

Human Resource Development in Education: systematic literature review

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Information of Article	Abstract
<p><i>Article history:</i> Received: June 2025 Revised: July 2025 Accepted: August 2025 Available Online: Aug 2025</p> <p><i>Keywords:</i> Human Resource Development, Education, Systematic Literature Review, Competency-Based Frameworks, Digital HRD</p>	<p>This systematic literature review (SLR) examines the evolving field of Human Resource Development (HRD) in education, synthesizing insights from 42 peer-reviewed articles published between 2014 and 2024. Guided by PRISMA methodology, the review explores how HRD has been conceptualized, implemented, and measured across diverse educational contexts. Key themes identified include competency-based HRD frameworks, the integration of digital technologies and artificial intelligence in professional development, sustainable and green HRD practices, inclusive and intergenerational learning approaches, and the alignment of HRD with national human capital development goals. The findings indicate that HRD has become a strategic function in educational institutions, contributing not only to educator effectiveness and institutional performance but also to broader societal outcomes such as equity, innovation, and sustainable development. However, the review also reveals significant challenges, including conceptual ambiguity, limited empirical evaluation, technological inequity, and underrepresentation of Global South perspectives. Future research is needed to develop context-sensitive, impact-driven, and ethically grounded HRD models that respond to the complex demands of 21st-century education. This review contributes to the field by offering a comprehensive synthesis of current trends, identifying critical research gaps, and providing a roadmap for advancing HRD as a transformative force in education.</p>

1. Introduction

Human Resource Development (HRD) plays a pivotal role in shaping the success and sustainability of educational institutions in the 21st century. In the context of education, HRD extends beyond traditional staff training and includes strategic investments in the continuous learning, development, and empowerment of educators, administrators, and institutional leaders. It involves a comprehensive set of practices aimed at enhancing human capabilities, fostering innovation, improving institutional performance, and responding to socio-economic and technological shifts. As the global landscape of education becomes increasingly complex, driven by digital transformation, globalization, sustainability imperatives, and workforce expectations, HRD has emerged as a key driver of educational effectiveness and adaptability (Obazuaye, 2024; Abdullah & Sahid, 2023). HRD in educational settings is therefore not limited to individual development but also encompasses organizational learning, talent management, strategic planning, and capacity-building, all of which contribute to the broader objective of cultivating human capital for national and global development (Findler et al., 2019; Arokiasamy et al., 2023).

Over the last two decades, a growing body of literature has examined the relationship between HRD and educational outcomes. Studies highlight the importance of investing in human capital through targeted learning and development initiatives, leadership development programs, and performance enhancement strategies (Galorio et al., 2024; Adula et al., 2022). In particular, research has increasingly acknowledged the role of HRD in fostering innovation in pedagogy, integrating technology in teaching, and promoting inclusive and equitable learning environments (Chuang & Graham, 2018; Bhatt & Muduli, 2023). Furthermore, sustainable human resource development practices, such as green HRM and socially

responsible HRM, are becoming essential as educational institutions align their operations with global sustainability goals (Macke & Genari, 2019; Omid & Dal Zotto, 2022). These shifts signify an expanded understanding of HRD, one that transcends traditional operational functions and is aligned with strategic goals related to sustainability, mental health, digitalization, and lifelong learning.

Despite these advancements, the literature on HRD in education remains fragmented and lacks an integrated framework that comprehensively captures its strategic, operational, and technological dimensions. Much of the existing research is either conceptual or context-specific, focusing on isolated aspects such as employee well-being, HR analytics, or competency development, without fully exploring the interrelationships among these elements (Ekuma, 2024; Mahdia, 2024). For example, while some studies examine the impact of HRD on institutional performance in higher education (Ramly & Handrianto, 2024), others focus on the development of human capital as a driver of economic growth without grounding the analysis in educational policy or institutional practice (Gemawati & Kholifaturrohman, 2023). Moreover, HRD in education across different geographical contexts, particularly in low-resource and developing countries, has not received sufficient attention, creating a gap in comparative research that could inform more inclusive policy approaches (Anlesinya & Susomrith, 2020; Hoque & Atheef, 2024). These gaps highlight the need for a systematic synthesis of the current literature to assess where the field stands and where it needs to evolve.

A systematic literature review (SLR) is thus essential to capture the breadth and depth of existing research, trace conceptual developments, and identify gaps in the field of HRD within education. By synthesizing findings from a wide range of studies, including those focused on higher education, public policy, sustainability, and technological change, this review offers a holistic view of how HRD is currently theorized and practiced in educational institutions. It also maps the dominant themes emerging from the literature, such as the growing use of artificial intelligence in HR processes (Votto et al., 2021; Ramachandran et al., 2024), the emphasis on intergenerational knowledge transfer (Leon, 2023), and the integration of HRM systems in school governance (Putri, 2023). These insights are critical for both scholars and practitioners seeking to understand the evolving role of HRD in fostering educational transformation and institutional resilience. Ultimately, this review aims to provide a foundational reference point for future research and policy-making by addressing the following guiding questions: How has HRD in education evolved over time? What are the dominant themes, innovations, and challenges in HRD practices within education? And what gaps remain that future research must address to strengthen HRD as a transformative force in education?

2. Methodology

This review adopts a systematic literature review (SLR) approach to rigorously examine the state of research on Human Resource Development (HRD) in education. The process is grounded in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology, which provides a standardized framework for conducting transparent and replicable literature reviews (Rocco et al., 2023). The SLR method was selected due to its suitability in synthesizing large volumes of research, identifying thematic trends, and exposing conceptual and methodological gaps within a defined area of study. By following this structured review protocol, the study ensures comprehensive coverage of existing literature while maintaining the validity and reliability of its findings. The systematic review process consisted of four main phases: identification, screening, eligibility, and inclusion, as recommended by the PRISMA

guidelines. During the identification phase, an extensive search was conducted across several academic databases including Scopus, Web of Science, ERIC, JSTOR, and Google Scholar. These databases were selected due to their broad interdisciplinary coverage and their indexing of high-impact journals in education, human resource development, and management studies. A combination of keywords and Boolean operators was used to construct the search strings. Keywords included: “human resource development,” “HRD in education,” “educational institutions,” “teacher training,” “capacity building,” “higher education,” “school leadership,” “human capital,” “HR analytics,” “competency models,” and “systematic review.” The search was limited to peer-reviewed publications written in English and published between 2014 and 2024, to capture the most recent and relevant developments in the field. This search yielded a total of 291 initial records.

