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The Role of Human Resource Management in Implementing the Merdeka Curriculum: A Deep Learning Approach in Elementary Education at Polewali Mandar

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Abstract

This study examines how human resource management (HRM) practices enable the successful implementation of Indonesia's Merdeka Curriculum to support deep learning in elementary schools. Using a qualitative multiple-case study design, data were collected from four elementary schools in Palu City, Indonesia. The data sources included interviews with school leaders and teachers, classroom observations, and relevant district-level policy documents. Data were analyzed through thematic analysis to identify patterns in HRM practices related to curriculum implementation. The findings reveal four interdependent themes: strategic HRM alignment, professional development transformation, leadership and school culture, and systemic support and constraints. These themes form an integrated HRM–Deep Learning Synergy model, illustrating a continuous relationship in which supportive policy environments sustain teacher recruitment, capacity building, and collaborative leadership. The study also finds that weaknesses in one component—such as limited professional development or rigid administrative structures—can disrupt the overall cycle and reduce curriculum effectiveness. This research contributes to the literature on educational leadership, HRM, and deep learning by offering practical implications for policymakers and school leaders seeking to transform schools into learning organizations that foster higher-order thinking and meaningful learning.

Keywords Deep Learning; Human Resource Management; Merdeka Curriculum; Professional Development; Transformational Leadership

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1. INTRODUCTION

Elementary education serves as a cornerstone for shaping high-quality human resources. In Indonesia, the Merdeka Curriculum has been introduced as a major policy reform to raise the standard of learning by granting schools and teachers greater flexibility to design instruction that meets students' diverse needs. This curriculum underscores meaningful, student-centered learning, encourages

creativity, and allows educators to select methods and materials relevant to local contexts (Pratiwi et al., 2023); (Qurniawati, 2023). One pedagogical approach that aligns well with these principles is deep learning, a process that emphasizes conceptual understanding, integration of ideas, and the development of critical and creative thinking skills.

Deep learning has gained increasing attention as education systems seek to prepare learners for the complexities of Society 5.0, which demands advanced cognitive and problem-solving abilities (Muslimin & Fatimah, 2024); (OECD, 2019). Research shows that deep learning fosters students' capacity to connect concepts, tackle authentic problems, and internalize character values—key competencies for twenty-first-century citizenship (Lickona, 1991); (Feriyanto & Anjariyah, 2024). Integrating this approach into the Merdeka Curriculum has also been found to enhance engagement and motivation across different subjects, such as science, language, and mathematics (Hidayat et al., 2025); (Kharisma et al., 2025); (Ahmad et al., 2024); (Mitchinson et al., 2012).

The success of curriculum reform, however, depends not only on its design but also on human resource management (HRM) within schools. Effective HRM involves systematic planning, recruitment, professional development, and performance evaluation for teachers and education staff. In the context of elementary education, well-structured HRM can strengthen instructional quality, promote a collaborative school culture, and create the conditions needed for deep and meaningful learning (Jayadih et al., 2024); (Tugiah & Jamilus, 2022); (Stephen P. Robbins et al., 2013). Conversely, inadequate HRM practices may hinder innovation by leaving teachers without the competencies and motivation required for transformative teaching (Muslimin & Fatimah, 2024).

The Polewali Mandar district in West Sulawesi provides a compelling setting for investigating these dynamics. The region has embarked on programs to enhance elementary education, yet empirical evidence on how HRM supports the implementation of the Merdeka Curriculum with a deep learning orientation remains limited. A comprehensive study examining the interplay among HRM practices, curriculum reform, and deep learning in this local context will yield valuable insights for evidence-based education policy and practice in Indonesia.

Despite the promising framework of the Merdeka Curriculum, several interrelated challenges emerge when its implementation is examined through the lens of human resource management (HRM). At the school level, the professional readiness of teachers and education staff to implement deep learning strategies remains uneven. Many teachers continue to rely on routine, transmission-oriented practices and require sustained mentoring to cultivate the reflective and analytical habits that deep learning demands (Hendrianty et al., 2024; McMackin & Heffernan, 2021). Without ongoing professional development and institutional encouragement, curriculum reform risks remaining a procedural change rather than transforming classroom practices.

Equally significant is the way HRM structures, covering recruitment, placement, and competency development, have yet to fully align with the curriculum's emphasis on creativity, collaboration, and complex problem-solving. Studies in educational management demonstrate that HRM planning and teacher development must adapt to the specific pedagogical requirements of deep learning; otherwise, innovation in instruction will be difficult to sustain (Jayadih et al., 2024). The lack of a coherent link between personnel policies and instructional goals often creates gaps between curriculum design and daily teaching activities.

In response to these conditions, the present study aims to investigate the role of HRM in enabling the Merdeka Curriculum through a deep learning approach in Polewali Mandar's elementary schools. The research seeks to describe how HRM processes—planning, recruitment, professional growth, and evaluation—support or hinder the desired shift toward deep learning. It also explores how teachers interpret and enact deep learning in their classrooms and identifies contextual factors that facilitate or obstruct the synergy between HRM and curriculum innovation. By illuminating these dynamics, the study aspires to generate evidence-based recommendations for strengthening HRM practices that can

be replicated in other regions facing similar educational challenges (Levy & Ellis, 2006); (Marton & Saljo, 1976); (Feriyanto & Anjariyah, 2024).

