

Adaptation of Independent Curriculum in Remote Elementary Schools: A Field Study in Disadvantaged, Frontier, and Outermost Areas

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ABSTRACT: *This study aims to examine how elementary school teachers in remote areas of East Java adapt the Merdeka Curriculum to address local challenges, while also responding to the urgent need to understand how national curriculum policy is interpreted and implemented in the context of Disadvantaged, Frontier, and Outermost (DFO) regions. The study employed thematic analysis, which included stages of data familiarisation, coding, and critical reflection, with data validity ensured through triangulation of interviews, observations, and documentation. The findings reveal three major themes. First, teachers integrated local culture, such as folklore and traditional games, into instruction to enhance relevance and student engagement. For instance, students learned moral values through local hero stories, which enriched their literacy skills. Second, teachers applied project-based learning, such as creating teaching aids from recycled materials to explore environmental issues, fostering student creativity and critical thinking. Third, teachers implemented differentiated instruction by grouping students according to their learning styles, ensuring that each learner received appropriate and inclusive learning experiences tailored to their abilities and needs. This study is limited to several schools in East Java (Sumenep, Sidoarjo, Gresik, and Blitar), which do not fully represent all 3T regions with their diverse cultural and geographical contexts. Moreover, time constraints and limited data accessibility reduced the possibility of more profound exploration of cultural variations and strategies in other areas. Despite these limitations, the study contributes to a better understanding of curriculum localisation and the transformative role of teachers in contextualising the curriculum within challenging environments, while offering practical implications for policymakers, particularly in empowering teachers through locally-based training modules and flexible policies to promote educational equity in remote regions.*

Penelitian ini bertujuan untuk mengkaji bagaimana guru sekolah dasar di daerah terpencil Jawa Timur mengadaptasi Kurikulum Merdeka untuk menjawab tantangan lokal dan mendesak untuk memahami bagaimana kebijakan kurikulum nasional ditafsirkan dan diimplementasikan dalam konteks wilayah tertinggal, terdepan, dan terluar (3T). Penelitian ini

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menggunakan analisis tematik dengan tahapan familiarisasi data, pengodean data, dan refleksi kritis. Validitas data melalui triangulasi dengan membandingkan wawancara, observasi, dan dokumentasi. Penelitian ini mengungkapkan tiga temuan utama. Pertama, guru mengintegrasikan budaya lokal seperti cerita rakyat dan permainan tradisional ke dalam pembelajaran untuk meningkatkan relevansi dan keterlibatan siswa. Misalnya, siswa mempelajari nilai moral melalui cerita pahlawan lokal, yang memperkaya keterampilan literasi mereka. Kedua, guru menerapkan pembelajaran berbasis proyek, seperti membuat alat peraga dari bahan daur ulang untuk mempelajari isu lingkungan, yang mendorong kreativitas dan berpikir kritis siswa. Ketiga, guru menggunakan pembelajaran berdiferensiasi, dengan membagi siswa berdasarkan gaya belajar mereka sehingga memastikan setiap siswa mendapatkan pengalaman belajar yang sesuai dengan kemampuan dan kebutuhan mereka untuk menciptakan pembelajaran yang lebih inklusif dan efektif. Penelitian ini terbatas pada beberapa sekolah di Jawa Timur (Sumenep, Sidoarjo, Gresik, Blitar) yang belum merepresentasikan seluruh wilayah 3T dengan konteks budaya atau geografis yang berbeda. Selain itu, keterbatasan waktu dan aksesibilitas data mengurangi kemungkinan eksplorasi yang lebih mendalam terhadap variasi budaya dan strategi yang diterapkan di daerah lain. Penelitian ini turut berkontribusi pada pemahaman mengenai lokalisasi kurikulum dan peran aktif guru transformatif yang berhasil meng-kontekstualisasikan kurikulum dalam lingkungan yang penuh tantangan, serta memberikan implikasi praktis bagi pengambil kebijakan, khususnya dalam pemberdayaan guru melalui pelatihan dan kebijakan fleksibel untuk mendorong kesetaraan pendidikan di daerah terpencil.