The screening phase involved the removal of duplicates and the preliminary review of titles and abstracts to assess relevance. Studies were excluded if they did not focus on HRD within educational contexts, lacked a theoretical or empirical contribution, or were purely technical or administrative without human development components. After this stage, a total of 105 articles remained. The next phase, eligibility, involved full-text reviews of the shortlisted articles to ensure that each study met the inclusion criteria. The inclusion criteria required that the study (1) explicitly addressed HRD in educational settings (such as K–12 schools, vocational institutions, or higher education), (2) was based on empirical, theoretical, or conceptual frameworks related to HRD, and (3) offered substantial insight into HRD practices, models, or impacts. Articles that discussed only general HRM policies without development components, or that focused solely on non-educational sectors (e.g., private corporations), were excluded. After a thorough evaluation, 42 articles were selected for inclusion in the final synthesis.

Once the final corpus of literature was established, a detailed data extraction process was carried out. A data extraction matrix was developed to capture key information from each study, including the authors, publication year, country or region of focus, type of institution studied (e.g., primary school, university), research design (quantitative, qualitative, or mixed methods), key findings, and thematic contributions. This process enabled both a descriptive analysis, to identify publication trends, methodological orientations, and geographical distributions, and a qualitative thematic analysis, to synthesize the core conceptual insights presented in the literature. Key themes that emerged from this process included: competency-based HRD models for academic institutions (Ramly & Handrianto, 2024), the growing influence of artificial intelligence and digital tools in HRD systems (Bhatt & Muduli, 2023; Ekuma, 2024), sustainable and green HRD practices in alignment with global sustainability goals (Macke & Genari, 2019; Saad et al., 2024), and the strategic role of HRD in strengthening national human capital productivity (Abdullah & Sahid, 2023; Kafando et al., 2022).

To ensure the rigor of the synthesis, additional validation procedures were employed. These included cross-referencing through backward and forward citation tracking, consultation of bibliometric reviews where available (e.g., Putri, 2022), and the use of triangulation between thematic categories. The systematic process not only ensured that the most relevant and methodologically sound studies were included but also facilitated the identification of under-researched areas such as HRD in developing countries, the integration of HRD into educational policy frameworks, and the role of intergenerational learning within academic environments (Leon, 2023; Anlesinya & Susomrith, 2020). Ultimately, the structured and systematic approach enabled a coherent and reliable review of the literature on HRD in education. It provided a solid foundation for mapping the intellectual terrain of the field, understanding

its methodological evolution, and offering evidence-based insights for future research and policy development. By clearly documenting each phase of the review, from initial search to final synthesis, this study upholds the principles of methodological transparency and academic integrity essential to high-quality systematic reviews.

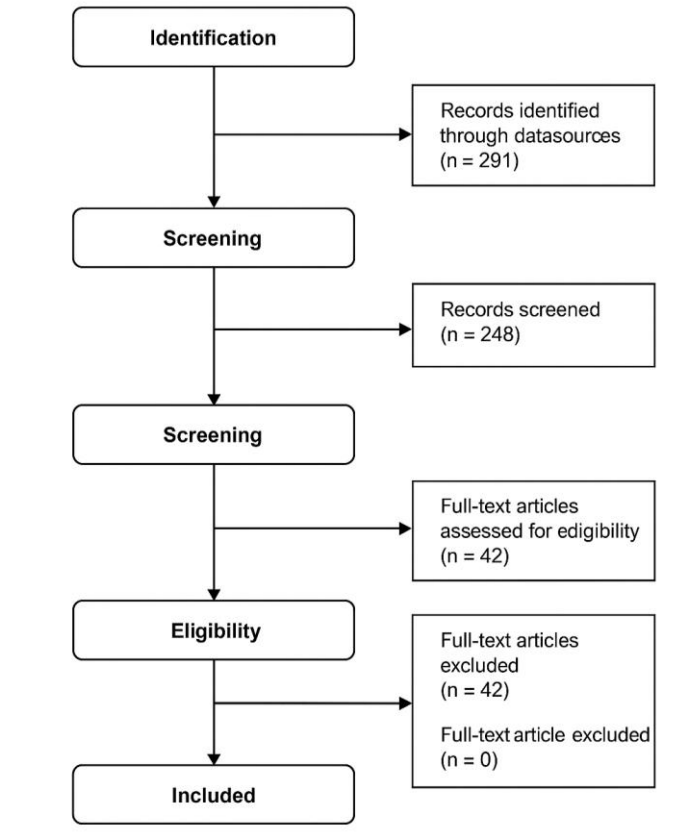


Fig1. The Systematic Review Process

3. Human Resource Development in Education

3.1 Conceptualizing HRD in the Educational Context

Human Resource Development (HRD) in the educational context refers to the strategic and continuous process of developing the skills, knowledge, competencies, and professional capacities of educators, administrators, and academic staff to support both individual career growth and institutional excellence. Unlike general human resource management (HRM), which is often administrative and transactional in nature, focusing on recruitment, payroll, and compliance, HRD is developmental, strategic, and transformative. It seeks to align the learning and growth of human capital with the broader mission of educational institutions (Obazuaye, 2024; Rocco et al., 2023). In schools, colleges, and universities, HRD encompasses structured training, professional development programs, mentoring, leadership development, knowledge sharing, and performance improvement initiatives that contribute to sustainable institutional effectiveness.

