Evaluating Education Cost Indices in Indonesia: A Comparative Analysis of Construction Cost Index and Purchasing Power Parity
Using Empirical Methods

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Abstract
This study employs an empirical methodology to investigate the calculation of indices for determining the unit costs of equivalent education. This study compares the Construction Cost Index (CCI) and Purchasing Power Parity (PPP) in order to evaluate their relative effectiveness. A review of the existing literature on these indices reveals a need for more refined calculation and comparison methods. The study employs data from the Indonesian Central Statistics Agency (CSA), including CCI and PPP figures from 2021 and allocations for School Operational Assistance (SOA) for non-formal education in 2022, to examine the relative significance of the CCI and PPP. The findings indicate that the CCI exerts a greater influence than the PPP. Furthermore, the application of a relative importance approach through multiple regression analysis reveals a robust positive correlation between the CCI and PPP, underscoring their intricate interrelationship.

INTRODUCTION

The paradigm of education for poor and marginalised communities needs to change. Efforts to equalise education should not only support individuals in poor conditions, but also include those with limited access to education (Sutisna, 2016). The right of every child in Indonesia to a quality education is a principle that should be upheld. Through the Ministry of Education, Culture, Research and Technology (Kemendikbudristek), the government provides various options to accommodate the implementation of education in formal and non-formal forms, including equality education (Directorate of Community Education and Equality Education, 2020). Since 2016, the government has been promoting the improvement of equality education. As part of this effort, the government is considering an eligibility standard that institutions providing equality education must meet. These eligibility standards cover aspects such as the legality of the institution, the number of participants, the quality of educators, the governance of the institution and the existing infrastructure. The government also pays particular attention to the document management process for prospective students and educators.

To improve the quality of education in Indonesia, the government needs to develop appropriate policies. It shows that policy development must be based on a strong focus on the objectives set. The Indonesian government's policies in the education sector are not limited to legal regulations. Education policy covers the entire process and outcomes of formulating strategic steps in education. These steps are outlined based on the educational vision and mission to achieve educational goals in the context of the society within the specified time period.

The Education Operational Assistance (EOA) policy refers to the provision of financial assistance and additional resources by the government to provide financial support and

operational resources to educational institutions. This policy aims to improve the quality of education, increase accessibility and help maintain the operational continuity of educational institutions. Educational Operational Assistance (EOA) can be provided at different levels of education, including primary, secondary, tertiary, equivalency and non-formal education. This form of support can vary according to the policies and priorities of local governments.

In the context of Equal Education, Educational Operational Assistance (EOA) provides financial support for the implementation and maintenance of equal education programs. This support can include funding for school operating costs, support for teaching materials, teacher training, curriculum development and other relevant components. Equivalent education refers to a range of educational programs aimed at adults who need the opportunity or access to complete their formal education at primary or secondary level. The design of this program is aimed at promoting the acquisition of qualifications parallel to a primary or secondary education diploma.

In addition to implementing institutional improvements, the government is also providing operational support for gender education. One of the focal points of this policy is the non-physical Special Allocation Fund (SAF) 2022 initiated by the Ministry of Education, Culture, Research and Technology (Kemendikbudristek), namely the distribution of operational support for gender equality education. The distribution of this aid is regulated to be carried out directly to educational institutions according to their region. This success shows an extraordinary achievement of the Ministry of Education, Culture, Research and Technology (Kemendikbudristek), because the amount of operational assistance is calculated on the basis of the Construction Cost Index (CCI) and the Student Index (SI) at the district/city level, which is used as the basis for calculating the operational assistance for the provision of early childhood education and gender equality education (Cabinet Secretariat, 2021). In 2021, the calculation of Operational Assistance (EOA) for the Equality Program will be carried out uniformly throughout the year in all districts/cities (see Table 1).

In the future, the provision of Operational Assistance (EOA) for the Equality Program will take a different approach, depending on the needs of each region. This support will also be more flexible and comprehensive, adapted to the needs of the organisers. According to a statement quoted by Kompas (2021), Coordinating Minister for the Economy Airlangga Hartarto said, "This program helps schools in its implementation and has a positive impact on improving the quality of education." The Implementation Operational Assistance (EOA) in the Equality Program is flexible in its use for various needs in the school environment. These funds cover several aspects, including student admissions, school administration, improving the teaching process and the welfare of educational staff, paying for subscription services, and various other things. In addition, the EOA under the Equality Program can also support the implementation of Face-to-Face Learning (FFL) on a limited basis by referring to the checklist established by the competent authority (Kemendikbudristek, 2021). Apart from the allocations described above, the Education Operational Assistance (EOA) policy in the Equality Program makes a positive contribution by providing funds for operational costs in the implementation of Teaching and Learning Activities (TLA) in Package A, Package B and Package C. Priority is given to the age group 7 to 21 years, which covers 12 years of compulsory education. This step is an integral part of the government's commitment to improving the quality standards of human resources with a global perspective. The main objective of this program is to reduce the burden on participants in this educational initiative. An equally important aspect is to ensure that the needs of children interrupted in their education are met so that they can continue their education. The Education Operational Assistance (EOA) program initiative in the Equality Program has been implemented since 2016. In the period 2016-2018, the funding provided for Package A was IDR 970,000.00, Package B was IDR 1,400,000.00 and Package C was IDR 1,700,000.00.

Table 1. Amount of Equivalent EOA Funds for Each Student per Year

No.	Education Unit that organizes Equal Education	Fund (Rp)/student/year
1	Package A is equivalent to Elementary School	Rp. 1,300,000.00
2	Package B is equivalent to Junior High School	Rp. 1,500,000.00
3	Package C is equivalent to Senior High School	Rp. 1,800,000.00

Source: *Permendikbud 9 of 2021*

One hindrance to implementing the Equality Operational Assistance (EOA) unit cost variant is the unavailability of sufficient statistical measures that markedly influence the education sector. Currently, the Construction Cost Index (CCI), ascertained by the Central Statistics Agency (CSA), is the sole index accessible to compute unit education costs. This index denotes the inflation proportion of construction expenses in a specific location. Data on the Construction Cost Index (CCI) was gathered via a series of price surveys, focusing on elements such as materials for construction, construction labour wage rates, and heavy construction equipment rental rates. The Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) utilises the CCI data to compute the unit cost of school operational assistance, Early Childhood Education operational assistance, and various equality education initiatives in 2022. The importance of using the Construction Cost Index remains a debatable topic for scholars and professionals alike, particularly in the context of the Education sector's unit cost.

In this study, we compared data on the Construction Cost Index (CCI) and the realization of school activity plans and budgets, which includes the components of Implementation Operational Assistance (EOA), alongside data on Purchasing Power Parity (PPP). The latter refers to the ability to purchase goods and services. Therefore, conducting correlation tests is necessary to construct a regression model that yields the most optimal and statistically significant results. After conducting correlation testing, the subsequent stage is to calculate the composite index. Once the composite index has been successfully generated, the following stage is to determine the operational assistance unit cost (EOA) per district/city. Research is required in this context to appraise policy implementation, specifically to ascertain the EOA unit costs for equivalency education. The acquisition of unit costs should align with the principles of fairness, completeness, and sustainability. This study centres on meeting operational needs to generate optimum advantages, particularly when costs closely align with the actual requirements of students in terms of diversity and nominal values, and are distributed suitably.

The following section presents a summary of previous literature that discusses terminology from different perspectives and the application of indices in unit cost calculations through an empirical approach in the context of equity education. This is followed by an explanation of the methodology used. The paper then describes the empirical study and the results obtained. The final section presents the conclusions and recommendations of this research.

LITERATURE ON EDUCATIONAL EQUITY AND UNIT COST INDICES

In this section, we present a review of previous literature on the terminology related to educational equity and the use of educational cost indices in calculating educational cost estimates. This review has been carried out by examining different perspectives on the definition of equity in education. It then explains how previous literature has carried out empirical analysis.

Equal Education Terminology

(1) Informal education becomes a lifelong learning journey in which individuals acquire attitudes, values, skills and knowledge through a range of experiences, educational influences and resources available in their environment. Specific resources include family and neighbourhood circles, work and leisure activities, interactions in the market environment, opportunities for access to library facilities and content presented by mass media. The role of informal education is fundamental to the formation of individual personalities and to the trajectory of life over time. (2) Formal education is a hierarchical and chronological sequence of education from primary to tertiary level. This framework includes various general academic programs, specialisation programs and full-time vocational and technical training institutions. (3) Non-formal education is a set of structured educational activities outside the formal framework, which may exist as an independent entity or as an integral part of a more comprehensive program. Non-formal education aims to provide services to identified target groups and to achieve specific educational goals (Bacquelaine & Raymaekers, 1991). This last definition is the most relevant in this context, given the different definitions proposed by different authors.

