

HUMAN RESOURCE SKILLS DEVELOPMENT STRATEGIES BASED ON LOCAL WISDOM IN THE INDUSTRY 4.0 ERA

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Abstract

This study aims to explore how local cultural values are integrated into human resource development (HRD) strategies to address workforce transformation in the Industry 4.0 era. This phenomenon is critical as technological advancements demand training models that not only focus on technical competencies but also incorporate local social and cultural contexts. A qualitative approach with a case study design was employed to investigate a community-based training program in a local Indonesian training institution. Data were collected through semi-structured interviews, participant observation, and document analysis involving five key informants selected through purposive and snowball sampling techniques. Thematic analysis revealed three major themes: the internalization of gotong royong (mutual cooperation) in the training curriculum, reinforcement of local work ethic as a foundation for discipline, and collective responsibility as a collaborative learning strategy. The findings indicate that HRD programs based on local values can foster a more participatory, adaptive, and contextually relevant learning ecosystem. Theoretically, this study contributes to the enrichment of Human Capital Theory, Transformational Learning, and Cultural Embeddedness frameworks. Practically, it offers an alternative community-based training model that supports workforce readiness amidst industrial transitions. The study recommends the development of national training policies that are more responsive to local cultural contexts.

SDM, Keterampilan, Kearifan Lokal, Industri 4.0, Transformasi Pekerjaan

Penelitian ini bertujuan untuk mengeksplorasi bagaimana nilai-nilai kearifan lokal diintegrasikan dalam strategi pengembangan keterampilan sumber daya manusia (SDM) untuk menghadapi transformasi pekerjaan di era Industri 4.0. Fenomena ini menjadi penting karena perkembangan teknologi menuntut model pelatihan yang tidak hanya berorientasi pada kompetensi teknis, tetapi juga mempertimbangkan aspek sosial dan budaya lokal. Pendekatan yang digunakan adalah kualitatif dengan desain studi kasus, yang memungkinkan eksplorasi mendalam terhadap praktik pelatihan berbasis komunitas di salah satu lembaga pelatihan lokal di Indonesia. Data dikumpulkan melalui wawancara semi-terstruktur, observasi partisipatif, dan dokumentasi terhadap lima informan yang dipilih menggunakan teknik purposive dan snowball sampling.

Hasil analisis tematik mengungkap tiga tema utama: internalisasi nilai gotong royong dalam kurikulum pelatihan, penguatan etos kerja lokal sebagai dasar disiplin, dan tanggung jawab kolektif sebagai strategi pembelajaran kolaboratif. Temuan ini menunjukkan bahwa pelatihan

SDM yang berbasis nilai lokal mampu menciptakan ekosistem belajar yang lebih partisipatif, adaptif, dan relevan secara kontekstual. Secara teoretis, penelitian ini memperkaya perspektif Human Capital Theory, Transformational Learning, dan Cultural Embeddedness. Secara praktis, model ini dapat menjadi alternatif pelatihan berbasis komunitas yang mendukung kesiapan kerja di tengah perubahan industri. Penelitian ini merekomendasikan pengembangan kebijakan pelatihan nasional yang lebih responsif terhadap konteks budaya lokal.

1. INTRODUCTION

The rapid advancement of global digital technology, driven by the Fourth Industrial Revolution (Industry 4.0), has significantly transformed the nature of work and human resource (HR) competencies worldwide, including in Indonesia. Globally, automation and artificial intelligence (AI) are reshaping job roles, demanding adaptive, collaborative, and critical-thinking skills from the workforce. In Indonesia, reports indicate that many workers, including educators, are still inadequately prepared to adapt, as they rely heavily on conventional training systems that fail to integrate digital technologies effectively. Preliminary observations show that in various regions, training programs often prioritize technical skills while neglecting soft skills and the incorporation of local cultural values—despite the fact that these cultural values serve as strong motivators and commitment drivers among participants.

This gap between digital skill demands and the weak integration of local wisdom is a critical issue that deserves scholarly attention, particularly from socio-cultural and educational perspectives. Local wisdom-based approaches—such as the values of mutual cooperation (gotong royong), communal responsibility, and place-based identity—have proven effective in strengthening participant character and enhancing the relevance of learning in the digital era [2]. However, recent literature (2020–2024) has rarely explored the subjective meanings, lived experiences, and internalization processes of these local values in the context of HR development for Industry 4.0 [3], [4]. Most existing studies are descriptive or prescriptive in nature, with limited qualitative exploration into how culture is meaningfully embedded within capacity-building programs.