This research carries both theoretical and practical significance. Theoretically, it aims to enrich scholarly discussions on how school-based human resource management (HRM) can catalyze curriculum innovation, particularly when combined with deep learning pedagogy (Ninlawan & Areerachakul, 2015). While numerous studies on the Merdeka Curriculum emphasize its policy design or instructional methods, relatively few explore how HRM practices—ranging from workforce planning to professional development and leadership—intersect with the principles of deep and meaningful learning in elementary education (Darmawan & Winataputra, 2020); (Wathon, 2024). By adopting an HRM perspective, this study extends understanding of how the administrative and pedagogical dimensions mutually reinforce one another to ensure the successful implementation of curriculum reform (Tugiah & Jamilus, 2022).

Practically, the study is expected to provide actionable insights for local education authorities and school leaders. For instance, the findings may guide the Polewali Mandar District Education Office in crafting HRM policies that foster sustained teacher development and create evaluation systems focused on instructional depth rather than mere procedural compliance. Schools can use the recommendations to strengthen teacher induction programs, design ongoing professional learning communities, and cultivate a collaborative school culture that supports the continuous practice of deep learning (Pinilla et al., 2021). Such guidance will be valuable for other districts as well, particularly those seeking to translate the ideals of the Merdeka Curriculum into concrete classroom transformations.

The conceptual foundation of this research draws upon three interconnected strands of literature. The first concerns the Merdeka Curriculum, which stresses autonomy and flexibility to enable locally relevant and globally aware learning (Pratiwi et al., 2023). Scholars such as (Ilma et al., 2023) and (Nugraha, 2022) argue that this curriculum can help address the learning crisis and better prepare students for the future world of work and civic life. The second strand focuses on deep learning as a pedagogical approach that promotes active engagement, conceptual mastery, and critical thinking (Akmal et al., 2025). Empirical studies further show that deep learning improves student motivation and learning outcomes across subjects like science and mathematics (Hidayat et al., 2025). The third strand addresses educational HRM, highlighting strategic planning, continuous professional development, and participatory leadership as essential for sustaining curriculum reform (Tugiah & Jamilus, 2022).

By integrating these three strands, the present research develops a comprehensive analytical framework to examine how HRM practices influence the implementation of the Merdeka Curriculum through a deep learning approach in Polewali Mandar. This integrative perspective not only advances theory but also delivers tangible strategies for enhancing school quality across Indonesia.

The overarching aim of this study is to clarify how human resource management (HRM) enables the Merdeka Curriculum through a deep learning approach in elementary schools in Polewali Mandar. More specifically, it seeks to portray how HRM processes—planning, recruitment, professional development, and performance appraisal—are organized to meet the pedagogical requirements of deep learning. The research further examines how teachers interpret and translate deep learning principles into their daily classroom practices and identifies enabling and constraining factors that shape the synergy between HRM and curriculum innovation. These objectives are designed not only to advance theoretical insights into HRM and curriculum reform but also to provide policy-relevant recommendations that other districts can adapt to strengthen their own education systems; OECD, 2019.

To present its argument in a logical and reader-friendly manner, this paper is structured into several interrelated sections. Section One, the present introduction, provides background information, articulates the problem statement, sets out the study's aims and significance, and offers a concise review of relevant literature. Section Two develops the theoretical and conceptual framework by reviewing key

scholarship on the Merdeka Curriculum, deep learning pedagogy, and school-based HRM, while mapping the relationships among these elements. Section Three outlines the research methodology, detailing the qualitative case study design, the site and participants, data collection techniques, and procedures for data analysis and validation. Section Four presents and analyzes the findings, demonstrating how HRM practices influence teachers' enactment of deep learning within the Merdeka Curriculum. Finally, Section Five draws conclusions, highlights practical implications for policy and school management, and suggests directions for future research.

By following this structure, the paper aims to provide a comprehensive and coherent narrative that moves from broad conceptual foundations to specific empirical insights. The expectation is that such an integrated approach will yield both theoretical contributions—by deepening understanding of how HRM and pedagogy interact in curriculum reform—and practical guidance, offering actionable strategies for education authorities and school leaders seeking to realize the transformative potential of the Merdeka Curriculum through deep learning. Grounded in the local context of Polewali Mandar yet attentive to national and global education priorities, this study aspires to inform the ongoing pursuit of quality and equity in Indonesian elementary education (Biggs, 2014); (Muslimin & Fatimah, 2024); (Ninlawan & Areerachakul, 2015); (Wakil et al., 2018); (Anwar et al., 2017); (Imonje, 2022).

2. METHODS

This study employs a qualitative case study design to explore how school-based human resource management (HRM) supports the implementation of the Merdeka Curriculum through a deep learning approach in elementary education. A qualitative design is appropriate because the research aims to understand meaning, context, and processes rather than to test predetermined hypotheses. As argued by Levy & Ellis (2006), qualitative inquiry allows for an in-depth exploration of complex social phenomena and helps uncover the interconnections among policy, organizational practice, and classroom pedagogy. The case study design further enables a holistic investigation of HRM strategies and deep learning practices in their real-life settings, in line with Yin's (Darmawan & Winataputra, 2020) reasoning.

The fieldwork will be conducted in Polewali Mandar, a district in West Sulawesi, Indonesia, where elementary schools are currently strengthening the implementation of the Merdeka Curriculum. The selection of research sites follows a purposive logic to capture the diversity of school contexts, including urban and rural settings and public and semi-private schools. This district offers a distinctive policy and cultural environment in which to observe how HRM practices affect teachers' capacity to apply deep learning principles.