Non-formal education is defined as education that takes place outside the formal school context, as explained by Adams et al. (2020), Werquin (2012), Jackson (2016), Kalenda (2015) and Kalenda and Kočvarová (2022). However, non-formal education is not new. The current development of understanding shows that the term reflects a pre-existing concept with a different approach. The understanding of non-formal education can be interpreted from three core perspectives: process, system and context (Zikargae et al., 2022). As a process, non-formal education focuses on the learning aspects and active participation of participants. In the context of the system, non-formal education experiences significant differences from formal education through five dimensions, namely objectives, time period, material, implementation and control (Pienimäki et al., 2021), which gives the two entities a distinctive identity based on their characteristics. From a context (setting) perspective, non-formal education recognises the importance of the informal atmosphere in the dynamics of non-formal education, such as the flexibility and non-formal character inherent in the learning process. It draws attention to the fact that not all participants in non-formal education are always adults (Kedrayate, 2012). Non-formal education can also be interpreted as a structured and regular learning process initiated by non-formal institutions within a set time limit to provide students with understanding and skills, all supported by appropriate facilities (Milana & Nesbit, 2015). According to Gloria et al. (2014) and Willems (2015), non-formal education can take different forms, including 1. Second chance education, which is provided on a part-time basis to those who are unable to attend regular classes. 2. Youth clubs with a focus on substantive education. 3. Adult education and training. 4. Community education focusing on local needs. 5. The individual development plan includes initiatives such as cultural programs, sports and fitness activities, vocational programs and job-oriented programs for the unemployed and for updating the skills of the workforce. Those providing non-formal education may include a variety of entities, including public institutions, partnerships between the private sector and public institutions, workers, trade unions, media organisations, civil social communities, NGOs and international organisations (Latchem, 2014).

According to Law Number 20 of 2003 on the National Education System, Indonesia values three educational pathways: formal education, non-formal education, and informal education. These pathways complement each other and enhance the richness of our educational system. Article 13, Paragraph 1 of the law illustrates this principle. Additionally, Article 26, Paragraphs (3, 4, and 6) provide detailed explanations of non-formal education pathways. Article 26, Paragraph (3) highlights that non-formal education encompasses a range of educational forms such as life skills, early childhood education, youth empowerment, women's empowerment, literacy education, skills mastery, job training, equality education, as well as other forms of education that aim to enhance the academic abilities of students. Thus, the National Education System Law offers a distinct legal foundation for cultivating non-formal learning in Indonesia. According to Article (4), non-formal education units comprise course providers, training centres,

study groups, community learning facilities, taklim councils, and other comparable educational organisations. Article (6) "Non-formal education outcomes can be deemed equal to formal education program outcomes provided they undergo an evaluation and equalization procedure by an organization designated by the government or regional government, guided by national assessment standards." The National Education System Law lays down a well-defined legal framework for the expansion of non-formal education in Indonesia. Article (4) Non-formal education units include course institutions, training institutions, study groups, community learning activity centres, taklim councils and similar educational units. Article (6) Non-formal education outcomes can be regarded as comparable to those of formal education programs after undergoing an assessment and equalisation process by an institution appointed by the government or regional government in accordance with national assessment standards.

One form of non-formal education that holds great importance is that of equality education. Equivalency education can be defined as an organized system that exists outside the boundaries of formal education, with regular structures and levels (Henschke, 1998; Gloria et al., 2014; Marques & de Freitas, 2016). This educational model offers educational services to children who are unable to access formal education due to poverty, remote location, or delayed development (Boyadjieva & Trichkova, 2022). Technical term abbreviations are explained when first used. Biased, emotional, or ornamental language is avoided in favour of a formal register, with positions on subjects made explicit through hedging. The educational services provided comprise of the Package A Program, which is equivalent to the primary school level; the Package B Program, which corresponds to the lower secondary school level; and the Package C Program, which is equivalent to the upper secondary school level. The educational services offered are objectively assessed and exclude the use of subjective evaluations, ensuring clear, concise, and necessary information is presented in simple sentences. Furthermore, the text follows conventional academic sections and employs consistent formatting features including citation and footnote style. The sentence structure is standard, and causal connections between statements are necessary to ensure a logical flow of information. Lastly, precise word choices have been used, and the text is free of grammatical, spelling, and punctuation errors. Through these programs, the focus is on enhancing students' knowledge, abilities, and skills, whilst fostering positive attitudes and personality traits. The programs are organized by the government and the community through a range of institutions, such as the Learning Activity Studio (LAS), Learning Activity Development Centre (LADC), Community Learning Activity Centre (CLAC), Course Training Institute (CTI), Social Organisations, Community Organisations (Ormas), Non-Governmental Organisations (NGOs), and Islamic Boarding Schools (Hermawan, 2012). This education program aims to provide access to formal education for individuals residing in remote locations, migrant workers, and those who had to drop out of school due to economic constraints (Meijer & Watkins, 2019). The text is free from grammatical errors, follows a conventional structure and adheres to the prescribed style guide. This education program aims to provide access to formal education for individuals residing in remote locations, migrant workers, and those who had to drop out of school due to economic constraints (Meijer & Watkins, 2019). Clear and logical progression of information is maintained in the text, with no bias or subjective evaluations. Technical abbreviations are explained when first introduced, and formal language is used throughout. The initiative by Herlyna et al. (2019) enables students to attend weekend classes without impacting their work productivity. This educational initiative aims to broaden educational access by recognizing that access to education is an intrinsic human right that endures throughout one's lifetime (Choi, 2021). The implementation of equitable education holds paramount importance as it can adapt to various circumstances that restrict access to formal education, including financial limitations, time constraints stemming from the need to earn a living, far-flung geographic areas (such as ethnic minority communities and isolated tribes), the desire to pursue further studies in a pesantren setting, and socio-legal impediments that hinder entry to formal academic institutions (Munawwir & Hanip, 2021).

The implementation of equal education plays a pivotal role in maximising students' potential with a focus on mastering academic knowledge and relevant functional skills, alongside developing professional attitudes and character (Alamsyah et al., 2022). Equal education can fulfil the skills requirements of students amidst the constant changes in the current global landscape (Merriam et al., 2006; Syaefuddin et al., 2019). Equality education aims to provide high-quality primary education for children facing disadvantages, including those who have dropped out of school, not continued their education, or who have never received formal education. These targets also prioritise disadvantaged groups, such as girls and ethnic minority communities, as well as children who reside in remote, marginalised, or difficult-to-reach areas due to geographical location and/or transportation barriers (Fauzi & Siregar, 2021). Overall, the objective of introducing equality education, particularly in the Programs A, B, and C, is to enhance students' comprehension, abilities, and values, leading to the development of positive character traits, ultimately impacting their future prospects in a positive manner (Suhaenah, 2016). Additionally, Pangestu et al. (2021) reported other objectives of the equality program, including

1. Ensure the fulfillment of learning needs for all young and adult individuals through equitable access to learning and life skills programs,
2. Address gender disparities in primary and secondary education, and
3. Providing adaptive services for students who need academic education and life skills to improve quality.

The implementation of equal education by communities, as presented by Hermawan (2012), has heterogeneous variations in dynamics and quality. This factor arises from the disparity of students' abilities, the diversity of organising institutions, and the conditional environment that affects the quality of equality education graduation in the region. In order to maintain higher quality standards for the services of equal education and to reduce potential problems that may arise, the government has set competency standards that must be achieved by graduating students. In addition, content standards, learning processes and assessment systems for students will be defined (Suryana, 2020). Equal education, as an alternative to the education system, specifically targets students who face five barriers: economic barriers, time barriers, geographical barriers, belief barriers and social/legal barriers. The students targeted by Equal Education include school-age children and adults who have not completed formal education. Economic barriers arise due to poverty, which affects various groups such as farmers, fishermen, labourers, domestic workers, women workers, slum dwellers and people living in poverty in urban areas. Meanwhile, time constraints arise from their work as artisans, labourers and other unskilled workers. Geographical barriers include isolated tribal communities, ethnic minorities and remote communities on islands or in remote forest areas. Religious barriers include people from Islamic (Salafiyah) boarding schools that do not provide formal education. On the other hand, social and legal barriers include street children, children in correctional institutions and children with other social challenges. Despite these obstacles, the learning process provided to the students still meets the graduate competency standards and other regulations, all of which are done to improve the quality of graduates so that they have strong independence, creativity and professionalism (Harlinda et al., 2020). Equal education services provide opportunities to all citizens who have not completed primary and secondary education, regardless of differences in ethnicity, religion, race or social group, and are not limited by certain age limits, as long as these individuals still have the interest and motivation to continue the learning process. (Dewi, 2019).

A number of fundamental characteristics distinguish equivalence education from formal education. According to Oong Komar (2006), these differences can be identified in the form of flexibility in the delivery of education, including aspects of time and duration of the learning process, age range of students, learning materials, methods of delivery of materials and assessment of learning outcomes. In the context of equitable education, learning outcomes can be recognised as equivalent to the outcomes of formal education programs through equivalence

assessment procedures by institutions appointed by the government or regional government. This process refers to national education standards, as Hermawan (2012) noted. In order to ensure the equivalence education program meets the expectations, the structure of the education curriculum in the equivalence program is regulated by the government to meet the graduate competency standards according to the provisions of Permendiknas No. 23 of 2006. These graduate competency standards focus on providing workshops to achieve functional skills that are characteristic of the Package A, Package B and Package C programs. Specifically, the Package A program aims to provide skills that are relevant to the needs of daily activities; the Package B program aims to provide skills that meet the demands of the labour market; and the Package C program aims to provide skills in entrepreneurship.

