



**Pedagogical transformation of equitable education through 5.0 competencies
in elementary schools**

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ABSTRACT

In the 21st century, pedagogic transformation requires an educational approach oriented toward justice and critical thinking, particularly in preparing elementary students to respond to global challenges. This study aims to examine the application of 5.0 skills, including critical thinking, creativity, collaboration, communication, and care in learning based on social justice principles. Using a qualitative literature review, data were collected from various contemporary sources, including scientific journals, reference books, and relevant research findings, for the period 2015-2023. The study's findings reveal that a critical pedagogic model that integrates 5.0 skills has been effective in increasing student involvement, strengthening social awareness, and fostering mastery of essential competencies in the 21st Century. Further analysis shows that successful implementation requires a more flexible curriculum reorganization accompanied by an ongoing teacher professional development program. This research concludes that this approach is not only relevant to contemporary needs but also plays a strategic role in achieving inclusive and equitable education. Implicitly, systematic policies are needed to encourage the adoption of this model in the basic education system.

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ABSTRAK

Di era Abad 21, transformasi pedagogik mengharuskan pendekatan pendidikan yang berorientasi pada keadilan dan berpikir kritis, khususnya dalam menyiapkan murid tingkat dasar untuk menjawab tantangan global. Studi ini bertujuan mengkaji penerapan kemampuan 5.0 meliputi berpikir kritis, kreativitas, kolaborasi, komunikasi, dan kepedulian dalam pembelajaran yang berprinsip keadilan sosial. Dengan menggunakan metode studi literatur kualitatif, data dikumpulkan dari berbagai sumber terkini seperti jurnal ilmiah, buku referensi, dan hasil penelitian relevan periode 2015-2023. Temuan penelitian mengungkap bahwa model pedagogik kritis yang mengintegrasikan kemampuan 5.0 terbukti efektif dalam meningkatkan keterlibatan murid, penguatan kesadaran sosial, serta penguasaan kompetensi esensial Abad 21. Analisis lebih lanjut menunjukkan bahwa keberhasilan implementasi memerlukan penyusunan ulang kurikulum yang lebih fleksibel disertai dengan program pengembangan profesional guru secara berkelanjutan. Penelitian ini menyimpulkan bahwa pendekatan tersebut tidak hanya relevan dengan kebutuhan zaman tetapi juga berperan strategis dalam mewujudkan pendidikan yang inklusif dan berkeadilan. Implikasinya, diperlukan kebijakan sistematis untuk mendorong adopsi model ini dalam sistem pendidikan dasar.

Kata Kunci: keadilan sosial; kemampuan 5.0; pendidikan kritis; transformasi pedagogik

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INTRODUCTION

Indonesia's basic education system is currently facing three main challenges, according to empirical data. The 2022 PISA (Programme for International Student Assessment) survey shows that Indonesian students' competencies in science and mathematics rank 74th out of 81 participating countries, with critical thinking skills 34% below the OECD international standard. The book "*Education at a Glance 2020: OECD Indicators*" published by the OECD reports that the disparity in educational quality between urban and rural areas reaches 40%, particularly in access to digital devices, as reported by the United Nations Children's Fund. In the book entitled "*Kurikulum Merdeka: Pedoman untuk Sekolah Dasar*" Kemendikbud states that this reality is contrary to the implementation of the Kurikulum Merdeka, which emphasizes the development of the Profil Pelajar Pancasila through the Capability 5.0 approach.

This phenomenon conceptually illustrates the gap between education policy and its implementation in the field. The theory of educational change identifies three critical factors that are often overlooked: 1) the professional capacity of educators; 2) the availability of supporting facilities; and 3) the mechanism of continuous assessment. This situation is increasingly complex, given the characteristics of Indonesia's hierarchical education bureaucracy, which, in many cases, hinders innovation at the level of educational units (Yurkofsky et al., 2020). Therefore, integrating critical educational approaches with the Capability 5.0 framework is not only academically relevant but also a strategic means of addressing these systemic lags.

