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Reforming teacher salary policy to strengthen human capital development in Indonesia 2045

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ABSTRACT

This study aims to explore teacher salary schemes as a strategic instrument for strengthening human capital formation in the context of Indonesia Emas 2045. This study uses a qualitative approach to understand the relationship between teacher compensation and human capital quality through a conceptual and contextual analysis. The literature review method was chosen because it systematically examines theories, empirical findings, and regulatory frameworks. The main sources of research include laws and regulations governing teacher welfare, official reports from state institutions such as the Central Statistics Agency and the Ministry of Education, and international publications, including the OECD, which provide cross-country comparative data. The data collection strategy involved selecting documents with high credibility, direct relevance, and up-to-date information, which were then analyzed using content analysis techniques that emphasized categorization, interpretation, and synthesis. The results of the study show that teacher salary policy reform is a strategic prerequisite for strengthening the quality of human capital and accelerating Indonesia's competitiveness. Evidence from the 2022 PISA results, which show a decline in mathematics, reading, and science achievement, confirms the urgency of improving instructional quality based on teacher welfare and professionalism in Indonesia. Human capital theory explains that investing in educators as knowledge producers can increase productivity and drive long-term growth through skill accumulation and innovation diffusion. Literature findings show that adequate compensation strengthens motivation, retention, and pedagogical commitment, whereas low salaries correlate with a decline in teaching performance and student engagement.

Keywords: teacher salaries; human capital; education policy; golden Indonesia 2045

1. INTRODUCTION

Education plays a strategic role in shaping the quality of human resources and strengthening a country's economic structure. Investing in education tangibly improves the skills and capacity of the workforce, thereby promoting sustainable economic growth. The concept of human capital emphasizes that education is a crucial form of investment for countries that want to accelerate their economic growth (Filippova et al., 2021). Improving the quality of human resources through education is a key prerequisite for achieving inclusive and sustainable economic growth (Sun, 2021). However, the effectiveness of education in driving the economy is highly dependent on its quality and accessibility, as well as its suitability to the needs of the labor market (Ogurtsova et al., 2018).

Educational institutions, as part of the economic sector, also contribute significantly by providing skilled labor that can strengthen economic output across the board (Ihsan and Supaat, 2023). Research shows that higher levels of education are positively associated with increased productivity, with universities providing spillover effects on regional economic growth through the provision of quality human capital (Valero & Reenen, 2016). The impact of education on the economy is non-linear because, at a certain point, the level of educational attainment can change the dynamics of economic growth (Márquez-Ramos & Mourelle, 2019). However, the benefits of education are greatly influenced by the socioeconomic context, where less developed regions benefit more from educational investment than developed regions (Zhang & Zixuan Lu, 2022). Inequality in access to and quality of education between regions deepens economic disparities, as Liang (2024) highlights the impact of educational disparities on economic inequality.

Indonesia faces an urgent need to improve the quality of education because the 2022 Programme for International Student Assessment (PISA) scores show a decline in the average performance in mathematics, reading, and science compared to the 2018 results (OECD, 2022). These results are among the lowest since PISA began, equivalent to the 2003 level for reading and mathematics and the 2006 level for science, indicating an erosion of achievement since 2015. In mathematics, only 18% of Indonesian students achieved at least Level 2, far behind the OECD average of 69%, reflecting weak basic quantitative representation and reasoning skills.

Similar results were also seen in reading and science, with 25% and 34% of students reaching Level 2 and above, respectively, while there were almost no top performers, indicating a limited supply of outstanding academic talent. Socioeconomic factors further exacerbate these results, with 43% of Indonesian students in the bottom quintile internationally with an average math score of 354, lower than students in similar circumstances in several comparable countries. Furthermore, although the performance gap between the top and bottom quartiles is only 34 points, socioeconomic status still explains 6% of the variation in mathematics achievement, indicating that learning equity remains a significant issue. Based on this quantitative evidence, policy reforms to improve teachers' welfare and working conditions are seen as a strategic instrument to address teacher shortages, strengthen instructional support, and close the achievement gap, the causal impact of which on accelerating Indonesia's PISA achievements towards global standards needs to be tested.

In developing countries, including Indonesia, low teacher salaries are a fundamental problem that hinders improvements in the quality of education. This issue has a direct impact on motivation, retention, and overall educational achievement because financial incentives determine the ability of the teaching profession to attract and retain qualified educators (Agusniati, 2022; Han & Borgonovi, 2020). Empirical evidence shows that inadequate compensation reduces the interest of high-achieving candidates in becoming teachers, while also decreasing the job satisfaction of existing educators, resulting in high turnover (Han & Borgonovi, 2020).