The existence of equitable education in the future will face increasingly complicated and complex challenges, as noted by Wahidin et al. (2022). Some of these challenges include the complexity of society's needs in the education sector, rapid and large-scale changes in the unstable business world, as well as an increase in poverty rates due to the COVID-19 pandemic, and high unemployment rates among productive age groups who have not yet been integrated into the labour market. Thus, in the future, gender education services must focus on developing skills to support individual development in society, as Yanti and Sunarti (2021) argue.

Unit Cost of Education

Education, at all levels, is a crucial policy for a country with substantial public expenditure (Dewi, 2019). From an economic perspective, education and training are valuable investments for the government. Any rise in employment, productivity, and other positive effects can contribute to Gross Domestic Product (GDP) growth and net social benefits, affecting the size of government expenditure (Griffin, 2016).

Cost is the expense incurred for producing and manufacturing a specific product, estimated from the viewpoint of the producer and measured in nominal currency (Ngadirin, 2011). The cost can be influenced by market dynamics, resulting in an increase or decrease in the value (Olajide et al., 2018). The term "cost" has multifaceted applications in various contexts and relates to economic assets that hold intrinsic value (Fauzi, 2020). The cost function is crucial in generating profits (Nurdiyanti, 2021). Within educational institutions, cost refers to the total expenses necessary for producing or providing set services (Budi, 2020). Costs are composed of direct and indirect components, with direct costs typically encompassing direct materials and labour expenses that have a clear and accurate association with a specific cost object. Indirect costs cannot be attributed solely to a defined cost object with precision, as per Novák et al. (2017). Meanwhile, Gaspersz's (2003) alternative perspective regarding cost definition, as presented by Ferdi W. P. (2013), shows that costs reflect production system efficiency from a managerial economics standpoint. The concept of cost is intricately tied to production in this context. However, under the cost concept framework, the quantification of inputs is calculated in the form of economic value referred to as costs. Within the educational context, the cost approach delineates educational institutions as stakeholders who produce educational services. These services comprise various components, including expertise, skills, knowledge, character, and values which students internalize (Hasibuan & Pendi, 2021). Educational institutions acquire human resources as input, which are then developed through various educational and training processes ultimately leading to producing output capable of meeting the demands of the labour market. According to Ţaran-Moroşan, et al (2010), the cost of education encompasses two key components; the actual expenditure and the opportunity cost incurred by individuals investing in education. Education costs involve the income that must be foregone during one's lifetime to attain education. In the educational context, actual expenses can be determined through easily measurable investments such as tuition fees, book purchasing, and travel costs incurred for educational purposes (Hariyanto, 2020). Building on Mutegi's (2015) perspective, education costs are defined as the precise resources required, involving sacrifices and financial allocations,

to foster educated individuals (Dewi & Indrayani, 2021). Ferdi W. P. (2013) outlines that in the field of education, cost components consist of both direct and indirect costs. Direct costs comprise expenses incurred in implementing teaching activities, maintaining learning facilities, providing transportation and compensating teaching staff. These costs are covered by the government, parents or students. Meanwhile, the indirect cost comprises of missed opportunities, including expenditures on pocket money and educational equipment, forfeiting potential profits during the educational process.

As a follow-up to Fironika's (2011) study within the education concept framework, two aspects need analysis: the total cost of education and the cost per unit for each student. The cost per unit includes the aggregate costs contributed by the government, parents, and the community to support education for one academic year in formal educational institutions. The concept of unit costs provides an objective measure of effective fund allocation at educational institutions to support students' educational process (Wakhid, 2020). Clear causal connections are made between these statements for easy comprehensibility. Precise subject-specific vocabulary is utilized where appropriate. The unit cost of education refers to the amount of funds allocated to each student and is calculated by dividing the total expenditure incurred by the institution for a particular period by the number of students (Fattah, 2009). Technical term abbreviations are fully explained on first use. The language is formal, objective, and value-neutral, with no filler words, bias, figurative, or emotional language. The text adheres to conventional structure, citation, footnote, and formatting features. Finally, the text is completely free of grammatical, spelling, or punctuation errors. Educational unit costs can be defined as the operational expenses allocated by educational institutions, divided by the number of active participants during a defined period. Evaluation should use clear objective language, avoiding figurative language, emotional expressions, or ornamental phrases. These expenses are calculated regularly within the academic year, which is split into two semesters (Alwi, 2017). The process involves avoiding any subjective evaluations, employing clear and concise language, and adhering to formal language protocols. It is essential to maintain logical and balanced content with clear causal connections between statements. Technical terms should be explained, grammatical errors, spelling or punctuation mistakes corrected, and academic sections appropriately structured in line with established style guides. Ekanem and Ekpiken (2013) define unit costs of education as costs calculated per unit, playing an essential role in education management for achieving predetermined goals. The identification of unit cost education components entails per student cost, per graduate cost, program costs, tuition costs, material costs, and per capita education costs in various community settings.

Unit costs are calculated on the basis of routine or operational costs associated with educational activities. The unit cost per student is a measure that describes the effective allocation of resources by educational institutions for the benefit of students in educational activities (Moscarola & Kalwij, 2021). The total funds received by educational institutions, or the total costs received by educational institutions, can be divided by the number of students. The aim is to obtain the cost per student unit. Based on the explanation provided, the unit cost of education estimates the average cost incurred by each student in a given period of time to obtain an education. The unit cost is a benchmark that is used as a guideline to meet the educational needs of each student in educational institutions. Furthermore, the unit cost per student refers to the average cost incurred by each student in an educational institution during a given period. Knowledge about the amount of cost per unit event, based on the level and type of education, is of great value in evaluating different policy alternatives to improve the quality of education. According to Anwar (2018) and Jaelani et al. (2021), the calculation of the cost of education should be carried out with the highest level of accuracy, taking into account the components of the activity and the unit cost.

Reference Index for Calculating Unit Cost of Education

Apart from education inflation, an important economic indicator used as a reference in the calculation of unit costs is the economic index in each region. The existence of this index is essential in order to take account of variations in the price levels of goods and services in each region. All three references are now available as a means of monitoring this variation. **First**, the Education Cost Index (ECI) is specified in the Regulation (Permendiknas) No. 69/2009 of the Minister of National Education on standards for non-personnel operating costs (Minister of National Education, 2009). The ECI can be classified as a spatial index that illustrates the comparison of non-personnel operating costs of education between regions for a given period. The Education Cost Index (ECI) calculates the standard cost of education between districts/cities. However, this index has become outdated as it has not been updated for quite some time and is therefore no longer relevant as a reference guide. The various concepts and definitions used in the 2009 ECI calculations refer to the academic analysis of the Minister of National Education's Regulation (*Permendiknas*) No. 69/2009.

1) Education Cost

"Education costs" refers to the nominal amount in Rupiah currency spent to accommodate all the resources needed to carry out the education process.

2) Education Operational Costs

Educational operational costs refer to expenditures directed towards acquiring educational resources that will be used up within one year or less, as well as expenditures that must be realized repeatedly yearly. Several aspects are included in the scope of educational and operational costs, including remuneration and incentives for teaching staff, acquisition of objects with a life of less than one year, maintenance of physical infrastructure and equipment, and expenses related to energy resources and services.

3) Personnel Education Operational Costs

Personnel education operational costs refer to expenses allocated to support the welfare and development of personnel involved in the learning process in the school environment. This personnel includes various roles involving educators, educational staff (such as laboratory assistants and librarians), administrative staff (such as school principals and administrative employees), and other employees (such as school guards and gardeners) who are involved in implementing or supporting the learning process.

4) Non-Personnel Education Operational Costs

Non-personnel educational operational costs refer to the expenditure required to meet the needs for materials, equipment, and supplies involved in the learning process, including the budget allocated for maintaining facilities and infrastructure.

5) Education Cost Index (ECI)

The Education Cost Index (ECI) is a number that compares the operational costs of non-personnel education in a district/city with the operational costs of non-personnel education in the city of Jakarta, which is used as a benchmark.

Second, The Construction Cost Index (CCI) is an index compiled by the Central Statistics Agency (CSA) and plays a role in representing the level of construction costs in a particular area. CCI is an index number that compares the value of goods and services included in the CCI commodity collection, both between one district/city or province and another district/city or province. Based on its conception, the Construction Cost Index (CCI) can be grouped as a spatial index that reflects price comparisons between different regions within a specific time period. Data relating to CCI was obtained through a price survey process that focused on construction costs, wages for construction work, and heavy equipment rental rates (CSA 2018). This index corrects unit cost values based on regional inflation rates in various geographical areas, from provincial to district/city levels. The Central Statistics Agency (CSA) periodically updates the Construction Cost Index (CCI) yearly. In this study, 2021 CCI data published by CSA was used. Furthermore, Semarang City has been designated as a reference region with an index value of

100% in this analysis. According to CSA, Semarang City has an index closest to the national average. **Third,** Purchasing Power Parity (PPP) is an economic concept introduced by classical economist David Ricardo and popularized by Swedish economist Gustave Cassel in 1920 amid high inflation in European countries. The concept is based on the principle of the law of one price. This principle stipulates that prices of identical goods in two countries are identical when evaluated using the same currency. Using the law of one price principle, we can establish the total value of comparable goods and services in two different countries.

