

Culturally Responsive Pedagogy in Indigenous Contexts: A Framework for Enhancing Learning in Malaysian Orang Asli Primary Schools

Nur Hazira Abu Bakar, Norwaliza Abdul Wahab*

Faculty of Human Development, Universiti Pendidikan Sultan Idris (UPSI), UPSI, 35900 Tanjong Malim, Perak, Malaysia

*Corresponding author: norwaliza@fpm.ups.edu.my

Article history: Received: 27 December 2025 Received in revised form: 29 April 2026 Accepted: 28 July 2026 Published online: 17 September 2026

Abstract

This study examines the development of a culturally responsive teaching framework for Orang Asli primary schools in Malaysia. Despite significant educational reforms, Orang Asli students continue to face persistent challenges including low academic performance, high dropout rates, and a misalignment between mainstream pedagogy and their cultural realities. While global scholarship emphasizes the value of culturally responsive teaching in enhancing learning outcomes for marginalized and Indigenous learners, limited empirical work exists in Southeast Asia, particularly within the Malaysian context. This research therefore seeks to identify the needs for such a framework, explore teachers' instructional practices, and examine the integration of Indigenous knowledge in classroom pedagogy. A qualitative case study design was employed, involving ten participants (teachers and administrators) across four Orang Asli school zones in Negeri Sembilan, Pahang, Perak, and Selangor. Data were collected through semi-structured interviews, classroom observations, and document analysis. Thematic analysis using ATLAS.ti revealed three critical insights: first, teachers expressed the urgent need for a structured culturally responsive teaching framework due to the lack of contextualized resources, training, and professional development opportunities; second, teachers demonstrated adaptive and contextualized instructional strategies shaped by their creativity, cultural sensitivity, and responsiveness to students' backgrounds; and third, Indigenous knowledge emerged as a vital pedagogical resource that supported engagement, relevance, and continuity between home and school. The study concludes with a proposed culturally responsive teaching framework that integrates Indigenous knowledge, contextualized pedagogy, and institutional support. The findings provide new insights into culturally responsive pedagogy in Southeast Asia, contributing to local policy debates, informing teacher training, and offering a foundation for future curriculum development and enhanced learning outcomes in Indigenous education contexts.

Keywords: culturally responsive teaching framework, Indigenous knowledge, Orang Asli education.

Abstrak

Kajian ini meneliti pembangunan kerangka pengajaran responsif budaya bagi sekolah rendah Orang Asli di Malaysia. Walaupun pelbagai reformasi pendidikan telah dilaksanakan, murid Orang Asli masih berhadapan dengan cabaran seperti pencapaian akademik yang rendah, kadar keciciran yang tinggi serta ketidakselarasan antara pedagogi arus perdana dengan realiti budaya mereka. Walaupun kajian global menekankan kepentingan pengajaran responsif budaya dalam meningkatkan hasil pembelajaran murid daripada komuniti terpinggir dan peribumi, kajian empirikal dalam konteks Asia Tenggara, khususnya Malaysia, masih terhad. Sehubungan itu, kajian ini bertujuan mengenal pasti keperluan pembinaan kerangka pengajaran responsif budaya, meneroka amalan pengajaran guru serta meneliti integrasi pengetahuan peribumi dalam pedagogi bilik darjah. Kajian ini menggunakan reka bentuk kajian kes kualitatif yang melibatkan sepuluh orang peserta terdiri daripada guru dan pentadbir sekolah di empat zon sekolah Orang Asli di Negeri Sembilan, Pahang, Perak dan Selangor. Data dikumpulkan melalui temu bual separa berstruktur, pemerhatian bilik darjah dan analisis dokumen. Analisis tematik berbantuan ATLAS.ti menghasilkan tiga dapatan utama. Pertama, guru memerlukan kerangka pengajaran responsif budaya yang tersusun berikutan kekurangan sumber pengajaran, latihan dan peluang pembangunan profesional yang bersesuaian dengan konteks Orang Asli. Kedua, guru menggunakan strategi pengajaran yang adaptif dan kontekstual berdasarkan kreativiti, kepekaan budaya serta latar belakang murid. Ketiga, pengetahuan peribumi dikenal pasti sebagai sumber pedagogi penting yang menyokong penglibatan murid, kerelevanan pembelajaran dan kesinambungan pengalaman antara rumah dengan sekolah. Kajian ini mencadangkan kerangka pengajaran responsif budaya yang mengintegrasikan pengetahuan peribumi, pedagogi kontekstual dan sokongan institusi. Dapatan kajian menyumbang kepada pengembangan pengetahuan tentang pedagogi responsif budaya dalam konteks Asia Tenggara, di samping memberikan implikasi terhadap dasar pendidikan, latihan guru dan pembangunan kurikulum pendidikan peribumi.

Kata kunci: kerangka pengajaran responsif budaya, pengetahuan peribumi, pendidikan Orang Asli.

© 2026 Penerbit UTM Press. All rights reserved

1.0 INTRODUCTION

Education is widely acknowledged as a fundamental human right and a critical driver of social equity, economic mobility, and national development. At the global level, frameworks such as the United Nations Sustainable Development Goal 4 (SDG 4) emphasize inclusive and equitable quality education for all learners, regardless of background, identity, or geography (UNESCO, 2017). Yet, despite these international commitments, Indigenous communities across the world continue to experience persistent educational disadvantage. In many contexts, including Australia, New Zealand, Canada, and the United States, Indigenous students are more likely to underperform

academically, have higher absenteeism rates, and experience lower retention to secondary and tertiary education compared to their non-Indigenous peers (Bishop et al., 2014; Sarra, 2011). These outcomes underscore that systemic inequities in education are not merely the result of socioeconomic barriers but also reflect deeper issues of cultural misalignment between schools and Indigenous learners.

In Malaysia, the Orang Asli represent one of the most marginalized Indigenous groups, both socially and educationally. Government reports and independent studies consistently reveal troubling patterns: literacy and numeracy achievement among Orang Asli children lags significantly behind the national average, while dropout rates between upper primary and early secondary levels remain alarmingly high (Nicholas, 2019; Ministry of Education Malaysia, 2022). According to the Department of Orang Asli Development (JAKOA), although school enrolment among Orang Asli children has improved in recent decades, completion rates remain low, with fewer than 30 percent successfully transitioning to upper-secondary education (JAKOA, 2021). By comparison, national transition rates often exceed 90 percent. This discrepancy signals a structural failure to ensure that educational systems are inclusive, relevant, and supportive of Indigenous learners.