Nevertheless, implementing this approach at the elementary school level remains a significant challenge. A curriculum that is overly dense and oriented toward standardized exams is the primary obstacle to implementing more holistic, student-centered learning. On the other hand, many educators do not fully understand the concept of critical pedagogy and its implementation in daily learning practices. Pedagogical transformation requires a fundamental paradigm shift among teachers, from those who initially served as transmitters of knowledge to facilitators of the critical learning process (Raduan & Aziz, 2023).

This situation is further compounded by the persistent dominance of traditional, one-way teaching methods that minimally engage students in active participation. Freire has strongly criticized such approaches in his seminal work, characterizing them as representative of the "banking" model of education, which positions students as empty vessels to be filled with knowledge by teachers. In reality, recent cutting-edge studies demonstrate that elementary students engaged in critical pedagogy-based learning experience significant progress not only academically but also in their social and emotional development. Consequently, modern education must cultivate not only cognitive abilities but also socioemotional intelligence, thereby fostering balanced student development. In this context, this research aims to address the need for an educational model that more closely aligns with the challenges of the 21st century. Specifically, it focuses on integrating Competency 5.0—a development of the 4C concept (critical thinking, creativity, collaboration, communication) with the additional dimension of social care (compassion) into the framework of equitable critical pedagogy. The emphasis is on the need for education in the modern era to develop both students' cognitive

skills and their socio-emotional competencies, thereby preparing them comprehensively for global challenges (Maoulida et al., 2023; Tuomi, 2022).

Recent research underscores the urgency of adopting this approach, highlighting the need to shift from traditional methods to more inclusive, student-centered pedagogies. Learning that integrates social justice values can increase student motivation and engagement (Dare et al., 2021). Meanwhile, an educational approach grounded in compassion and empathy can foster a more inclusive learning environment and reduce various behavioral problems in schools. These findings are increasingly relevant in the post-pandemic era, when education gaps are widening, and the need for equitable education is urgent (Li & Singh, 2022; McWayne et al., 2022).

This research aims to develop a pedagogical transformation model that seamlessly integrates the principles of equitable critical education with the development of Competency 5.0, specifically tailored for the elementary school level, by combining the theoretical framework of critical pedagogy with the concept of 21st-century learning (Ariyanti et al., 2025). This research is expected to contribute both theoretically and practically to the development of basic education that is more relevant and equitable.

LITERATURE REVIEW

The Role of Critical Pedagogy in Realizing Social Justice in Primary Education

Critical pedagogy plays a crucial role in advancing social justice in elementary education by developing critical thinking skills, increasing awareness of injustice, and fostering students' active participation. In the framework of equitable education, critical pedagogy not only focuses on deconstructing structural inequalities but also strengthens students' capacity as agents of change (Guberina, 2023). Educational institutions that apply the principles of critical pedagogy generally produce graduates with better multicultural awareness, demonstrating the relevance of this approach in pluralistic societies (Ngiu et al., 2023).

The role of teachers in critical pedagogy has shifted from a source of knowledge to a guide who helps students question existing social norms and power structures (George et al., 2024). On the other hand, students are invited to take an active role in critical discussions to develop awareness of their role in creating society. This approach aligns with Nancy Fraser's framework, which focuses on three aspects of justice: economic equity, cultural recognition, and political representation (Acharya, 2022). The positive effects of critical pedagogy on learning outcomes are increasingly supported by empirical evidence. Research proves that this method can improve students' critical thinking skills, social awareness, and civic participation (Gonzalez-Mohino et al., 2023)

Although it has great potential for change, the application of critical pedagogy is often constrained by a hierarchical education system and limited infrastructure (Kondo, 2022). However, the ever-growing discourse on critical pedagogy further underscores the importance of this approach in producing a critical, socially just generation.