Secondary data from the three references for calculating unit costs are available for each Regency/City. The Central Statistics Agency (CSA) updates the Construction Cost Index (CCI) and Purchasing Power Parity (PPP) data annually, taking into account local conditions. The government advocates for the use of unit education costs based on regional factors in the future.

Regression by Using Relative Importance and Winsorization Approach

The term "relative importance" refers to the process of quantifying the contribution made by each predictor variable to a multiple regression model. The evaluation of the relative importance of a multiple regression model is determined by the contribution of each predictor variable to the model's R2 value. This signifies that the statistical R2 value of the multiple regression model is subdivided into the portions associated with each predictor variable (Groemping, 2006).

In general, two common methods can be employed to address outliers in the data: the trimming method and the winsorization method. The trimming method involves removing or deleting observations with extreme values, thereby eliminating these values from the dataset. This method is most suitable for survey data with a large sample size, where outlier values do not accurately reflect the object under investigation. If the outlier values are an accurate representation of the object being surveyed within the context of limited data and have a spatial dimension, deletion of these objects is not recommended. Instead, the winsorization method is the preferred method to handle these outliers. This method involves adjusting very extreme x values towards a lower direction or shallow values towards a higher direction while leaving moderate values unchanged (Chambers et al., 2000).

METHOD

Data Source

To calculate the Sustainable Development Index, certain criteria must be met by the variables/indicators used. These include being issued by a legitimate agency, continuous publication, and relevance to education costs. In accordance with these criteria, the Construction Cost Index (CCI) and Purchasing Power Parity (PPP) will be employed as indicators when determining the ECI. Both the CCI and PPP are published by the Central Statistics Agency (CSA). The Sustainable Development Index model is validated against the Family Welfare Index and Gross Regional Domestic Product (PPPB) using target variables. In this context, School Activity Plan and Budget Application (ARKAS) data on school operational assistance funds is utilized.

Construction Cost Index (CCI)

The Construction Cost Index (CCI) is a spatial index that functions as a number to describe the comparison of the level of construction costs in a district/city compared to a reference city. The CCI was formed using data from the Construction Feasibility Price Survey (CFP), an annual activity carried out by the Central Statistics Agency (CSA). Price data included in the Construction Feasibility Price (CFP) survey involves the price of building or construction materials, heavy construction equipment rental costs, and the value of wages for construction services. Apart from these data, data regarding the realization of the Regional Revenue and Expenditure Budget at the district/city level, as well as Detailed Unit Prices (Bill of Quantity - BoQ) from completed projects,

are also collected as weighting factors for the District/City Welfare Index (CCI) both at the district/city and provincial levels. This data was obtained through simultaneous surveys conducted in all districts/cities in Indonesia, with an average sample size of 15 trader respondents in each district/city in four different periods: January, April, July, and October. The interpretation of the Regency/City Welfare Index (CCI) value can be expressed as follows: if the CCI value=100, this indicates that, in general, the price of construction materials in a regency/city has a similar level to the reference city; if the CCI value is > 100, this indicates that in general the price of construction materials in a district/city is at a higher level than the reference city, whereas if the CCI value is <100, this indicates that in general the price of construction materials in a district/city has a lower level than the reference city. The CCI data from 2021, with the city of Makassar as a reference.

Purchasing Power Parity (PPP)

GrossRegional Domestic Product Per Capita (PPP) refers to the purchasing power of people for goods and services. The PPP calculation involves using 96 types of commodities, comprising of 96 distinct food commodities and 30 types of non-food commodities. The writing is free of grammatical and spelling errors, and bias has been avoided throughout. The data used for PPP is from 2021 and South Jakarta is the reference city. Technical abbreviations employed are explained within the text. As assumed by the Regency/City Welfare Index (CCI), which correlates the price of building materials with the cost of education, the prices of both food and non-food commodities forming the Gross Regional Domestic Product Per Capita (PPK) Index are also believed to be correlated with education costs.

School Operating Assistance (SOA) Fund Usage Data

To verify the suitability of the Regency/City Welfare Index (CCI) and Gross Regional Domestic Product Per Capita (PPC) as constituents of the synthesized Human Development Index (HDI), as well as establishing the weight distribution for each component, a target variable that effectively captures education-related expenditures at the education unit level is required. As the District/City Welfare Index (CCI) and Gross Regional Domestic Product Per Capita (PPC) concentrate on the district/city administrative unit level, it is necessary that the target variables share the same unit basis. Therefore, the solitary viable choice for the target variable is to report data regarding the School Operational Assistance Funds (SOA) usage by each educational unit, conveyed through the RKAS (Realization of School Activities and Budget) Application. Details on the usage of School Operational Assistance (SOA) funds extracted from ARKAS are explicated thoroughly, in alignment with the components articulated in Permendikbudristek Number 2 of 2022 regarding Technical Instructions for Management of Operational Assistance Funds for Offering Early Childhood Education, School Operational Assistance, and Operational Assistance for Implementing Equal Education (Table 2). In addition to the data pertaining to the use of SOA funds, information on the quantity of students, teachers, and teacher status was gathered.

Table 2. Components of Use of SOA Funds

Component	Information
Component 1	Acceptance of New Students
Component 2	Library Development
Component 3	Implementation of Learning and Extracurricular Activities
Component 4	Implementation of Learning Assessment and Evaluation Activities
Component 5	Implementation of Administration of School Activities
Component 6	Professional Development of Teachers and Education Personnel
Component 7	Power and Service Subscription Financing

Component	Information
Component 8	Maintenance of School Facilities and Infrastructure
Component 9	Provision of Learning Multimedia Tools
Component 10	Organizing Skills Competency Improvement Activities
Component 11	Organizing Activities to Support Graduate Absorption
Component 12	Honor Payments

Analysis Stages

The following are the stages of data analysis carried out.

a. Calculate the actual expenditure of School Operational Assistance (SOA) funds for each component per student. This calculation is carried out by dividing the value of each component by the number of students in each school as recorded in Table 3.

Table 3. Variables for Realization of Expenditure and SOA for Each Component per Student

No.	Variable	Unit
1	Component 1 per student	Rupiah/person
2	Component 2 per student	Rupiah/person
3	Component 3 per student	Rupiah/person
4	Component 4 per student	Rupiah/person
5	Component 5 per student	Rupiah/person
6	Component 6 per student	Rupiah/person
7	Component 7 per student	Rupiah/person
8	Component 8 per student	Rupiah/person
9	Component 9 per student	Rupiah/person
10	Component 10 per student	Rupiah/person
11	Component 11 per student	Rupiah/person
12	Component 12 per student	Rupiah/person
13	Total cost per student	Rupiah/person

b. Calculate the variable percentage of Civil Servant (PNS) teachers at each school.

c. Calculate the variable percentage of total honorarium (component 12) to total expenditure. This variable is calculated using the following formula:

$$\text{Percentage of total honorarium} = (\text{Component 12/ Total Fees}) \times 100\%$$

d. Filtering school data that will be used as a sample in calculating the composite index. In this case, there are 3 alternatives used, namely:

   i. Alternative 1: Based on an analysis of the percentage of school expenditure on honorariums, the school data considered is schools that show a percentage of expenditure on honorariums of less than 30%.

   ii. Alternative 2: Based on the number and percentage of State Civil Service (ASN) teachers, with the minimum limit referring to the information listed in Table 4.

Table 4. Minimum Filtering Limit for Alternative 2

No	Level	Min. The number of students	Min. Percentage of Civil Service Teachers
1	Elementary School	336	80%
2	Junior High School	384	80%

3	Senior High School	324	80%
4	Vocational School	324	80%

iii. Alternative 3: Based on the number and percentage of ASN teachers, the minimum limit is based on Table 5.