Keywords: *Merdeka Curriculum, Teacher Adaptation, Remote Schools.*

Received: August 10, 2025; Revised: September 25, 2025; Accepted: October 21, 2025

I. INTRODUCTION

The Government of Indonesia has officially enacted the Independent Curriculum since 2022 in response to the goal of more adaptive and contextual education reform (Aulia et al., 2023; Azzahra et al., 2025). This curriculum allows schools to align teaching approaches locally and allocate more time to character development and creative methods according to their learning conditions (Yunita et al., 2023). This program will expand opportunities for more equitable educational development throughout Indonesia, including in remote and hard-to-reach areas, otherwise known as 3T areas (Hasballah & Zulfatmi, 2024).

However, implementing the Independent Curriculum faces serious obstacles in the disadvantaged, frontier, and outermost (DFO) (*tertinggal, terdepan, and terluar/3T*) area, which includes border areas, outermost islands, and lagging locations (Lestari et al., 2022; Putri et al., 2024). Key factors include a limited internet network, a lack of supporting infrastructure such as proper classrooms and libraries, and a lack of qualified and trained teachers. Difficult geographical conditions also complicate the distribution of teaching materials and periodic supervision, thus threatening the sustainability and effectiveness of implementing this new curriculum (Azzahra et al., 2025). This situation urgently requires us to research issues of educational justice and quality equity, ensuring

the Independent Curriculum is a practical, inclusive, and impactful tool (Praekanata et al., 2024).

Previous research has explained that most 3T schools have not fully implemented the Independent Curriculum, especially in remote areas, due to limited facilities and teacher training (Atmojo et al., 2024; Saputra, 2025). Teacher underpreparation, limited facilities, and a lack of continuous support prevented a significant increase in student learning achievement scores under the curriculum's partial implementation. Teachers in many Disadvantaged, Frontier, and Outermost areas have not received sufficient training to fully grasp and implement the new curriculum, leading to inconsistent application in the classroom. The lack of adequate teaching resources and poor infrastructure further hindered the curriculum's effectiveness. Without sufficient supervision, mentoring, and professional development, these factors prevented the curriculum from realising its full potential and significantly improving student achievement.

Other studies in the Madura and Gresik regions show that strengthening teacher capacity through training, continuous supervision, and mentoring has increased teachers' readiness to implement the new curriculum (Suryaningrum, 2023). Other research has also found that collaborative and adaptive leadership of school principals is a key factor in local strategies to respond to resource constraints (Cahyanti, 2025). Meanwhile, creative solutions in several Disadvantaged, Frontier, and Outermost areas, such as local folklore, project-based learning based on local culture, and simple learning media, show the positive potential for effective curriculum implementation even in limited conditions.

Although several studies have described aspects of limitations and adaptation strategies in 3T areas, there is still little research that explores in detail how teachers in primary school interiors interpret and implement the Independent Curriculum in daily practice, as well as what concrete creative strategies they develop to respond to the limitations of the local environment (Baidis, 2025; Wardhani & Supriyanto, 2023). In particular, empirical field data is needed to capture the nuances of adaptation in remote elementary schools in East Java, whose ecosystems are unique and may differ from those in other regions. This is a crucial research gap that needs to be filled (Safitri & Fajar, 2023).

This research study focuses on understanding how elementary school teachers in the Disadvantaged, Frontier, and Outermost area interpret and adapt the Independent Curriculum in daily learning practices, especially in the East Java region. It also aims to identify creative adaptation strategies that they use to overcome the limitations of facilities, training, and access to teaching modules (Maskur, 2023; Vhalery et al., 2022). Through field studies in various remote locations, this research hopes to provide concrete recommendations for formulating more inclusive, responsive, and targeted education policies for the Disadvantaged, Frontier, and Outermost regions. The ultimate goal is to support creating equitable and quality education nationwide.

Research on implementing the Independent Curriculum in the Disadvantaged, Frontier, and Outermost (DFO) is still limited. However, several studies have highlighted schools' challenges in remote areas, such as limited teacher training, facilities, and resources (Atmojo et al., 2024; Putri et al., 2024; Saputra, 2025). Several studies also indicate that despite efforts to improve teacher capacity through training, uneven implementation remains a significant problem (Safitri & Fajar, 2023; Suryaningrum, 2023). However, no in-depth research has examined how teachers in the Disadvantaged, Frontier, and

Outermost regions, particularly in East Java, adapt the Independent Curriculum into their daily learning practices and the creative adaptation strategies they use to overcome limited facilities and training.