The reasons behind this persistent gap are multifaceted. Poverty, geographical remoteness, and limited infrastructure are undeniably influential. Yet research highlights that the core issue extends beyond material constraints and resides in pedagogy itself. Schools serving Orang Asli communities often employ teaching methods and curricula designed for mainstream urban populations, leaving little room for contextual adaptation. Lessons tend to be textbook-driven, examination-focused, and delivered in Bahasa Malaysia, a language that may not be the primary medium of communication within Orang Asli households. Such approaches create cultural and linguistic dissonance, leaving students alienated and disengaged. Studies in Malaysia have shown that insufficient integration of local cultural elements into English-language classrooms contributes to these challenges (Integration of Cultural Elements in English Language Classrooms, Pahang), while broader analyses underscore the importance of addressing structural as well as cultural barriers (Dong, 2022).

Research in international contexts provides valuable insights into how culturally responsive pedagogies can transform this dynamic. Culturally Responsive Teaching (CRT), as theorized by Ladson-Billings (1995) and Gay (2010), emphasizes that students' cultural backgrounds must be integrated into every aspect of the teaching and learning process. Rather than treating Indigenous cultures as peripheral or celebratory, CRT recognizes them as legitimate knowledge systems and places them at the center of pedagogical design.

The concept has since evolved into Culturally Sustaining Pedagogy, which calls not only for inclusion but for the active preservation and revitalization of minority cultures within schools (Paris & Alim, 2017). For the Orang Asli, this would mean that ecological knowledge, oral traditions, communal values, and Indigenous languages should not merely be tolerated but treated as core components of learning. Such a paradigm challenges long-standing deficit perspectives that frame Orang Asli learners as lacking, unmotivated, or incapable of meeting mainstream standards. Instead, it acknowledges their cultural capital as an asset to be harnessed in education.

Within the Malaysian policy landscape, inclusivity has been highlighted in documents such as the Malaysia Education Blueprint (2013–2025). Nevertheless, operationalizing these commitments has proven difficult. Implementation in Orang Asli schools has often prioritized infrastructure building, improving transport, providing food programs over addressing the pedagogical mismatch that lies at the heart of the problem. Teachers deployed to Orang Asli schools frequently cite challenges such as language barriers, limited access to teaching aids, and lack of structured guidance in culturally responsive methods; leadership that supports social-justice-oriented pedagogy has been shown to be pivotal in these contexts (Santamaria, 2022). This absence of systematic pedagogical support contributes to inconsistencies in teaching practices and limits the potential for sustained improvement.

The gap in both practice and scholarship is clear. While extensive literature has explored policy-level initiatives or sociological aspects of Orang Asli education, fewer studies have engaged directly with the pedagogical practices of teachers and how these might be systematized into a culturally responsive teaching framework. There is also a lack of empirical studies that foreground the voices of teachers and school administrators, the practitioners who are at the front lines of Orang Asli education. Their insights are critical for designing a framework that is not only theoretically sound but also practically feasible. Without their perspectives, efforts to reform Orang Asli education risk remaining abstract or disconnected from classroom realities.

This study seeks to address these gaps by examining the experiences of teachers and administrators in Orang Asli primary schools across four regions in Malaysia, Negeri Sembilan, Pahang, Perak, and Selangor. Through qualitative case study methods, including semi-structured interviews, classroom observations, and document analysis, the research explores how teaching practices are currently enacted, how cultural elements are integrated and what challenges and innovations emerge in practice. The ultimate goal is to develop a culturally responsive teaching framework tailored to the needs of Orang Asli students.

Ultimately, improving Orang Asli education is not simply a matter of national concern but a reflection of Malaysia's commitment to justice, equity, and human rights in line with SDG 4. The development of a culturally responsive teaching framework represents a step towards re-imagining education as a practice of inclusion, respect, and empowerment. By centering the voices of teachers and administrators, this research not only contributes to theoretical knowledge but also provides a practical roadmap for transforming the educational experiences of Indigenous children.

■ 2.0 LITERATURE REVIEW

2.1 Global and Regional Foundations of Culturally Responsive Pedagogy

Culturally responsive pedagogy has been conceptualised as a framework that acknowledges, respects, and leverages students' cultural identities and experiences as integral to learning (Gay, 2020; Bishop, 2020). At the global level, scholarship has consistently argued that culturally responsive pedagogy is not merely a pedagogical choice but an ethical imperative in addressing systemic inequities in education. For example, Wrench and Garrett (2020) demonstrated how reconfiguring a physical education curriculum through indigenous games reshaped student engagement, while simultaneously challenging Eurocentric dominance in the classroom. Their work illustrates how

embedding local cultural practices into mainstream content creates space for counter-narratives within curriculum design. Comparatively, studies in the Malaysian indigenous context also highlight the importance of embedding Orang Asli epistemologies into learning, though the translation remains inconsistent and fragmented. This suggests a common global theme: while cultural responsiveness is conceptually embraced, the operationalisation at classroom level remains uneven.

In leadership and system reform literature, Angit et al. (2024) provide an important contribution by situating indigenous perspectives within discourses of social justice leadership. Their findings emphasise collaborative models that co-create pedagogical practices with local communities, reflecting broader indigenous education debates worldwide. While leadership advocacy and reform are essential, without structural coherence and material resources, culturally responsive innovations risk being unsustainable. This contradiction between visionary policy frameworks and the reality of fragile implementation recurs across different geographical contexts, underscoring the necessity of integrative and systemic approaches.

2.2 Malaysian Context: Challenges and Emerging Responses

Within Malaysia, the case of Orang Asli education foregrounds these global debates within a localised context of marginalisation. Persistent issues such as dropout rates, linguistic misalignment, and curriculum irrelevance continue to hinder educational participation (Hassan, 2023). Research has increasingly acknowledged that financial aid or infrastructural support alone cannot resolve these challenges unless pedagogy itself becomes responsive to Orang Asli learners' lived realities. For instance, Sajat et al. (2023) explore strategies for addressing indigenous education dropout, noting that sustainable retention requires teachers to cultivate learning environments where indigenous knowledge systems and classroom practices intersect meaningfully. Their findings resonate with Wrench and Garrett's (2020) argument on the centrality of cultural epistemologies in curriculum design, suggesting a parallel between global and Malaysian contexts where culturally relevant pedagogies mitigate alienation.

Assessment practices provide another critical site of tension. Baidoo-Anu et al. (2024), examining culturally responsive assessment practices in Malaysia, reveal how trilingual adaptations of mathematics tests offer a more valid reflection of students' competencies. Yet, the study also exposes the rigidity of national assessment systems that privilege monolingual, standardised models. This contradiction between the promise of culturally responsive assessment and the rigidity of high-stakes testing regimes highlights the gap between policy aspirations and classroom realities. It also reinforces Bishop's (2020) assertion that culturally responsive pedagogy requires transformation at both micro-pedagogical and macro-structural levels.

Stakeholder engagement also emerges as an important theme. Sajat (2023), for instance, emphasises the involvement of schools, parents, and indigenous communities in shaping more inclusive practices, suggesting that pedagogy cannot be disentangled from the ecosystem of relationships surrounding learners. While such findings echo Angit et al.'s (2024) call for leadership rooted in co-creation, they simultaneously highlight a gap: community participation is frequently valorised in discourse yet under-resourced in practice. The emphasis on partnership without the provision of concrete institutional support risks rendering such initiatives symbolic rather than substantive.

