

The Effectiveness of Teacher Certification Policy in Addressing the Teacher Crisis in Indonesia

Ade Setiadi¹, Didin Muhafidin²

¹Universitas 17 Agustus 1945 (UNTAG) Cirebon, Indonesia

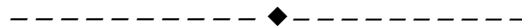
²Universitas Padjadjaran, Bandung, Indonesia

Email: adesetiadi234@gmail.com

Abstract

This study evaluates the effectiveness of teacher certification policy in addressing the teacher shortage crisis in Indonesia. Using a qualitative approach, data were collected from interviews with certified teachers, principals, and policymakers to understand the implementation of the policy, the challenges faced, and its impact on education quality. The results show that although teacher certification can improve pedagogical skills, implementation is often hampered by inadequate operational support, uneven distribution of certified teachers, and budget constraints. Inequitable distribution of teachers, especially in remote areas, as well as budget and ongoing training issues are key issues that reduce the effectiveness of the policy. To increase the impact of the certification policy, better operational support at the school level, incentives for teachers in less developed areas, and most importantly, more effective budget planning are needed. These findings provide important insights for policy makers and education practitioners in designing more comprehensive strategies to improve education quality in Indonesia.

Keywords: *Teacher Certification Policy, Education Crisis, Teacher Distribution, Operational Support, Education Budget.*



A. INTRODUCTION

The teacher crisis is a global phenomenon affecting many countries, including many developing countries, including Indonesia. A significant shortage of teachers, uneven distribution, and low-quality teaching characterise it. Countries such as Kenya, Uganda, and Pakistan face similar challenges, where the number of teachers available is insufficient to meet the increasing educational needs of the growing number of school-age children (Carver-Thomas et al., 2021), the uneven distribution between urban and rural areas exacerbates the teacher crisis in Indonesia. Many schools in remote areas need more qualified teachers, while the number of teachers in large cities tends to be excessive. In addition, teacher recruitment and placement systems could be more effective, resulting in disparities in the quality of education across regions (Peyton et al., 2021; Wiggan et al., 2021).

Data from the Ministry of Education and Culture shows that the teacher-student ratio in some areas could be more balanced, with one teacher having to teach more than 40 students. This crisis has impacted the quality of education and the motivation and welfare of teachers, who often have to work in less than supportive conditions. The Indonesian government has implemented a teacher certification policy to improve professionalism and the quality of teaching to address this problem.

However, the effectiveness of this policy still needs to be debated, given the challenges in implementation and its varying impacts in different regions. This is exacerbated by the shortage of teachers, as shown in the following statistics:

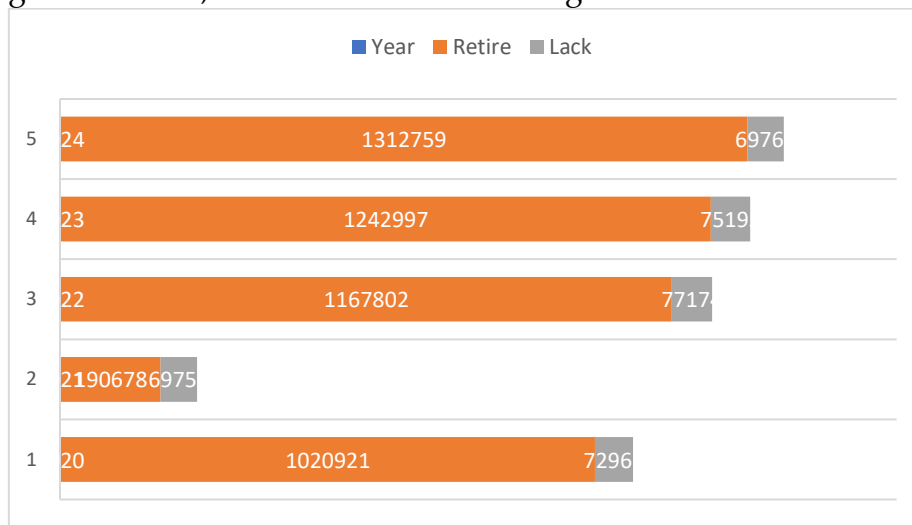


Figure 1. Data on Educator Shortages in the Last 5 Years

Source: Kompas (2024)