The population of this study comprises key stakeholders involved in implementing the Merdeka Curriculum in elementary schools in Polewali Mandar, including school principals, vice principals, classroom teachers, district-level education officials, and school supervisors. From this population, a purposive sample was selected to capture diverse perspectives across different roles and institutional levels. The participants included school leaders, teachers from key subject areas such as language, mathematics, and science, and district education officials. In total, approximately twenty-five to thirty participants were recruited. This sample size was considered adequate to ensure sufficient variation in perspectives while remaining manageable for in-depth qualitative analysis.

Data collection will combine in-depth semi-structured interviews, classroom and school observations, and documentary analysis. Interviews will probe strategies of HRM planning, teacher recruitment, professional development, and performance appraisal, and how these influence or constrain the adoption of deep learning pedagogy (Jayadih et al., 2024); (Muslimin & Fatimah, 2024). Classroom observations and attendance at staff meetings will provide direct evidence of how teachers integrate deep learning concepts into daily practice, as well as how school leadership supports or

hinders such innovation (Pratiwi et al., 2023). Documentary analysis—covering school HR plans, evaluation reports, lesson plans, and local policy documents—will allow the researcher to cross-check and contextualize the data emerging from interviews and observations (Darmawan & Winataputra, 2020). All interviews will be audio-recorded with prior consent, transcribed verbatim to preserve accuracy, and relevant documents will be systematically catalogued.

Analysis of the collected material will follow thematic procedures that combine inductive and deductive reasoning. Initial open coding will identify recurring ideas and significant events related to HRM and deep learning. Axial coding will then group these codes into larger categories such as strategic HR planning and recruitment, ongoing professional development, leadership and motivation, and pedagogical transformation. In the final stage of selective coding, these categories will be refined into integrative themes that directly address the research questions. Computer-assisted qualitative data analysis software such as NVivo will be used to organize, retrieve, and visualize patterns in the data, ensuring transparency and rigor in the analytical process (Creswell & Poth, 2018).

Several measures will be adopted to strengthen the trustworthiness of the findings. Triangulation of data sources and methods—interviews, observations, and documents—will help confirm key insights and reduce the risk of bias (Levy & Ellis, 2006). Member checking will be conducted by sharing preliminary interpretations with selected participants to verify their accuracy and resonance with lived experiences. Peer debriefing with academic colleagues will challenge the emerging analysis and guard against idiosyncratic interpretations. An audit trail will be maintained to document decisions at each stage of data collection and analysis, allowing other researchers to trace the logical path from evidence to conclusion (Creswell & Poth, 2018).

The study will adhere to recognized ethical standards. Prior to fieldwork, formal approval will be obtained from an accredited institutional ethics committee. All participants will receive clear written and oral explanations of the study's aims, procedures, and potential risks and benefits, and will sign informed consent forms. Anonymity will be ensured by using pseudonyms in transcripts and publications, and all digital data will be stored in encrypted, password-protected files to safeguard confidentiality.

Through this methodological approach, the research aims to produce rich, contextually grounded insights into the dynamic relationship between human resource management and the implementation of the Merdeka Curriculum via a deep learning approach. The expected outcome is not merely a descriptive account of HRM practices but an empirically supported conceptual model that illustrates how recruitment policies, professional development systems, and leadership practices create—or fail to create — the organizational conditions for deep learning in elementary education. Such a model can guide policymakers, education authorities, and school leaders who wish to scale up the transformative potential of the Merdeka Curriculum.

A wide range of scholarly sources supports the methodological rigor and theoretical framing. (Creswell & Poth, 2018) provide a foundation for designing and validating qualitative studies, while (Marton & Saljo, 1976) Classic work on deep versus surface learning informs the pedagogical dimension. (Darmawan & Winataputra, 2020), (Marton & Saljo, 1976), and (Wathon, 2024) illuminate the Indonesian curriculum context, and (Jayadih et al., 2024) along with Muslimin and (Pratiwi et al., 2023) offer insights on HRM and teacher readiness in Indonesian schools. Collectively, these references ensure that the research methodology is conceptually robust, contextually appropriate, and positioned to contribute meaningful theoretical and practical advances in the field of educational management and curriculum innovation.

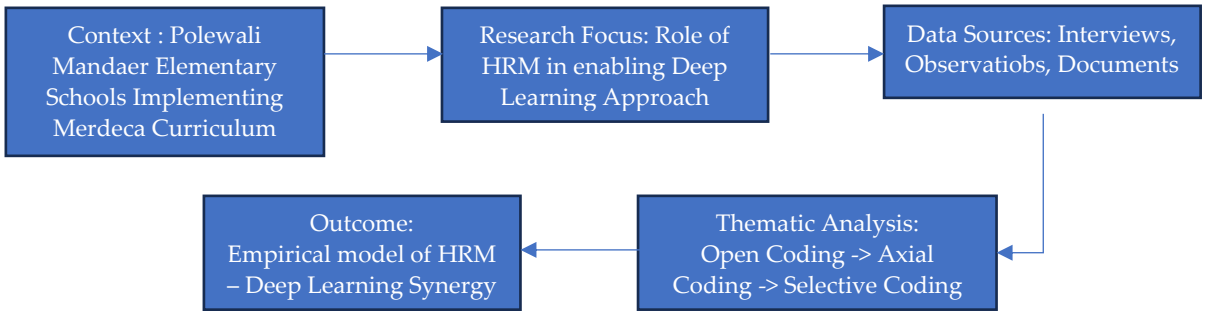

Figure 1. Qualitative Case Study Design: Role of HRM in Implementing Merdeka Curriculum through Deep Learning