Low job satisfaction due to low salaries has been shown to correlate with weakened performance and a decline in the quality of learning (Gemedá & Tynjälä, 2015; Saeed & Kayani, 2018). Teachers who feel that they are not valued materially tend not to invest extra effort in teaching, thereby reducing classroom engagement and harming students' learning outcomes. This situation is exacerbated by the fact that low salaries limit teachers' access to professional development and continuing education, which are

essential for improving their competence (Agusniati, 2022). Furthermore, the attractiveness of the teaching profession weakens when salaries are compared to other professions that require equivalent qualifications, leading high-achieving graduates to choose other career paths (Liu et al., 2024). This cycle has the potential to perpetuate educational inequality because schools are forced to recruit teachers with lower qualifications (Han et al., 2017; Tavares & Ponczek, 2019).

The findings of Saeed and Kayani (2018) confirm the direct link between teacher satisfaction supported by competitive compensation and improved education quality. Teachers who are financially secure are more committed to student learning, resulting in a better learning experience. Furthermore, wage disparities between regions and school types deepen educational inequality in Indonesia, where areas with lower compensation struggle to attract qualified teachers (Rusina, 2022). In fact, the public's perception of low teacher salaries also lowers the social status of this profession, which has implications for weakening public confidence in the attractiveness of a teaching career (Deniz et al., 2018).

This study aims to explore teacher salary schemes as a strategic instrument for strengthening human capital formation in the context of Indonesia Emas 2045. This study focuses on how adequate compensation levels can improve teacher motivation, retention, and performance, thereby systematically improving the quality of education. Theoretically, this study contributes to the literature on the relationship between teacher welfare and the quality of education and labor productivity, which are the main foundations of the human capital theory. These findings are expected to broaden the understanding of the mechanisms by which teacher compensation policies affect the accumulation of skills, knowledge transfer, and innovation, which are essential for long-term economic growth. In practical terms, this study provides policy recommendations for designing a competitive and equitable teacher salary structure capable of attracting and retaining high-quality educators.

2. LITERATURE REVIEW

Human capital theory is a central framework in economic and social research that emphasizes the value of individual capabilities, education, experience, and skills as key drivers of economic performance and growth. Sianesi and Reenen (2003) show that the accumulation of human capital through education and training increases individual productivity while strengthening sustainable economic development. This finding is consistent with the neoclassical growth model of Lucas and Romer, which places human capital on par with physical capital in explaining variations in productivity between countries (Hou & Wang, 2015). Efforts to measure human capital are also an important concern because accurate assessment determines the understanding of its contribution to economic outcomes, both through educational attainment indicators and comprehensive frameworks that include skills and competencies (Abraham & Mallatt, 2022; Bassi & McMurrer, 2008).

Vidotto et al. (2017) offer a holistic scale that integrates competencies, skills, attitudes, and leadership, thereby overcoming the limitations of previous instruments. The relationship between human capital and innovation further emphasizes its relevance, as the concentration of skilled labor accelerates the diffusion of technology and regional innovation (Messinis & Ahmed, 2009; Xing-yang & Liu, 2021). Crook et al. (2011) prove through a meta-analysis that human capital is positively correlated with company performance, although declining returns require optimal investment strategies. In the context of small and medium-sized enterprises, the combination of education and experience accelerates the internationalization process and enhances global competitiveness (Dar & Mishra, 2019; Javalgi & Todd, 2011). Macroeconomically, human capital inequality explains the differences in growth trajectories between countries, making it essential to understand the accumulation process to narrow global economic disparities (Teles & Andrade, 2008). The perspective of Manuelli & Seshadri (2014) reinforces the argument that variations in the quality of human capital have direct implications for national welfare, emphasizing the urgency of targeted and evidence-based education policies.

Teacher quality is often directly linked to human capital formation, and compensation models play an important role in influencing these dynamics (Aaronson et al., 2007). Aaronson et al. (2007) show that traditional indicators such as work experience and educational background cannot always predict teacher

quality, thus opening up space for innovation in compensation designs that are more performance-oriented. Bowen and Mills (2017) emphasize that performance-based pay can stimulate improvements in teacher effectiveness when implemented appropriately, making performance-based compensation models a potential policy alternative. However, compensation is also closely related to attrition rates, with Wangchuk and Dorji (2020) proving that low salaries and institutional support accelerate teachers' departure from the profession. This condition is reinforced by Buchanan (2012), who found that disappointment due to a lack of financial rewards exacerbates the teacher retention crisis and weakens the quality of education.