Teacher shortages are a pressing issue and affect the overall quality of education. The Ministry of Education and Culture data shows that the national teacher-to-student ratio is around 1:20, but this figure varies significantly across regions. In some remote areas, such as Papua and East Nusa Tenggara, this ratio can reach 1:40 or even higher, indicating an acute teacher shortage. The uneven distribution of teachers is one of the leading causes of this problem. Urban areas such as Jakarta and Surabaya have a relatively sufficient number of teachers, while many rural and remote areas need more teachers. For example, in several districts in Papua, many schools have only one or two teachers to teach all grades, from elementary to secondary. The quality of education in these areas is also affected, with many teachers needing more professional certification or adequate training. Government efforts to improve this situation include teacher redistribution programs and certification policies, but logistical challenges and teachers' reluctance to be placed in remote areas often hamper the effectiveness of these initiatives. This situation reflects the urgency of finding more sustainable and practical solutions to address the teacher crisis in Indonesia. This condition shows that the Indonesian education system faces a significant challenge in filling the increasing number of teaching staff vacancies, which impacts the quality of education and the stability and development of the education system as a whole. More effective policies and strategic steps are needed to address this crisis, including improving teacher recruitment and training programs and incentives for teachers willing to teach in remote areas that need them most.

Teachers play a crucial role in the education system, serving not only as instructors but also as mentors, motivators, and role models for students. They are responsible for transferring knowledge, shaping character, and developing critical and creative skills needed in life (García & Weiss, 2020). The role of teachers is crucial in creating a conducive learning environment, stimulating curiosity, and encouraging

active participation of students in the learning process. Competent and dedicated teachers can inspire and motivate students to reach their full potential and prepare them for future challenges (Machmud & Fakhri, 2021; Shaturaev, 2021).

Teacher shortages significantly negatively impact the quality of education and student development. When there are not enough teachers, the teacher-to-student ratio becomes too high, resulting in a lack of individual attention for each student. This can lead to a decline in academic achievement and make it difficult for students to understand the material properly. Teachers who have to teach classes with too many students often feel overwhelmed, which can impact the quality of their teaching and their well-being. Teacher shortages also exacerbate inequities in the distribution of education, with schools in remote and less developed areas needing more support in obtaining adequate teaching staff (Ismail et al., 2021; Kawuryan et al., 2021). As a result, students in these areas often need to receive an education on par with their peers in big cities, widening the education gap and hampering sustainable human resource development in Indonesia.

Since its enactment in 2005, the Teacher Certification Policy in Indonesia has become an important milestone in efforts to improve the standard of education and professionalism of teachers throughout the country. The history of this policy began as a response to the challenges in improving the quality of national education, focusing on improving teacher competency and qualifications. The main objective of the certification policy is to ensure that every teacher has adequate academic qualifications and professional competencies to provide quality education to students. This is expected to improve overall education standards, reduce disparities in teaching quality between regions, and increase public trust in the education system.

The expectations of the certification policy also include improving teacher professionalism by strengthening their work ethics, teaching skills, and managerial abilities. Through certification, teachers are expected to continue to develop themselves through further training and education and actively participate in developing innovative curricula and learning strategies. Thus, this policy aims to improve the quality of teaching in the classroom and build a strong foundation for sustainable education development in the future. Although still facing several challenges in its implementation, the teacher certification policy continues to be the focus of education reform in Indonesia, reflecting the government's commitment to improving access to and quality of education for all Indonesians (Fanani et al., 2020).