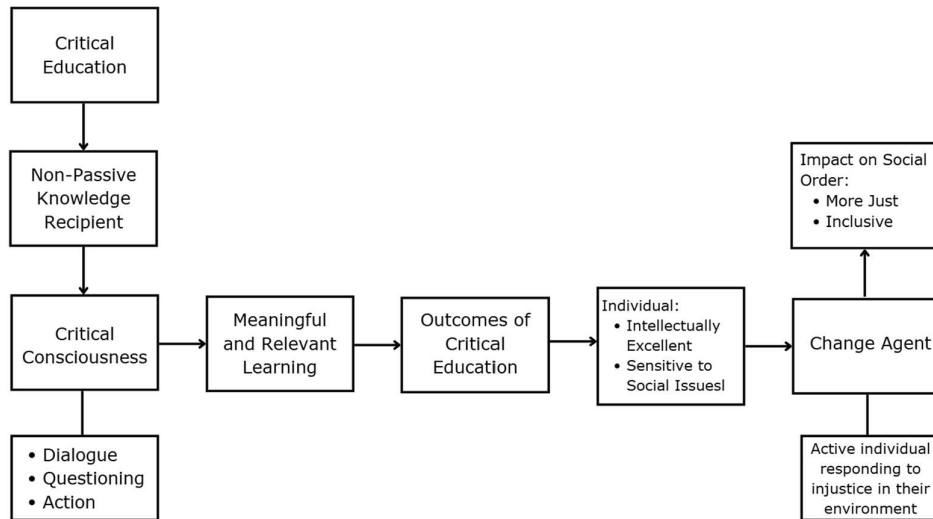


Figure 1. Outputs of Critical Education

Source: Author's Construction, 2025

Critical education (See **Figure 1**) holds that each of us is not merely a passive recipient of knowledge but an agent of change. By understanding and applying the basic principles of critical education, the learning process can be a powerful means of forming a person who not only stands out intellectually but also has sensitivity to various social problems. Some of the important principles of critical education include (Ariyanti et al., 2025).

1. Learning to Be Independent: Inspired by Paulo Freire's thoughts, education should help students realize their potential as agents of change, not just passive recipients of knowledge.
2. A Vibrant and Relevant Curriculum: Learning materials need to be linked to everyday realities, such as poverty issues, unequal access to education, or cultural bias in the education system.
3. Teacher as a Critical Companion: The role of teachers is not only to teach, but also to encourage students to think independently, dialogue, and reflect on their experiences.

Support in the form of continuous teacher capacity-building and competency programs is an important step toward ensuring that critical approaches do not merely become discourse but are truly embedded in learning practices.

Table 1. Synthesis of Critical Education Principles in the Indonesian Context

Freire's Principle	Reality in Indonesia
Dialogue	Teachers are still dominant, and students are passive.
Liberative	Homogeneous curriculum, minimal local issues
Reflective Praxis	Evaluation still focuses on cognitive scores.
Power Deconstruction	Still a dominant elite and centralized narrative

Source: Freire, 2021

Integration of Capability 5.0 in Primary School Learning: A Holistic Approach in the Digital Age

Capability 5.0, an improvement on the Critical Thinking, Creativity, Collaboration, Communication (4C) framework (P21 Framework), integrates compassion as an important element to develop students' competencies in a balanced manner. This competency was developed in response to the Society 5.0 initiative, launched by the Japanese government, which envisioned a human-centered, technology-based society (Hadiapurwa et al., 2021). Its application at the elementary school level can be implemented through various methods, such as 1) Project-Based Learning (PjBL), which fosters cooperation and creativity; 2) Social-critical discussions to develop empathy and critical thinking skills; and 3) The use of digital technology to expand insight and communication (Asigigan & Samur, 2021). Tailored instruction enables students to learn at their own pace and according to their abilities and interests, thereby creating a more effective learning experience (Casmana et al., 2023). Teachers play a critical role in driving this transition, ensuring a flexible learning environment responsive to each student's needs (Ibarra, 2022).