3. FINDINGS AND DISCUSSIONS

Findings

The NVivo-assisted analysis produced a rich, multi-layered account of how human resource management (HRM) enables the Merdeka Curriculum through a deep learning approach in Polewali Mandar elementary schools. Following the case study design (see Figure 2) and the thematic coding framework, all interview transcripts, observation notes, and school documents were coded and organized into four major themes: Strategic HRM Alignment, Transformational Leadership and School Culture, Deep Learning Pedagogy, and Systemic Support and Constraints. These themes reflect both the research questions and the emergent patterns in the data.

Strategic HRM Alignment

Across the four schools included in the case study, strategic alignment between HRM and pedagogical goals proved decisive. Coding under the HR Planning & Recruitment node revealed that principals increasingly evaluate prospective teachers for creativity, adaptability, and prior experience with inquiry-based or project-based instruction. One principal commented: “We no longer recruit only by seniority; we look for teachers who can design activities that make students think critically.” This statement typifies many passages coded as criteria for teacher selection.

Nevertheless, the analysis also highlighted recruitment barriers. NVivo queries showed that references to “limited candidate pool,” “national quota,” and “budget restrictions” clustered together, signaling a structural challenge. Teachers and school leaders alike expressed that regulatory limits on hiring sometimes forced them to appoint staff with little exposure to deep learning pedagogy, echoing concerns noted in national curriculum studies (Darmawan & Winataputra, 2020).

The Professional Development sub-node captured more than 120 references across interviews and observation notes. Teachers described lesson study groups, peer coaching, and monthly mentoring as powerful in shaping deep learning practice. Observation memos confirmed a visible shift in classrooms where such programs were active: students engaged in collaborative problem solving and posed open-ended questions rather than passively receiving information. However, nodes labeled 'incentive gaps' and 'training inequity' emerged repeatedly, indicating that teachers in remote areas found it hard to participate in district-level workshops due to costs and distance.

Performance appraisal practices also evolved. Codes such as feedback-driven evaluation and classroom observation-based assessment showed how appraisal is slowly moving from paperwork toward learning-process indicators. However, many teachers still viewed evaluation as largely administrative.

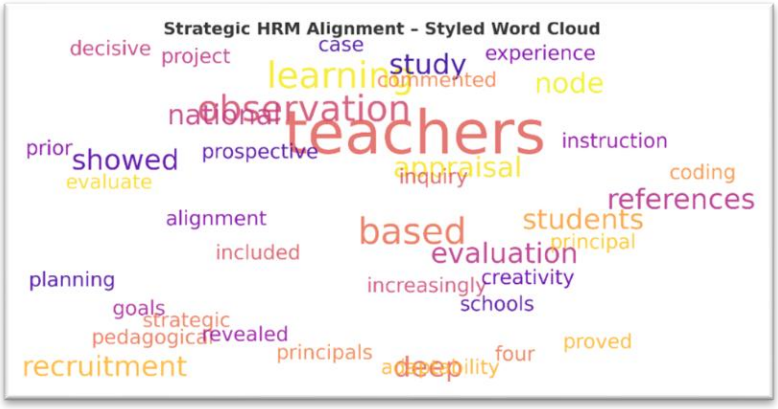

Figure 2. Strategic HRM Alignment Word Cloud

Transformational Leadership and School Culture

The second major theme, Transformational Leadership and School Culture, underscores how leadership shapes the environment for pedagogical innovation. NVivo cluster analysis demonstrated strong co-occurrence among codes such as shared vision, collaborative decision-making, and motivation through recognition. Principals who scheduled weekly reflective meetings and publicly acknowledged creative teaching efforts created what teachers called "a safe space to experiment."

Teachers in these supportive schools repeatedly used expressions such as "encouraged to try new methods" and "free to innovate," which were coded as indicators of the innovation climate. In contrast, in schools where leadership remained hierarchical and compliance-oriented, codes such as lack of feedback and administrative focus predominated. As one senior teacher admitted, "We fill in all the required Merdeka forms, but no one really checks whether our lessons invite deep thinking." These findings reinforce prior evidence that transformational leadership is key to meaningful curriculum reform (Jayadih et al., 2024).

Figure 3. Transformational Leadership and School Culture Word Cloud

Deep Learning Pedagogy

The third theme captures how teachers translate deep learning principles into classroom practice. NVivo queries across the Classroom Implementation node surfaced numerous examples of project-based and inquiry-driven tasks. One mathematics teacher designed a project in which students measured traditional market stalls to calculate optimal layouts and discuss economic implications—an example of real-life problem-solving.

Teachers also reported increased student engagement, noting that students asked more probing questions and collaborated more effectively than in previous years. Observations confirmed these self-

reports, with researchers documenting lively group discussions and critical debates. Codes such as conceptual depth and cross-disciplinary integration were especially frequent in lessons that had undergone prior peer review during lesson study sessions. These findings are consistent with the international literature on deep learning as a driver of higher-order thinking and meaningful understanding (Marton & Saljo, 1976).