In educational systems, HRD plays a dual role. First, it enhances the professional competencies of individual staff members, such as improving pedagogical techniques, subject-matter expertise, and leadership skills. Second, it supports institutional innovation, adaptability, and long-term capacity-building. This dual role is particularly crucial in the face of rapidly evolving educational demands, technological integration, and global shifts in learning paradigms (Galorio et al., 2024). As Chuang and Graham (2018) note, educational institutions today must function within a fast-changing socio-technical landscape, requiring continuous staff development not just to deliver education effectively, but to innovate, collaborate, and respond to emerging societal needs. Therefore, HRD is no longer a supportive function, it is a strategic imperative embedded in institutional planning and reform. The scope of HRD in education is wide-ranging. It includes the preparation and ongoing development of teaching staff, the training of administrative personnel, succession planning, and the creation of collaborative, learning-oriented work environments. It also extends to curriculum developers, support services, and management teams who collectively contribute to institutional success. Reniati et al. (2023) emphasize that HRD in higher education must also be forward-looking, enabling institutions to build academic leadership, promote interdisciplinary research, and compete in international education rankings. In this sense, HRD directly contributes to an institution's academic reputation and long-term sustainability.

Furthermore, HRD in education must be contextually grounded. It is influenced by national education policies, institutional culture, available resources, and socio-economic conditions. In many developing countries, HRD serves as a vital mechanism for addressing systemic issues such as teacher shortages, outdated curricula, and weak school governance (Abdullah & Sahid, 2023). In these settings, HRD becomes a tool not only for professional development but also for social transformation and nation-building. At the same time, global trends such as the United Nations Sustainable Development Goals (SDGs) have encouraged educational institutions to adopt HRD practices that are ethical, inclusive, and environmentally conscious (Findler et al., 2019; Macke & Genari, 2019). Critically, HRD in education should not be seen as a one-time intervention but as a continuous, lifelong learning process. Educators, like learners, must adapt and evolve in response to changing student needs, technological advances, and evolving educational standards. Institutions that embed HRD into their strategic frameworks are better positioned to foster innovation, retain high-performing staff, and build organizational resilience. As Obazuaye (2024) rightly asserts, HRD is not simply a means to an end, but a core driver of educational excellence, equity, and sustainability in the modern era.

3.2 Competency-Based HRD Models in Education

Competency-based Human Resource Development (HRD) models have become an essential framework in shaping educational excellence and accountability across all levels of academic institutions. These models are grounded in the principle that clearly defined competencies, comprising knowledge, skills, behaviors, and attitudes, are central to individual and organizational performance. In the context of education, competency-based HRD aligns the professional development of educators and administrative personnel with institutional goals, performance indicators, and national education standards (Ramly & Handrianto, 2024). This approach moves beyond generic training programs by emphasizing measurable outcomes, continuous assessment, and strategic alignment with broader educational reforms. Higher education institutions, in particular, have widely adopted competency-based HRD models to enhance teaching effectiveness, research productivity, and leadership capacity. According to Reniati et al. (2023), institutions across 27 countries have increasingly formalized professional development programs that articulate clear expectations for faculty roles and competencies. These frameworks often categorize

competencies into pedagogical (e.g., teaching methodology, curriculum design), technological (e.g., digital literacy, online instruction), leadership (e.g., strategic planning, team management), and socio-emotional (e.g., communication, inclusivity) domains. Such categorization allows for targeted interventions, modular training, and individualized learning paths for educators at different stages of their careers. The goal is to ensure not only content mastery but also the ability to adapt and lead in dynamic educational environments.

Competency-based HRD also plays a critical role in institutional quality assurance and accreditation. Many universities now align their faculty development programs with national and international accreditation criteria, which increasingly require evidence of staff competencies and their direct impact on student outcomes and institutional performance (Ramly & Handrianto, 2024). In this context, HRD becomes a strategic lever for institutional competitiveness, supporting both internal performance metrics and external evaluations. Moreover, it enhances transparency and accountability in professional development processes by providing structured benchmarks and performance indicators. Beyond higher education, competency-based HRD is being adapted in primary and secondary school systems, especially in countries undergoing large-scale education reforms. For example, national education policies in several Southeast Asian countries now mandate continuous professional development for teachers, grounded in national competency frameworks (Abdullah & Sahid, 2023). These frameworks often include standards for lesson planning, student engagement, classroom management, assessment literacy, and use of technology in teaching. By linking HRD to these national standards, education ministries aim to improve instructional quality at scale and reduce disparities in educational outcomes across regions.

However, the implementation of competency-based HRD models is not without challenges. One key concern is the tension between standardization and contextualization. While standardized competency models provide consistency and comparability, they may not fully capture the local realities of schools, including resource constraints, cultural norms, and varying levels of educator readiness (Adula et al., 2022). In low-resource contexts, the rigid application of these models can lead to superficial compliance rather than meaningful development. Therefore, competency frameworks must be adaptable and responsive to the unique needs of each educational setting. Another concern involves the measurement of competencies. Unlike technical skills, many of the competencies required in education, such as critical thinking, empathy, and leadership, are complex and difficult to quantify. This creates a risk of oversimplification or misalignment between what is taught in professional development programs and what is actually needed in practice. To address this, researchers such as Leon (2023) advocate for more holistic and reflective evaluation tools that incorporate peer feedback, portfolios, classroom observations, and self-assessment alongside standardized metrics.

Despite these limitations, the competency-based HRD model remains one of the most promising approaches for institutionalizing professional growth in education. When properly designed and implemented, these frameworks serve as powerful tools for linking individual development with organizational change. They foster a culture of continuous improvement, clarify role expectations, and empower educators to take ownership of their professional journeys. As educational institutions continue to face pressures for accountability, innovation, and sustainability, competency-based HRD provides a structured yet flexible foundation for building the human capital required to meet these demands.