Table 5. Minimum Filtering Limit for Alternative 3

No	Level	Min. The number of students	Min. Percentage of Civil Service Teachers
1	Elementary School	504	70%
2	Junior High School	576	70%
3	Senior High School	432	70%
4	Vocational School	432	70%

e. Calculate the average realization of the use of School Operational Assistance (SOA) funds per component per student and per district/city area.
f. Combine data in stage e, with CCI and PPP data
g. Data exploration is carried out at stage f. The data exploration process includes creating a histogram of the Urban Poverty Index (CCI) and Gross Regional Domestic Product per Capita (PPP) variables, as well as calculating the correlation value between the average of each component per student with the CCI and PPP variables.
h. Determine a target variable (dependent variable) that reflects a proxy for variations in actual education unit costs: either per component or an aggregation of several relevant components. The target variable chosen is the one that has the highest correlation with the Urban Poverty Index (CCI) and Gross Regional Domestic Product per Capita (PPP) variables. At this stage, the CCI and PPP variables are explored with the aim of enabling handling steps if outlier values are detected.
i. Carry out linear regression analysis between components that have a high correlation with the CCI and PPP variables, then evaluate the R2 value. A high R2 value means that the model formed is able to explain the diversity of the target variable, namely the high component expenditure per selected student.
j. The best model is selected based on the highest coefficient of determination (R2). After that, the relative importance weights were calculated for the Urban Poverty Index (CCI) and Gross Regional Domestic Product per Capita (PPP) variables. (Groemping, 2006).
k. The calculation of the Education Cost Index (ECI) for each district/city is carried out based on the relative importance weights that have been generated at stage j.
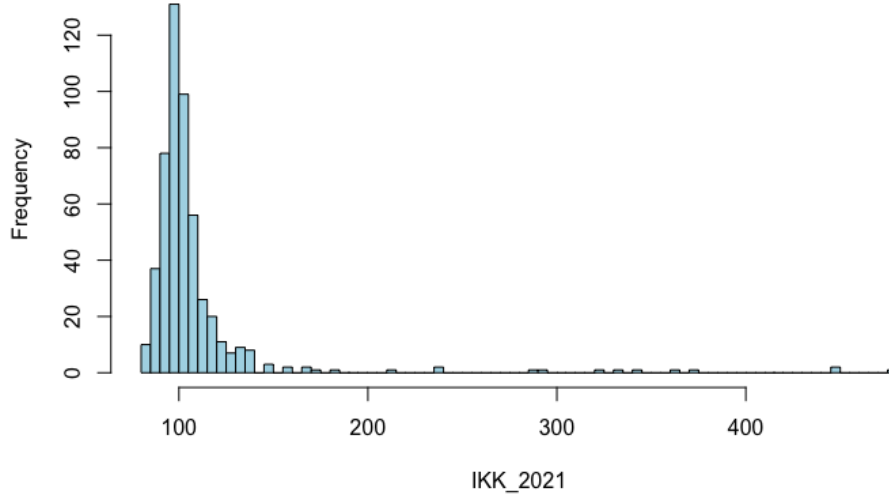
RESULTS AND DISCUSSION
Data Exploration

Figure 1 displays a histogram for the CCI variable (Figure 1(a)) and the PPP variable (Figure 1(b)). In general, the distribution pattern of these two variables can be said to be right skewed, where there are several extreme observations (outliers).
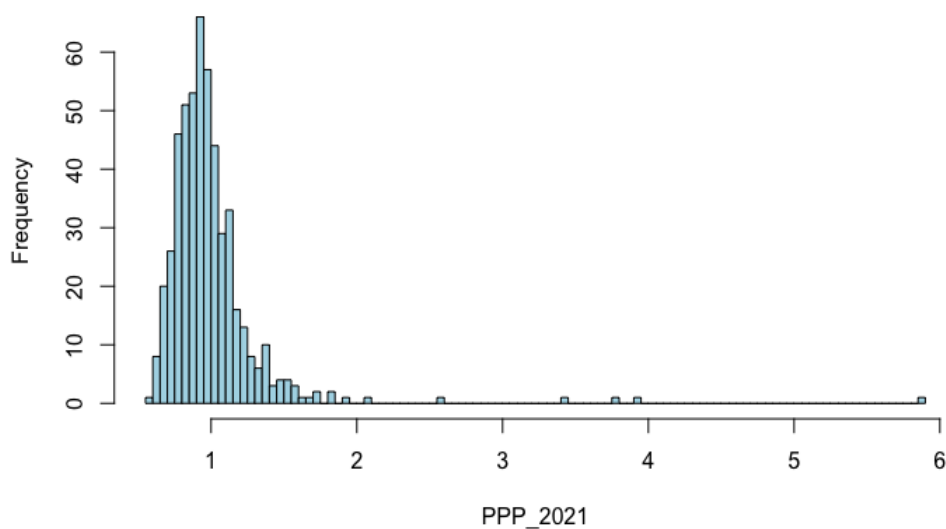
Figure 1. Histogram of Variables: (a) CCI, (b) PPP

Histogram of IKK_2021


(a)

Histogram of PPP_2021

(b)

In summary, there is a range of minimum and maximum values for the City Poverty Index (CCI) variable of 80.99 to 478.12, which has a significant difference. In addition, the Gross Regional Domestic Product per Capita (PPP) variable has a minimum and maximum value range between 0.567 and 5.875, which also shows quite a significant difference. In this study, efforts were made to handle outlier observations using the one-sided winsorization method (Chambers et al., 2000).

In applying the winsorization method, a limit value is determined, which is used as the cut-off value. In the CCI variable, a cut-off value is set *to K=150*. As a result, districts/cities with a CCI value > 150 will have their CCI value adjusted to 150. In the PPP variable, a cut-off value is set *as K=1.5*. As a result, districts/cities with a PPP value > 1.5 will have their value adjusted. The

PPP becomes 1.5. The choice of this *K* value is due to making the data distribution of the CCI and PPP variables more symmetrical (Figure 2).

Figure 2. Histogram After One-sided Winsorization Process for Variables: (a) CCI, (b) PPP
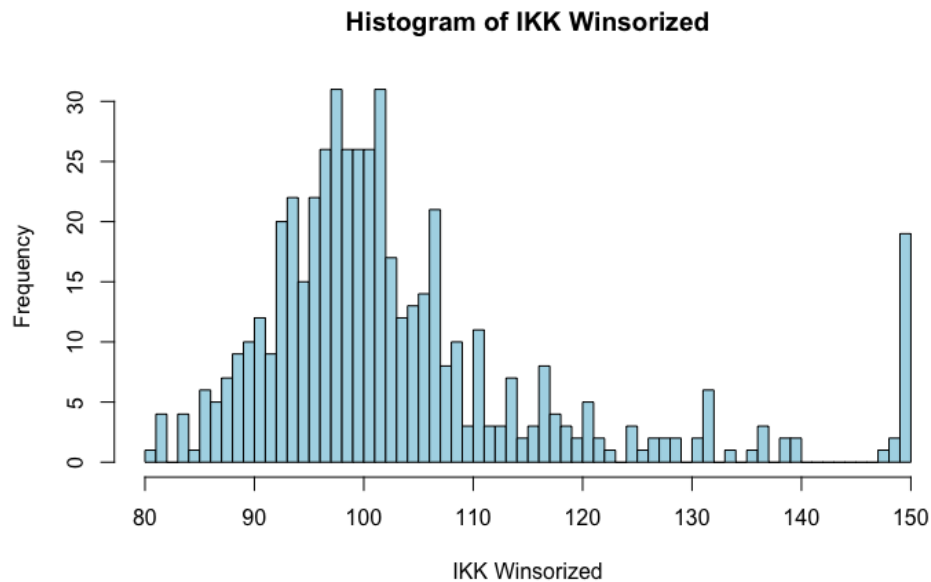
(a)
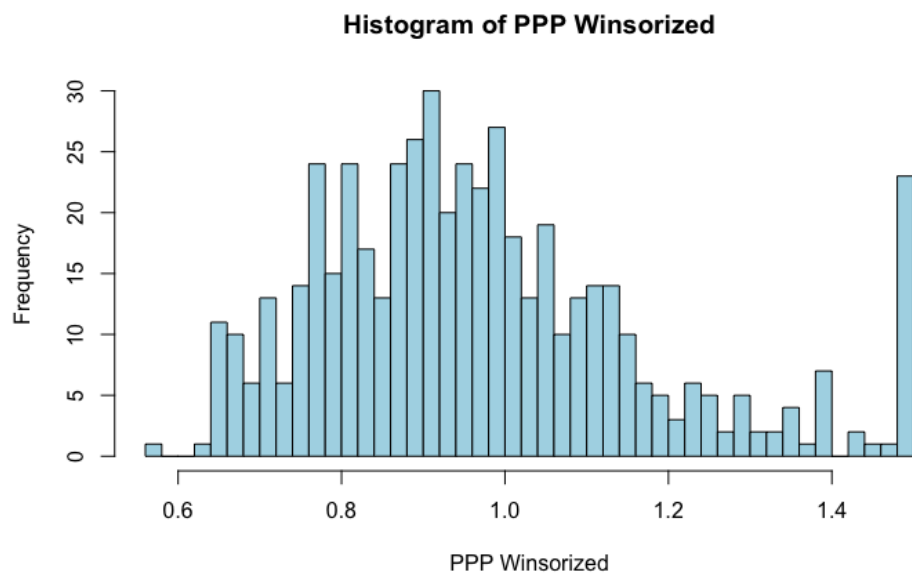
(b)

Furthermore, the variables City Poverty Index (CCI) and Gross Regional Domestic Product per Capita (PPP) which have gone through the winsorization process are also taken into account in determining the regression model used to form the composite index. This analysis approach was carried out on data from the Junior High School and Senior High School levels.

EOA Analysis Results

The number of schools contained in the School Activity Plan and Budget Application (ARKAS) which are part of the EOA is 196,978 schools. The next step is to carry out the filtering process, with the following results:

EOA Analysis Results for CLAC and SKB Levels

After filtering the levels of Community Learning Activity Centers (CLAC) and Special Schools (SKB), a total of 7,471 schools meeting the criteria were identified. Additionally, following the aggregation process of average components per student per district/city, the results revealed that 501 districts/cities were included in this analysis.