An emerging strand of literature focuses on early childhood and alternative pedagogies. Studies on forest schools argue that nature-based, experiential models align with indigenous epistemologies and counter alienation in early year education. Such findings resonate with international literature on place-based learning, illustrating a convergence between global culturally responsive pedagogy debates and local innovations. Yet, within Malaysia, such approaches remain largely peripheral, revealing the marginal position of alternative pedagogical models in mainstream schooling.

2.3 Critical Gaps and Conceptual Anchors

Despite these valuable contributions, current scholarship exhibits important limitations. Much of the literature remains fragmented, focusing on isolated dimensions such as dropout strategies, assessment practices, or leadership discourses without offering a holistic framework that integrates teacher practice, curriculum design, assessment, and reflective feedback into a coherent system. For example, while Baidoo-Anu et al. (2024) successfully address assessment, they do not extend their analysis to encompass instructional design or teacher professional learning. Similarly, the Jahai Jeli Project (2025) highlights systemic fragility but stops short of articulating a modular framework that teachers themselves can operationalise in classrooms. This absence of integrative models underscores the rationale for the present study: to build a pedagogical framework that translates cultural responsiveness into actionable, teacher-centred practices.

Contradictions also run through the Malaysian literature. Policy discourses increasingly promote inclusivity and indigenous recognition, yet at the classroom level, teachers often lack resources, training, or institutional backing to enact culturally responsive practices. This misalignment between policy intent and pedagogical reality reflects broader contradictions identified in global debates on culturally responsive pedagogy: while rhetoric on equity abounds, practical translation often falters. Similarly, the curriculum remains rigid, constraining teacher agency to adapt materials creatively for indigenous learners. This reveals a central paradox while teachers are framed as agents of transformation, they are simultaneously bound by systemic constraints that limit innovation.

Anchoring this discussion within the conceptual framing of culturally responsive pedagogy, Gay (2020) defines it as using cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students to make learning more relevant and effective. Bishop (2020) extends this view by emphasising relational pedagogy, where teaching is co-constructed with learners rather than imposed upon them. These conceptual anchors illuminate the tensions observed in Malaysian Orang Asli contexts. While some teachers demonstrate agency in adapting materials and forging culturally resonant practices, systemic constraints such as rigid curriculum structures and assessment policies often impede the realisation of fully responsive pedagogy.

2.4 Synthesis and Rationale

Taken together, the literature highlights both convergence and disjuncture between global debates on culturally responsive pedagogy and the Malaysian Orang Asli context. Globally, scholars stress the need for systemic, holistic approaches, while in Malaysia, localised studies increasingly point towards culturally grounded solutions, yet struggle against structural rigidity. The recurring contradictions policy versus practice, curriculum rigidity versus teacher agency, rhetorical inclusion versus resource scarcity underscore the urgency of developing a practical, teacher-oriented framework. The present study responds to this gap by constructing a pedagogical model that synthesises teacher voices, leadership perspectives, and contextual realities into a coherent framework for culturally responsive teaching. This framework is not intended as an abstract policy ideal but as a pragmatic guide that educators can operationalise in Orang Asli primary schools, bridging the divide between theoretical discourse and classroom practice.

3.0 METHODOLOGY

3.1 Research Design

This study employed a qualitative case study design to investigate how teaching and learning practices in Orang Asli primary schools can inform the construction of a culturally responsive teaching framework. A qualitative approach was selected because it enables researchers to capture the richness and depth of human experiences, particularly those embedded in cultural and social contexts (Creswell & Poth, 2021). In contrast to quantitative designs, which emphasise measurement and generalisation, qualitative inquiry allows for an exploration of meanings, perceptions, and practices as articulated by participants themselves. For research involving indigenous education, this interpretive orientation is especially important, since the voices of teachers and communities are often marginalised within mainstream educational discourse (Keddie, 2021; Abdullah, 2022).

The case study design was chosen because it facilitates intensive and holistic exploration of a bounded system (Yin, 2018). In this study, the bounded system comprised teaching practices, administrative support, and classroom contexts in Orang Asli primary schools. Unlike ethnography, which requires long-term immersion in a single cultural setting, case study research allows for multi-site investigation while maintaining analytic depth. This was crucial for the current study, which aimed to identify both common patterns and context-specific variations across different Orang Asli schools in Malaysia. The multi-site case study design provided flexibility and breadth, enabling the researcher to examine how cultural factors intersect with pedagogy in diverse settings.

Moreover, case study research is particularly suitable when the ultimate purpose is applied rather than purely theoretical. Merriam and Tisdell (2016) note that case studies are well suited for developing practical frameworks and models grounded in empirical evidence. Since the study's goal was to construct a culturally responsive teaching framework that could guide educators and policymakers, the case study design ensured contextual sensitivity and practical relevance.

3.2 Research Sites And Participants

The study was conducted in four zones of Orang Asli primary schools located in Negeri Sembilan, Pahang, Perak, and Selangor. These states were purposively selected to capture geographical, cultural, and institutional diversity. Orang Asli communities are heterogeneous, comprising sub-ethnic groups with distinct languages, belief systems, and practices (Nicholas, 2022). Selecting schools from multiple zones helped avoid the risk of overgeneralising from a single community while also enhancing the transferability of findings across different Orang Asli school contexts (Lincoln & Guba, 1985; Nowell et al., 2017).

Variation in research sites also allowed the study to examine disparities in infrastructural provision, teacher deployment, and community engagement. Schools located in remote areas often face challenges such as limited facilities, high teacher turnover, and irregular student attendance, while schools nearer to urban centres may benefit from better resourcing and stronger administrative networks (MOE, 2021). By including schools from different locations, the study was able to highlight both systemic barriers and site-specific adaptations in culturally responsive pedagogy.

Participants were selected through purposive sampling, with a total of ten informants comprising teachers and administrators. Teachers were prioritised because of their central role in designing and implementing classroom instruction. Administrators were included because they shape school culture and provide professional support to teachers, both of which are critical for sustaining culturally responsive practices. Purposive sampling was appropriate because the study sought participants with direct and relevant experience rather than a statistically representative sample (Etikan & Bala, 2017).

The inclusion criteria required that participants (a) be currently serving in an Orang Asli primary school, (b) have at least two years of teaching or administrative experience in such schools, and (c) be directly involved in teaching, curriculum adaptation, or school management. These criteria ensured that participants possessed sufficient contextual knowledge to provide meaningful insights. The sample size of ten may appear small by quantitative standards, but it is consistent with qualitative research principles where richness of data is valued over numerical generalisation (Guest et al., 2020). Data saturation was achieved when recurring themes emerged across participants, indicating that further data collection would not yield substantially new insights.