This study aims to evaluate the effectiveness of teacher certification policies in addressing the teacher crisis in Indonesia. This study aims to investigate the extent to which certification policies have succeeded in improving the quality of education and teacher professionalism in various regions and identify obstacles and challenges that may arise in their implementation. By analysing the impact of certification policies on teacher distribution, teaching quality, and the stability of the education system, this study hopes to provide policymakers and education practitioners with in-depth insights into steps that can be taken to improve and strengthen education policies in the future; this study also intends to make an academic contribution by adding to the

literature on the effectiveness of education policies in this complex and diverse Indonesian context.

B. LITERATURE REVIEW

The teacher crisis in Indonesia has become a critical issue affecting the overall quality of education. Based on data from the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), in 2022, there will be a shortage of 1,167,802 teachers, a figure that will increase to 1,242,997 in 2023 and is projected to reach 1,312,759 in 2024. Several factors, including the retirement of many teachers each year without adequate replacement, cause this shortage. In 2022, 77,124 teachers entered retirement, while in 2023 and 2024, the number of teachers who retired reached 75,195 and 69,762, respectively. The decline in teaching staff differs from the number of Pre-Service Teacher Professional Education (PPG in Bahasa) graduates, which only reached 27,935 people from 2006 to 2018, plus 2,963 graduates from 2019 to 2021. In addition to the pension factor that has occurred in recent years, the teacher crisis is also influenced by the uneven distribution between urban and rural areas. Research by Rosser (2018) shows that many teachers are reluctant to be placed in remote areas due to the lack of facilities and incentives, which causes inequality in access to quality education. Another contributing factor is the ineffective teacher recruitment and training system. According to research by (Shaturaev, 2021), many teachers in Indonesia need adequate training before starting to teach, which impacts the low quality of teaching. This study also found that the teacher certification policy, although aimed at improving professionalism, still faces challenges in implementation and has not been able to address the underlying problems of this crisis entirely; the teacher shortage in Indonesia is the result of a combination of various structural and systemic factors.

Relevant theories and models in assessing the effectiveness of education policies are essential to understanding how teacher certification policies can impact the teacher crisis in Indonesia. One of the theories often used is the Policy Implementation Theory, proposed by Pressman and Wildavsky (1973) in (Ismail et al., 2021; Machmud & Fakhri, 2021), this theory emphasises the importance of the implementation process in determining the success of a policy. According to them, a well-designed policy can only succeed if its implementation is effective. Factors such as coordination between institutions, availability of resources, and stakeholder involvement greatly influence the effectiveness of education policies.

The CIPP (Context, Input, Process, Product) Evaluation Model developed by (Kawuryan et al., 2021) is also very relevant in evaluating teacher certification policies. This model proposes that policy evaluation considers four main components: context, input, process, and product. Context evaluation involves analysing the needs and problems the policy intends to address. Input evaluation includes assessing the resources, strategies, and plans used to implement the policy. Process evaluation assesses how the policy is implemented and whether any obstacles are encountered.

Outcome evaluation focuses on achieving policy objectives and their impact on previously identified problems (Fanani et al., 2020; Suryani, 2021).

Previous research by (Hofer et al., 2021) emphasised that the success of education policies is highly dependent on the ability to identify and overcome various obstacles in implementation. Research by (Ulla & Perales, 2021) also emphasised that changes in education require a systemic approach that considers the complex dynamics in the field. These models can be used to evaluate the extent to which the policy has succeeded in improving the quality and distribution of teachers, as well as addressing teacher shortages in various regions. A comprehensive analysis using these theories and models can provide deeper insights into the effectiveness of the policy and provide more accurate recommendations for future improvements.

Previous international research on the effectiveness of education policies and policy evaluation models provides many insights that can be applied in the Indonesian context. For example, research by (Hill et al., 2020) in the United States showed that a rigorous teacher certification policy, which included comprehensive professional training and ongoing performance evaluation, significantly improved teaching quality and student learning outcomes. The study found that teachers who underwent an extensive certification program were better prepared to face challenges in the classroom and more effective in teaching.