3.3 Technological Innovations and Digital HRD

The integration of technology into Human Resource Development (HRD) practices has significantly transformed the educational landscape, reshaping how institutions plan, implement, and evaluate professional development. As education systems increasingly rely on digital infrastructure to deliver instruction and manage administrative functions, HRD practices have evolved to incorporate digital tools such as learning management systems (LMS), artificial intelligence (AI), virtual training platforms, HR analytics, and mobile learning applications. These technologies enhance the scalability, efficiency, and personalization of HRD initiatives, allowing institutions to respond more rapidly to changing skill demands, emerging pedagogical trends, and global disruptions such as the COVID-19 pandemic (Bhatt & Muduli, 2023). Artificial intelligence has emerged as a particularly transformative tool in the domain of learning and development. According to Bhatt and Muduli (2023), AI-powered systems enable personalized learning paths by analyzing educators' performance data, learning histories, and feedback loops to suggest tailored development activities. This capability not only makes HRD more adaptive but also supports continuous feedback and real-time learning, replacing outdated models of one-time training workshops. Ekuma (2024) highlights that AI applications in HRD now support virtual coaching, intelligent performance assessment, and the prediction of future learning needs through machine learning algorithms. These applications help institutions transition from reactive to proactive HRD strategies, thereby enhancing the strategic alignment of training initiatives with institutional goals.

Digitalization also allows HRD to become more inclusive and accessible. Learning management systems and cloud-based training platforms enable educators and administrators, especially those in remote or underserved areas, to participate in high-quality professional development without geographical limitations. This democratization of learning is particularly important in regions with disparities in resource distribution, where traditional face-to-face training may be logistically or financially unfeasible (Putri, 2022). Moreover, asynchronous learning formats give participants the flexibility to engage with content at their own pace, accommodating different learning styles and work schedules.

HR analytics is another innovation gaining momentum in education-based HRD. By using data analytics tools, institutions can monitor training participation rates, measure learning outcomes, identify skill gaps, and evaluate the return on investment of HRD programs. Jiang and Akdere (2022) argue that human resource analytics provides an operational framework that links training outcomes with institutional performance indicators, such as student achievement, employee retention, and administrative efficiency. These analytics tools empower educational leaders to make evidence-based decisions regarding resource allocation, training prioritization, and policy design. The digital transformation of HRD is also reshaping the role of human resource professionals and educational leaders. They are now expected to possess digital fluency and data literacy, alongside traditional HR competencies. As noted by Ramachandran et al. (2024), the digitalization of HRD has shifted the focus from administrative task execution to strategic value creation, with HR professionals playing key roles in talent analytics, workforce planning, and technology-enabled learning design. Institutions that fail to invest in these digital capacities risk falling behind in a competitive and rapidly evolving educational environment.

However, the adoption of technology in HRD is not without challenges. Digital fatigue, lack of digital infrastructure, cybersecurity risks, and resistance to change are significant barriers to effective implementation. In some cases, educators may lack the confidence or technical skills needed to fully

benefit from digital HRD tools, which can hinder participation and engagement (Chuang & Graham, 2018). Furthermore, the emphasis on data-driven learning must be balanced with ethical considerations around privacy, consent, and the human dimensions of education. As such, institutions must provide not only the digital platforms but also the necessary support systems, such as training in digital literacy and policies for responsible data use. Despite these challenges, the incorporation of technological innovations into HRD presents a major opportunity for educational institutions to future-proof their workforce and create agile, learner-centered environments. When strategically implemented, digital HRD enables continuous, customized, and data-informed professional development that meets the demands of modern education systems. As the pace of technological change accelerates, the institutions that integrate technology thoughtfully into their HRD strategies will be better positioned to lead in innovation, inclusivity, and excellence.

3.4 Sustainable and Green HRD Practices

In recent years, sustainability has emerged as a core strategic priority in education, influencing institutional policy, curriculum design, and increasingly, Human Resource Development (HRD) practices. Sustainable HRD in education refers to development strategies that not only enhance the competencies and performance of educational staff but also align with environmental responsibility, social equity, and long-term institutional viability. It integrates ethical considerations, resource efficiency, and a commitment to continuous improvement into professional development frameworks. As Macke and Genari (2019) emphasize, sustainable HRD goes beyond conventional training to consider the broader impact of development practices on society, the economy, and the environment. The role of HRD in advancing sustainability is particularly visible in higher education institutions, which are increasingly positioning themselves as leaders in climate action and social responsibility. Universities are embedding sustainability into their professional development programs by training faculty and staff on sustainable teaching practices, energy conservation, climate literacy, and green campus initiatives (Saad et al., 2024). For example, green HRD practices may include workshops on sustainable procurement, carbon footprint reduction, or ethical leadership. These efforts aim to create institutional cultures that prioritize long-term thinking, ecological balance, and socially inclusive development.

Green HRD also supports institutional alignment with global goals, particularly the United Nations Sustainable Development Goals (SDGs). Educational institutions are expected to not only teach sustainability but to embody it in their operations. As noted by Findler et al. (2019), this shift calls for comprehensive HRD strategies that prepare educators and administrators to model sustainability principles in both classroom and organizational settings. This includes building competencies in critical thinking, systems thinking, and collaborative problem-solving, which are essential for addressing complex global challenges. HRD thus becomes a mechanism through which education professionals are empowered to integrate sustainability into curriculum, pedagogy, and institutional policy. An important aspect of sustainable HRD is its role in promoting organizational resilience. Institutions that invest in sustainable human resource practices are better equipped to adapt to environmental disruptions, financial uncertainties, and shifting stakeholder expectations. By embedding sustainability into HRD, educational institutions foster a workforce that is not only skilled but also values-driven, adaptable, and committed to institutional mission (Macke & Genari, 2019). This is especially critical in the face of growing environmental crises, such as climate change and resource scarcity, which pose direct threats to institutional operations and long-term viability.