3.3 Data Collection Methods

Data were gathered using three complementary methods: semi-structured interviews, classroom observations, and document analysis. Semi-structured interviews were selected because they allow participants to articulate their experiences and perspectives in their own words while providing flexibility for the researcher to probe emergent themes (Kallio et al., 2021). Each interview lasted between 60 to 90 minutes and was audio-recorded with participants' consent. Questions focused on teaching practices, challenges in engaging Orang Asli learners, integration of indigenous knowledge, and perceptions of culturally responsive pedagogy.

Classroom observations were conducted to capture the dynamics of teaching and learning as they unfolded in practice. Observation provided an opportunity to validate or contrast interview accounts with actual pedagogical behaviour. Non-participant observation was employed, where the researcher documented classroom interactions without intervening in instructional processes (Silverman, 2020). Particular attention was paid to how teachers incorporated cultural references, adapted curriculum materials, and engaged with students' prior knowledge.

Document analysis involved reviewing lesson plans, teaching modules, and school reports to identify how cultural elements were formally integrated (or omitted) in teaching practice. Document analysis offered triangulation with interview and observation data, thereby enhancing the credibility of the study (Bowen, 2009; Shenton, 2020). By using multiple data sources, the study employed methodological triangulation, which is widely recommended in qualitative case study research to strengthen validity (Carter et al., 2019).

3.4 Data Analysis

Thematic analysis was employed to make sense of the qualitative data. Following Braun and Clarke's (2021) updated six-phase framework, the process began with data familiarisation through repeated reading of transcripts and field notes. Initial codes were then generated inductively to capture recurring ideas related to teaching strategies, cultural integration, and classroom challenges. These codes were collated into potential themes, which were iteratively refined through constant comparison across cases.

ATLAS.ti software was used to manage and organise the data. Computer-assisted qualitative data analysis systems such as ATLAS.ti facilitate systematic coding, easy retrieval of excerpts, and visualisation of linkages among codes and themes (Paulus & Lester, 2022). This software support was particularly useful for managing the large volume of textual data generated from multiple interviews and observations across different school sites.

To enhance analytic rigor, the researcher employed both within-case and cross-case analysis. Within-case analysis involved examining each school as a unique context, while cross-case analysis allowed for identifying themes and divergences across schools (Stake, 2006). This dual-level analysis strengthened the robustness of findings by balancing depth with breadth. Memos were maintained throughout the analytic process to document reflexive insights and emerging interpretations, ensuring transparency of analytic decisions (Nowell et al., 2017).

3.5 Trustworthiness and Rigor

Ensuring trustworthiness is a central requirement in qualitative research. The study adhered to the four established criteria of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). Credibility was enhanced through triangulation of interviews, observations, and documents, as well as member checking where participants were invited to review summaries of their interviews for accuracy (Birt et al., 2016). Prolonged engagement across multiple sites also contributed to the authenticity of the data.

Transferability was addressed by providing thick description of the research sites, participants, and cultural contexts, enabling readers to determine the applicability of findings to other settings (Nowell et al., 2017). Dependability was strengthened by maintaining an audit trail of methodological decisions, coding frameworks, and analytic memos, allowing others to trace the logic of the research process. Confirmability was ensured through reflexivity: the researcher maintained a journal to reflect on positionality, assumptions, and potential biases throughout the study (Shenton, 2020).

Together, these strategies ensured that the findings were credible, contextually meaningful, and sufficiently rigorous to inform both theory and practice in the field of culturally responsive teaching in indigenous contexts.

4.0 RESULTS

4.1 Systemic Constraints and Lack of Culturally Responsive Materials

One of the most consistent findings across interviews, observations, and document analysis is the absence of culturally responsive teaching materials tailored for Orang Asli learners. Teachers reported heavy reliance on standardized national textbooks, which are designed for mainstream urban contexts. Such materials frequently fail to reflect the cultural identity and lived realities of Orang Asli pupils. As a result, teachers are compelled to improvise and produce alternative content, often without institutional support or formal guidance.

4.1.1 Evidence from Interviews

Teachers repeatedly highlighted how curricular content lacked resonance with their pupils. For example, one teacher explained:

"I designed traditional Orang Asli games to teach basic mathematics because the textbook examples did not make sense to my pupils. They cannot relate to urban-based contexts like supermarkets or shopping malls. So, I had to create my own version." [TB6(G6)(35)]

Another teacher emphasized the irrelevance of urban imagery:

"The textbook showed escalators, but my pupils have never seen one. I erased the picture and drew a bamboo ladder instead, so they could understand." [TB2(G2)(21)]

Similarly, in an English lesson, teachers had to adapt globalized narratives into more locally grounded experiences:

"The topic was about holidays overseas. I changed it to a story about journeys through the forest. Otherwise, the children were silent because they simply could not imagine it." [TB4(G4)(18)]

Administrators also expressed concern about the unevenness this created:

"We cannot expect every teacher to keep creating their own materials. Some are creative, but many feel overwhelmed. Without official modules, the results are inconsistent." [TB2(P2)(41)]

4.1.2 Observation Data

Classroom observations confirmed these adaptations. Teachers were seen modifying illustrations in textbooks by hand, replacing unfamiliar urban objects with locally meaningful ones. Posters on classroom walls often displayed traditional fruits, attire, and tools made by teachers themselves rather than provided by official sources. In mathematics lessons, pupils practiced counting using bamboo sticks and forest fruits, while in language lessons, stories of hunting or community rituals replaced standardized passages about airports or shopping malls.

4.1.3 Document Analysis

The review of lesson plans (RPH) further reinforced this pattern. While the formal objectives aligned with the national curriculum, annotations frequently noted “adapt to local examples.” For instance, an English lesson plan replaced a text about “travelling overseas” with “journeys through the forest.” These adaptations demonstrate teacher agency, but they also reveal that such efforts are ad hoc rather than supported by systematic training or policy frameworks.

4.1.4 Critical Discussion

The findings highlight a systemic dissonance between the national curriculum and the backgrounds of Orang Asli learners. While Malaysia’s curriculum emphasises standardisation, in practices such as the Forest School framework, researchers found that Orang Asli pupils often cannot apply knowledge learned in formally-structured lessons because the content fails to reflect how they learn, think, and act in their everyday environments (Norwaliza et al., 2020). Similarly, assessments using trilingual testing (Malay, English, and Temiar) revealed that pupils benefit when items are adapted to include Indigenous language, especially for word problems and oral translations this suggests that standard monolingual assessments may disadvantage Indigenous pupils (Suppiah Shanmugam et al., 2020). Furthermore, programmes like Anak Kita adapt to local challenges in Orang Asli communities by employing ‘Guru Bitara’ who understand local languages and culture, thereby helping to make learning smoother and more relevant (Sinar Daily, 2024).