Another study by (Tomczyk & Walker, 2021) in the OECD report "Preparing Teachers and Developing School Leaders for the 21st Century" highlights the importance of continuing professional development and support for new teachers to ensure the success of certification policies. The report includes an analysis of education policies in several developed and developing countries, showing that countries with solid teacher certification programs tend to have better education systems. (See, Morris, Gorard, & El Soufi, 2020) also emphasises that teacher quality is the most critical factor in student success. Investing in teacher training and certification is one of the most effective ways to improve education quality.

Research by (Mason-Williams et al., 2020) in the context of developing countries shows that education policies often fail due to problems in implementation, such as lack of resources, poor coordination, and the inability to adapt policies to local conditions. This study is relevant to understanding the challenges faced by Indonesia in implementing teacher certification policies.

Research by (Kalloo et al., 2020) suggests that in addition to certification policies, it is also essential to have precise and data-based performance evaluation mechanisms to ensure that teachers are certified and able to apply their skills effectively in the classroom. These studies together provide a solid theoretical and practical basis for evaluating and improving teacher certification policies in Indonesia, highlighting the importance of comprehensive training, ongoing support, and data-based performance evaluation to achieve higher education goals.

C. METHOD

This study will use a qualitative research design to evaluate the effectiveness of teacher certification policy in addressing the teacher crisis in Indonesia. A qualitative approach was chosen to provide an in-depth understanding of the experiences and perceptions of teachers, school administrators, and policymakers related to implementing the certification policy. The study population includes teachers participating in the certification program, school principals, and Ministry of Education and Culture officials. The sample will be selected purposively, namely by selecting individuals who have direct knowledge and experience related to the teacher certification policy, including teachers at various levels of education (primary, secondary, and high school) and from urban and rural areas. The main research instruments will be in-depth interviews and secondary data analysis. In-depth interviews will be conducted with certified teachers, school principals, and policymakers to gain insights into the implementation of the policy, the challenges faced, and the impact of the policy on the quality of education. Secondary data, including policy documents, program evaluation reports, and statistics related to the number of teachers, will be collected to provide context and support the analysis.

The data collection procedure will be conducted in several stages: first, an interview guide will be developed that includes questions about experiences with the certification policy, perceived changes, and problems faced. Next, interviews will be scheduled and conducted either face-to-face or through an online platform, depending on the location and availability of the participants. Secondary data will be collected from official sources such as ministry reports and education databases. Thematic analysis techniques will be used to identify patterns, themes, and critical issues from the interview results. Data will be analysed by grouping information based on relevant themes, such as implementation effectiveness, challenges faced, and impacts on education quality. The thematic analysis results will be combined with secondary data to provide a comprehensive picture of the effectiveness of the teacher certification policy. This approach is expected to produce in-depth and valuable insights for developing more effective policies in the future.

D. RESULT AND DISCUSSION

Several central themes emerged based on the results of in-depth interviews with certified teachers, principals, and policymakers. An accredited teacher from West Java stated, *"Certification gave me new tools and knowledge to teach better, but challenges in applying the material learned often arise due to a lack of support from the school."*

The interview results provide in-depth insights into how the teacher certification policy is implemented and its impact on the education system. Analysis of the interviews shows that although the teacher certification policy brings some benefits, such as improving pedagogical skills, the challenges faced in implementation indicate that the policy needs to be fully effective in improving the quality of education as a whole.

Interviews with teachers from West Java revealed that certification provides valuable new tools and knowledge for teaching; challenges arise when teachers need more support from the school in implementing the material they have learned. This indicates that although teachers have the skills gained from certification, the success of implementation in the field is highly dependent on the support and facilities available at the school level. Inadequate operational support and resources at schools often hinder teachers' ability to implement new teaching techniques effectively. This reflects the benefits of certification in terms of skill enhancement but also highlights the need for more support for implementation at the school level. A principal from the same area shared his views on the issue: *"We support teacher certification, but there is an uneven distribution of certified teachers. It is difficult to find certified teachers willing to work in remote areas in our area..."*.