Moreover, sustainable HRD encompasses the social dimension of sustainability, including equity, inclusion, and employee well-being. Green HRD initiatives often intersect with diversity and mental health programs, aiming to create safe, inclusive, and empowering environments for all staff members. Omidì and Dal Zotto (2022) argue that socially responsible HRD in education must address issues of gender equity, work-life balance, and fair access to professional development. In this sense, sustainable HRD is not limited to ecological considerations but extends to creating ethical, equitable, and people-centered workplaces. Despite its growing prominence, the implementation of sustainable and green HRD in education faces several challenges. Many institutions lack the frameworks, funding, or expertise to systematically integrate sustainability into their HRD strategies. Additionally, there is often a gap between sustainability discourse at the policy level and the actual practices experienced by staff on the ground. Without adequate monitoring, incentives, and leadership support, green HRD initiatives may be seen as peripheral rather than strategic. Saad et al. (2024) caution that sustainability efforts must be institutionalized through policies, metrics, and cultural change to avoid tokenism and ensure meaningful impact. Nevertheless, the potential of sustainable HRD to transform education is significant. By aligning professional development with environmental stewardship and social justice, institutions can foster a generation of educators and leaders who are equipped to address global sustainability challenges. As educational institutions seek to become models of responsible innovation and civic engagement, HRD offers a powerful lever for embedding sustainability into the heart of academic practice and institutional identity.

3.5 Intergenerational and Inclusive Learning Approaches

Intergenerational and inclusive learning approaches in Human Resource Development (HRD) have gained increasing attention in educational institutions seeking to build organizational knowledge, improve staff engagement, and promote equity. As education systems face demographic shifts, such as the retirement of experienced faculty and the entry of younger, digitally native staff, intergenerational HRD strategies have become essential for preserving institutional memory, fostering mentorship, and facilitating knowledge transfer. These approaches support collaborative learning between different age groups, ensuring that the experiences of veteran educators inform the innovation of younger staff, while also exposing senior professionals to emerging technologies and pedagogical techniques (Leon, 2023). This reciprocal learning dynamic enhances not only individual development but also institutional resilience and adaptability. In higher education settings, intergenerational HRD is often implemented through structured mentoring programs, cross-age project teams, and leadership succession planning. These programs provide opportunities for junior faculty and administrative staff to benefit from the wisdom and institutional insight of senior colleagues while encouraging older professionals to remain engaged and updated on current trends. According to Leon (2023), successful intergenerational learning requires intentional design, including shared goals, inclusive communication strategies, and support from leadership. Institutions that foster these environments are more likely to retain talent, build a culture of mutual respect, and mitigate the disruption caused by generational turnover.

In addition to fostering intergenerational exchange, inclusive HRD seeks to create equitable access to professional development opportunities for all members of the educational workforce. This includes addressing systemic barriers that may prevent marginalized or underrepresented groups, such as women, people with disabilities, and individuals from rural or minority communities, from participating fully in institutional development programs. Inclusive HRD embraces diversity in all its forms and ensures that

training content, delivery methods, and institutional culture reflect and support this diversity (Anlesinya & Susomrith, 2020). For example, inclusive learning design may incorporate multilingual resources, flexible learning schedules, culturally relevant examples, and accommodations for different learning abilities. Equity-focused HRD is especially critical in addressing gender disparities in educational leadership. In many contexts, women remain underrepresented in senior academic and administrative positions despite constituting a significant portion of the teaching workforce. Inclusive HRD initiatives that provide targeted leadership development, mentorship, and networking opportunities can help close this gap and promote a more diverse leadership pipeline (Omid & Dal Zotto, 2022). Additionally, organizations benefit from a diversity of perspectives, which contributes to innovation, problem-solving, and institutional growth.

Mental health and well-being are increasingly recognized as central components of inclusive HRD. As educational work environments become more complex and stressful, particularly in the aftermath of the COVID-19 pandemic, institutions must design HRD strategies that support emotional resilience, work-life balance, and psychological safety. Mahdia (2024) emphasizes that HRD in education must address burnout prevention, stress management, and staff engagement as essential outcomes of professional development. This shift reflects a broader understanding of HRD not only as a tool for skill development but also as a mechanism for holistic well-being and sustainable performance. Digital inclusion is another important dimension of inclusive HRD. As more institutions shift to online or hybrid modes of professional development, access to technology, internet connectivity, and digital literacy must be addressed. Without inclusive planning, digital HRD initiatives risk exacerbating inequalities, particularly for staff in remote or under-resourced regions. Bhatt and Muduli (2023) and Putri (2022) point out that technology-driven learning must be complemented by support systems such as digital skills training, peer mentoring, and technical assistance to ensure equitable participation.

Despite progress, inclusive and intergenerational HRD remains a developing field with several gaps in implementation. Many institutions lack formal policies or dedicated resources to support equity-driven professional development. Moreover, unconscious bias, institutional inertia, and limited awareness can undermine the inclusivity of HRD programs. As a result, organizations must move beyond surface-level commitments and embed inclusion into the design, delivery, and evaluation of HRD initiatives. This includes involving diverse stakeholders in planning processes, disaggregating data to track participation and impact, and continuously adapting strategies based on feedback. Ultimately, intergenerational and inclusive learning approaches enrich the educational workplace by cultivating diverse, collaborative, and sustainable professional communities. They ensure that HRD serves not just as a vehicle for individual advancement but as a platform for institutional transformation, social justice, and lifelong learning. As educational institutions seek to respond to complex societal needs, the integration of these approaches into HRD is essential for building equity-driven, future-ready systems.

3.6 HRD and National Human Capital Development

Human Resource Development (HRD) in education plays a pivotal role in the broader agenda of national human capital development, particularly in regions where educational institutions are directly linked to economic growth, workforce productivity, and social transformation. Human capital, defined as the accumulated knowledge, skills, and abilities of a population, is increasingly regarded as a strategic asset that drives innovation, competitiveness, and sustainable development (Kafando et al., 2022). In this

context, HRD within educational systems is not only an internal institutional priority but also a policy instrument for achieving national development goals. As highlighted by Abdullah and Sahid (2023), investing in HRD across all levels of education, primary, secondary, and tertiary, is critical for enhancing the productivity and employability of the labor force and for fostering a culture of lifelong learning. Governments across the globe, particularly in low- and middle-income countries, have recognized the importance of embedding HRD strategies within national education reforms. These strategies often include comprehensive teacher training programs, leadership development initiatives, competency-based curricula, and performance-based funding models aimed at improving educational quality and equity. For instance, in many Southeast Asian and Sub-Saharan African countries, education ministries have adopted national HRD frameworks to upskill teachers, improve instructional methods, and promote innovation in school management (Adula et al., 2022; Hoque & Atheef, 2024). These frameworks are aligned with macroeconomic policies that seek to increase the knowledge intensity of labor markets and reduce youth unemployment through stronger education-to-employment pathways.