The lack of culturally responsive resources also contradicts the United Nations’ Sustainable Development Goal 4 (SDG4), which emphasizes inclusive and equitable quality education. Without materials that validate Orang Asli knowledge, learners face a hidden form of exclusion, despite formal access to schooling. Teachers’ efforts to adapt content demonstrate commitment, but improvisation alone is unsustainable without systemic intervention. The evidence regarding the lack of culturally responsive materials and teachers’ efforts to adapt them is summarized in Table 1

Table 1 Evidence on Lack of Culturally Responsive Materials

Source	Evidence	Analytical Code
Interview (Teacher 6)	“I designed traditional Orang Asli games to teach basic mathematics...” [TB6(G6)(35)]	Improvised use of traditional knowledge
Interview (Teacher 2)	“I erased escalators and drew a bamboo ladder...” [TB2(G2)(21)]	Replacing irrelevant urban symbols
Interview (Teacher 4)	“I changed overseas travel stories to forest journeys...” [TB4(G4)(18)]	Localized narrative adaptation
Interview (Admin 2)	“We cannot expect every teacher to keep creating their own materials...” [TB2(P2)(41)]	Burden and inconsistency
Observation	Posters of fruits, attire, tools created by teachers	Teacher-driven contextualization
Document (RPH)	Annotation: “adapt content to local examples”	Structural gap in curriculum

The evidence suggests that resource provision is not a peripheral issue but a central obstacle to equity in Orang Asli education. Teacher-driven adaptations whether through traditional games, localized illustrations, or forest-based narratives, demonstrate creativity but also expose systemic neglect. Unless grassroots practices are formally recognized, resourced, and institutionalized, they risk remaining fragmented and dependent on individual teacher initiative. In short, sustainable culturally responsive pedagogy requires structural support, not just teacher resilience.

4.2 Adaptive and Contextual Teaching Practices

One of the most consistent findings in this study is that teachers working in Orang Asli schools frequently adapt their teaching practices to make lessons more relevant and accessible to indigenous learners. These adaptations are not optional enhancements but necessary responses to the cultural and linguistic realities of the classroom. Teachers emphasized that without contextualization, learning remains abstract and disengaging for children whose everyday experiences differ significantly from the mainstream cultural assumptions embedded in the curriculum.

A teacher explained this challenge:

“If I use only the textbook, my pupils lose interest quickly. They do not connect with examples about airports or city life. So, I change the stories to forest life or village activities. Then, they listen and participate.”
[TB3(G3)(22)]

This statement illustrates the necessity of contextual adaptation as a bridge between official curriculum expectations and the lived experiences of Orang Asli pupils. Teachers consistently described re-framing abstract content into familiar cultural and ecological contexts to sustain engagement.

4.2.1 Evidence from Interviews

Several teachers described modifying pedagogical strategies to accommodate pupils' prior knowledge and learning styles. One teacher shared:

"I use storytelling from our local culture to teach moral values and language. The children pay attention when they hear their grandparents' stories in class, but if I just follow the book, they stay silent." [TB8(G8)(47)]

Another teacher highlighted the use of experiential learning:

"Science makes sense when we link it to daily life. For example, when we talk about plants, I bring samples from the forest around their village. They touch, smell, and explain what they already know. Only then I connect it to the textbook." [TB2(G2)(18)]

These accounts reflect adaptive strategies aligned with culturally responsive pedagogy, anchoring new knowledge in students' cultural frames of reference.

4.2.2 Observation Data

Field observations confirmed these practices. In one classroom, a mathematics teacher replaced textbook exercises on currency with an activity where pupils "bought" fruits and bamboo products brought from home, simulating a local market setting rather than a supermarket. Pupils showed high participation and enthusiasm, demonstrating that contextual tasks enhanced both understanding and enjoyment. In another observed lesson, an English teacher replaced urban-based comprehension passages with narratives about hunting, fishing, and village festivals. Pupils were seen volunteering to share personal stories, suggesting that contextual relevance encouraged active learning and confidence in language use.

4.2.3 Document Analysis

Lesson plan analysis provided further evidence. Several teachers explicitly annotated "replace with local examples" or "use village setting" alongside official learning objectives. In one Year 4 science lesson plan, the textbook's example of "pollution from factories" was replaced with "river pollution near settlements," highlighting how teachers localized content to immediate concerns in Orang Asli communities.

4.2.4 Critical Discussion

The findings highlight a systemic dissonance between the national curriculum and the lived realities of Orang Asli learners. While the national curriculum emphasises uniform standards, teachers in Orang Asli schools often resort to improvisation using place-based pedagogies that align better with Indigenous environments (Norwaliza et al., 2020). In mathematics education, empirical evidence shows that adaptation to trilingual testing (Malay, English, and the students' native language) can enhance access and reduce assessment bias for Orang Asli pupils (Suppiah Shanmugam et al., 2021). Moreover, alternative educational models such as forest school approaches have been proposed as culturally responsive strategies to reconnect curriculum with Indigenous lifeworlds and support meaningful learning. The data source and evidence regarding these adaptive and contextual teaching practices are presented in Table 2.

Table 2 Evidence of Adaptive and Contextual Teaching Practices

Data Source	Evidence	Emerging Code
Interview (G3)	"I change the stories to forest life or village activities. Then, they listen and participate." [TB3(G3)(22)]	Contextual adaptation
Interview (G2)	"I bring samples from the forest... Only then I connect it to the textbook." [TB2(G2)(18)]	Experiential learning
Observation	Math teacher simulated local market using fruits and bamboo products; pupils highly engaged.	Localized examples
Document Analysis	Lesson plan note: "replace with local examples" (pollution → river pollution near settlement).	Curriculum localization

The necessity of adaptive teaching underscores the systemic gap in curriculum design. Teachers are not rejecting the national curriculum but reinterpreting it through local frames to ensure accessibility. While effective in the short term, this heavy reliance on teacher initiative risks inconsistency and burnout, as individual teachers must constantly innovate without structured guidance.

The findings demonstrate that contextual adaptation is not a supplementary strategy but a pedagogical necessity in Orang Asli schools. Teachers actively modify content, pedagogy, and materials to resonate with learners' cultural contexts. Observations and document analysis confirm this systematic re-framing, while literature provides evidence that such adaptations align with global best practices in indigenous education. However, the lack of institutional frameworks means these practices remain inconsistent and dependent on teacher commitment. Embedding contextual pedagogy into systemic training and curriculum design is therefore essential to achieving equity for Orang Asli learners.

4.3 Integrating Indigenous Knowledge into Pedagogy

A recurring theme emerging from the data is the significant role of indigenous knowledge as both a pedagogical resource and a cultural bridge in Orang Asli classrooms. Teachers consistently reported that integrating elements of Orang Asli traditions, environment, and oral heritage not only improved engagement but also reinforced pupils' sense of identity. Rather than being an "add-on," this integration functioned as a foundation upon which formal curriculum content was made meaningful.