This statement highlights the challenges associated with the uneven distribution of teachers, which impacts policy implementation in underserved areas. Interviews with school principals revealed inequities in the distribution of certified teachers, particularly in remote areas. This suggests that while the certification policy aims to improve teaching quality equitably, the uneven distribution of certified teachers creates inequities in access to quality education. The difficulty in attracting certified teachers to underdeveloped areas highlights the need for additional strategies, such as better incentives and support, to encourage teacher deployment in areas of greatest need. Policymakers from the Ministry of Education and Culture explained that: *"The certification policy aims to improve teacher professionalism and the quality of education. However, implementation in the field is often hampered by logistical problems and a lack of budget for ongoing training..."*.

This quote illustrates the structural and financial challenges faced in implementing the policy. Key findings from the data collected indicate that the teacher certification policy has provided benefits in improving teacher skills but also faces significant challenges in implementation. The problem of uneven distribution and lack of operational support are substantial obstacles that must be addressed to improve the effectiveness of the policy. Although the certification policy has great potential to improve the quality of education, the challenges faced on the ground require more integrated attention and solutions. Interviews with policymakers highlighted structural and financial issues in implementing the certification policy. Logistical issues and a limited budget for ongoing training indicate that, although the policy aims to improve teacher professionalism, adequate support in effective budgeting and planning is necessary for the policy to be maintained successfully.

Analysis of interview results shows that although the teacher certification policy can improve the quality of education, implementation success is greatly influenced by school support, fair distribution of teachers, and adequate resource allocation. Still, improvements are needed in operational support, better distribution policies, and strengthening the budget for ongoing training to ensure that the certification policy can provide the expected positive impact.

The results of this study show similarities and significant differences when compared to previous studies on teacher certification policies. The finding that teacher certification provides benefits in improving pedagogical skills aligns with research by (Darling-Hammond & Hyler, 2020), which shows that rigorous certification can enhance the quality of teaching and student learning outcomes. In that study, certification contributed to teacher professional development and improved teaching skills, which was also found in this interview.

The findings on challenges in implementing and distributing certified teachers highlight the differences with the results of previous studies. Research by (Stevenson et al., 2020) suggested that ongoing support and training are critical to the success of certification policies. Still, interviews in this study showed that the lack of operational support at the school level often hindered the implementation of the techniques that had been learned, indicating that although certification policies are designed to improve the quality of teaching, support for implementation in the field remains an issue that has not been fully resolved.

Significant differences are also seen in the issue of teacher distribution. Research by (Bacher-Hicks et al., 2023; Billingsley et al., 2020) identified that unequal distribution can hamper the effectiveness of education policies in developing countries. The results of interviews in this study confirm this, with principals expressing difficulties in attracting certified teachers to remote areas, and this shows that certification policies, although intended to improve the quality of education, have not fully addressed the problem of inequity in the distribution of teaching staff. The logistical and budgetary issues faced, as expressed by policymakers in this study, align with the analysis by (Damşa et al., 2021), who showed that challenges in implementation are often related to inadequate structural and financial support. This emphasises that the success of certification policies requires a holistic approach and adequate resources to support practical training and implementation. While this study confirms some of the findings of previous studies on the benefits of certification, it also identifies specific challenges that need to be addressed to improve the effectiveness of the policy, these differences suggest the need for a more integrated approach to certification policies, including operational support improvements, teaching staff distribution, and budget allocation for ongoing training.