This research aims to fill this gap, focusing on understanding how teachers in the Disadvantaged, Frontier, and Outermost Remote Areas interpret and adapt this curriculum and identify their adaptation strategies. Through field studies in various remote locations, it is hoped that this research can provide concrete recommendations for formulating more inclusive, responsive, and targeted education policies for the Disadvantaged, Frontier, and Outermost regions, with the ultimate goal of supporting equitable and quality education across Indonesia.

II. METHOD

This study uses a qualitative case study approach to understand how teachers in 3T elementary schools interpret and adapt the Independent Curriculum in daily practice. Data collection was carried out in a triangulative manner through semi-structured interviews, class observations, and curriculum documentation (Bogdan & Biklen, 1998). This study uses three main data collection techniques: semi-structured interviews, classroom observations, and document analysis. Interviews were conducted with five teachers from Disadvantaged, Frontier, and Outermost areas in East Java, selected using purposive sampling based on criteria such as teaching experience and involvement in implementing the Merdeka Curriculum. Classroom observations were conducted to understand the application of teaching strategies, such as project-based and differentiated learning, across five different schools. Additionally, document analysis was carried out by reviewing lesson plan documents and classroom activity notes to explore the adaptations made by teachers according to local conditions (Creswell & Creswell, 2017).

Data analysis follows Thematic Analysis based on Braun and Clarke's model (Braun & Clarke, 2006; Byrne, 2022). It starts with repeated reading (data familiarisation), then coding to identify units of study (data reduction), and then grouping the code into main themes with critical reflection (Theme Development) (Braun & Clarke, 2019a). This approach systematically allows researchers to construct consistent themes both inductively and deductively (Braun & Clarke, 2019b). Data credibility verification is carried out through triangulation of sources, involving interviews, classroom observations, and document analysis. This method ensures that data is cross-verified across different data sources to enhance reliability. In addition, inter-coder agreement is used, where part of the data is double-coded, and the level of agreement between coders is calculated. This approach follows Miles and Huberman's recommendation that consistency across different data sources and coders indicates good analysis reliability. (Miles et al., 2014).

Below is a table of key informants for interview needs, data validation from each field observation finding, and documentation relevant to the topic of this finding.

Table 1. Tabel Informant

Code	Status Description	Area
TI-GD1	Primary School Teacher (remote area, limited access)	Sumenep, Madura Coast
TI-GD2	Primary School Teacher	Wates, Blitar

(minimal classroom space)		
TI-GD3	Primary School Teacher (flood-prone, boat Access only)	Sumenep, Madura
TI-GD4	Primary School Teacher (geographically isolated, extremely remote)	Gresik Interior
TI-GD5	Primary School Teacher (small coastal/island context)	Sidoarjo Interior

Source: Data collection, 2025

III. RESULT AND DISCUSSION

Interpretation and Localisation of Learning Objectives

The results of observations and interviews in five remote elementary schools in East Java show that teachers have a central role in adjusting the implementation of the Independent Curriculum to align with the real conditions in the field. In a challenging geographical and social context, teachers play a role as a link between the national standards set by the Ministry of Education and Culture and the needs and potential of students in the 3T area. From the interviews, it was revealed that teachers simplified formal learning objectives and linked them directly to the local lives of students:

"When the learning objectives are too theoretical, we change them to be simpler and more applicable. For example, we connect it with agricultural activities or local traditions, so that children understand and are more interested." (TI-GD1, 2025)

Classroom learning observations also show that teachers use a project-based learning approach as the primary strategy. The teacher guides students to make props from recycled materials to instil environmental values and creativity. This approach has proven effective in encouraging student engagement, even amid limited facilities.