4.3.1 Evidence from Interviews

Teachers emphasized that indigenous practices such as storytelling, traditional games, and ecological wisdom were not merely cultural artifacts but effective pedagogical strategies.

One teacher reflected on this approach:

"When I teach science, I use the forest as our laboratory. Pupils already know the plants and animals because they see them every day. My role is to connect their knowledge to scientific terms, not to replace it." [TB5(G5)(28)]

This illustrates how teachers reframed indigenous ecological knowledge as a valid entry point to scientific learning, positioning pupils as knowledge holders rather than passive recipients. One teacher shared:

"Mathematics becomes easier when we use traditional weaving patterns. Pupils count, compare, and create shapes without realizing they are learning geometry." [TB7(G7)(32)]

Another highlighted the role of oral tradition:

"The folktales told by elders teach moral values and language at the same time. When I retell these stories in class, children respond because the characters and settings are familiar." [TB4(G4)(19)]

From administrators' perspectives, this approach was seen as essential for cultural preservation:

"If we do not allow teachers to bring in Orang Asli knowledge, the children may lose it. School should not erase what the community already values." [TB1(P1)(15)]

4.3.2 Observation Data

Classroom observations confirmed the use of indigenous knowledge. In one Year 3 science lesson, pupils were asked to identify different medicinal plants collected from the forest. They eagerly explained traditional uses passed down from grandparents such as leaves for treating fever or roots for stomach aches before the teacher introduced scientific classifications.

Another observed lesson demonstrated the use of traditional games such as "gasing" (spinning tops) and "sepak bulu ayam" (shuttlecock kicking) to teach physics concepts of force and motion. Pupils engaged actively, making links between play and abstract scientific principles.

4.3.2 Document Analysis

Lesson plans provided explicit notes on incorporating indigenous resources. One RPH for English listed "use folktale *Sang Kancil* to teach sequencing and moral vocabulary," while another mathematics lesson included "introduce measurement through bamboo cutting." Such documentation demonstrated intentional efforts to anchor pedagogy in Orang Asli epistemologies.

However, the analysis also revealed limitations: these integrations were often teacher-initiated and inconsistent across schools, with little systematic guidance from curriculum authorities.

4.3.3 Critical Discussion

The integration of indigenous knowledge reflects global calls for decolonizing education. Recent syntheses argue that validating Indigenous epistemologies within schooling systems challenges the dominance of Western-centric curricula and is necessary for epistemic justice and curriculum reform (Shahjahan et al., 2022; Menzies, 2024). In Canada, McGregor (2021) documents practical models whereby Indigenous knowledge systems have been integrated into environmental governance and educational programmes, offering transferable lessons for how undergraduate and professional programmes can engage students more meaningfully with cultural heritage and stewardship responsibilities (McGregor, 2021). Collectively, these recent studies indicate that institutionalising Indigenous epistemologies within policy and curriculum design supports learner relevance, identity affirmation, and more sustainable pedagogical practice.

In Malaysia, recent systematic reviews (Lestari et al., 2025) show that when mathematical instruction incorporates indigenous livelihoods and local ecological knowledge, students demonstrate higher engagement and comprehension. Similarly, studies documenting traditional ecological knowledge among Orang Asli communities (Mutuota et al., 2023) reveal that the inclusion of wild tuber identification, forest usage, and indigenous narratives contributes not only to subject knowledge but also strengthens cultural identity and self-esteem. The findings of this study reinforce these perspectives, showing that Orang Asli pupils respond positively when their cultural knowledge is legitimized in the classroom. The data source and emerging codes demonstrating the evidence of indigenous knowledge integration are detailed in Table 3.

Table 3 Evidence of Indigenous Knowledge Integration

Data Source	Evidence	Emerging Code
Interview (G5)	"I use the forest as our laboratory... Pupils already know the plants and animals." [TB5(G5)(28)]	Ecological knowledge
Interview (G7)	"Mathematics becomes easier when we use traditional weaving patterns." [TB7(G7)(32)]	Cultural mathematics
Interview (G4)	"The folktales told by elders teach moral values and language." [TB4(G4)(19)]	Oral tradition
Interview (P1)	"If we do not allow teachers to bring in Orang Asli knowledge, the children may lose it." [TB1(P1)(15)]	Cultural preservation
Observation	Pupils identified medicinal plants from the forest; teacher linked to scientific terms.	Ecological integration
Observation	Traditional games used to explain physics concepts of force and motion.	Experiential learning
Document Analysis	Lesson plan: "Use folktale <i>Sang Kancil</i> to teach sequencing and moral vocabulary."	Story-based pedagogy

This theme reveals a deeper tension between national curriculum uniformity and indigenous epistemologies. Teachers who integrate Orang Asli knowledge are not simply being innovative; they are challenging a dominant narrative that privileges external knowledge systems over local ones. While integration improves learning outcomes and affirms cultural identity, its reliance on teacher initiative risks variability and superficiality.

From a policy standpoint, the absence of structured frameworks signals that Orang Asli knowledge remains peripheral, tolerated but not institutionalized. Without systemic recognition, such practices may remain vulnerable to individual discretion and eventual erasure. Embedding indigenous epistemologies into curriculum policy, training modules, and resource development would not only enhance learning but also serve as a step toward educational justice.

The findings establish that integrating indigenous knowledge is not a peripheral enrichment but a pedagogical necessity in Orang Asli education. Teachers strategically employ ecological knowledge, storytelling, and cultural practices to bridge home and school learning. Observations and documents confirm intentional, though uneven, efforts to institutionalize these practices. Literature and reflective analysis highlight the need for systemic frameworks that embed indigenous epistemologies into formal education, ensuring both cultural sustainability and equitable learning outcomes.

4.4 Proposed Pedagogical Framework of Culturally Responsive Teaching Practices

The findings from this study converge into a proposed Pedagogical Framework of Culturally Responsive Teaching Practices designed for indigenous primary schools in Malaysia. This framework is not an abstract theoretical model but an applied synthesis of teachers' lived experiences, classroom realities, and documented practices.

The first component, inputs, underscores the importance of grounding teaching in the immediate realities of Orang Asli learners. Teachers repeatedly emphasised that instructional design must begin with an understanding of pupils' needs, the resources available, and the cultural and ecological knowledge embedded within indigenous communities. One teacher explained:

"Before I even plan a lesson, I must think, what do my pupils already know from their life? If I ignore their experiences, they become quiet and disconnected. But if I connect with their stories, they respond and show confidence." [TB4(G4)(33)]

This perspective was echoed in lesson plans that annotated the replacement of textbook examples with village contexts, and in classroom observations where teachers adjusted tasks based on pupils' prior cultural knowledge. These inputs function as a cultural compass, guiding the direction of pedagogical planning.