In higher education, HRD supports national development by preparing graduates with the advanced competencies needed in the knowledge economy. Universities and vocational training institutions are increasingly required to demonstrate their contribution to national innovation systems, entrepreneurship, and research outputs. As Reniati et al. (2023) explain, universities serve as engines of human capital development, not only through student instruction but also by training educators, managers, and researchers who contribute to public and private sector capacity. Effective HRD in this context includes staff development, research leadership training, and the cultivation of institutional networks that foster collaboration between academia, government, and industry. The link between HRD and national economic performance has been supported by various studies demonstrating that educational quality and institutional capacity are major predictors of labor productivity and national income. For example, Gemawati and Kholifaturrohman (2023) found that countries with robust investments in HRD at the educational level show stronger long-term GDP growth, innovation performance, and employment resilience. These findings reinforce the argument that education systems must be equipped with forward-looking HRD strategies that address the evolving demands of a globalized and technologically driven economy.

However, the implementation of HRD as a tool for national human capital development faces several systemic challenges. In many developing countries, educational institutions operate under severe constraints such as limited funding, teacher shortages, inadequate infrastructure, and political instability. These factors hinder the consistent application of HRD policies and limit their impact on human capital outcomes (Anlesinya & Susomrith, 2020). Moreover, there is often a disconnect between national development strategies and the day-to-day realities faced by educators and administrators. As noted by Mulia and Saputra (2021), HRD initiatives frequently lack local adaptation and stakeholder involvement, resulting in programs that are misaligned with institutional needs and cultural contexts. Another critical challenge is the need for data-driven planning and evaluation of HRD programs at the national level. Policymakers often face difficulties in measuring the long-term impact of HRD on labor market outcomes, partly due to weak data systems and the complexity of linking educational inputs to economic indicators. This gap limits the ability of governments to scale successful programs and allocate resources efficiently. As Ramachandran et al. (2024) suggest, investing in HR analytics and longitudinal studies is essential to building evidence-based HRD policies that contribute meaningfully to human capital development.

Despite these challenges, the potential of HRD in education to drive national transformation remains substantial. Countries that prioritize HRD in their educational policy frameworks are better positioned to compete in the global knowledge economy, adapt to technological disruption, and foster inclusive and sustainable growth. This requires a coordinated effort among ministries of education, labor, finance, and planning, as well as partnerships with universities, civil society, and the private sector. As Abdullah and Sahid (2023) emphasize, HRD should be seen not merely as a training function but as a strategic development tool that builds national capacity and resilience

3.7 Emerging Challenges and Research Gaps

Despite significant progress in the conceptualization and implementation of Human Resource Development (HRD) within education, several challenges continue to hinder its full potential and effectiveness. These challenges span institutional, technological, socio-political, and theoretical domains. As education systems evolve under increasing pressure to be more agile, inclusive, and responsive, HRD strategies must also adapt accordingly. However, many institutions still rely on fragmented, outdated, or narrowly focused HRD models that fail to address the complex realities of modern educational environments (Chuang & Graham, 2018). One of the most persistent challenges is the lack of integrated HRD frameworks that connect professional development to institutional transformation and student outcomes. A recurring gap in the literature is the limited empirical evidence linking HRD interventions to measurable outcomes such as teaching effectiveness, academic performance, staff retention, and institutional innovation. While theoretical models abound, practical assessments and longitudinal studies remain scarce. Mahdia (2024) notes that although teacher training programs are widely implemented, there is insufficient tracking of their long-term effects on educator well-being and student learning. Similarly, evaluation mechanisms for leadership development, digital literacy training, and sustainability-oriented HRD are often weak or non-existent. This limits the capacity of policymakers and administrators to make data-informed decisions and to scale successful interventions.

Another major gap is the underrepresentation of HRD research in low-income and resource-constrained contexts. Much of the existing literature is concentrated in high-income countries or elite academic institutions, overlooking the specific HRD needs and constraints of schools and universities in marginalized regions (Anlesinya & Susomrith, 2020). This skewed focus can result in the promotion of HRD strategies that are incompatible with local realities, such as digital learning platforms in areas with poor internet infrastructure or leadership models that ignore cultural nuances. There is an urgent need for more context-sensitive, inclusive, and participatory research that reflects the diversity of educational systems globally. Digital transformation, while offering numerous advantages, also introduces new challenges. Issues such as digital inequality, technology resistance, and the lack of digital competencies among educators can undermine the effectiveness of tech-enabled HRD initiatives. Bhatt and Muduli (2023) caution that digital HRD, without adequate support and infrastructure, may exacerbate existing inequities rather than resolve them. Furthermore, the rapid adoption of artificial intelligence in HRD raises ethical concerns related to data privacy, algorithmic bias, and surveillance, areas that are only beginning to be explored in educational contexts (Ekuma, 2024; Ramachandran et al., 2024).