Lesson planning documentation and classroom activity notes show that teachers focus on essential materials, as directed by the Ministry of Education and Culture in the 2022 curriculum reform. The material is tailored thematically and contextually, considering the students' minimum learning needs and characteristics. This is done so that learning remains meaningful and not burdensome. Furthermore, interviews with teachers (TI-GD3) reveal how they implement differentiated learning. Teachers divide learning groups based on student learning styles: visual, kinesthetic, and auditory. He explains:

"The children here have very diverse abilities. Some are quick to catch, some need real examples. So I modified the teaching method so that everyone could follow." (TI-GD3, 2025).

This approach reflects the application of flexible and responsive learning, a hallmark of the Independent Curriculum. In some classrooms, teachers use learning media from the surrounding environment, such as leaves, stones, and household tools, to explain basic science and mathematics concepts. Teachers at the research site generally showed high creativity and fighting power in designing learning. Despite the limitations of facilities being a significant challenge, these educators still strive to provide a meaningful and enjoyable learning experience. They no longer fixate on one teaching method but combine various approaches according to the students' character and environmental conditions.

The field findings show that teachers in the Disadvantaged, Frontier, and Outermost (DFO) region carry out instructional functions and have evolved into transformative actors in the local education system. Their role extends to facilitators, mentors, and initiators of contextual learning relevant to students' needs. This is reflected in teachers' creativity in designing independent learning media and forming a community of informally sharing good practices with fellow educators.

This phenomenon can be analysed through the framework of teacher agency theory (Biesta et al., 2015; Priestley et al., 2015). This emphasises that teacher agency is formed from the interaction between individual capacity, institutional structure, and the social conditions surrounding it. In the context of the Independent Curriculum, teacher agency is crucial because this policy provides greater flexibility and autonomy than the previous curriculum. These findings confirm that when autonomy spaces are provided, teachers in remote areas can use them to adapt the meaningful and appropriate curriculum to the local context.

Furthermore, these results strongly correlate with the theory of curricular adaptation in disadvantaged schools (Trujillo, 2012). This emphasises the importance of localising the curriculum relevant to students' life experiences in marginalised areas. The adaptation process occurs not only in the learning content, but also in methods, media, and evaluation approaches. In some cases, teachers even replace textbook materials with authentic experiences from the surrounding environment. This shows that adaptation practice is not just technical, but also a critical pedagogical action that enables students to access knowledge meaningfully (Hasballah & Zulfatmi, 2024).

Findings from observations in five remote elementary schools indicate that teachers consistently adapted the learning objectives by simplifying formal curriculum statements and linking them directly to students' everyday lives. For example, overly abstract objectives were transformed into concrete experiences related to agricultural activities or local traditions. This practice aligns with the concept of teacher agency (Biesta et al., 2015; Priestley et al., 2015). This emphasises the teacher's role as an active agent who interprets and contextualises the curriculum rather than merely executing centrally designed instructions (Robinson, 2011).

Classroom observations further revealed the use of Project-Based Learning (PBL). Teachers guided students in creating teaching aids from recycled materials to address environmental issues. This strategy provided a practical response to the scarcity of learning resources and reflected the principles of PBL, which focus on authentic learning and solving real-world problems (Thomas & Berry III, 2019). In this way, PBL implementation in disadvantaged, frontier, and outermost areas represents a creative adaptation that enhances student engagement and fosters 21st-century competencies such as collaboration, critical thinking, and creativity (Neliwati et al., 2023).

Lesson plan documentation and classroom activity notes also demonstrated the application of differentiated instruction. Teachers grouped students according to their visual, auditory, and kinesthetic learning styles to ensure more inclusive learning experiences. This practice is consistent with (Tomlinson et al., 2003). The theory of differentiated instruction emphasises that teachers should adjust content, process, and product to meet students' diverse needs and learning profiles. These findings highlight that even in resource-constrained environments, teachers can operationalise the principle of equity pedagogy by providing fair and accessible learning opportunities tailored to individual differences.

These findings reinforce the idea that implementing the Independent Curriculum in remote areas is not merely a technical exercise but a process of curriculum recontextualisation that is theoretically aligned with project-based and differentiated learning. Such adaptations illustrate the transformation of teachers' roles from facilitators to transformative actors who balance national curriculum standards with local realities.