The adoption of technologies such as Artificial Intelligence (AI), Virtual Reality (VR), and gamification has been shown to increase student participation and learning achievement (Munir et al., 2022; Schipper et al., 2020). However, this approach should be combined with Outcome-Based Education (OBE) to ensure that learning is oriented not only toward academic outcomes but also toward the development of skills that support personal growth and social contribution (Rao, 2020). Therefore, it is important to balance the use of technology with conventional learning methods to ensure optimal educational outcomes (Valtonen et al., 2023). With this integrated approach, basic education can prepare students not only to face future challenges but also to become empathetic, innovative, and adaptive individuals.

Pedagogic Transformation Framework: Integration of Critical Education and Capability 5.0

Based on a synthesis of the literature, the framework for pedagogic transformation is formulated as follows: the integration of critical education and capability 5.0.

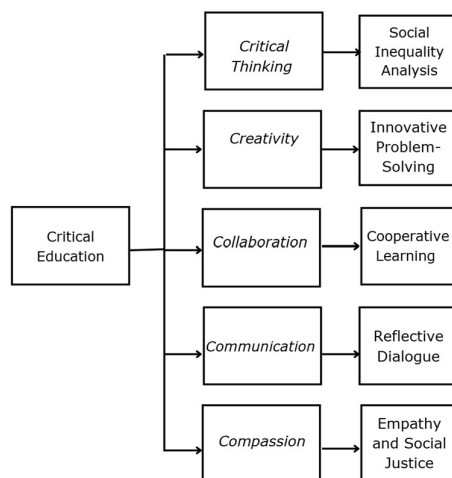


Figure 2. Critical Pedagogic Integration and Capabilities Framework 5.0
Source: Author's Construction, 2025

Based on **Figure 2** above, this framework combines the principles of critical pedagogy (change-oriented) with the 5.0 skills (4Cs and compassion) to create a holistic learning approach focused on social justice. The following is a description of each component and its relation to the latest research:

1. Critical Thinking → Social Inequality Analysis

In the book "Pedagogy of Hope," Freire notes that critical thinking in critical pedagogy extends beyond academic analysis to include the critical study of unjust social structures, such as economic inequality and discriminatory practices. Recent research demonstrates that incorporating social issues into the curriculum can increase students' awareness of injustice and encourage transformative action (Boenigk et al., 2021).

2. Creativity → Innovation Problem Solving

The creativity aspect is directed toward formulating innovative solutions to social problems, for example, through community-based projects. The application of design thinking in the learning process can enhance students' capacity to solve real problems through collaboration (Freire, 2021).

3. Collaboration → Cooperative Learning

The collaboration focuses on inclusive, mutually cooperative learning, in which students from diverse backgrounds work together. The cooperative learning model is effective in reducing prejudice while strengthening social skills (Johnson & Johnson, 2020).

4. Communication → Reflective Dialogue

Communication within this framework is dialogical and reflective, adopting Freire's concept of "critical dialogue". Open discussions of controversial issues (such as the environment or human rights) can improve students' argumentative skills (Takona, 2025).

5. Compassion (Empathy) → Social Justice

Compassion is a new dimension that bridges socio-emotional abilities and social responsibility. Empathy-based learning programs (such as poverty simulations) have increased students' awareness of the importance of justice.

This framework reinforces the findings on transformative learning that emphasize perspective change through critical reflection (Rahmawati et al., 2023). However, contemporary studies expand their scope by incorporating technological elements and socio-emotional approaches, in line with the demands of Society 5.0 (Erdwiyana et al., 2024).

Practical Implementation of Critical Pedagogic Integration and Capability 5.0

To realize the integration of critical pedagogy and Capability 5.0, several concrete steps can be implemented in basic education (Khan & Nadeem, 2024). Educators must serve as guides for critical discussions, helping students analyze social problems in depth (Chuang, 2021). This method facilitates students not only in mastering the subject matter but also in developing a critical understanding of social phenomena in their environment. The use of digital devices, such as online collaboration platforms, can broaden the scope of critical education (Alam & Mohanty, 2023; Selfa-Sastre et al., 2022). Technology not only increases participation in learning but also provides opportunities for students to engage with global issues while developing communication skills and digital literacy.