From a macro perspective, Findlay et al. (2013) confirm that teacher income levels affect recruitment and retention, both of which are crucial for maintaining the stability of a qualified teaching workforce. Rice et al. (2012) add that performance-based incentives, such as the Teacher Incentive Fund, are designed to attract qualified teachers to underserved schools while strengthening professional development. However, Yuan et al. (2013) found that the implementation of such incentive programs often fails to increase motivation or change teaching practices, indicating limitations in their effectiveness. In contrast, Lavy (2009) and Woessmann (2011) show that compensation directly linked to student achievement can produce real improvements in academic performance while also proving the return on investment in teacher compensation policies. Furthermore, Liang and Akiba (2011) confirm that the effectiveness of performance-based compensation is highly dependent on the institutional context, teacher quality, and administrative support; thus, compensation reforms must be designed holistically to produce sustainable educational impacts.

3. METHOD

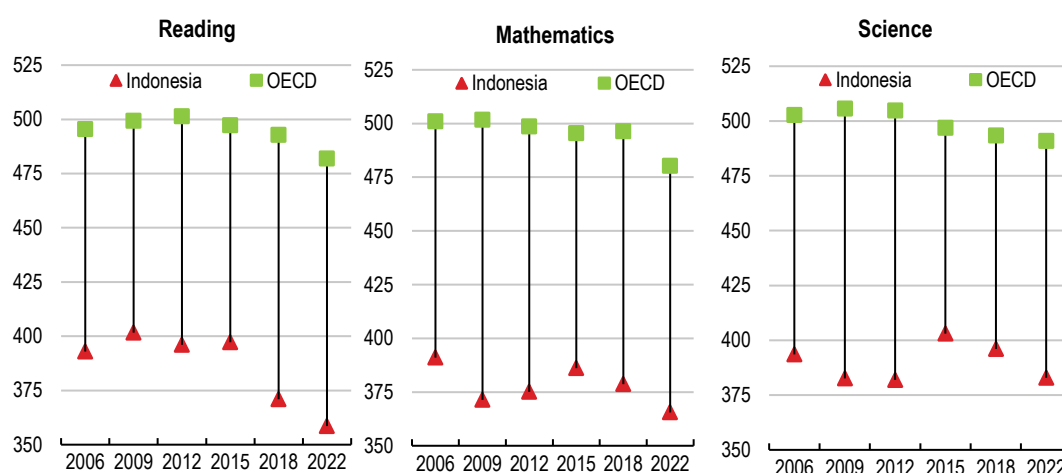
This study uses a qualitative approach designed to understand the relationship between teacher compensation and human capital quality in depth through a conceptual and contextual analysis. The researchers adopted a literature review method because it allows for a systematic examination of theories, empirical findings, and relevant regulatory frameworks. The main sources of research include laws and regulations governing the education system and teacher welfare, enabling the study to map the normative basis for policy. In addition, the researchers compiled official reports from state institutions, such as the Central Statistics Agency and the Ministry of Education, as well as publications from international organizations, including OECD, which provide comparative data across countries. The data collection strategy involved selecting documents with high credibility, up-to-date information, and direct relevance to the research issue. Literature analysis was conducted using content analysis techniques that emphasized the process of categorization, interpretation, and synthesis from various sources.

4. RESULT AND DISCUSSION

4.1 PISA Scores and the Challenge of Human Capital Formation

The results of the study show that the decline in the 2022 Programme for International Student Assessment (PISA) scores poses a serious threat to the quality of Indonesia's human capital in the future. OECD (2023) data shows that Indonesian students' achievements in mathematics, reading, and science are not only lower than the OECD average, but have also declined since 2015, reaching the lowest point in Indonesia's history of participation (Figure 1). This poor performance is even more worrying because the proportion of students who achieve the minimum competency level (Level 2) is only around 18% for mathematics, 25% for reading, and 34% for science, far behind the OECD average of around 69%.

Figure 1. Student performance in PISA tests in Indonesia



Source: OECD (2024)

Regional disparities further exacerbate the situation, with students in Jakarta and Yogyakarta scoring 40–50 points higher than the national average, highlighting the uneven quality of education (OECD, 2019). This condition illustrates the risk of human capital fragmentation, which has the potential to widen the productivity gap between regions in Indonesia. Furthermore, external factors such as the COVID-19 pandemic have worsened the situation because school closures have hampered the continuity of learning, even though the downward trend in achievement had already emerged before the pandemic (OECD, 2023).