Table 6 below contains the correlation value between each component average per student with the CCI and PPP variables before and after the winsorization process was applied.

Table 6. Correlation Value Between Each Component Average per Student on CCI and PPP for CLAC and SKB Levels

Variable	CCI	CCI Winsor	PPP	PPP Winsor
Average Component 1 per student	0.160	0.142	0.272	0.220
Average Component 2 per student	0,000	-0.026	-0.024	-0.047
Average Component 3 per student	-0.054	-0.033	-0.113	-0.125
Average Component 4 per student	-0.057	-0.036	-0.100	-0.105
Average Component 5 per student	0.025	0.079	-0.055	0.089
Average Component 6 per student	-0.040	-0.050	-0.047	-0.045
Average Component 7 per student	-0.116	-0.087	-0.113	-0.129
Average Component 8 per student	-0.041	-0.047	-0.085	-0.033
Average Component 9 per student	-0.147	-0.126	-0.148	-0.174
Average Component 10 per student	-0.146	-0.106	-0.175	-0.181
Average Total Cost per student	-0.177	-0.122	-0.251	-0.234

Based on the table above, it can be seen that the correlation value between each component average and the PPP and CCI variables shows a relatively low level of correlation. Therefore, the decision was taken not to continue exploration at this stage.

EOA Analysis Results for CLAC and SKB Levels with Alternative 1

At this stage, a filtering process is carried out at the Community Learning Activity Center (CLAC) and Special School (SKB) levels, as has been done previously. Apart from that, the first filtering alternative is also applied, namely applying filtering to the percentage of expenditure/realization for honoraria (component 10) which is less than 20%. As a result, 1,225 schools met these criteria. After aggregating the average components per student per district/city, data was obtained from 341 districts/cities.

Table 7 below shows the correlation value between each average component per student and the CCI and PPP variables before and after the winsorization process.

Table 7. Correlation Value Between Each Component Average per Student on CCI and PPP for Alternative CLAC and SKB level 1

Variable	CCI	CCI Winsor	PPP	PPP Winsor
Average Component 1 per student	0.083	0.094	0.056	0.124
Average Component 2 per student	0.068	0.086	0.003	0.029

Variable	CCI	CCI Winsor	PPP	PPP Winsor
Average Component 3 per student	-0.047	-0.030	-0.090	-0.142
Average Component 4 per student	0.008	0.032	-0.034	-0.047
Average Component 5 per student	0.014	0.078	0.010	0.138
Average Component 6 per student	-0.069	-0.095	-0.032	-0.032
Average Component 7 per student	-0.099	-0.070	-0.081	-0.104
Average Component 8 per student	-0.080	-0.068	-0.061	-0.050
Average Component 9 per student	-0.080	-0.032	-0.097	-0.033
Average Component 10 per student	-0.044	-0.053	-0.029	-0.075
Average Total Cost per student	-0.033	0.009	-0.078	-0.066

However, based on the table above, it can be concluded that the correlation value between each component average for the PPP and CCI variables indicates a relatively low level of correlation. This condition resulted in the decision not to continue further exploration at this stage.

EOA Analysis Results for All Levels

In this exploration, all levels of EOA were involved, namely Early Childhood Education, Community Learning Activity Centers, and Special Schools (SKB), with a total of 196,978 schools. After that, at the aggregation stage, the average component per student per district/city was 514 districts/cities.

Table 8 below describes the correlation value between each average component per student and the CCI and PPP variables, both in conditions without the winsorization process and after the winsorization process has been carried out.

Table 8. Correlation value between each component average per student on CCI and PPP for all EOA levels

Variable	CCI	CCI Winsor	PPP	PPP Winsor
Average Component 1 per student	0.524	0.319	0.475	0.433
Average Component 2 per student	0.271	-0.010	0.118	0.061
Average Component 3 per student	0.008	-0.009	-0.001	-0.030
Average Component 4 per student	0.059	0.075	0.015	0.033
Average Component 5 per student	0.230	0.231	0.177	0.330
Average Component 6 per student	0.005	0.022	-0.048	-0.037
Average Component 7 per student	0.314	0.150	0.067	0.127
Average Component 8 per student	0.321	0.132	0.318	0.140
Average Component 9 per student	0.147	0.026	0.096	0.093
Average Component 10 per student	0.056	0.058	0.100	0.164
Average Total Cost per student	0.346	0.149	0.315	0.175

Based on the results of the correlation values that have been analyzed, the three component averages that show the most excellent correlation are selected to be included in the process of forming the composite index. The three components are Average Component 1 per student, Average Component 5 per student, and Average Component 8 per student. Due to the significant correlation between the two, the modeling for the formation of the composite index

was carried out by utilizing the CCI and PPP variables without carrying out winsorization. Therefore, a linear regression analysis was carried out to investigate the relationship between the target variables of the selected components and their totals with the CCI and PPP variables

Table 9 presents a summary of the results of the regression analysis for each component that has been selected using the CCI and PPP variables, along with the associated R2 values. From the results obtained, it can be concluded that the model that includes the target variable, average component 1 per student, shows the highest R2 value, namely 31.16%.

Table 9. Estimated values of regression coefficients and coefficients of determination (R2) calculated for a number of models that consider the predictor variables Construction Cost Index (CCI) and Purchasing Power Parity (PPP) at all levels of Educational Operational Costs (EOA).

Model	Y	Intercept	CCI	PPP	R2	
1	Comp. 1	-9281.83	100.95	16844.72	31.16%	*EOA*
2	Comp. 5	65028.39	56.04	21131.80	5.51%	
3	Comp. 8	-402740	2184	248386	12.65%	
4	Total Comp 1, 5, 8	-346993.6	2340.7	286362.3	15.44%	

Analysis Results for All Levels with Alternative 1

In this exploration, all levels of EOA were used, namely Early Childhood Education, Literacy and Equity Education, and Special Problem Schools (SKB). This use was carried out by applying filter alternative 1, resulting in 86,008 schools. Furthermore, after the data was aggregated based on the average component per student per district/city, there were 508 districts/cities in this analysis.

Table 10, the section below, presents the correlation values between each average component per student and the Construction Cost Index (CCI) and Purchasing Power Parity (PPP) variables, both those that have not undergone the winsorization process and those that have gone through this process.

Table 10. The correlation value between each average component per student and the Construction Cost Index (CCI) and Purchasing Power Parity (PPP) variables has been calculated for all levels of Educational Operational Costs (EOA) using the first alternative model.

Variable	CCI	CCI Winsor	PPP	PPP Winsor
Average Component 1 per student	0.488	0.270	0.312	0.370
Average Component 2 per student	0.322	0.035	0.191	0.105
Average Component 3 per student	-0.007	-0.010	-0.017	-0.037
Average Component 4 per student	0.020	0.026	0.015	0.010
Average Component 5 per student	0.282	0.255	0.290	0.431
Average Component 6 per student	0.027	0.036	-0.001	0.018
Average Component 7 per student	0.349	0.152	0.117	0.170
Average Component 8 per student	0.166	0.091	0.174	0.069
Average Component 9 per student	0.207	0.074	0.168	0.197
Average Component 10 per student	0.234	0.075	0.204	0.161
Average Total Cost per student	0.036	0.013	0.025	-0.014

Based on the results of the correlation values listed above, the two-component averages that showed the highest correlation, namely Component Average 1 per student and Component

Average 5 per student, were selected to be implemented in the context of forming a composite index. The modeling process to form a composite index utilizes the CCI variable without using the winsorization method and the PPP variable because both show more significant correlation values. Next, linear regression analysis is applied to investigate the relationship between the target variables originating from the selected components and the total, using the CCI variable, which has not experienced winsorization, and the PPP variable.

Table 11 summarizes the regression analysis results for each selected component involving the CCI variable, which has undergone the winsorization method and the PPP variable. In addition, the coefficient of determination (R2) value is also presented. These results reveal that the model involving the target variable, which includes the total between the average component 1 and the average component 5 per student, produces the highest R2 value, namely 27.24%.

Table 11. Estimated regression coefficient values along with determination values (R2) for several models that consider CCI and PPP predictor variables at all levels of Educational Operational Costs (EOA), with the first alternative model.