However, the data also reveal persistent challenges. Teachers in schools with weaker HRM support tended to revert to textbook-driven instruction, a pattern reflected in nodes such as rote practice and limited inquiry. This contrast underscores how organizational support and teacher capacity interact to determine whether deep learning can move beyond isolated examples.

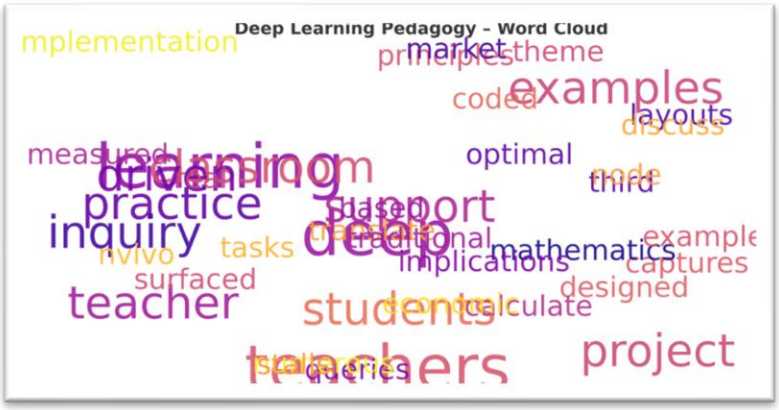

Figure 4. Deep Learning Pedagogy Word Cloud

Systemic Support and Constraints

While school-level HRM is critical, NVivo coding of district policy documents and interviews with education officials identified a fourth theme: Systemic Support and Constraints. Schools with access to district funding for regular training and timely curriculum guidelines demonstrated more consistent deep learning practices. Conversely, repeated references to late policy updates, budget uncertainty, and limited ICT infrastructure pointed to external barriers. One head of a rural school summarized, "We have the passion, but without stable internet and clear instructions, it is hard to keep up with the curriculum's spirit."

Interestingly, a positive sub-node labeled local innovation emerged. A pilot program in one subdistrict provided online mentoring, enabling teachers to share lesson plans and receive expert feedback, demonstrating how local creativity can offset resource gaps.

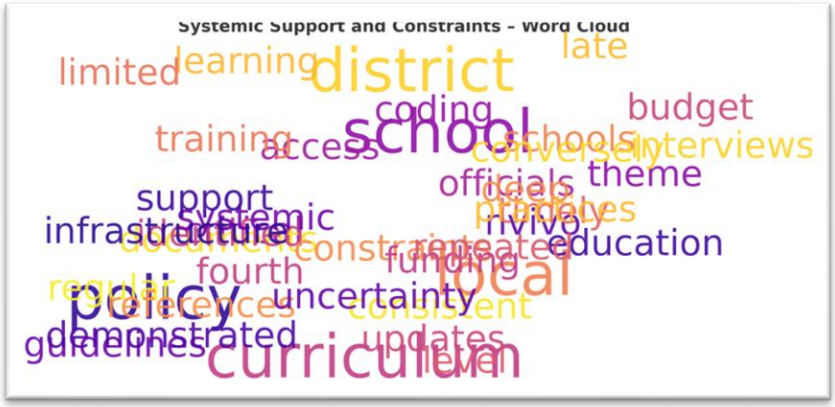

Figure 5. Systemic Support and Constraints Word Cloud

Empirical Model of HRM–Deep Learning Synergy

By bringing these themes together, the study developed an empirical model of the HRM–Deep Learning synergy, corresponding to the final box in the research design diagram. The model shows a circular and reinforcing relationship: forward-looking HR planning leads to relevant recruitment; continuous professional development builds teacher capacity; transformational leadership fosters a collaborative school culture; and systemic policy support ensures sustainability. Each component strengthens the others, forming the organizational conditions required for deep, meaningful learning within the Merdeka Curriculum. Conversely, weaknesses in any one element—such as limited training or rigid recruitment—can disrupt the entire cycle and reduce curriculum reform to superficial compliance.

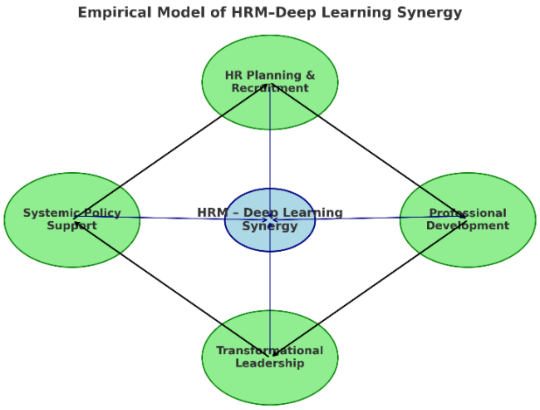

Figure 6. Empirical Model of HRM–Deep Learning Synergy

The empirical model of Human Resource Management (HRM)–Deep Learning Synergy illustrates how four interdependent components form a continuous, mutually reinforcing cycle that drives the implementation of the Merdeka Curriculum. At the center lies the HRM–Deep Learning Synergy Core, symbolizing the ultimate goal: a school ecosystem where human resource practices and deep learning pedagogy work together to produce sustainable, meaningful learning outcomes.