METHODS

To deepen understanding of equitable critical education in the 21st century, this study adopts a qualitative approach through an in-depth literature review. Various academic sources, such as scientific journals, textbooks, research reports, and education policy documents, are carefully examined to gather relevant data. In analyzing the data, researchers use thematic analysis to identify key patterns, group information into meaningful categories, and explore relationships between concepts to obtain a comprehensive picture of the opportunities and challenges in implementing critical education. To ensure the research results were accountable, sources were triangulated by comparing multiple sources of literature and seeking input from peers through peer review on the interpretation of the data.

To enhance transparency and rigor in the methodology, it is essential to specify the criteria used to select the literature for this study. The literature review encompasses publications published within the last six years (2019-2025), ensuring that the analysis captures the most current developments and theoretical advancements related to critical and equitable education, particularly in the context of Industry 5.0 competencies for elementary schools. Sources considered comprised peer-reviewed journal articles, official education policy documents, reputable research reports, and authoritative textbooks that specifically address pedagogical approaches, technological integration, and policy implementations pertinent to the study's focus. By setting such inclusion criteria, this review aims to provide a comprehensive yet focused synthesis of recent scholarly discourse, thus ensuring the relevance and reliability of the findings.

Regarding citation updates, it is recommended that older references be replaced with more recent and diverse sources to enhance the review's credibility and currency. The references should include a balanced mix of empirical studies, conceptual frameworks, and policy analyses published within the last six years (2019-2025), reflecting the latest research trends and emerging insights. This approach accounts for rapid technological changes and shifts in pedagogical paradigms that influence the understanding of Industry 5.0 competencies and critical education. Moreover, increasing the diversity of sources, such as including international journal articles, government policy papers, and conference proceedings, will offer a richer perspective on global and regional practices, enabling a more robust and nuanced discussion of opportunities and challenges. Incorporating these recent, high-quality sources will significantly strengthen the study's validity, relevance, and academic contribution, aligning it with best practices for systematic literature reviews in contemporary education research.

RESULTS AND DISCUSSION

Challenges and obstacles in implementing critical pedagogy

The literature review highlights that, despite the recognized importance of integrating critical pedagogy in elementary education, its implementation in Indonesia remains a significant challenge. Among these, resistance from stakeholders who are reluctant to change, such as educators, administrators, and community members who hold traditional pedagogical views, poses a substantial barrier to adopting critical and equitable educational practices (Lomba-Portela et al., 2022; Singun, 2025). Additionally, infrastructural limitations, including

inadequate technological facilities and resource constraints, hinder the effective delivery of innovative pedagogical strategies aligned with Industry 5.0 competencies. Furthermore, there is a widespread lack of understanding of, or misconceptions about, the fundamental principles of critical education, which impedes its acceptance and sustainability. These issues collectively underscore the difficulty of operationalizing critical pedagogy within the socio-cultural and institutional contexts of Indonesian elementary schools.

However, the literature also emphasizes that these obstacles are not insurmountable when addressed through strategic, concerted efforts. Evidence suggests that fostering a shared awareness among educators, policymakers, and communities about the importance of preparing students with critical thinking, problem-solving, and ethical reasoning skills can catalyze change. Continuous professional development programs, awareness campaigns, and inclusive policymaking are instrumental in gradually shifting perceptions and building consensus. Moreover, investing in infrastructural improvements and digital integration can facilitate more dynamic and interactive learning environments conducive to critical pedagogy. Ultimately, these findings point to the necessity of systemic, culturally responsive, and collaborative approaches to overcome initial resistance and embed critical justice education sustainably across Indonesian elementary schools.