On the other hand, structural problems such as child malnutrition and high dropout rates also weaken the cognitive capacity of the younger generation, thereby reducing the quality of human resource inputs. If this trend continues, Indonesia faces the threat of a deficit in basic skills that are crucial for global competitiveness, as evidenced by the low levels of adult literacy and numeracy according to the Programme for the International Assessment of Adult Competencies survey (OECD, 2016). The consequences of weak human capital are reflected in stagnant labor productivity, low innovation, and limited capacity to adapt to technological change.

The low quality of education will also affect the success of the demographic bonus policy because a large workforce does not automatically increase economic growth without adequate skills. In addition, the inability of graduates to meet the needs of the job market has the potential to increase the youth unemployment rate, which as of 2023 is still at 13%, higher than Malaysia, the Philippines, and Thailand (OECD, 2021). The long-term impact is Indonesia's delay in transitioning to a knowledge-based economy, which requires human capital with high skills. This is even more evident when compared to higher education attainment, where only 13% of the population aged 25–64 have completed tertiary education, the lowest among G20 countries (OECD, 2024). This limitation poses the risk of a middle-income trap because labor productivity cannot keep pace with the demands of economic development.

4.2 Teacher Salary Regulations

The results of the study show that the issue of teacher salaries in Indonesia remains a structural problem with broad implications for the quality of education and human capital formation. *First*, the teacher salary system still lacks consistent national standards, resulting in inconsistencies between school types and employment status (Agusniati, 2022). Teachers with civil servant status, whether as civil servants (PNS) or government employees with work agreements (PPPK), have relatively more certainty regarding their salaries, allowances, and career paths (Han & Borgonovi, 2020). This condition is different from teachers in private schools whose income is highly dependent on the financial capacity of the foundation, resulting in significant variations, from quite high in elite schools to very low in community-based schools. These differences create a dualism of welfare that does not reflect the equality of the teaching profession as national educators. *Second*, the workload of teachers in private schools is often equivalent to that of civil servants, in terms of teaching hours, administrative responsibilities, and competency development requirements. However, the compensation they receive is vastly different, creating a social gap between teachers even though their teaching functions are relatively the same (Gemedá & Tynjälä, 2015). This injustice causes social jealousy that has the potential to reduce the work motivation of private teachers. Teachers who feel that they are not properly valued tend to be less motivated to improve the quality of learning, thereby reducing the effectiveness of teaching in the classroom (Saeed & Kayani, 2018). This not only affects teacher job satisfaction but also student engagement in the teaching and learning process.

Third, income disparities affect teachers' access to professional development, such as training, certification, and mastery of learning technologies. Civil servant teachers are more likely to participate in capacity-building programs because they are supported by the state budget, while private school teachers with low salaries find it difficult to finance additional training (Agusniati, 2022). This inequality widens the competency gap between teachers in public and private schools, which ultimately has implications for the quality of student learning outcomes. Students in schools with low-paid teachers are at risk of receiving less innovative learning that is limited to conventional methods. *Fourth*, unequal teaching quality has a direct effect on student academic achievement. Studies show that teachers who have adequate welfare are more able to commit to student learning and produce better academic achievements (Saeed & Kayani, 2018). Conversely, students taught by teachers with precarious financial conditions face the risk of low-quality instruction, minimal guidance, and reduced creativity in teaching. This situation exacerbates the quality gap between public and private schools. *Fifth*, the issue of social jealousy among teachers causes fragmentation of professional solidarity, which should be a strength in fighting for quality education. This inequality can lower the collective morale of teachers, which in turn reduces the effectiveness of collaboration-based education policies. This condition becomes even more crucial when linked to Indonesia's efforts to improve the quality of human capital towards its 2045 vision. If disparities in teacher compensation are left unaddressed, it will be difficult to achieve the formation of equal quality human capital throughout Indonesia.

Sixth, relatively similar workloads but with different rewards create a perception of unworthiness in the teaching profession, especially in private schools with low salaries. This reduces the attractiveness of the teaching profession among high-achieving young people, as they prefer other careers with more competitive compensation (Liu et al., 2024). In the long term, this condition has the potential to reduce the quality of teacher recruitment, where schools with limited financial capabilities are only able to recruit teaching staff with lower qualifications (Han et al., 2017; Tavares & Ponczek, 2019). *Seventh*, students are the most affected by teacher pay inequality. Differences in the quality of learning between schools lead to uneven academic achievement, widening socioeconomic gaps, and hindering social mobility. This can be seen from PISA data, which shows that Indonesian students' achievements are still low and uneven across regions, partly due to the quality of teaching staff (OECD, 2023).