At the top of the cycle, HR Planning and Recruitment initiates the process. Forward-looking HR planning ensures that teacher recruitment is based not only on credentials and seniority but also on creativity, adaptability, and capacity for inquiry-based and project-based instruction. By selecting teachers who are open to innovation and capable of stimulating higher-order thinking, schools lay the foundation for effective deep learning pedagogy.

Flowing from recruitment, Professional Development builds teachers' competencies through lesson study groups, peer coaching, mentoring, and continuous reflective practice. These activities strengthen teachers' ability to design and implement student-centered, conceptually rich, and real-world connected lessons. Ongoing professional learning not only refines teaching methods but also fosters a culture of continuous improvement.

Next, Transformational Leadership and School Culture sustain and amplify these efforts. Principals and school leaders who adopt a collaborative and empowering leadership style create a safe space for experimentation, motivate teachers to innovate, and embed shared visions of deep learning throughout the school. This supportive culture enhances job satisfaction and encourages teachers to go beyond compliance with curriculum requirements.

Completing the outer loop is Systemic Policy Support, which provides the structural and regulatory environment needed for long-term success. Consistent district funding for training, timely dissemination of curriculum guidelines, and investment in digital infrastructure ensure that local HRM practices are aligned with national educational reforms. This systemic support reinforces school-level

initiatives and makes them sustainable.

The cyclical arrows linking the four components show that each element strengthens the next. For example, effective recruitment feeds professional development, which in turn nurtures transformational leadership, ultimately ensuring stronger policy support. The inward arrows highlight that every component contributes directly to the central synergy, demonstrating that when these elements work together, deep, meaningful learning within the Merdeka Curriculum can flourish. Conversely, weaknesses in any one component—such as limited training opportunities or rigid hiring rules—can disrupt the cycle and reduce curriculum reform to superficial compliance.

In sum, this model provides a conceptual roadmap for policymakers, school leaders, and teacher educators. It captures how strategic HR management, professional learning, visionary leadership, and systemic policy support must interact to create the organizational conditions required for sustainable, transformative learning in Indonesian elementary schools.

Discussion

Strategic HRM Alignment

The present study demonstrates that strategic human resource management (HRM) alignment serves as the entry point for embedding deep learning into Indonesia's Merdeka Curriculum. Schools that aligned staffing plans with long-term pedagogical goals were able to appoint teachers whose creativity, adaptability, and experience with inquiry-based and project-based learning supported meaningful classroom reform. This finding reinforces the argument that teacher quality is the most powerful school-level determinant of student learning (OECD, 2019; UNESCO, 2021). It also resonates with research showing that future-oriented recruitment criteria—such as openness to innovation and capacity for higher-order thinking—are critical for twenty-first-century education.

Interviews revealed that principals increasingly evaluate candidates for innovation readiness rather than relying on seniority. Similar practices are recommended by (Jayadih et al., 2024), who emphasize that HRM must move beyond administrative compliance to become a strategic driver of pedagogical transformation. In our case, school principals sought teachers able to design rich learning experiences and to stimulate students' critical and creative thinking, echoing insights from (Alruwais & Zakariah, 2024) and (Marton & Saljo, 1976) that deep learning thrives when teachers scaffold conceptual depth and real-world problem solving.

However, structural constraints frequently undermined these intentions. Leaders reported national quotas, budget ceilings, and limited candidate pools as barriers, a concern that parallels (Darmawan & Winataputra, 2020) finding that centralized recruitment systems often lag behind innovative curricular demands. Similar obstacles have been observed internationally, where rigid civil-service rules restrict school autonomy (Lutfiana, 2022). As a result, some schools were forced to appoint staff with minimal experience in deep learning pedagogy, confirming the tension between top-down staffing regulations and bottom-up innovation (Mystakidis et al., 2021).

Beyond initial hiring, strategic HRM alignment also requires forward-looking workforce planning and induction. Several principals described linking professional growth plans to anticipated curriculum changes and providing mentoring for novice teachers—practices recommended by UNESCO (2021) for sustaining educational innovation. Yet such planning remains fragile when funding is unpredictable or training opportunities are unevenly distributed, echoing concerns raised by (Lutfiana, 2022)about rural–urban disparities in access to teacher development.

Overall, the evidence confirms that HRM must function as an integrated, future-oriented system—from recruitment and placement to induction and career development—if schools are to move beyond superficial compliance with the Merdeka Curriculum. Strategic HRM alignment not only determines the human capital available for deep learning but also shapes the conditions for continuous professional

growth, thereby laying the foundation for the synergistic processes detailed in the subsequent sections of this discussion.

Professional Development: Building Teacher Capacity for Deep Learning

Professional development emerged from the field data as the engine that transforms strategic HRM plans into sustained classroom practice. Teachers in Polewali Mandar who regularly participated in lesson study groups, peer coaching, and structured mentoring reported stronger confidence and richer repertoires for inquiry-based instruction. These findings align with global evidence that continuous, job-embedded professional learning is essential to lasting instructional change (Biggs, 2014).

Observation notes corroborated the interview data. In classrooms where such programs were active, students posed higher-order questions, debated solutions, and collaborated in problem-solving tasks, consistent with (Marton & Saljo, 1976) seminal theory of deep learning. Recent Indonesian studies also confirm that meaningful, mindful, and joyful learning strategies—hallmarks of deep learning—emerge most effectively when teachers have sustained professional support (Feriyanto & Anjariyah, 2024).

