trends in teacher-student ratio, differences in ratios across continents, factors affecting teacher-student ratio, implications for educational quality and academic achievement, and consequences for the attainment of SDG 4. Thematic analysis enabled the identification of similarities and differences across studies and provided a structured basis for explaining why disparities in teacher-student ratios exist between different continents and what factors drive these disparities.

Several measures were taken to ensure the credibility of the research. These included the exclusive use of peer-reviewed and officially published literature from recognized bodies such as UNESCO, the OECD, and the World Bank; the application of clearly defined inclusion and exclusion criteria; the maintenance of a transparent and systematic approach to literature searching and selection in accordance with PRISMA guidelines; and the adoption of a rigorous and systematic approach to data extraction and thematic analysis. With respect to ethical considerations, since this study involved the analysis of existing publicly available data, no

direct interaction with human participants was required. All sources consulted have been cited in APA 7th edition format to maintain academic integrity and ensure proper attribution throughout the manuscript.

This study is directly aligned with SDG 4 through its focus on the availability of qualified educators as measured by the teacher-student ratio. The selection of teacher-student ratio as the primary variable of analysis corresponds to the internationally recognized monitoring indicator used to assess teacher supply and educational quality standards. By systematically analyzing teacher-student ratios across different regions of the world, this study contributes to a broader understanding of global inequities in teacher supply and provides an empirically grounded foundation for supporting progress toward the educational equity objectives embedded in SDG 4.

RESULTS AND DISCUSSION

This chapter presents the results and discussion of a systematic comparative review of teacher-student ratios across continents, conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The review drew on a body of literature encompassing peer-reviewed journal articles as well as global reports and datasets produced by recognized international bodies including UNESCO, the OECD, and the World Bank. Studies were identified, assessed, and analyzed through a systematic search of multiple academic databases, with data extracted using a structured matrix and synthesized through thematic analysis. The reviewed literature covered comparative information drawn from multiple geographical regions including Asia, Africa, Europe, North America, South America, and Oceania. All results are interpreted in direct relation to the three research objectives of the study, and the discussion is organized around the principal themes that emerged from the synthesis, namely international trends in teacher-student ratios, continental differences, determining factors, implications for educational quality and equity, and relevance to SDG 4.

International trends in teacher-student ratios

The findings confirm that considerable variation exists in teacher-student ratios across countries, yet discernible international patterns are evident. A consistent and well-documented trend across the reviewed literature is that teacher-student ratios are substantially lower in developed nations, while developing countries record markedly higher ratios. Data provided by the OECD indicate that the average number of students per teacher in primary education is approximately 14 students per teacher, and in lower secondary education approximately 13 students per teacher (OECD, 2024). These relatively low averages reflect greater teacher availability and the capacity of well-resourced systems to offer more individualized attention to students. By contrast, UNESCO statistics demonstrate that in many nations, particularly those situated in developing regions, teacher-student ratios exceed 30 students per teacher (UNESCO, 2024). The disparity between these figures underscores the existence of a significant and persistent global gap in access to adequate numbers of teachers, a gap that has direct consequences for the quality and equity of educational provision across national boundaries.

Continental differences in teacher-student ratios

One of the most significant observations arising from the systematic review is the pronounced variation in teacher-student ratios across continents. The reviewed literature consistently identifies Africa and South Asia as the regions recording the highest teacher-student ratios, with this pattern attributed primarily to challenges such as rapid population growth and chronic underfunding of education systems. The consequence of these high ratios is overcrowded classrooms and constrained pedagogical effectiveness, limiting the ability of teachers to meet diverse student needs. In contrast, nations in Europe and North America consistently record lower teacher-student ratios, a pattern made possible by well-developed and adequately funded education systems that support greater teacher availability relative to student enrollment. Regions such as Latin America and Oceania occupy an intermediate position, recording moderate ratios on average, though notable within-region variation exists in both areas, reflecting the influence of differing national policies and varying levels of economic development. These continental patterns collectively demonstrate that economic development, political context, and education policy are powerful determinants of how teachers are distributed relative to student populations, and that continental location serves as a broad but meaningful proxy for the structural conditions that govern teacher supply.

Factors affecting teacher-student ratios

The systematic review identified several interrelated factors that exert significant influence on teacher-student ratios across continents. Teacher availability and the global shortage of qualified educators constitute the most critical determinant. Global research projects that approximately 44 million additional teachers will be required by 2030 to meet worldwide educational demands (Teacher Task Force, 2024), with the shortage most acutely felt in developing countries, where it directly contributes to higher ratios. A country's economic capacity is a closely related factor, as higher-income countries possess greater fiscal capacity to recruit and retain teachers, while lower-income nations face structural constraints that prevent sufficient investment in the teaching workforce. Government education policy represents another direct determinant, as national legislative and budgetary commitments to teacher training, deployment, and working conditions shape the ratio of teachers to students within any given system. Population growth in certain regions further compounds the challenge by increasing student enrollment numbers at rates that outpace the growth of the teaching workforce, thereby driving ratios upward. The interaction of these factors confirms that the teacher-student ratio is not a product of any single variable but rather the outcome of multiple interconnected structural, economic, and policy-related forces operating simultaneously within and across national and continental contexts.

Teacher-student ratios, educational quality, and equity

The analysis reveals that the ratio between teachers and students carries considerable significance for educational quality, although the relationship is not always direct or simple. Smaller teacher-student ratios are associated with personalized learning, improved classroom management, and higher levels of student engagement. Research reviewed in the study confirms that smaller class structures facilitate better attention to diverse learner requirements, enabling teachers to provide more tailored instruction and timely feedback (OECD, 2024). However, the review also makes clear that teacher-student ratio alone cannot guarantee educational quality. Additional variables including the qualifications and experience of teachers and the availability of learning materials are critically important mediating factors. Accordingly, some countries with relatively lower ratios may still experience poor instructional quality and weak student performance if these other dimensions are underdeveloped, while

some systems with higher ratios may partially compensate through strong teacher preparation and resource provision. This finding affirms that improvements in teacher-student ratios must be pursued in conjunction with broader systemic reforms rather than treated as sufficient in isolation.

The implications of teacher-student ratios for educational equity are equally significant. In developing countries where ratios are substantially higher, students are systematically disadvantaged in terms of the quality and quantity of instructional attention they receive. Learners enrolled in high-ratio classrooms receive fewer individual learning opportunities and are exposed to conditions that differ fundamentally from those experienced by students in lower-ratio, better-resourced educational systems. The reviewed literature thus establishes that disparities in teacher-student ratios do not merely reflect differences in resource allocation; they actively reproduce and entrench inequalities in educational outcomes across and within national contexts, thereby constituting a structural barrier to the realization of educational equity on a global scale.

Implications for SDG 4

The findings of this review carry direct and substantial implications for the attainment of Target 4.c of SDG 4, which designates the teacher-student ratio as one of the principal indicators of progress toward inclusive and equitable quality education. The evidence reviewed demonstrates that numerous countries, the majority of them in the developing world, remain far from meeting the targets set under this goal (UNESCO Institute for Statistics, 2025). The persistent global shortage of teachers and their unequal distribution across continents indicate that meaningful progress toward SDG 4 will require concerted attention to several interconnected priorities: increased financial investment in teacher training and education workforce development, improvements in working conditions to support teacher recruitment and retention, and heightened levels of international cooperation to address the structural inequities that sustain global disparities in teacher supply. Without deliberate and sustained policy intervention across these areas, the gap between high-ratio and low-ratio countries is likely to persist or widen, further compromising the prospects of achieving the equitable educational access that SDG 4 envisions.

Taken together, the findings of this systematic comparative review establish that the teacher-student ratio remains a critical and consequential indicator in comparative education research. The analysis of the systematically reviewed literature reveals several consistent patterns: global inequality persists in teacher-student ratios; developing countries face disproportionately difficult conditions owing to chronic teacher shortages; economic capacity and education policy are primary determinants of teacher distribution; and while teacher-student ratio significantly influences educational quality, it must be understood alongside other mediating factors to yield a complete account of educational outcomes. These results demonstrate congruence with the major global reports produced by UNESCO and the OECD, reinforcing the validity and relevance of the review's conclusions. Collectively, the findings address all three research objectives of the study and contribute a synthesized, globally oriented evidence base to a literature that has previously been fragmented across individual country or regional studies. The conclusions and recommendations presented in the subsequent chapter will build directly on this synthesis to propose policy-relevant responses to the disparities in teacher-student ratios identified across the world's continents.

CONCLUSION

The current study has reviewed the ratios of teacher-student in several continents and their effects on quality and equality in education. It is evident from the findings that the ratios of teachers per student have been unequal around the world and there are developing countries having higher ratios as compared to developed countries. Such inequalities occur because of several issues including scarcity of qualified teachers, economic conditions of nations, population and national education policies. International statistics show that the issue needs to be addressed urgently, since nearly 44 million more teachers will be needed globally in 2030 (Teacher Task Force, 2024).

In addition, it was found that while reduced teacher-student ratios could enhance class interactions and foster individualized learning, they do not alone guarantee superior educational results. Some other aspects such as teacher quality and teacher preparation, along with the presence of adequate learning materials, are crucial for enhancing learners' academic performance (Organisation for Economic Co-operation and Development [OECD], 2024). Hence, a more holistic approach to education reform is needed rather than paying attention only to teacher-student ratios. [oecd.org]

Also, the findings indicate that teacher-student ratio differences lead to unequal educational opportunities, especially for learners from disadvantaged communities. Unequal opportunities obstruct the realization of Sustainable Development Goal (SDG) 4 which envisages ensuring quality inclusive and equitable education for everyone. For example, SDG target 4.c states that teacher supply needs to be increased and teacher-related indicators, like pupil-teacher ratio, should be enhanced (UNESCO Institute for Statistics, 2025). Thus, there remains a considerable amount of work to be done to reach this target. [uis.unesco.org]

Considering the Philippine situation, these results reveal the necessity to consider overcrowded classrooms, optimize teacher distribution, and reinforce the retention policy. On an international scale, the study underlines the significance of increased cooperation and coordinated policies. In general, this study proves that although the teacher-to-student ratio is an important measure in comparative analysis in the field of education, it needs to be tackled along with other variables to achieve tangible changes in the education sector.

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