4.3 Strategies for Resolving Teacher Salary Issues

This study shows that the solution to teacher salary disparities in Indonesia must begin with the formulation of a national minimum salary standard for teachers, which takes into account differences in employment status (civil servants and private sector) and regional cost of living. OECD countries generally

set starting salaries for teachers at between 75% and 150% of GDP per capita, reflecting compensation that is oriented towards contextual welfare. The application of a similar scheme in Indonesia would help bridge the salary gap and provide a benchmark for fair and competitive compensation policies. Furthermore, Indonesia could encourage private school teachers' salary adjustments based on the financial capacity of the foundation, while maintaining minimum standards, as other Southeast Asian countries have done.

As an example of concrete reform, Indonesia once implemented a significant increase in civil servant teachers' salaries through a certification program that doubled their base salary, moving teachers from the median to the 90th percentile in the distribution of salaries for university graduates in the country. Although this intervention significantly increased teacher satisfaction and reduced financial anxiety and the need for a second job, experimental evaluations showed that it did not sufficiently encourage improvement in student learning outcomes in the short term. This shows that salary increases must be combined with performance-based policies, rather than simply unconditional salaries, in order to have a real impact on teaching quality.

Several developed countries have implemented incentives based on learning outcomes and performance pay, which have proven effective in boosting teacher motivation and productivity, although their implementation requires a robust and transparent evaluation system. Indonesia should adopt a model that ties part of teachers' compensation to student learning outcomes, peer review evaluations, and other indicators of professionalism. Teacher salary reforms should also involve synchronization between levels and workloads. The OECD notes that teachers with 15 years of experience at the primary to secondary level receive annual salaries of approximately USD 44,198–51,234, with a clear teaching load. This model can be used as a benchmark for evaluating relative workloads. In Indonesia, without a correlation between workload and salary among civil servant and private teachers, the system becomes unfair and undermines professionalism.

Comparative studies in ASEAN also emphasize the importance of comprehensive Teacher Laws to set income standards, merit-based recruitment, and systematic continuous professional development (Vuong et al., 2024). This model provides a legal foundation for stable and decisive policies, while reducing disparities between schools and regions. In addition, the allocation of tax revenue to fund education, particularly teacher salaries, must be increased progressively. The OECD notes that OECD countries allocate an average of 4.9% of GDP to education, with some countries spending more than 6%.

5. CONCLUSION

This study concludes that reforming teacher salary policies is a strategic prerequisite for strengthening human capital formation and accelerating Indonesia's competitiveness towards 2045. PISA 2022 evidence showing a decline in mathematics, reading, and science achievement underscores the urgency of improving instructional quality based on teacher welfare and professionalism. Human capital theory explains that investing in educators as knowledge producers increases productivity and drives long-term growth through the accumulation of skills and diffusion of innovation. Literature findings show that adequate compensation strengthens motivation, retention, and pedagogical commitment, while low salaries are associated with declining teaching performance and student engagement.

This study recommends setting a national minimum wage standard for teachers indexed to the cost of living and regional GDP per capita, with a top-up scheme for private schools with low fiscal capacity to maintain equity in learning quality. The government needs to complement salary increases with fair and transparent performance-based incentives, reliable competency evaluations, and systemic access to continuing training and learning technologies. Policies must also address interregional disparities through placement allowances and incentives for shortage areas, so that the distribution of quality teachers is more even and achievement gaps can be narrowed. At the ecosystem level, increasing spending per student and improving school governance will strengthen the instructional core and reduce the risk of a middle-income trap due to weak human resource quality. Further research is recommended to test the causal impact of the salary, incentive, and professional development policy package through cross-regional

quasi-experimental designs and reform event studies, with output indicators that combine learning outcomes and inequality indicators.

Ethical Approval

Ethical approval was not required for this study.

Informed Consent Statement

Ethical approval was not required for this study.

Authors' Contributions

NDK contributed to the conceptualization, methodology, and data analysis of the study. AOPG led the literature review, data search, and contributed to the discussion and conclusion sections. Both authors collaborated closely throughout the research process, ensuring a cohesive approach to the study's objectives.

Disclosure Statement

No potential conflicts of interest were reported by the author.

Data Availability Statement

The data presented in this study can be downloaded from OECD Publications.

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Notes on Contributors

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Alex Oktobertus Pandapotan Gultom

Alex Oktobertus Pandapotan Gultom is a professional in the Ministry of Finance with a strong background in public policy, public finance, law, and taxation. His research interests lie in understanding the intersections between financial systems and legislative frameworks.

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