Mental health and well-being are increasingly recognized as essential dimensions of HRD, yet they remain inadequately addressed in many professional development programs. The emotional labor involved in teaching, combined with high workloads and systemic pressures, can lead to burnout, job dissatisfaction,

and attrition, issues that are rarely integrated into HRD planning (Mahdia, 2024). Institutions must therefore move beyond the technical dimensions of HRD and incorporate psychological support, work-life balance strategies, and inclusive well-being policies as core elements of development programs. The theoretical landscape of HRD in education also shows fragmentation and conceptual ambiguity. Many studies do not clearly differentiate HRD from HRM, or they adopt vague definitions that hinder theoretical coherence and practical application. Obazuaye (2024) argues for a clearer, operational definition of HRD in educational contexts that accounts for its strategic, developmental, and value-based dimensions. Additionally, there is limited research on interdisciplinary approaches that connect HRD with fields such as sustainability science, critical pedagogy, or innovation management, an area that holds promise for enriching both theory and practice. Finally, a significant research gap lies in the lack of participatory and practitioner-informed studies. Too often, HRD research is conducted from an external, top-down perspective, without engaging the very educators, administrators, and learners who are affected by HRD policies and programs. Inclusive research methodologies, such as action research, co-design, and ethnographic case studies, can provide deeper insights into the lived experiences of educational professionals and lead to more grounded, effective HRD strategies.

4. Discussion

The systematic review of 42 scholarly articles on Human Resource Development (HRD) in education reveals a rapidly evolving field that intersects with numerous educational priorities, including teaching quality, institutional performance, digital transformation, sustainability, and equity. The findings highlight that HRD has moved from a support function to a strategic imperative in modern educational institutions. As such, HRD must be understood as a central pillar of educational change, shaping how institutions respond to both internal performance pressures and external global demands. The review reinforces the idea that effective HRD in education does not operate in isolation; rather, it is deeply embedded in national development agendas, institutional governance, and individual educator trajectories (Rocco et al., 2023; Obazuaye, 2024). However, while theoretical advancements and innovative practices are present in the literature, the review also identifies significant disparities in implementation, conceptual clarity, and alignment between research, policy, and practice.

A key finding from the review is the widespread adoption of competency-based HRD frameworks, especially in higher education. These frameworks are designed to standardize expectations and ensure that professional development is aligned with institutional and national quality assurance goals (Ramly & Handrianto, 2024). In many contexts, they serve as mechanisms for accountability, linking educator competencies to student learning outcomes and institutional performance metrics. These systems also support career progression and succession planning by clarifying role expectations and required competencies (Renjati et al., 2023). However, despite their utility, competency-based models are not without critique. There is an inherent risk that over-standardization may lead to rigidity, ignoring the contextual diversity of educational institutions, especially those in low-resource settings (Adula et al., 2022). Furthermore, such models can inadvertently promote a checklist mentality, where the richness of teaching and learning is reduced to measurable indicators. To avoid these pitfalls, institutions must strike a balance between standardization and contextual flexibility allowing competency frameworks to guide, but not constrain, professional practice.

Equally significant is the role of technology in transforming HRD. The review finds that digitalization has

become a defining feature of HRD strategies across educational contexts. Artificial intelligence (AI), learning management systems (LMS), virtual simulations, and HR analytics are increasingly utilized to personalize professional development, track performance, and predict future learning needs (Bhatt & Muduli, 2023; Ekuma, 2024). These tools allow for more responsive, scalable, and cost-effective approaches to educator training. Digital platforms have become essential in post-pandemic education systems where remote and hybrid work models are common. However, these advancements come with critical caveats. Not all institutions possess the infrastructure or human capital to implement tech-driven HRD effectively. Digital divides particularly those affecting educators in rural or underserved areas persist, raising concerns about equity and access (Putri, 2022). Moreover, the increasing reliance on AI and data analytics raises ethical concerns about privacy, surveillance, and algorithmic bias (Ramachandran et al., 2024). Thus, while technology offers unprecedented opportunities for HRD, institutions must develop comprehensive strategies that include digital literacy, ethical data governance, and support systems to ensure meaningful and inclusive engagement.

Sustainability and green HRD emerged as a rising area of importance in the reviewed literature. As educational institutions increasingly align their missions with the United Nations Sustainable Development Goals (SDGs), HRD is expected to reflect values of environmental stewardship, ethical leadership, and social responsibility. Studies show that universities are incorporating sustainability training into HRD programs, encouraging staff to engage in green campus initiatives, and developing competencies related to climate literacy and sustainable decision-making (Macke & Genari, 2019; Saad et al., 2024). This shift reflects a broader trend toward mission-driven HRD that transcends technical competence to encompass global citizenship and ethical responsibility. However, the operationalization of sustainable HRD remains inconsistent. While elite institutions in the Global North often lead in this area, many others lack the frameworks, funding, or leadership buy-in to implement sustainability at scale. Furthermore, green HRD remains under-theorized, with limited attention to how it intersects with social inclusion, Indigenous knowledge, or regional environmental priorities (Findler et al., 2019). To maximize its potential, sustainable HRD must be conceptualized not just as environmental action, but as an integrated approach to social, economic, and ecological development in education.

A particularly important contribution of the reviewed literature is the recognition of intergenerational and inclusive HRD strategies. As educational workforces become more diverse in age, gender, ethnicity, and ability, HRD must evolve to support collaboration, equity, and well-being across these dimensions. Intergenerational learning, through mentoring and knowledge transfer, helps institutions preserve institutional memory while fostering innovation (Leon, 2023). Inclusive HRD also involves ensuring equitable access to development opportunities for women, minority groups, persons with disabilities, and staff in peripheral regions. Yet, evidence from the literature indicates that inclusion often remains rhetorical rather than operationalized. For example, while many policies promote diversity in leadership, actual representation and access to mentorship remain limited in practice (Anlesinya & Susomrith, 2020; Omid & Dal Zotto, 2022). Furthermore, the review finds growing concern about educator well-being and mental health, which is still insufficiently addressed in many HRD programs. Mahdia (2024) calls for more holistic HRD models that incorporate psychosocial support, emotional intelligence, and work-life balance. These findings suggest that inclusive HRD must go beyond demographic representation and adopt a systemic, values-driven approach that transforms institutional culture.