To fill this research gap, the present study aims to explore strategies for developing workforce competencies through the integration of local wisdom, focusing on participants' lived experiences and meaning-making processes. Employing a

qualitative methodology through case studies and in-depth interviews, this research investigates how local cultural values are contextualized in digital training and how they affect participant motivation, engagement, and learning outcomes. Theoretically, the study contributes to Human Capital Theory and Transformational Learning by introducing cultural capital as a critical dimension of human development in the digital age. Practically, the study offers a holistic and culturally grounded model for HR development, serving as a relevant alternative for policymakers, educational institutions, and industries in designing inclusive and future-ready workforce training in the context of Industry 4.0.

LITERATURE REVIEW

The Concept of 21st-Century Skills and the Industry 4.0 Context

The Fourth Industrial Revolution (Industry 4.0) demands a fundamental shift in workforce competencies, emphasizing not only technical abilities but also soft skills such as critical thinking, creativity, collaboration, communication, and digital literacy. The World Economic Forum (2020) states that 21st-century skills are essential for preparing an adaptive and competitive workforce amid automation and digitalization. Papagiannis and Pallaris (2024) showed that makerspace-based learning environments significantly support the development of these skills in higher education settings [2]. However, there remains a lack of empirical studies exploring how these competencies are internalized through culturally embedded training approaches, particularly in developing countries like Indonesia.

Human Resource Development and Transformational Learning in the Digital Era

Human Capital Theory (Becker, 1993) posits that investment in education and training enhances individual productivity. Nevertheless, in the context of digital transformation, this theory must be complemented by deeper learning approaches. Transformational Learning Theory (Mezirow, 1991) emphasizes the importance of critical reflection and experiential learning capable of transforming individuals' perspectives. Research by Li et al. (2022) emphasized that reskilling and upskilling are key in preparing a future-ready workforce, underscoring the importance of lifelong learning strategies in HR development [3]. However, studies integrating transformational learning processes into HRD programs grounded in local cultural values remain scarce, especially in the Indonesian context.

Local Wisdom as Social Capital and Cultural Embeddedness

Local wisdom—such as mutual cooperation (gotong royong), collective responsibility, and harmony with nature—acts as a form of social capital that strengthens motivation, participation, and social cohesion in learning processes. Cultural Embeddedness Theory (Granovetter, 1985) argues that organizational and economic behavior is strongly influenced by cultural values and existing social relationships. Armaidy and Limbongan (2022) demonstrated that local wisdom-based social capital played a crucial role in strengthening community resilience during the COVID-19 pandemic [4]. Likewise, Putri and Sumartik (2024) found that leadership incorporating local values improved employee engagement and performance [5]. Despite these findings, theoretical and empirical discussions on integrating local wisdom into HRD strategies—especially in digital training—remain limited.

Theoretical Gaps and Conceptual Framework

Although the literature has recognized the significance of 21st-century skills, transformational learning, and local cultural values in human resource development, a clear theoretical and empirical gap exists in integrating these three components into a comprehensive conceptual framework. Most studies are descriptive in nature and confined to formal education sectors, lacking exploration of subjective meaning, reflective learning processes, and cultural value internalization in digital-based HR training. Therefore, this study proposes a conceptual framework that combines Human Capital Theory, Transformational Learning, and Cultural Embeddedness Theory to understand how local cultural values can be strategically integrated into HR development. This framework serves as the analytical foundation for qualitative research to explore how culturally grounded training shapes digital and adaptive competencies in the context of Industry 4.0.

2. RESEARCH METHOD

This study employs a qualitative case study approach, selected for its strength in exploring complex social phenomena within their real-life context. The case study method is particularly suitable for investigating how human resource development (HRD) strategies grounded in local wisdom are applied in digital training programs during the Industry 4.0 era. The research was conducted between August and October 2024 in a community-based vocational training center affiliated with a local SME

cluster. The study focused on 3 to 5 key informants, including program managers, trainers, and training participants. Informants were selected using purposive sampling based on their direct involvement and experience in the program. To expand the network of participants, snowball sampling was also used, where initial informants referred other relevant individuals with contextual insights.

Data were collected through method triangulation, including semi-structured interviews, participatory observation, and document analysis. In-depth interviews were conducted to explore personal experiences, perceptions, and the integration of local cultural values in digital training materials. Participant observation allowed the researcher to record real-time interactions, group dynamics, and learning processes during training sessions. Supporting documents such as syllabi, training modules, photos, and meeting notes were also reviewed to enrich data interpretation. To ensure data validity, member checking was conducted by returning transcripts to informants for confirmation, and triangulation of methods and sources was applied to ensure the consistency and credibility of the findings.