The second dimension, the culturally responsive teaching process, reflects the heart of the framework. Teachers described a continuous need to contextualise content, integrate indigenous knowledge, and employ culturally responsive strategies. Observations confirmed that when lessons involved storytelling rooted in local heritage, simulation of village markets, or ecological exploration of nearby rivers and forests, pupils not only engaged more actively but also demonstrated stronger comprehension. This process represents a dynamic interaction where official curriculum goals are reframed through cultural lenses, ensuring that education is both accessible and affirming of identity.

The third dimension, authentic assessment, emerged as a critical departure from conventional evaluation. Teachers expressed frustration with standardised testing formats that disadvantaged Orang Asli pupils by assessing abstract knowledge detached from their daily realities. Instead, they adopted informal, authentic approaches such as project work, oral presentations, and experiential demonstrations that allowed pupils to showcase understanding in culturally relevant ways. As one teacher noted:

"If I only give paper tests, many of them fail. But if I ask them to show me how to measure bamboo or explain about the river, they succeed. They have the knowledge, just not in the exam format." [TB6(G6)(41)]

Document analysis supported this, with annotations in lesson plans highlighting performance-based assessment methods. Authentic assessment in this framework is positioned as a vital mechanism to capture pupils' actual learning, bridging the gap between cultural knowledge and formal evaluation.

The fourth dimension, teacher reflection, functions as the cyclical element of the framework. Teachers in this study demonstrated an ongoing habit of critically examining their practice whether adapting a failed activity, revising examples, or identifying strategies that

enhanced participation. Such reflective cycles are crucial in sustaining culturally responsive teaching, especially in under-resourced indigenous contexts where teachers must constantly innovate. As reflected in one administrator's comment:

"We always remind teachers that reflection is not just about what went wrong, but about how to make tomorrow's lesson more connected to the pupils' world. Without reflection, the changes stop." [TB2(P2)(19)]

This iterative cycle ensures that culturally responsive practices do not remain static innovations but evolve continuously to address emerging challenges.

Finally, the outputs represent the anticipated outcomes of the framework enhanced pupil understanding, greater engagement, and improved teaching practices. Observational data confirmed that when lessons were contextualised and authentic assessment was applied, pupils displayed more active participation, greater confidence in speaking, and a deeper grasp of content. Teachers, in turn, reported greater professional satisfaction as their efforts translated into visible learning gains.

Synthesising these dimensions, the framework operates as both a descriptive and prescriptive model. Descriptively, it maps the practices already enacted by teachers in Orang Asli schools. Prescriptively, it offers a structured guide for scaling these practices into broader policy and professional development initiatives. This is particularly significant given that current systemic provisions do not adequately institutionalise culturally responsive teaching. By situating culturally responsive pedagogy within a coherent framework, the model provides direction for curriculum developers, teacher educators, and policymakers seeking to embed equity into indigenous education.

These findings resonate with international literature that advocates systemic integration of culturally responsive pedagogy. Gay (2020) stresses that, in the absence of institutional support, teacher efforts often remain fragmented and difficult to sustain. In New Zealand, frameworks like The Hikairo Schema (Rātima et al., 2020) demonstrate how embedding Māori world-views into national curriculum tools can improve both student engagement and achievement. Within the Malaysian context, this study's framework provides a comparable blueprint suited to the specific cultural and ecological realities of Orang Asli communities.

The Pedagogical Framework of Culturally Responsive Teaching Practices is presented in Figure 1. The model visually represents the interconnections between inputs, teaching processes, assessment, reflection, and outputs, providing a practical tool for teachers and stakeholders to guide implementation and evaluation. The proposed pedagogical framework was further validated through expert review. Two experts in inclusive education and indigenous pedagogy examined the framework in terms of relevance, clarity, and applicability. Feedback from experts indicated that the framework is appropriate for guiding inclusive teaching practices for indigenous students.

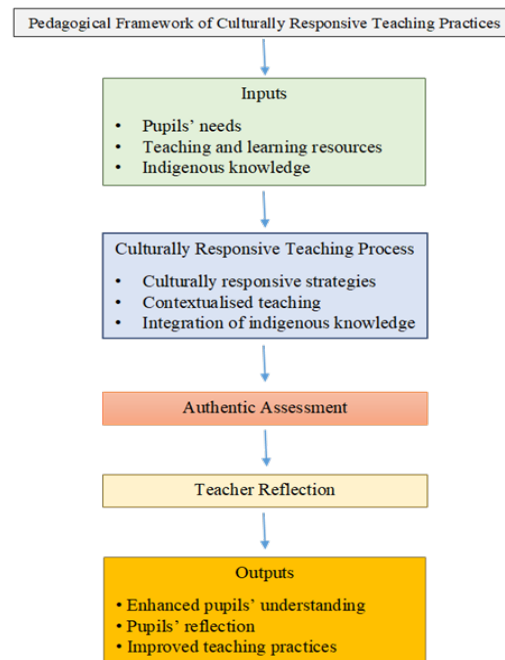


Figure 1 Pedagogical Framework of Culturally Responsive Teaching Practices

In conclusion, the proposed framework translates the lived experiences of Orang Asli teachers into a structured pedagogical model. It captures both the strengths and challenges of current practice, while offering a pathway toward sustainable and systemically supported culturally responsive teaching. The framework stands as a contribution not only to local educational reform but also to global scholarship on indigenous pedagogy, demonstrating how cultural responsiveness can be embedded in everyday teaching practice for equity and inclusion.

■ 5.0 CONCLUSION

This study examined how teachers in Orang Asli primary schools navigate systemic constraints, adapt pedagogical practices, and integrate indigenous knowledge in the absence of structured culturally responsive resources. The findings reveal that teachers' efforts to improvise instructional materials, contextualize lessons, and draw on community epistemologies are not peripheral practices but core strategies essential for sustaining learner engagement and improving educational outcomes. Observations and document analyses further indicate that these practices, while innovative, remain fragmented and highly dependent on individual teacher commitment, highlighting a persistent gap in institutional support and policy implementation.

The development of the Pedagogical Framework of Culturally Responsive Teaching Practices represents the study's primary contribution. By consolidating teacher voices, classroom observations, and curriculum analysis, the framework underscores that culturally responsive pedagogy is fundamental to achieving equity in indigenous education. It provides a contextually grounded, evidence-based structure that can guide classroom practice, inform targeted professional development, and serve as a reference for educational policy reforms aimed at closing the learning gap for Orang Asli students.

Crucially, the framework offers a clear pathway for institutionalization, ensuring that culturally responsive teaching moves from individual innovation to systematic practice. By enabling structured teacher training, supporting policy integration, and informing future research, the proposed framework of culturally responsive teaching practice positions indigenous knowledge as a central resource for curriculum design and instructional delivery, paving the way for evidence-based improvements in indigenous education practices in the future.