Table 2. Interpretation and localisation of learning objectives

Item	Research Findings	Theoretical Analysis
Simplification of learning objectives	Teachers simplified formal objectives and connected them to students' daily lives (e.g., agriculture, local traditions).	Reflects teacher agency (Biesta, Priestley, & Robinson, 2015), emphasising teachers' role as curriculum interpreters rather than passive implementers.
Project-Based Learning (PBL)	Students created learning props from recycled materials to study environmental issues.	Aligned with PBL principles of authentic learning and real-world problem solving (Thomas, 2000; Bell, 2010).
Differentiated instruction	Students were grouped according to learning styles (visual, auditory, kinesthetic) to ensure inclusivity.	Consistent with Tomlinson (2003) theory of differentiated instruction, which adapts content, process, and product to student profiles.

Source: Data collection, 2025

Utilisation of Local Cultural Resources

Instead of relying on standardised textbooks, teachers in remote elementary schools often begin their lessons with local folklore retold by students. This strengthens literacy and instils moral values such as honesty and cooperation. In another case, traditional games and handicrafts, including weaving with coconut leaves and simple batik making, were incorporated into classroom projects to enhance students' motor skills and cultural appreciation. These practices illustrate how local cultural resources were actively utilised as integral learning tools in implementing the Independent Curriculum.

During an observation at one of the coastal schools, for example, it was found that teachers started thematic lessons with local folklore retold by students. The story is used not only to strengthen literacy, but also as a medium for internalising moral values such as honesty, cooperation, and responsibility. This practice is strengthened by the documentation of the RPP, which shows that folklore is positioned as the main text in Indonesian and PPKn learning. In an interview with the TI-GD2 Teacher, he said that:

"Children here are easier to understand when they learn using stories they have heard from their parents. For example, stories about the village's origins or wise figures in the village. So the lessons feel close to their lives." (TI-GD2, 2025).

In addition to folklore, teachers utilise local crafts such as weaving, simple written batik, and traditional games as part of art and skills projects. Learning observations showed students making woven works from coconut leaves, taught by residents as learning partners. This activity strengthens students' motor skills and introduces economic and cultural values.

The documentation of the students' portfolios shows that the work is then exhibited in thematic classroom activities, creating pride and appreciation for the local culture. This

emphasises that integrating local wisdom is not just an additional activity, but an integral part of the cross-subject learning process. The TI-GD4 and TI-GD5 teacher from schools in the archipelago added:

"We intentionally included regional songs in art and language lessons, because it made the children more excited and felt valued for their culture." (TI-GD4, 2025; TI-GD5, 2025)

The field findings revealed that the role of teachers in integrating local wisdom into the Independent Curriculum is not only instructional, but also transformational. Teachers play a dual role as preservationists of local culture and facilitators of meaningful learning, encouraging students to recognise their cultural identity while developing global competence. Within the framework of Culturally Responsive Pedagogy (Gist, 2017), this practice reflects a form of learning that respects, represents, and builds bridges between students' culture and curriculum content. Instead of imposing homogeneous teaching materials from the centre, teachers construct learning from a reality familiar to students, thus creating a sense of ownership of the learning process (Thomas & Berry III, 2019).

Pedagogically, using local elements such as folklore, traditional games, and handicrafts becomes a mediating tool between student experience and formal learning objectives. This process is in line with the concept of place-based education (Gruenewald & Smith, 2014). This approach emphasises the importance of attachment between learning and the student's local socio-ecological environment. This approach is innovative and structurally relevant in remote schools that often lack standard teaching materials. These findings show that when teachers use "living books" in the form of local culture, the learning process becomes more contextual, authentic, and meaningful (Smith, 2002). In terms of effects on students, increasing active participation, learning motivation, and emotional involvement in learning strengthens the thesis that local wisdom has a high educational content and deserves to be used as the leading learning resource in the 3T area.

This aligns with the results of Nieto & Zoller Booth (2009), Research emphasising that the connection between home culture and school culture determines students' involvement and academic success from marginalised communities. However, the integration of local wisdom is not without challenges. Teachers must deeply understand local cultural values and pedagogical skills to transform them into systematic teaching materials. This is where the importance of strengthening teachers' professional capacity lies, as Banks (1995) suggested. In the theory of Multicultural Education, teachers need to be culturally and pedagogically reflective to run a curriculum responsive to diversity.