Data were analyzed using the thematic analysis method as proposed by Braun and Clarke (2012), involving six stages: familiarization with data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. All transcripts were coded using qualitative data analysis software to ensure a systematic approach. A reflexive journal was maintained to record the researcher's observations and minimize subjective bias during interpretation. This method allowed the identification of recurring patterns (e.g., how local values such as gotong royong were embedded in training) and their relevance to digital competency development. This methodological framework is rigorous, transparent, and replicable within the natural limitations of qualitative research.

3. RESULTS AND DISCUSSION

Research Findings

The analysis of interview transcripts, participant observations, and documentation revealed three major themes that characterize strategies for skills development based on local wisdom within community-based digital training programs. These themes include: (1) The Internalization of Gotong Royong (Mutual Cooperation) Values in the Training Curriculum, (2) Local Work Ethic as the Foundation for Discipline and Productivity, and (3) Collective Responsibility as a Collaborative Learning Strategy.

The value of gotong royong was embedded in project-based training practices where participants were encouraged to work collaboratively and assist each other in mastering digital tools. One participant stated, “When we work together, learning digital skills becomes easier. If someone is confused, others help immediately. We’re not left to struggle alone.” Observations confirmed that this spirit of cooperation accelerated the adaptation process for participants who initially had limited exposure to technology.

Additionally, instructors incorporated local values of diligence, respect, and perseverance into the training through reflective sessions and storytelling rooted in local culture. These values laid a strong foundation for shaping positive work attitudes. The theme of collective responsibility emerged in the shared roles and continuity of the program, where more experienced participants took on mentorship roles for newcomers, fostering a sustainable, peer-supported learning system derived organically from the community.

Discussion

These findings suggest that locally rooted approaches significantly enhance the effectiveness of human resource training—particularly in shaping work ethics, collaboration, and digital readiness. This aligns with Cultural Embeddedness Theory (Granovetter, 1985), which asserts that economic and organizational behavior is deeply influenced by the social and cultural contexts in which individuals operate. The participants’ active engagement within their learning community created a socially interconnected learning ecosystem that reinforced outcomes through informal learning and cultural values.

Compared to conventional training models—often individualistic and content-centered—the local wisdom-based strategy proved to be more contextual and adaptive, especially for rural or semi-urban participants. This supports Li et al. (2022), who emphasized the importance of experience-based and contextualized reskilling. Furthermore, the training model illustrates the principles of Transformational Learning Theory (Mezirow, 1991), as participants experienced shifts in mindset and work attitudes through reflection and collaborative experience.

Theoretically, the findings strengthen the argument for integrating Human Capital Theory with culturally embedded learning approaches to develop programs that build not only technical competence but also social values and sustainable work behaviors. Practically, this study presents a replicable model of community-based training that can

be tailored to other regions using their respective local values. Future research is recommended to explore how this model could be expanded to a larger scale and integrated into national-level human resource development policies focused on community and cultural resilience.

4. CONCLUSION

This study has revealed that human resource development strategies that integrate local cultural values—such as gotong royong (mutual cooperation), work ethic, and collective responsibility—can positively impact the effectiveness of training programs in the digital era. Through a qualitative case study approach, the findings demonstrate that local cultural values not only enhance participant engagement but also foster a collaborative and contextually relevant learning ecosystem.

These insights contribute significantly to the broader understanding of how HR development can be contextualized within the socio-cultural identity of local communities, enriching the application of Human Capital Theory, Transformational Learning, and Cultural Embeddedness in practice. Theoretically, this research highlights the need for interdisciplinary approaches that incorporate cognitive, affective, and socio-cultural dimensions in developing 21st-century skills. From a practical perspective, the findings offer valuable guidance for designing inclusive and sustainable community-based training programs, particularly in regions with strong local cultural heritage. In terms of policy implications, national and regional HR training programs should consider the integration of local wisdom as a strategic component in enhancing workforce competitiveness in the context of Industry 4.0.

However, this study is limited by its focus on a single community training setting, which restricts the generalizability of its findings. Therefore, future research is recommended to explore similar models across diverse regions and types of training programs, as well as to examine the long-term impact of cultural integration on learning outcomes and workplace productivity. Subsequent studies may also consider developing culture-based evaluation frameworks to measure training effectiveness more comprehensively.

5. REFERENCES

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