From a macro-perspective, HRD in education is increasingly linked to national human capital

development strategies. The reviewed literature strongly supports the idea that investment in educational HRD contributes to broader socio-economic outcomes, including labor productivity, employment resilience, and national innovation (Abdullah & Sahid, 2023; Gemawati & Kholifaturohmah, 2023). This linkage is particularly important in developing economies where education serves as a pathway to economic mobility and social cohesion. However, aligning institutional HRD initiatives with national policy goals remains a complex endeavor. The review reveals a frequent disconnect between national development plans and institutional capacities. In many countries, HRD is treated as a standalone administrative activity rather than a cross-sectoral policy lever involving ministries of labor, education, and finance (Mulia & Saputra, 2021). Moreover, limited investment in HR analytics, monitoring, and evaluation makes it difficult to track the long-term impact of HRD on national outcomes. These findings point to the urgent need for policy coherence, resource integration, and multi-stakeholder engagement to ensure that HRD fulfills its potential as a tool of national development.

Finally, the review identifies several research gaps and theoretical limitations in the field. Despite a growing number of systematic reviews and conceptual papers, many studies remain descriptive and lack methodological rigor. Longitudinal studies assessing the impact of HRD interventions are rare, and there is limited comparative research across different geopolitical and institutional contexts (Chuang & Graham, 2018; Rocco et al., 2023). Furthermore, the literature often fails to distinguish clearly between HRD and HRM, leading to conceptual ambiguity. Obazuaye (2024) calls for a redefinition of HRD as a distinct strategic function with its own theoretical base, one that incorporates adult learning theory, organizational development, and systems thinking. Additionally, more participatory and qualitative research is needed to capture the lived experiences of educators and staff in relation to HRD. Inclusive, practitioner-informed studies such as action research, narrative inquiry, and ethnography can help bridge the gap between top-down policy and grassroots realities.

5. Conclusion and Future Research

This systematic literature review examined the evolving landscape of Human Resource Development (HRD) within educational institutions, highlighting its strategic significance in improving organizational capacity, educator effectiveness, and national human capital development. Drawing on 42 peer-reviewed articles, the review synthesized core themes such as competency-based HRD models, the digital transformation of professional learning, sustainable and green HRD practices, intergenerational and inclusive learning approaches, and the integration of HRD with national policy objectives. Collectively, the findings confirm that HRD in education is undergoing a paradigmatic shift from a supplementary administrative function to a central pillar of institutional and societal advancement (Obazuaye, 2024; Rocco et al., 2023). The review reinforces the argument that HRD must be strategically embedded in the fabric of educational systems. Institutions that invest in structured, outcome-oriented, and inclusive HRD frameworks are better positioned to navigate complexity, drive innovation, and respond to rapidly changing educational demands. Competency-based approaches, for instance, allow institutions to align professional development with measurable performance indicators and strategic goals (Ramly & Handrianto, 2024). Likewise, the integration of artificial intelligence and digital platforms into HRD has expanded the reach, efficiency, and personalization of professional learning (Bhatt & Muduli, 2023; Ekuma, 2024). The rise of sustainable and green HRD practices further illustrates the potential of HRD to promote not only institutional effectiveness but also ethical leadership and environmental stewardship (Macke & Genari, 2019; Saad et al., 2024).

Yet, the review also reveals several persistent challenges. Chief among them is the lack of empirical and longitudinal studies that demonstrate the causal impact of HRD interventions on educational outcomes such as student achievement, teacher retention, and institutional innovation. Much of the current literature remains descriptive or conceptual, leaving gaps in our understanding of what works, for whom, and under what conditions (Chuang & Graham, 2018). Additionally, the underrepresentation of HRD research from developing and under-resourced contexts limits the global applicability of existing frameworks. Many models are designed in or for well-resourced, Western institutions and may not adequately address the infrastructural, cultural, or policy constraints present in other parts of the world (Anlesinya & Susomrith, 2020; Adula et al., 2022). The field also faces theoretical fragmentation. HRD is frequently conflated with human resource management (HRM), and this lack of conceptual clarity hinders the development of a distinct body of theory and practice. Obazuaye (2024) argues for a clearer operational definition of HRD in educational contexts one that draws on adult learning theory, organizational development, critical pedagogy, and systems thinking. Moreover, the emerging importance of inclusion, mental health, and work-life balance in educational settings calls for a broader, more holistic understanding of HRD that extends beyond skill acquisition to encompass well-being, empowerment, and social equity (Mahdia, 2024; Omid & Dal Zotto, 2022).

The review also suggests that HRD must be more deeply connected to national policy frameworks and intersectoral development strategies. Education systems are key drivers of national productivity, innovation, and social cohesion, and HRD is a critical mechanism for realizing these goals (Abdullah & Sahid, 2023; Gemawati & Kholifaturrohman, 2023). However, the misalignment between institutional HRD efforts and broader national development plans remains a barrier to systemic coherence. This points to the need for stronger policy integration and data infrastructure to track the long-term effects of HRD at both institutional and national levels (Ramachandran et al., 2024).

Given the identified gaps, several future research directions emerge. First, there is a pressing need for longitudinal and impact-focused studies that evaluate the outcomes of HRD initiatives over time. Such research should go beyond self-reported measures and incorporate student learning data, institutional performance indicators, and labor market outcomes. Second, comparative and cross-cultural studies are needed to explore how HRD models function across different geopolitical, cultural, and economic contexts. This would help in developing more adaptable and context-sensitive frameworks. Third, researchers should explore interdisciplinary approaches to HRD that integrate perspectives from sustainability studies, critical theory, public policy, and digital learning. For example, how can HRD be leveraged to promote ecological literacy, ethical leadership, or social justice in education? Fourth, there is a need for participatory and practitioner-informed research, including action research, ethnography, and case studies, that center the voices of educators, administrators, and learners. These methodologies can reveal the lived realities of HRD implementation and help bridge the gap between policy and practice.

Fifth, the ethical dimensions of HRD in the digital age demand urgent attention. Future studies should investigate the implications of AI, datafication, and automation on privacy, autonomy, and trust in professional development. Finally, researchers should examine how HRD supports educator well-being, especially in light of increased stress, burnout, and emotional labor in the post-pandemic era. This includes integrating mental health support, psychological safety, and inclusive workplace design into HRD frameworks.

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