The results of this study also reveal several additional dimensions that distinguish it from previous studies. One significant difference is how the implementation aspect of certification policies faces specific local constraints. Research by (Schmitt & DeCourcy, 2022; Van Nuland et al., 2020) suggests that data-based performance evaluation mechanisms are critical to the success of education policies. Interviews in this study revealed that problems in collecting and utilising performance evaluation data in the field can hinder practical assessment of the impact of certification. This suggests that certification policies, although designed to improve the quality of education, are often hampered by the inadequacy of existing evaluation systems.

This study shows differences in terms of teacher motivation and perception towards certification. Research by (See et al., 2020) highlighted that motivation to take part in certification is often influenced by incentives and support from the school. This study found that although certification can improve teacher skills, the lack of incentives and recognition from the school often reduces teacher motivation to apply new knowledge optimally; this suggests that the motivational and reward aspects of certification policies need more attention to increase their effectiveness.

Differences are also evident in the context of budget allocation and ongoing support. Research by (Cardichon et al., 2020) emphasised the importance of continuing support for new teachers, but interviews showed that significant budget constraints hindered ongoing training and operational support. This suggests that, although certification policies are designed to enhance professionalism, there needs to be more in budget and operational planning to reduce the effectiveness of implementation. While teacher certification policies can potentially improve the quality of education, specific challenges in the field require more holistic attention and solutions that include improving evaluation systems, developing effective incentives, and better budget planning to support training and implementation (Oyen & Schweinle, 2020). By understanding these differences and challenges, policymakers can design more effective strategies to achieve better education goals.

The findings of this study have significant implications for education policy, particularly regarding teacher certification policy in Indonesia. The results highlight the importance of adequate operational support at the school level to ensure the effectiveness of certification policies. Although teacher certification provides skills enhancement, challenges in implementing the material learned are often caused by a lack of support from the school. Education policy should include additional components that strengthen support and facilities at the school level, including ongoing training and provision of the resources needed to implement new teaching techniques effectively.

The uneven distribution of certified teachers, especially in remote areas, highlights the need for additional strategies in policy to ensure that certified teachers are more evenly distributed. Policies focusing only on certification without considering additional incentives and support for teachers in less developed areas will be less effective in addressing the uneven distribution. This implication suggests that policies should include attractive incentives for teachers to work in remote areas and programs that support teacher placement and retention in areas of need. Findings related to budget issues and ongoing support indicate that certification policies must be balanced with adequate budget allocations for ongoing training and evaluation. Limited financial support often hinders the effectiveness of policy implementation, so education policies need to plan and allocate budgets better to ensure that ongoing training and performance evaluation can be carried out effectively (Nguyen et al., 2022; Ramot & Donitsa-Schmidt, 2021).

This study has several limitations that need to be considered, which may affect the results and interpretation of the findings. One major limitation is the limited

sample size. Although interviews were conducted with teachers, principals, and policymakers, the limited number of participants and uneven representation from different regions may limit the generalizability of the findings. The focus on a particular region, such as West Java, may not fully reflect conditions across Indonesia, especially in remote or underserved areas.

Another limitation is the reliance on qualitative data from interviews, which can be subject to subjective bias by researchers and participants. Individual perceptions and experiences may be influenced by personal or situational factors that may not provide the complete picture of the effectiveness of certification policies. In addition, the availability and accessibility of relevant secondary data, such as recent evaluation reports and statistics, may be limited or incomplete, affecting the study's depth of analysis and conclusions (Ingersoll, 2020; Nguyen et al., 2022). Time and resource constraints also limit the ability to conduct more comprehensive analyses. In-depth interviews are time-consuming and may be limited by logistical constraints, reducing the quality or depth of information obtained. These limitations also affect the ability to conduct longitudinal analyses that could provide deeper insights into changes in policy effectiveness over time.

The findings of this study have significant practical implications for everyday educational practice, especially in implementing teacher certification policies. First, the study results indicate the need for more robust operational support at the school level. Schools should improve the facilities and resources available to teachers to implement new teaching techniques learned from certification, and this includes providing additional training, teaching materials, and technical support needed to ensure that teachers can utilise their new skills effectively.