Teachers in remote elementary schools integrated local folklore, traditional games, and handicrafts into the learning process in ways that preserved cultural identity and supported the development of 21st-century skills. For instance, storytelling activities based on folklore encouraged students to retell narratives from their community, which simultaneously enhanced literacy, stimulated creativity, and developed communication skills. Traditional games such as congklak or local team-based activities promoted collaboration, as students had to interact, negotiate, and cooperate with their peers to achieve common goals. Furthermore, handicraft projects such as weaving coconut leaves or producing simple batik pieces encouraged problem-solving skills as students experimented with techniques, adapted to limited resources, and transformed raw materials into finished products. These examples indicate that integrating local cultural

resources provides contextual enrichment and actively cultivates creativity, collaboration, and critical problem-solving abilities, three essential competencies in 21st-century education (Trilling & Fadel, 2009).

Beyond the development of creativity and collaboration, integrating cultural resources also served as an entry point for strengthening economic literacy among students in disadvantaged, frontier, and outermost areas. Handicraft-based projects, for example, introduced students to concepts of resource management, production, and value creation. When students engaged in weaving or simple batik making, they were learning artistic skills and being exposed to the early stages of entrepreneurial thinking. Teachers encouraged students to display their work in classroom exhibitions, fostering appreciation of local products and creating a sense of ownership over their learning outcomes. This activity implicitly taught children in remote contexts the principles of production, distribution, and consumption in tangible and meaningful ways. By embedding economic values within culturally responsive pedagogy, teachers contributed to equipping students with life skills necessary for sustaining livelihoods and participating in the local economy.

These findings highlight that using local cultural resources in implementing the Independent Curriculum is not simply a compensatory strategy for the lack of textbooks or digital media. Instead, it represents a transformational approach that links cultural preservation with modern educational goals, bridging the gap between tradition and the demands of 21st-century learning. By embedding cultural practices into lessons, teachers positioned themselves as cultural mediators and educational innovators who transformed local knowledge into living textbooks. This aligns with the principles of culturally responsive pedagogy (Gay, 2013; Ladson-Billings, 1995). Place-based education emphasises that meaningful learning emerges when instruction is rooted in students' cultural and ecological realities. Consequently, integrating folklore, traditional games, and handicrafts supported literacy and moral education. It nurtured creativity, collaboration, problem-solving, and economic literacy, demonstrating that local wisdom is a powerful vehicle for cultural continuity and future-oriented education (Gruenewald & Smith, 2014).

Thus, integrating local wisdom in the Independent Curriculum is not only a technical strategy to overcome the limitations of teaching resources but also a manifestation of resistance to the homogenisation approach of education. In the hands of teachers with cultural awareness and pedagogical capacity, local wisdom becomes a dialectical space between tradition and modernity, globalisation and locality, and central policies and grassroots needs. In this context, the Independent Curriculum finds its relevance not because it is standardised, but because it is interpreted and adjusted contextually by actors in the field.

Table 3. Utilisation of local cultural resources

Item	Research Findings	Theoretical Analysis
Folklore as a learning medium	Folklore stories retold by students were used to improve literacy and instil moral values.	Reflects culturally responsive pedagogy (Gay, 2013) and culturally relevant teaching (Ladson-Billings, 1995).
Traditional games and local arts	Students engaged in games (e.g., congklak) and regional songs to foster engagement.	Strengthens place-based education (Gruenewald & Smith, 2014), linking learning with sociocultural context.

Handicrafts and local products	Students practised weaving and simple batik and exhibited their works.	Contributes to creativity, collaboration, and economic literacy, supporting 21st-century competencies (Trilling & Fadel, 2009).
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Source: Data collection, 2025

Learning Innovation Under Resource Constraints

Based on the results of direct observation in five remote elementary schools in East Java, the limitations in facilities and infrastructure are not merely obstacles; instead, they trigger adaptive innovations from teachers as responses to the unique needs of their students. These constraints, such as the lack of proper classrooms and teaching tools, push teachers to be more creative in developing effective learning strategies. For instance, one of the main innovations observed was the application of differentiated instruction. Without standardised resources, teachers did not simply generalise materials and methods; instead, they designed learning experiences tailored to each student's abilities, interests, and learning styles.