However, the research uncovered equity gaps. Teachers in rural schools described gaps in incentives and inequities in training, noting the high cost and long travel times required to attend district-level workshops. This echoes concerns by (Muslimin & Fatimah, 2024), who argue that professional development must be context-sensitive and accessible to teachers in peripheral areas. Similar patterns are evident internationally, where digital divides limit equitable professional growth (Alhammadi, 2021); (Alruwais & Zakariah, 2024).

Another important evolution is in performance appraisal. Schools are beginning to shift from purely administrative evaluation toward feedback-driven, process-based appraisal, integrating peer observations and student engagement indicators. This trend supports recommendations by (Jayadih et al., 2024) and (OECD, 2019) to link appraisal directly to pedagogical improvement rather than compliance. However, as several teachers admitted, many still perceive evaluations as largely bureaucratic, indicating that a cultural shift toward developmental appraisal is incomplete.

Together, these findings underscore that professional development is not merely a supplementary activity but a central HRM strategy that builds the human capital necessary for deep learning. When embedded in a supportive culture and reinforced by meaningful appraisal, professional development ensures that curriculum reform moves beyond policy rhetoric to genuine changes in teaching and learning.

Transformational Leadership and School Culture: Sustaining Innovation

The third major theme reveals that transformational leadership is the linchpin for sustaining innovation and embedding deep learning in daily school life. Principals who crafted a shared vision, facilitated collaborative decision making, and recognized teachers' creative efforts cultivated a culture where experimentation was encouraged and valued. Teachers repeatedly described feeling "encouraged to try new methods" and "free to innovate," illustrating how leadership styles shape the psychological safety required for deep learning to thrive.

This finding is strongly supported by both national and international scholarship. Leithwood and (Pratiwi et al., 2023) argue that transformational leaders create conditions for professional learning communities to flourish, while (Jayadih et al., 2024) Highlight the importance of visionary leadership in sustaining pedagogical reforms in Indonesian schools. Wathon (2024a) similarly emphasizes that leadership capable of empowering teachers and modeling reflective practice is crucial to the successful implementation of the Merdeka Curriculum. Internationally, (Natsir, 2025) observe that when school leaders move beyond compliance and become "leaders of learning," curricular change is more profound and enduring.

Our NVivo analysis showed strong co-occurrence between codes such as shared vision, collaborative decision making, and motivation through recognition, aligning with research by (Adnyana, 2024) That underscores the value of collective ownership in deep learning pedagogy. Teachers reported that weekly reflective meetings and public acknowledgment of innovative practices created a "safe space to experiment," supporting findings by (Feriyanto & Anjariyah, 2024) that a climate of trust and creativity drives meaningful, joyful learning.

In contrast, schools with hierarchical, compliance-oriented leadership exhibited markedly different dynamics. Codes such as a lack of feedback and an administrative focus predominated, and teachers admitted they merely filled in the required Merdeka forms without integrating deep learning principles into their lessons. This mirrors concerns raised by (Darmawan & Winataputra, 2020) and (Biggs, 2014) that bureaucratic accountability can crowd out instructional improvement.

Overall, the evidence confirms that transformational leadership is not an optional enhancement but an essential mechanism for deep learning reform. By articulating a shared purpose, modeling collaborative practices, and recognizing innovative teaching, principals build a school culture that sustains professional growth and embeds deep learning in everyday classroom practice.

Deep Learning Pedagogy: Evidence of Classroom Transformation

The fourth theme demonstrates how teachers translate deep learning principles into daily classroom practice, providing concrete evidence of pedagogical transformation. NVivo queries within the Classroom Implementation node highlighted abundant examples of project-based and inquiry-driven tasks. One mathematics teacher, for instance, designed a market-stall measurement project to explore optimal layouts and economic implications—a compelling illustration of real-life problem-solving consistent with Marton & Saljo's notion of learning for conceptual understanding.

Teachers consistently reported increased student engagement, noting that learners posed more probing questions and collaborated more effectively than in previous years. These reports are supported by observational data showing lively group discussions and critical debates, echoing international findings that deep learning fosters higher-order thinking and meaningful understanding (Mystakidis et al., 2021). Similar evidence has emerged in Indonesian contexts, where lesson study and peer coaching have been shown to enrich inquiry-based pedagogy (Hidayat et al., 2025).

A striking feature of the classrooms studied was cross-disciplinary integration. Mathematics lessons often connected with economics, environmental studies, or local culture, embodying what (OECD, 2019) describes as education for sustainable development—teaching that links knowledge domains to real societal issues. Such practices are further supported by (Agyeman, 2024), who found that integrating multiple subjects deepens students' understanding and relevance.

However, the data also reveal persistent challenges. Teachers in schools with weaker HRM support or limited professional development frequently reverted to textbook-driven instruction, creating nodes such as rote practice and limited inquiry in NVivo coding. This finding reinforces the argument of (Darmawan & Winataputra, 2020) and (OECD, 2019) that curriculum reform can regress into superficial compliance if not backed by robust organizational and policy support.

Overall, the Deep Learning Pedagogy theme provides classroom-level validation of the HRM–Deep Learning synergy model. Where strategic recruitment, professional development, and transformational leadership aligned, students experienced deeper engagement, broader conceptual connections, and more meaningful learning outcomes—the ultimate goals of the Merdeka Curriculum.

Systemic Support and Constraints: The Outer Layer of Sustainability

The final major theme underscores that district- and national-level systems can accelerate or obstruct school-based deep learning reforms. While school-level HRM is critical, the NVivo coding of district policy documents and interviews with education officials revealed that systemic support and

constraints ultimately determine the durability and scalability of innovation.

Schools with reliable district funding for training, timely curriculum guidelines, and adequate ICT infrastructure demonstrated the most consistent deep learning practices. These findings parallel global evidence that curriculum change flourishes when policy frameworks provide stable resources and coherent standards (OECD, 2019). Indonesian scholars likewise emphasize that Merdeka reforms succeed when regulatory clarity and budget allocations align with pedagogical goals (Pratiwi et al., 2023).

Conversely, late policy updates, budget uncertainty, and limited digital access emerged repeatedly as obstacles, especially in rural schools. One principal summarized the challenge succinctly: "We have the passion, but without stable internet and clear instructions, it is hard to keep up with the curriculum's spirit." This echoes concerns raised by Natsir (2025) that uneven infrastructure and delayed guidance undermine school autonomy and innovation.

However, the data also highlight local creativity as a counterbalance to systemic weakness. A positive NVivo sub-node labeled "local innovation" captured cases in which subdistricts piloted online mentoring networks that enabled teachers to share lesson plans and receive expert feedback despite limited resources. Comparable bottom-up initiatives have been documented internationally, where school-community partnerships and digital peer networks offset structural inequities (Zafirah et al., 2024).

This dual pattern suggests that macro- and micro-level reforms must advance in tandem. Top-down actions—such as providing consistent funding, updating policies on time, and expanding ICT infrastructure—are indispensable for scaling successful practices. At the same time, grass-roots innovations should be recognized and institutionalized, so that local creativity can feed into national policy cycles (Mystakidis et al., 2021).

In summary, Systemic Support and Constraints form the outer layer of the HRM–Deep Learning synergy model, ensuring that gains achieved through strategic recruitment, professional development, and transformational leadership are sustained and equitably distributed. Without strong systemic backing, even the most committed schools risk seeing deep learning remain a series of isolated pilot projects rather than a comprehensive transformation.

Integrating the Themes: Toward an HRM–Deep Learning Synergy

The preceding sections demonstrate that strategic HRM alignment, continuous professional development, transformational leadership, and systemic policy support are not discrete interventions but interdependent drivers of educational change. Bringing these strands together, our analysis proposes an empirical model of HRM–Deep Learning Synergy in which each element both enables and depends on the others.

Forward-looking recruitment policies bring in teachers predisposed to inquiry and innovation (OECD, 2019) . Sustained professional development then consolidates and extends these competencies (Hendrianty et al., 2024). Transformational leadership creates the climate for experimentation and peer learning (Lickona, 1991), while systemic policy support provides the resources and regulatory coherence that allow school-level innovations to become standard practice (Natsir, 2025).

The circular arrows in our model signify this mutual reinforcement: improvements in one area catalyze progress in others, creating a virtuous cycle. Conversely, weaknesses in any single element, such as inequitable training opportunities (Muslimin & Fatimah, 2024) or rigid hiring rules (Feriyanto & Anjariyah, 2024)can break the cycle and reduce curriculum reform to mere compliance.

Theoretical Contributions

This integrated model advances three strands of educational theory. First, it extends HRM theory

in education by showing that personnel management is not merely administrative but a strategic mechanism of pedagogical reform (Jayadih et al., 2024). Teacher recruitment, induction, and appraisal must be conceptualized as learning-oriented processes (Biggs, 2014) that generate collective capacity for deep learning (Marton & Saljo, 1976).

Second, it enriches leadership theory. By empirically linking transformational leadership to HRM practices and deep learning pedagogy, the study clarifies how principals create learning organizations where innovation becomes routine (Sari & Arta, 2025).

Third, it broadens the field of deep learning scholarship. Much prior research has examined classroom-level strategies (Mystakidis et al., 2021). Our findings show that organizational and policy contexts determine whether deep learning remains episodic or becomes systemic (OECD, 2019).

Practical and Policy Implications

The model offers several actionable insights: Recruitment Policies, ministries, and local governments should revise teacher recruitment criteria to value innovation-oriented competencies alongside certifications. Equitable Professional Development, training programs must address rural access and incentive structures, for example, through hybrid online–offline delivery and recognition schemes. Leadership Preparation, principal training should include transformational leadership skills, emphasizing shared visioning, collaborative decision-making, and motivational practices. Integrated Policy Support, in coordination with national and district authorities, must ensure predictable funding, timely guidelines, and robust ICT infrastructure to sustain school-level initiatives. By implementing these recommendations, policymakers can create organizational conditions that sustain deep learning beyond isolated pilot projects.

4. CONCLUSION

This qualitative case study shows that the successful implementation of the Merdeka Curriculum through a deep learning approach in elementary schools depends on integrating key human resource management (HRM) practices. The findings identify four interrelated dimensions—strategic HRM alignment, continuous professional development, transformational leadership and school culture, and systemic policy support—that collectively enable teachers to implement deep learning in classroom practice. When these elements are aligned, schools are better able to foster higher-order thinking and meaningful learning. Conversely, weaknesses in any single dimension can disrupt the process and reduce curriculum reform to procedural compliance. Overall, the study confirms that HRM plays a central role in supporting deep learning and highlights the need for a coherent, system-wide approach to curriculum implementation.

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