Model	Y	Intercept	CCI winsor	PPP	R2
1	Comp. 1	-22098.80	227.36	20460.89	25.72%
2	Comp. 5	-51639.4	1453.0	11290.7	19.08%
3	Total Comp 1.5	-73738.2	1680.3	31751.6	27.24%

Based on the data recorded in Table 9 and Table 11, the conclusion that can be drawn is that the most optimal model is model 1, which is recorded in Table 9. This regression model utilizes the target variable in the form of an average of 1 component per student, with the variable predictor of CCI and PPP. This model was applied to data covering all Educational Operational Costs (EOA) levels and obtained a coefficient of determination (R2) of 31.16%. Therefore, based on this framework, the LMG method (Groemping, 2006) is used to identify the relative contribution of R2, which is then calculated as the average of the sequence of predictor variables. The results of the composite index obtained based on this relative contribution are as follows:

$$IBP = \beta_1 CCI + \beta_2 PPP$$

$$ECI = (\,0.42 \times CCI\,) + (\,0.58 \times PPP)$$

CONCLUSION

Overall, this study concludes that improvements are needed in managing Equality Education Operational Costs (EOA), especially in calculating the EOA index. More specifically, this conclusion can be explained based on the focus of the study, which will be explained as follows. From the various indicators considered, this research resulted in the developing a composite index. The index consists of the Construction Cost Index (CCI), which has previously been used in policy, and Regency/City Purchasing Power Parity (PPP), which acts as a balancing factor for the nature of the CCI. By integrating the District Welfare Index (CCI), which emphasizes the physical dimension, and Purchasing Power Parity (PPP), which focuses on the non-physical dimension, it is hoped that the composite index, namely the Education Operational Costs (EOA) index, can be more potent in presenting the variety of prices that play a role in influencing the EOA unit costs in each district/city. The test was carried out by observing the correlation coefficient and the R2 value in the regression between each indicator and the amount of expenditure per student on each component of SOA expenditure, which comes from data from the School Activity Plan and Budget Application (ARKAS). The District Welfare Index (CCI) and Purchasing Power Parity (PPP) used in preparing the EOA index have undergone a transformation using the winsorization method in order to reduce the asymmetric nature and skewness towards the right (positive skewness) inherent in these two indicators. If this transformation is not implemented, there is potential for several districts/cities with EOA indexes to reach very high numbers. It could have an impact on regional divisions as well as the capability of educational institutions to manage significant cost increases. Furthermore, this winsorization process contributes to an increase in the correlation coefficient and coefficient of determination (R2), which indicates a closer relationship between the District Welfare Index (CCI) and Purchasing Power Parity (PPP) with expenditure patterns in the educational environment.

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REFERENCES

Adams, S., Farrelly, T., & Holland, J. (2020). Non-formal Education for Sustainable Development: A Case Study of the 'Children in the Wilderness' Eco-Club Program in the Zambezi Region. Journal of Education for Sustainable Development, 14(2), 117-139. https://doi.org/10.1177/0973408220957091

Alamsyah, D., Pangestu, L. F., & Darusman, Y. (2022). Manajemen Program Pendidikan Kesetaraan Paket C. Inovasi: Jurnal Sosial Humaniora dan Pendidikan, 1(1).

Alwi, S. (2017). Problematika Guru dalam Pengembangan Media Pembelajaran. ITQAN: Jurnal Ilmu-Ilmu Kependidikan, 8(2), 145-167.

Anwar, H. (2018). Implementation of Education Management Standard in the Guidance of Private Islamic High School. Jurnal Pendidikan Islam UIN Sunan Gunung Djati, 4(1), 75-86.

Bacquelaine, M., & Raymaekers, E. (1991). Non-formal Education in Developing Countries. International Journal of Educational Management.

Boyadjieva, P., & Ilieva-Trichkova, P. (2022). Does participation in non-formal adult education matter for individual subjective well-being as a multidimensional functioning? European Educational Research Journal. https://doi.org/10.1177/14749041221116261

Budi, M. H. S. (2020). Analisis Sistem Pembiayaan Pendidikan yang dikelola Kementerian Agama. Salimiya, 1(2).

Caesaria, Sandra Desi. (2021). DAK Nonfisik 2022, Nilai Satuan BOP dan BOS Tidak Lagi Seragam. Accessed on 23 September 2022, from https://www.kompas.com/edu/read/2021/09/03/140000771/dak-nonfisik-2022-nilai-satuan-bop-dan-bos-tidak-lagi-seragam?page=all.

Chambers, R., Kokic, P., Smith, P., & Cruddas, M. (2000, June). Winsorization for identifying and treating outliers in business surveys. In Proceedings of the second international conference on establishment surveys (Vol. 1, pp. 1-12). American Statistical Association.

Choi, S. (2021). Urban/rural disparities in the wage effect of additional vocational education after formal education: the case of the Philippines. International Journal of Training Research, 19(3), 229-241. https://doi.org/10.1080/14480220.2021.1922382

Coda Moscarola, F., & Kalwij, A. (2021). The effectiveness of a formal financial education program at primary schools and the role of informal financial education. Evaluation Review, 45(3-4), 107-133.

Dewi, E. (2019). Potret Pendidikan di Era Globalisasi Teknosentrisme dan Proses Dehumanisasi. Sukma: Jurnal Pendidikan, 3(1), 93-116.

Dewi, P. Y. A., & Indrayani, L. (2021). Persepsi Orang Tua Siswa Terhadap Biaya Pendidikan. Ekuitas: Jurnal Pendidikan Ekonomi, 9(1), 69-78.

Direktorat Pendidikan Anak Usia Dini. (2021). Penguatan PAUD Jadi Prioritas Program Pendidikan Nasional Tahun 2022, BOP Jadi Sumber Utama Pendanaan Lembaga. Accessed on 20 September 2022 from https://paudpedia.kemdikbud.go.id/berita/penguatan-paud-jadi-prioritas-program-pendidikan-nasional-tahun-2022-bop-jadi-sumber-utama-pendanaan-lembaga?id=20210922093230&ix=11.

Direktorat Pendidikan Masyarakat dan Pendidikan Khusus. (2020). Mencerdaskan Anak Bangsa Melalui Pendidikan Kesetaraan. Accessed on 27 September 2022 from https://pmpk.kemdikbud.go.id/read-news/mencerdaskan-anak-bangsa-melalui-pendidikan-kesetaraan.

Ekanem, E. E., & Ekpiken, W. E. (2013). Unit Cost of Education as a Determinant of Students' Learning Achievement in Universities in Cross River State of Nigeria. European Journal of Business and Social Sciences, 2(3), 10-16.

Fattah, N. (2009). Landasan Manajemen Pendidikan. Bandung: Rosda.

Fauzi, A. (2020). Analisis Biaya Mutu dalam Meningkatkan Daya Saing Pendidikan. Jumpa: Jurnal Manajemen Pendidikan, 1(1), 51-62.

Fauzi, A., & Siregar, H. (2021). Profil Pendidikan Alternatif Pusat Kegiatan Belajar Masyarakat (PKBM) Di Kota Serang Banten. Jurnal Eksistensi Pendidikan Luar Sekolah (E-Plus), 6(2).

Ferdi, W. P. (2013). Pembiayaan Pendidikan: Suatu Kajian Teoritis. Jurnal Pendidikan dan Kebudayaan, 19(4), 565-578.

Gaspersz, V. (2003). Ekonomi Manajerial: Pembuatan Keputusan Bisnis. Jakarta: Gramedia Pustaka Utama.

Gloria, R., Tatiana, D., Constantin, R. B., & Marinela, R. (2014). The effectiveness of non-formal education in improving the effort capacity in middle-school pupils. Procedia-Social and Behavioral Sciences, 116, 2722-2726. DOI: 10.1016/j.sbspro.2014.01.668

Griffin, T. (2016). Costs and Benefits of Education and Training for The Economy, Business and Individuals. NCVER, Adelaide.

Groemping, U. (2006). Relative Importance for Linear Regression in R: The Package relaimpo. Journal of Statistical Software, 17(1).

Hariyanto, A. (2020). Efektivitas Program Biaya Penunjang Operasional Penyelengaraan Pendidikan (BPOPP) Dan Managemen Pembiayaan Pendidikan Terhadap Pengembangan Mutu Pendidikan: Efektivitas Program BPOPP, Managemen Pembiayaan, dan Mutu Pendidikan. Journal of Education Management and Learning, 3(1), 1-13.

Harlinda, H., Madani, M., & Tahir, M. (2020). Manajemen Pendidikan Kesetaraan Kejar Paket C Pusat Kegiatan Belajar Masyarakat Amanah ummat Makassar. Kajian Ilmiah Mahasiswa Administrasi Publik (KIMAP), 1(1), 43-58.

Hasibuan, L., Us, K. A., & Pendi, H. Z. (2021). Pengelolaan Biaya Pendidikan: Kajian Studi Pustaka. Jurnal Literasiologi, 5(2).

Henschke, J. A. (1998). Modeling the Preparation of Adult Educators. Adult Learning, 9(3), 11–14.

Herlyna, H., Mukhtar, M., & Sari, E. (2019, January). The Evaluation of Paket C Equivalency Program

Implementation in Tangerang District, Indonesia. In 1st International Conference on Innovation in Education (ICoIE 2018) (pp. 567-573). Atlantis Press.

Hermawan, I. K. D. (2012). Kinerja Pendidikan Kesetaraan Sebagai Salah Satu Jenis Pendidikan Nonformal. Jurnal Pendidikan dan Kebudayaan, 18(1), 65–84.

Jackson, L. (2016). Education for Sustainable Development: From Environmental Education to Broader Views. In Handbook of research on applied learning theory and design in modern education (pp. 41-64). IGI Global.