This innovation directly results from the limitations faced, where teachers' resilience and resourcefulness lead to diverse, contextually relevant learning experiences that support student engagement and comprehension. The lack of resources, in this sense, becomes a catalyst for educational creativity rather than a barrier. For example, in a learning observation session in the lower grade, teachers use homemade props made from used materials such as bottle caps, cardboard, and bamboo to teach the concept of numbers. In other schools, teachers use the surrounding environment for hands-on learning, such as the school garden to explain the local ecosystem or a traditional math and social studies market. The lesson plan (Learning Implementation Plan) documentation shows that teachers systematically include these adaptations in an integrated thematic learning strategy. An interview with TI-DG2 Informant revealed that:

"Here we cannot rely on LCDs or laboratories. So, we use the environment as a second class. I often take students to the rice fields to learn about the crop cycle or calculate farmers' crops." (TI-GD2, 2025)

Furthermore, the multimodal teaching strategy is also applied through visual, auditory, and kinesthetic methods. Teachers integrate regional songs to introduce new vocabulary, use body movements to help understand math concepts, and create learning posters from scrap paper as a visual medium. This approach is not only effective in improving student understanding but also makes learning more lively and contextual.

In the classroom portfolio documentation, collaborative projects were found that students worked on in small groups, such as making a map of the village out of clay or documenting the process of growing vegetables with parents. This activity shows how collaborative learning builds academic understanding and strengthens social relationships, and the value of cooperation. Informant TI-GD5, a school principal, emphasised the importance of flexibility in decision-making on learning methods:

"We cannot get hung up on one approach. Each class has a different character. Teachers should be able to adjust today, maybe the demonstration method, and the group discussion tomorrow, depending on the situation and the availability of tools." (TI-GD5, 2025).

The findings of this study indicate that teachers in 3T areas have adopted a pedagogical approach oriented to problem-solving or problem-solving pedagogy. In the context of limited resources, they do not simply survive passively, but actively seek innovative and contextual solutions to meet learning needs. This can be read as a concrete form of resourceful teaching (Robinson, 2011), which is the ability of educators to manage, modify, and even create learning facilities that are appropriate for the local situation without relying on high-tech devices.

One clear example of this approach is using local materials as a learning medium. Using coconut shells as fragmented props, pebbles for counting, and dolls made of used cloth as storytelling aids not only reflects creativity but also represents low-cost teaching innovation widely adopted in education systems in developing countries (Carney, 2022). This approach shows that limitations are not barriers, but rather a trigger for innovation in line with the theory of resilient pedagogy (Evans et al., 2017). This states that teachers with high resilience can turn limitations into pedagogical opportunities.

More than just a technical strategy, this action contains a philosophical content that education must be place-based and contextual (Cahyanti, 2025). It was stressed that learning based on the surrounding environment is more relevant and strengthens students' social and cultural awareness. In this context, teachers become the designers of learning ecosystems that reflect the socio-economic reality of their communities. By utilising the environment and culture as part of the hidden curriculum, teachers transform local experiences into authentic pedagogical resources (Adamu, 2003).

In terms of impact, the learning supervision documentation data strengthens the validity of this approach. The increase in student attendance and active participation in class discussions indicates that the contextual and applicative approach has its appeal compared to conventional textbook-based learning. This is in line with (Hausfather, 1996), where social environment and cultural context play an important role in children's cognitive development. Learning becomes more meaningful and participatory when students can relate lessons to their daily lives (Vygotsky & Cole, 1978).

Furthermore, the results of data triangulation show that teachers not only act as curriculum implementers but have transformed into agents of change who design a needs-based curriculum learning model. In the framework of adaptive teaching (Tomlinson et al., 2003), this teacher's action is a concrete form of teaching responsive to differences in students' contexts, resources, and characteristics. They do not apply a one-size-fits-all approach but personalise teaching strategies to create inclusive and empowering learning spaces (Corno, 2008).