The subsequent implication is that to address the problem of uneven distribution of certified teachers, education policy needs to create attractive incentives for teachers to work in remote areas. This could be in the form of additional allowances, better facilities, or professional development programs tailored to the region's needs. This approach helps to level the playing field and ensures that all students, regardless of their geographic location, have access to quality teachers.

The findings on budget constraints and ongoing support underscore the importance of careful budget planning and adequate resource allocation for continuing training. These practices can include providing dedicated funding for ongoing training, developing relevant curricula, and having regular evaluation systems to ensure that certification policies have positive long-term impacts. Schools and policymakers can create more effective teacher-supportive environments, address inequities in the distribution of the teaching workforce, and ensure that investments in teacher certification deliver intended results by implementing these findings in practice. This approach not only improves the quality of teaching but also contributes to overall student learning outcomes.

E. CONCLUSION

The conclusion of this study confirms that the teacher certification policy has great potential to improve the quality of education through improving teacher skills and professionalism. Challenges in implementation at the school level, uneven distribution of certified teachers, and budget constraints and ongoing support hamper the effectiveness of the policy, and to overcome these problems, it is necessary to improve operational support in schools, incentives for teachers in remote areas, and better budget planning for ongoing training and evaluation, and it is hoped that the certification policy can be more effective in improving the quality of education in Indonesia with these improvements.

REFERENCES

1. Bacher-Hicks, A., Chi, O. L., & Orellana, A. (2023). Two years later: How COVID-19 has shaped the teacher workforce. *Educational Researcher*, 52(4), 219–229.
2. Billingsley, B., Bettini, E., Mathews, H. M., & McLeskey, J. (2020). Improving working conditions to support special educators' effectiveness: A call for leadership. *Teacher Education and Special Education*, 43(1), 7–27.
3. Cardichon, J., Darling-Hammond, L., Yang, M., Scott, C., Shields, P. M., & Burns, D. (2020). Inequitable Opportunity to Learn: Student Access to Certified and Experienced Teachers. *Learning Policy Institute*.
4. Carver-Thomas, D., Leung, M., & Burns, D. (2021). California Teachers and COVID-19: How the Pandemic is Impacting the Teacher Workforce. *Learning Policy Institute*.
5. Damşa, C., Langford, M., Uehara, D., & Scherer, R. (2021). Teachers' agency and online education in times of crisis. *Computers in Human Behavior*, 121, 106793.
6. Darling-Hammond, L., & Hyler, M. E. (2020). Preparing educators for the time of COVID... and beyond. *European Journal of Teacher Education*, 43(4), 457–465.
7. Fanani, A., Yasin, I., & Murniati, A. (2020). Politics of education in curriculum development policy in indonesia from 1947 to 2013: A documentary research. *Jurnal Pendidikan Islam*, 9(1), 29–56.
8. García, E., & Weiss, E. (2020). Examining the Factors That Play a Role in the Teacher Shortage Crisis: Key Findings from EPI's' Perfect Storm in the Teacher Labor Market Series. *Economic Policy Institute*.
9. Hill, C., Rosehart, P., St. Helene, J., & Sadhra, S. (2020). What kind of educator does the world need today? Reimagining teacher education in post-pandemic Canada. *Journal of Education for Teaching*, 46(4), 565–575.
10. Hofer, S. I., Nistor, N., & Scheibenzuber, C. (2021). Online teaching and learning in higher education: Lessons learned in crisis situations. *Computers in Human Behavior*, 121, 106789.
11. Ingersoll, R. M. (2020). Misdiagnosing the teacher quality problem. In *The state of education policy research* (pp. 291–306). Routledge.
12. Ismail, F., Pawero, A. M. D., & Umar, M. (2021). Education planning and its implications for education policy during the covid-19 pandemic. *International Journal for Educational and Vocational Studies*, 3(2), 110–115.