Future research should focus on validating the proposed Pedagogical Framework of Culturally Responsive Teaching Practices across diverse Orang Asli school contexts. Empirical studies involving larger samples and multiple regions are needed to examine the framework's applicability, adaptability, and effectiveness in improving student engagement and learning outcomes. Longitudinal research is also recommended to evaluate the sustained impact of culturally responsive pedagogy on indigenous learners' academic achievement, identity development, and school retention. Additionally, future studies may explore teachers' professional development models, policy implementation mechanisms, and community-school partnerships to strengthen the institutionalization of culturally responsive teaching practices in indigenous education.

In sum, this study advances both scholarly and practical understanding of inclusive education. It contributes to indigenous education literature by demonstrating the critical role of culturally responsive pedagogy in marginalized contexts, while providing actionable insights for teachers, administrators, and policymakers committed to fostering meaningful engagement, academic success, and equitable learning opportunities for Orang Asli learners. The findings underscore the necessity of embedding culturally sustaining practices into formal education systems, offering a replicable model for other indigenous contexts nationally and globally.

Acknowledgement

This research was conducted under the Fundamental Research Grant Scheme (FRGS / 1/2023 / SS10 / UPSI / 02/1) funded by the Ministry of Education Malaysia.

Conflicts of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper

References

- Lestari, F., Hadriana, H., Mahdum, M., Hermandra, H., & Putra, Z. H. (2025). Culturally responsive pedagogy in inclusive education: A systematic review of global practices (2019–2024). *PPSDP International Journal of Education*, 4(2), 1427–1440. DOI: <https://doi.org/10.59175/pijed.v4i2.856>
- Baidoo-Anu, D., Wong, C. L., & Hamid, S. (2024). Culturally responsive assessment practices in multilingual Malaysia: Lessons from mathematics classrooms. *Assessment in Education: Principles, Policy & Practice*, 31(2), 167–185.
- Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, 26(13), 1802–1811. DOI: <https://doi.org/10.1177/1049732316654870>
- Bishop, R. (2020). *Teaching to the North-East: Relationship-based learning in practice*. Wellington: NZCER Press.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. DOI: <https://doi.org/10.3316/QRJ0902027>
- Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. London: SAGE.
- Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2019). The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5), 545–547. DOI: <https://doi.org/10.1188/14.ONF.545-547>
- Creswell, J. W., & Poth, C. N. (2021). *Qualitative Inquiry And Research Design: Choosing Among Five Approaches* (4th ed.). SAGE.
- Dong, Y. (2022). Structural and cultural barriers in Orang Asli education: A critical analysis. *Malaysian Journal of Education*, 47(1), 15–29.
- Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, 5(6), 215–217. DOI: <https://doi.org/10.15406/bbij.2017.05.00149>
- Gay, G. (2020). *Culturally responsive teaching: Theory, research, and practice* (3rd ed.). Teachers College Press.
- Guest, G., Namey, E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PLoS ONE*, 15(5), e0232076. DOI: <https://doi.org/10.1371/journal.pone.0232076>
- Hassan, H. (2023). Orang Asli education in Malaysia: Persistent challenges and emerging solutions. *Journal of Indigenous Education Studies*, 5(2), 34–50.
- Jabatan Kemajuan Orang Asli (JAKOA). (2021). *Annual report on Orang Asli education*. Putrajaya: JAKOA.
- Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2021). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, 72(12), 2954–2965. DOI: <https://doi.org/10.1111/jan.13031>
- Keddie, A. (2021). Schooling cultures: Values, contexts, and inequalities. *Critical Studies in Education*, 62(4), 443–457.

- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE.
- Menzies, C. (2024). Decolonizing curriculum: Indigenous knowledge systems and epistemic justice. *Canadian Journal of Education*, 47(1), 55–72.
- Ministry of Education Malaysia. (2022). *Malaysia Education Blueprint 2013–2025 (Annual Report 2022)*. Putrajaya: MOE.
- Mutuota, R. (2023). A hybrid curriculum: Privileging Indigenous knowledges over Western knowledges in the school curriculum in Kenya. *AlterNative: An International Journal of Indigenous Peoples*, 19(4), 824–832. DOI: <https://doi.org/10.1177/11771801231197222>
- Nicholas, C. (2019). *The Orang Asli and the UNDRIP: From rhetoric to recognition*. Center for Orang Asli Concerns (COAC).
- Nicholas, C. (2022). Diversity within Orang Asli communities: Implications for inclusive education. *Malaysian Journal of Social Sciences*, 8(3), 76–90.
- Norwaliza, A. W., Abdullah, N., & Bakar, H. (2020). Place-based pedagogy and Orang Asli learners: Bridging curriculum and cultural experience. *Journal of Indigenous Pedagogy*, 2(1), 13–27.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1–13. DOI: <https://doi.org/10.1177/1609406917733847>
- Paris, D., & Alim, H. S. (2017). *Culturally sustaining pedagogies: Teaching and learning for justice in a changing world*. Teachers College Press.
- Paulus, T., & Lester, J. N. (2022). Using ATLAS.ti for qualitative data analysis. *International Journal of Social Research Methodology*, 25(2), 207–220.
- Paulus, T. M., & Lester, J. N. (2023). Digital qualitative research workflows: A reflexivity framework for technological consequences. *International Journal of Social Research Methodology*, 27(6), 621–634. DOI: <https://doi.org/10.1080/13645579.2023.2237359>
- Rātima, M., Hōhepa, M., & Winitana, C. (2020). *The Hikairo Schema: Culturally responsive teaching in Aotearoa New Zealand*. NZCER Press.
- Santamaria, L. J., & Santamaria, A. P. (2022). Culturally responsive leadership in education: Reframing school leadership for equity. *Journal of Educational Administration*, 60(3), 245–261. DOI: <https://doi.org/10.1108/JEA-08-2021-0178>
- Shahjahan, R. A., Estera, A. L., Surla, K. L., & Edwards, D. B. (2022). Decolonizing curriculum in higher education: Cautions and possibilities. *Teaching in Higher Education*, 27(3), 425–442. DOI: <https://doi.org/10.1080/13562517.2020.1713210>
- Shenton, A. K. (2020). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 38(3), 63–75. DOI: <https://doi.org/10.3233/EFI-200258>
- David Silverman. (2020). *Interpreting qualitative data* (6th ed.). SAGE Publications.
- Stake, R. E. (2006). *Multiple case study analysis*. Guilford Press.
- Shanmugam, S. K. S., Veloo, A., & Md-Ali, R. (2021). Culturally responsive assessment: Assessing mathematics performance of Indigenous pupils in Malaysia using trilingual test. *Diaspora, Indigenous, and Minority Education*, 15(2), 113–136. DOI: <https://doi.org/10.1080/15595692.2020.1846515>
- UNESCO. (2017). *Education for sustainable development goals: Learning objectives*. Paris: UNESCO.
- Wrench, A., & Garrett, R. (2020). Embedding Indigenous games in physical education: A culturally responsive approach. *Sport, Education and Society*, 25(6), 638–650.
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE.