

Group 3: Pro Data Scientists

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10/01/2025

Chosen Sustainable Development Goal (SGD):

- SGD 4 - Quality Education: Education Access, Skills Development, Lifelong Learning

Research Topic: Quality Education – Understanding the Impact of Regional Budgets and Literacy on Higher Education Outcomes in the Philippines

Research Questions:

The study focuses on investigating how government allocation of regional budgets influences higher education outcomes in the Philippines. Specifically, it explores the following questions:

1. How does regional budget allocation for higher education affect enrollment rates and faculty-student ratios?
2. Which regions have high or low higher education access and quality, and how do these disparities relate to overall educational development and budget allocation?
3. How do regional literacy rates relate to higher education enrollment in the Philippines?"

Proposed Solutions:

By analyzing data on regional education budgets, literacy rates, and higher education outcomes across the Philippines, we can identify patterns and relationships that reveal how government spending relates to enrollment levels, literacy achievements, and faculty-student ratios. This will provide a clearer understanding of how resources influence educational outcomes, while also highlighting areas where access and quality may still vary.

Background:

Access to quality education is essential as it forms the first stage in a person's learning, growth, and future opportunities. In line with this, the Fourth Sustainable Development Goal (SDG 4): Quality Education, emphasizes the need for inclusive and equitable quality education, as well as lifelong learning opportunities. Therefore, it is important to analyze the available data to understand how factors such as regional budget allocation, literacy rates, and higher education access interact, and to identify disparities that may hinder the achievement of this goal.

In the Philippines, recent studies have shown that while access to higher education has expanded, disadvantaged students remain less likely to complete higher education and are more often concentrated in lower-status institutions, suggesting that inequalities persist despite reforms (Yee, 2023). At the same time, while education spending per person has grown over the past 25 years, per-student public spending in basic education still lags behind regional peers. For instance, the Philippines spends only about 60–72% of Indonesia's per-student spending despite having a comparable per capita income, which

contributes to poor performance in international standardized assessments (Philippine Institute for Development Studies, 2022).

Studying the relationship between government education spending, enrollment in higher education, and literacy rates is important for two main reasons. First, it helps determine whether the current use of resources genuinely improves the quality and access to education. Second, it highlights regional differences that may continue to exist despite nationwide reforms, which is essential for creating fairer and more effective education policies. Beyond these, examining how education budgets translate into actual outcomes allows us to assess whether investments are aligned with the needs of learners and institutions. It also sheds light on whether policies such as free tuition and scholarships are effective in reducing barriers to higher education. The study aims to contribute to building a stronger evidence base for education reforms, ensuring that government interventions promote long-term development rather than short-term access alone.

Moreover, higher education does not only improve individual opportunities but also plays a pivotal role in reducing inequality and fostering economic development. Higher education investments can significantly influence income distribution and economic growth by modifying the circular flow of income (Easdown et al., 2024). Their findings highlight that when individuals, such as working professionals, pursue advanced education, the resulting improvements in income, skills, and productivity strengthen both personal financial stability and national economic performance. This perspective reinforces the idea that educational spending should be viewed not just as a cost, but as a long-term investment in human capital with broad social and economic returns.

By examining these relationships, this study underscores the role of education not only as a basic right but also as an important investment to the country's development. The results may provide guidance for policymakers to ensure that education budgets are distributed fairly and meet the needs of different regions, in line with the goals of SGD 4.

Hypothesis:

Research Question 1:

*Regions with **higher budget allocations per student** will exhibit **higher enrollment rates** and **better (lower) faculty-student ratios** compared to regions with lower budget allocations.*

Research Question 2:

*Regions with **a higher budget** will show **higher levels of access and quality in higher education**, while regions with limited budget allocations will fall behind, leading to noticeable disparities in educational development.*

Research Question 3:

*Regions with **higher literacy rates** will demonstrate **stronger participation in higher education** while regions with lower literacy will face constraints in enrollment and progression.*

Description of Data Sets:

1. Higher Education Enrollment Rates and Faculty-Student Ratio per Region (2024)
 - a. Enrollment data disaggregated by region and institution type (Private Higher Education Institutions, State Universities and Colleges [SUCs], Local Universities and Colleges [LUCs], and Other Government Schools [OGS]).
 - b. Faculty–student ratios categorized by sector (Private vs. Public institutions).
 - c. *Source:* Commission on Higher Education (CHED), recognized higher education institutions.
2. Literacy Rates per Region (2024)
 - a. Basic literacy: ability to read, write, and perform simple arithmetic.
 - b. Functional literacy: ability to read, write, compute, and comprehend written information.
 - c. Data disaggregated by sex (male and female) and by region.
 - d. *Sources:* Philippine Statistics Authority (PSA) and 2024 Functional Literacy, Education, and Mass Media Survey (FLEMMS) conducted by CHED.
3. Higher Education Budget per Region (2024)
 - a. Budget distribution across categories: Personnel Services (PS), Maintenance and Other Operating Expenses (MOOE), and Capital Outlay (CO).
 - b. Data further broken down by central office and regional office allocations.
 - c. *Source:* National Expenditure Program (NEP).

Data Collection Process:

The data utilized in this study were obtained from official government documents and statistical releases, specifically those published by the Commission on Higher Education (CHED), the Philippine Statistics Authority (PSA), and the National Expenditure Program (NEP). Relevant tables were extracted from the reports, and the values were manually digitized and encoded into an Excel spreadsheet for analysis. Basic data cleaning was performed, including the standardization of formats and labels, restructuring of tables into a consistent format, and merging of datasets at the regional level.

Data Set Size:

The 2024 Expenditure Program dataset comprises 18 observations, representing the CHED Central Office and the 17 administrative regions, with four budget-related variables. The Higher Education Enrollment and Faculty–Student Ratio dataset includes 18 observations, corresponding to 17 regions and one national total, with seven variables. The 2024 Functional Literacy, Education, and Mass Media Survey (FLEMMS) encompassed 179,560 eligible households and 610,590 individuals aged five years and above, which were subsequently aggregated into 17 regional observations with six variables.

Overall, the integrated dataset consists of approximately 17 to 18 regional observations, supplemented by entries for the Central Office and national totals, and encompasses between 17 and 20 variables across all data sources.

Data Set:

Link to our Data Set: [WFU Group 3 - Data Set](#)

Sources:

Easdown, N., et al. (2024, June 4). Harmonizing work and higher education: Analysis of the circular flow of income in the Philippine setting. <http://dx.doi.org/10.2139/ssrn.4853693>

Philippine Institute for Development Studies. (2022, January 22). *PH lags behind regional peers in basic education spending—PIDS study*.

<https://www.pids.gov.ph/details/ph-lags-behind-regional-peers-in-basic-education-spending-pids-study>

Yee, K. M. R. (2023). At all costs: educational expansion and persistent inequality in the Philippines. *Higher Education*, 87(6), 1809–1827.

<https://doi.org/10.1007/s10734-023-01092-y>