Table 4. Learning innovation under resource constraints

Item	Research Findings	Theoretical Analysis
Teaching aids from local materials	Teachers developed props from recycled or natural materials (e.g., bottle caps, bamboo, coconut shells).	Illustrates low-cost innovation and resourceful teaching (UNESCO, 2021; Robinson, 2011).
Environment as a learning resource	Rice fields, gardens, and traditional markets are used for contextual lessons.	Embodies resilient pedagogy (Evans, Waring, & Christodoulou, 2017), turning scarcity into opportunity.
Multimodal and collaborative strategies	Songs, movements, posters, and group projects are applied to	Consistent with adaptive teaching (Tomlinson et al., 2003), and sociocultural

support diverse learners. learning theory (Vygotsky & Cole, 1978).

Source: Data collection, 2025

These findings reinforce the position that implementing the Independent Curriculum in remote areas highly depends on teachers' capacity and professional autonomy. Quality and relevant education can still be realised despite limitations when teachers have space to innovate. In this context, the Independent Curriculum should not be understood solely as a national policy, but as a flexible framework that will only be effective when creatively translated by teachers at the forefront of education.

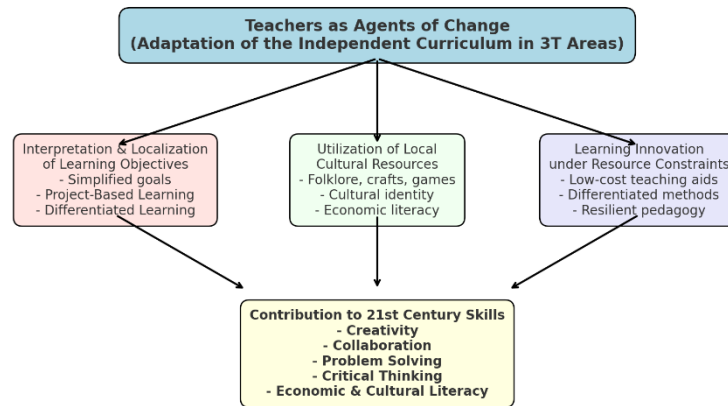


Figure 1. Summary of findings and contribution research

IV. CONCLUSION

This study reveals that teachers in remote elementary schools in East Java have actively adapted the Merdeka Curriculum by interpreting and localising learning objectives. Teachers adjusted content to fit local needs and integrated local wisdom, such as folklore, traditional games, and cultural activities, into the learning process. These approaches significantly enhanced student engagement, made the material more relevant, and promoted deeper contextual understanding. Project-based learning and differentiated instruction emerged as dominant strategies, enabling students to develop 21st-century competencies such as critical thinking, collaboration, and problem-solving within their environments. These findings have important policy implications. To strengthen the role of teachers as agents of change, it is necessary to design teacher training modules that are locally based and context-sensitive, so that pedagogical practices can optimally utilise cultural resources and adapt learning objectives to local realities. In addition, the government and related stakeholders should develop community support systems that provide resources, mentoring, and collaboration opportunities to sustain innovative teaching practices. An adaptive curriculum model that specifically addresses the challenges of schools in Disadvantaged, Frontier, and Outermost (DFO) Regions also need to be developed, ensuring that the implementation of the Independent Curriculum becomes more equitable, effective, and relevant to the needs of students in those areas.

V. ACKNOWLEDGEMENTS

The author extends heartfelt gratitude to all informants who generously shared their time, experiences, and insights throughout the research process. Special thanks are directed to the school principals and teachers from five elementary schools in East Java, whose institutions served as the sites of this field study. Their openness and cooperation enabled thorough observations, interviews, and documentation. The dedication and creativity demonstrated by these educators in implementing the Merdeka Curriculum under challenging conditions have been both enlightening and inspiring. Their commitment to meaningful and context-sensitive education in remote and under-resourced areas is a valuable contribution to this study. We hope this research's findings will provide helpful insights for advancing educational theory, policy development, and practical innovation in Indonesia's Disadvantaged, Frontier, and Outermost (DFO) regions.

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