13. Kalloo, R. C., Mitchell, B., & Kamalodeen, V. J. (2020). Responding to the COVID-19 pandemic in Trinidad and Tobago: challenges and opportunities for teacher education. *Journal of Education for Teaching*, 46(4), 452–462.
14. Kawuryan, S. P., Sayuti, S. A., & Dwiningrum, S. I. A. (2021). Teachers Quality and Educational Equality Achievements in Indonesia. *International Journal of Instruction*, 14(2), 811–830.
15. Machmud, M. T., & Fakhri, M. M. (2021). Indonesia teacher competencies in integrating information and communications technology for education. *Athens Journal of Technology & Engineering*, 331.
16. Mason-Williams, L., Bettini, E., Peyton, D., Harvey, A., Rosenberg, M., & Sindelar, P. T. (2020). Rethinking shortages in special education: Making good on the promise of an equal opportunity for students with disabilities. *Teacher Education and Special Education*, 43(1), 45–62.
17. Nguyen, T. D., Lam, C. B., & Bruno, P. (2022). Is There a National Teacher Shortage? A Systematic Examination of Reports of Teacher Shortages in the United States. EdWorkingPaper No. 22-631. *Annenberg Institute for School Reform at Brown University*.
18. Oyen, K., & Schweinle, A. (2020). Addressing Teacher Shortages in Rural America: What Factors Encourage Teachers to Consider Teaching in Rural Settings?. *Rural Educator*, 41(3), 12–25.
19. Peyton, D. J., Acosta, K., Harvey, A., Pua, D. J., Sindelar, P. T., Mason-Williams, L., Dewey, J., Fisher, T. L., & Crews, E. (2021). Special education teacher shortage: Differences between high and low shortage states. *Teacher Education and Special Education*, 44(1), 5–23.
20. Ramot, R., & Donitsa-Schmidt, S. (2021). COVID-19: education policy, autonomy and alternative teacher education in Israel. *Perspectives in Education*, 39(1).
21. Schmitt, J., & DeCourcy, K. (2022). The Pandemic Has Exacerbated a Long-Standing National Shortage of Teachers. *Economic Policy Institute*.
22. See, B. H., Morris, R., Gorard, S., & El Soufi, N. (2020). What works in attracting and retaining teachers in challenging schools and areas? *Oxford Review of Education*, 46(6), 678–697.
23. See, B. H., Morris, R., Gorard, S., Kokotsaki, D., & Abdi, S. (2020). Teacher recruitment and retention: A critical review of international evidence of most promising interventions. *Education Sciences*, 10(10), 262.
24. Shaturaev, J. (2021). Education in indonesia: financing, challenges of quality and academic results in primary education. *Архив Научных Исследований*.
25. Stevenson, N. A., VanLone, J., & Barber, B. R. (2020). A commentary on the misalignment of teacher education and the need for classroom behavior management skills. *Education and Treatment of Children*, 43(4), 393–404.
26. Suryani, A. (2021). "I chose teacher education because...": a look into Indonesian future teachers. *Asia Pacific Journal of Education*, 41(1), 70–88.
27. Tomczyk, Ł., & Walker, C. (2021). The emergency (crisis) e-learning as a challenge for teachers in Poland. *Education and Information Technologies*, 26(6), 6847–6877.

28. Ulla, M. B., & Perales, W. F. (2021). Emergency Remote Teaching During COVID19: The Role of Teachers' Online Community of Practice (CoP) in Times of Crisis. *Journal of Interactive Media in Education*, 2021(1).
29. Van Nuland, S., Mandzuk, D., Tucker Petrick, K., & Cooper, T. (2020). COVID-19 and its effects on teacher education in Ontario: a complex adaptive systems perspective. *Journal of Education for Teaching*, 46(4), 442–451.
30. Wiggan, G., Smith, D., & Watson-Vandiver, M. J. (2021). The national teacher shortage, urban education and the cognitive sociology of labor. *The Urban Review*, 53, 43–75.