1. The learning process is still conventional. One of the biggest challenges is the one-way learning habit that remains deeply entrenched in many schools. In this pattern, teachers are often the sole source of knowledge, whereas students are more passively receptive to information (Jacob et al., 2020). In fact, the spirit of modern education invites us to build a more dynamic space for dialogue between teachers and students. In an effort to transform pedagogy in Indonesia toward more critical and equitable education, it is important to examine how innovative learning approaches can be applied in the classroom. Research presented in the book "*Pedagogik: Telaah kritis ilmu pendidikan dalam multiperspektif*" by Herlambang provides a concrete example through the development of a multiliteracy learning model grounded in a futuristic pedagogic approach. This model helps students develop the ability to reflect on their learning process (metacognition), which is key to fostering a critical and reflective attitude.
2. Lack of training for teachers in the implementation of equitable critical education. Another, no less important, problem is the lack of professional development opportunities for teachers to apply a critical educational approach. Many educators desire to change their teaching methods but lack adequate mentoring and training (Rahimi & Oh, 2024). This condition certainly makes it difficult for teachers seeking to foster more participatory learning and to stimulate students' critical thinking.
3. The educational paradigm is still traditional in various educational circles. The next challenge comes from various parties who still hold tightly to traditional views on education. Many parents focus solely on academic grades, sometimes without recognizing the importance of developing children's critical thinking skills (Harefa, 2024). This kind of understanding is natural, but it needs to be balanced with more intensive socialization about the benefits of critical education approaches for children's futures.
4. Gaps in infrastructure facilities in each region in Indonesia. What warrants special attention is the actual conditions in the field, particularly in areas with limited facilities and infrastructure. Schools in remote areas often have difficulty accessing adequate teaching materials and learning technologies (Shadieff et al., 2021). This shows that pedagogic

transformation not only requires a change in thinking but also concrete support, including the equitable distribution of high-quality educational infrastructure throughout Indonesia.

Opportunities and Implementation Strategies

Despite facing various challenges, critical education offers numerous opportunities to be developed in more adaptive and relevant ways to current social conditions. Existing opportunities should be optimized through a targeted implementation strategy to ensure that critical educational benefits are realized for all parties. The following outlines the opportunities and strategies for implementing critical education in Indonesia.

1. Development of Critical Education in the Contemporary Social Context

More and more people are realizing the importance of a learning process that invites students to think critically and be sensitive to social injustice. One step toward realizing critical education is to design a curriculum that reflects students' lived experiences, for example, by addressing issues such as social disparities, the environment, and cultural diversity (Eden et al., 2024). This means that this approach not only fosters a more lively and contextual learning process but also encourages students to take greater care of the surrounding environment.

2. The Role of Teachers and the Challenges of Implementing Critical Education

When we discuss pedagogic transformation in Indonesia toward more critical and equitable education, one important consideration is the role of teachers in developing their pedagogic competence. In the Society 5.0 era, teachers are required not only to master technology and learning innovations but also to maintain a critical awareness of the social conditions students face (Erdwiyana et al., 2024). This means that education should not only focus on delivering content but also on creating spaces for dialogue, encouraging reflection, and empowering students to understand and engage in social change around them.

Teachers play a significant role in fostering critical and participatory learning. However, it is undeniable that many teachers still have difficulty in implementing this approach optimally. One of the leading causes is the lack of opportunities for teachers to participate in adequate training. This challenge is also strengthened by findings indicating that more than half of teachers in Indonesia feel insufficiently confident in designing critical analysis-based learning due to limited access to high-quality teacher development programs (Bergmark, 2023).

For teacher training to have a real impact, the content needs to focus not only on teaching techniques but also on emphasizing the importance of reflection and active student involvement. That training will be more effective if teachers are allowed to directly practice new methods with intensive mentoring (Saenen et al., 2024). This method makes teachers more understanding and confident in implementing innovative learning. In addition, research by Wijayanti shows that teachers who are members of learning communities are more successful at fostering participatory learning than those who rely solely on regular training (Wijayanti et al., 2025). This means that building an ecosystem of mutual learning between teachers is also key.