Jaelani, A., Sahudi, S., Supiana, S., & Zaqiah, Q. Y. (2021). Kebijakan Standar Pembiayaan Dalam Dunia Pendidikan. Jurnal Ar-Risalah: Media Ke-Islaman, pendidikan dan hukum islam, 19(1).

Kalenda, J. (2015). Development of non-formal adult education in the Czech Republic. Procedia-Social and Behavioral Sciences, 174, 1077-1084.

Kalenda, J., & Kočvarová, I. (2022). Participation in non-formal education in risk society.

Kedrayate, A. (2012). Non-formal Education: Is It Relevant or Obsolete. International Journal of Business, Humanities and Technology, 2(4), 1-5

Kementerian Keuangan Republik Indonesia. (2020). Kebijakan DAK Nonfisik Bidang Pendidikan Tahun 2020 dan Rancangan Kebijakan Tahun 2021 Dalam Kondisi Pandemi Covid-19. Downloaded on 20 September 2022 from http://www.djpk.kemenkeu.go.id/wp-content/uploads/2020/06/Bahan-Paparan-Kebijakan-DAK-Nonfisik-Pendidikan.pdf.

Kementerian Pendidikan dan Kebudayaan. (2021). Prioritas Dana Alokasi Khusus 2022: Pemenuhan Sarana TIK dan Rehabilitasi Prasarana Sekolah. Accessed on 27 September 2022 from https://www.kemdikbud.go.id/main/blog/2021/08/prioritas-dana-alokasi-khusus-2022-pemenuhan-sarana-tik-dan-rehabilitasi-prasarana-sekolah.

Kementerian Pendidikan dan Kebudayaan. (2021). Prioritas Dana Alokasi Khusus 2022: Pemenuhan Sarana TIK dan Rehabilitasi Prasarana Sekolah. Accessed on 28 September 2022 from https://www.kemdikbud.go.id/main/blog/2021/08/prioritas-dana-alokasi-khusus-2022-pemenuhan-sarana-tik-dan-rehabilitasi-prasarana-sekolah.

Komar, O. (2006). Filsafat Pendidikan Nonformal. Bandung: Pustaka Setia.

Latchem, C. (2014). Informal Learning and Non-formal Education for Development. Journal of Learning for Development, 1(1), 1-13.

Marques, J. B. V., & de Freitas, D. (2016). Mapping the future of non-formal education and the scientific dissemination of astronomy in Brazil: A Delphi study. Policy Futures in Education, 14(8), 1153-1181.

Meijer, C. J., & Watkins, A. (2019). Financing special needs and inclusive education–from Salamanca to the present. International Journal of Inclusive Education, 23(7-8), 705-721.

Merriam, S. B., Caffarella, R. S., Baumgarther, L. M. (2006). Adult Learning and Theory Building: A Review. San Francisco: Jossey-Bass.

Milana, M., Nesbit, T. (eds.). (2015). Global Perspectives on Adult Education and Learning Policy. Basingstoke. New York: Palgrave Macmillan.

Munawwir, A., & Hanip, S. P. N. (2021). Sekolah Pesisi Juang: Pendidikan Non-Formal Anak Pesisir. Jurnal Pendidikan Nonformal, 16(1).

Mutegi, R. G. (2015). Influence of unit cost of education on students enrollment rates in public secondary schools in Tharaka south sub county, Kenya (Doctoral dissertation, University of Nairobi).

Ngadirin, N. (2011). Studi Satuan Biaya Pendidikan Sekolah Dasar di Jakarta. Jurnal Pendidikan dan Kebudayaan, 17(6), 647-659.

Nurdiyanti, Y. (2021). Efektivitas Pengawasan dan Pengendalian Anggaran Belanja Sekolah Terhadap Efisiensi Biaya Pendidikan. Tadbir Muwahhid, 5(2), 167-185.

Olajide, S. E., Lizam, M., & Olajide, E. B. (2016). Understanding The Conceptual Definitions of Cost, Price, Worth and Value. IOSR Journal of Humanities and Social Science, 21(09), 53-57.

Pangestu, L. P., Yuliani, L., & Darusman, Y. (2021). Manajemen Program Pendidikan Kesetaraan Paket C Dalam Peningkatan Mutu Pendidikan. Jurnal Jendela PLS, 6(2).

Pemerintah Indonesia. (2003). Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pemerintah Indonesia. (2006). Permendiknas Nomor 23 Tahun 2006 tentang Standar Kompetensi Lulusan untuk Satuan Pendidikan Dasar dan Menengah. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pemerintah Indonesia. (2013). Peraturan Pemerintah Nomor 32 Tahun 2013 tentang Pembiayaan Pendidikan. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pemerintah Indonesia. (2020). Permendikbud 13 Tahun 2020 tentang Petunjuk Teknis Dana Alokasi Khusus

Nonfisik Bantuan Operasional Penyelenggaraan Pendidikan Anak Usia Dini dan Pendidikan Kesetaraan Tahun Anggaran 2020. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pemerintah Indonesia. (2020). Permendikbud 20 Tahun 2020 tentang Perubahan Petunjuk Teknis BOP PAUD dan Pendidikan Kesetaraan. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pemerintah Indonesia. (2021). Permendikbud Nomor 16 /P/2021 tentang Satuan Biaya Dana Bantuan Operasional Sekolah Reguler Masing-Masing Daerah. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pemerintah Indonesia. (2021). Permendikbud Nomor 9 Tahun 2021 tentang Petunjuk Teknis Pengelolaan Dana Bantuan Operasional Penyelenggaraan Pendidikan Anak Usia Dini dan Dana Bantuan Operasional Penyelenggaraan Pendidikan Kesetaraan. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Pienimäki, M., Kinnula, M., & Iivari, N. (2021). Finding fun in non-formal technology education. International Journal of Child-Computer Interaction, 29, 100283.

Rida Fironika, K. (2011). Pembiayaan Pendidikan di Indonesia. Jurnal Ilmiah Pendidikan Dasar, 26(1), 43-63.

Sekretariat Kabinet Republik Indonesia. (2021). Inilah Empat Fokus Kebijakan DAK Nonfisik Tahun 2022 di Bidang Pendidikan. Accessed on 21 September 2022 from https://setkab.go.id/inilah-empat-fokus-kebijakan-dak-nonfisik-tahun-2021-di-bidang-pendidikan/.

Suhaenah, E. (2016). Implikasi pendidikan kesetaraan paket C terhadap peningkatan taraf hidup warga belajar di SKB kota Serang. Jurnal eksistensi pendidikan luar sekolah (e-plus), 1(1).

Suryana, S. (2020). Permasalahan mutu pendidikan dalam perspektif pembangunan pendidikan. Edukasi, 14(1).

Suryana, S., Fakrudin, F., & Ustman, U. (2010). Pelatihan Asesment dan Evaluasi Pembelajaran untuk Peningkatan Kemampuan Profesional Bagi Tutor Kejar Paket B Kesetaraan pada Pusat Kegiatan Belajar Masyarakat (PKBM) di Kota Semarang. Jurnal Abdimas, 14(1).

Sutisna, A. (2016). Pengembangan Model Pembelajaran Blended Learning pada Pendidikan Kesetaraan Program Paket C dalam Meningkatkan Kemandirian Belajar. JTP-Jurnal Teknologi Pendidikan, 18(3), 156-168.

Syaefuddin, S., Yuliani, L., & Oktiwanti, L. (2019). Pemberian Kartu Indonesia Pintar (KIP) Dalam Upaya Meningkatkan Motivasi Belajar Bagi Peserta Didik di PKBM GEMA Pada Pendidikan Kesetaraan Program Paket B dan C Kecamatan Tawang Kota Tasikmalaya. Comm-Edu (Community Education Journal) Vol. 2 No.2.

Ţaran-Moroşan, A., Sava, R. and Diaconescu, C. (2010). The costs and benefits of education-a brief review. Studies in Business & Economics, 5(3).

Wahidin, N., Supriyono, S., & Widianto, E. (2022). Pemanfaatan Sumber Belajar Berbasis Digital pada Program Pendidikan Kesetaraan Paket C di PKBM Mentari Kabupaten Malang. Diklus: Jurnal Pendidikan Luar Sekolah Vol 6 No. 1.

Werquin, P. (2012). The missing link to connect education and employment: recognition of non-formal and informal learning outcomes. Journal of Education and Work, 25(3), 259-278.

Willems, J. (2015). Individual perceptions on the participant and societal functionality of non-formal education for youth: Explaining differences across countries based on the human development index. International Journal of Educational Development, 44, 11-20.

Yanti, V. R., & Sunarti, V. (2021). Hubungan Keterampilan Mengajar Tutor dengan Hasil Belajar Pendidikan Kesetaraan Paket C pada Peserta Didik di Pusat Kegiatan Belajar Masyarakat (PKBM) Media Kabupaten Pesisir Selatan. Jurnal Pendidikan Tambusai, Vol. 5 No. 1.

Zikargae, M. H., Woldearegay, A. G., & Skjerdal, T. (2022). Empowering rural society through non-formal environmental education: An empirical study of environment and forest development community projects in Ethiopia. Heliyon, 8(3), e09127.