3. Multistakeholder Collaboration in Critical Education

Critical education will be stronger if it is not limited to schools. When parents, communities, and community organizations are involved, the learning process becomes more meaningful because students can see firsthand how it relates to real life. When communities are involved in the educational process, the impact of critical learning in schools becomes more real (Erstad et al., 2021). Cooperation between schools and NGOs helps students understand issues of injustice more deeply through participatory learning methods (Sarkingobir & Bello, 2024). In fact, the role of parents is also significant. In the book titled "A Review of the Role of Parents, Caregivers & Community Members in Advocating for and Contributing to the Development of Inclusive Curricula," Ruhela notes that discussions at home that address the values of justice and equality can foster critical awareness from an early age.

4. Inequality of Access and Efforts to Equalize Education

The problem of educational inequality in Indonesia, particularly between urban and remote areas, remains a significant challenge. This inequality is evident not only in the physical condition of schools but also in limited access to technology and digital learning. (Ne'Matullah et al., 2021) revealed that this gap is not only seen in the condition of school buildings or the completeness of teaching aids, but also in the lack of access to digital learning, especially in remote areas. Cooperation between government agencies and the community in the use of digital technology and the improvement of basic infrastructure is a key factor (Thomas et al., 2021).

However, building infrastructure alone is not enough. Teachers, as the spearhead of education, also need continuous support. Unfortunately, many teachers still struggle to use digital devices to support learning. This aligns with findings that many educators in remote areas continue to have difficulty using digital devices for learning (Stenman & Pettersson, 2020). Therefore, the book entitled "Restarting and Reinventing School: Learning in the Time of COVID and Beyond" by Darling-Hammond mentions that a more comprehensive policy approach is needed, not only focusing on physical development, but also on building the capacity of teachers through continuous training.

CONCLUSION

This study concludes that integrating critical pedagogy with the 5.0 competencies provides a comprehensive framework for addressing contemporary learning challenges in elementary education. The findings demonstrate the model's effectiveness in promoting active student participation, fostering critical awareness of social inequalities, and developing 21st-century skills, despite existing structural barriers such as curriculum rigidity, disparities in educational facilities, and limitations in teacher capacity. These results underscore the urgency of adopting a pedagogical approach that simultaneously enhances intellectual abilities and character formation grounded in human values. Accordingly, policymakers are urged to develop integrated strategies that support adaptive curriculum reforms, implement competency-based professional development programs for educators, and expand access to modern educational infrastructure. The synergy among stakeholders, including policymakers, educators, communities, and the private sector, is critical to ensuring sustainable and equitable implementation. Such systemic transformation aims to produce a

generation competent in basic literacy and social sensitivity, equipped to navigate the complexities of Society 5.0.

To significantly enhance the quality and relevance of elementary education, several interconnected and strategic recommendations must be implemented. Strengthening stakeholder collaboration is equally vital; this entails fostering inclusive and participatory engagement among parents, community organizations, NGOs, and government agencies to co-design and implement critical education programs that ensure local relevance and shared ownership. Additionally, ensuring equitable access to technological resources and educational facilities should be prioritized, particularly in marginalized and disadvantaged areas, with public-private partnerships playing a crucial role in providing digital infrastructure, tools, and training aligned with Industry 5.0 competencies. Furthermore, ongoing research and evaluation are essential to assess both the immediate and long-term impacts of integrating critical pedagogy with Industry 5.0 skills, thus enabling continuous policy refinement and pedagogical adjustments. Implementing these comprehensive strategies will cultivate a more inclusive, equitable, and future-oriented elementary education system capable of nurturing students to become critical, innovative, and socially responsible members of Society 5.0.

AUTHOR'S NOTE

The author declares that there is no conflict of interest regarding the publication of this article. The author affirms that the article's data and content are free of plagiarism.

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