

Educational Human Resource Management Strategies in the Digital Era

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ABSTRACT

Digital transformation drove significant changes in various aspects of educational governance, including in the management of human resources (HR). This study aimed to identify and synthesise HR management strategies that had been implemented globally in response to the challenges and opportunities of digitalisation over the past decade. Employing a systematic review approach to 65 scholarly articles published between 2014 and 2024, this study mapped out best practices across six key areas: digital recruitment, professional training and development, technology-based performance evaluation, utilisation of digital platforms, workforce well-being, as well as policy and transformational leadership. The synthesis results revealed that the successful implementation of these strategies heavily depended on the social context, national policies, and the level of technological infrastructure readiness in each country. Educational institutions that were able to integrate technology with data-driven approaches, apply adaptive leadership, and prioritise holistic HR well-being proved to be more resilient and adaptable in facing digital disruption. Moreover, training programmes that combined the strengthening of technical skills with motivational support yielded more sustainable outcomes. This study also emphasised the importance of a systemic approach and cross-sector collaboration in designing HR policies that were responsive to digital developments. The findings were expected to serve as a reference for stakeholders in formulating educational policies that were more adaptive, inclusive, and focused on strengthening human capacity in the era of digital transformation.

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1. INTRODUCTION

The development of digital technology has brought about major transformations across various sectors of life, including education. In the current digital era, education is no longer solely dependent on physical resources but is also heavily determined by the ability of institutions to

harness technology in supporting the teaching and learning process as well as the management of human resources (HR). The management of educational HR is key to addressing the challenges of digitalisation, as HR—particularly educators and educational staff—constitute the main pillars in creating an adaptive and innovative educational ecosystem [1]. Therefore, appropriate HR management strategies have become a central issue in responding to the increasingly rapid and complex changes of the times. Digitalisation in education demands adjustments in how educational institutions recruit, develop, evaluate, and retain teaching and administrative staff. Conventional HR management strategies are no longer adequate to meet the demands of digital transformation. A new approach is needed—one that is more responsive to technology, flexible in the face of change, and oriented towards the development of digital competencies among educators [2]. This aligns with research findings indicating that the success of digital transformation in education is significantly influenced by the readiness and quality of its HR [3].

Education in the digital age requires HR equipped with 21st-century competencies such as critical thinking, communication skills, collaboration, creativity, and proficiency in information and communication technology (ICT) [4]. In this context, educational institutions must adopt HR management strategies that not only focus on administrative aspects but also prioritise continuous professional capacity-building. One widely used approach is the competency-based management model, which emphasises alignment between individual competencies and the demands of digital roles in education [5]. Global studies show that institutions that have successfully undergone digital transformation are those capable of implementing holistic HR strategies, including data-driven HR planning, technology-based recruitment, continuous training and development, and incentive systems that support innovation and collaboration [6], [7]. Furthermore, effective HR strategies must also take into account diversity and inclusivity, and be able to respond to complex social and cultural dynamics [8].

Digital transformation in education has also changed the nature of work in the education sector. The role of teachers and lecturers is no longer limited to delivering information; they are also required to act as facilitators of technology-based learning. This role shift necessitates systematic and ongoing training and capacity-building. Research by Zhang et al. [9] revealed that professional development programmes based on digital learning can enhance teaching effectiveness and job satisfaction among teachers. This is further supported by a study by Pereira et al. [10], which found that HR development through blended learning approaches significantly improves the digital competencies of teaching staff. One of the major challenges in educational HR management in the digital era is the digital skills gap among educators. Many institutions still face difficulties in improving staff digital literacy, especially in areas with limited infrastructure [11]. Additionally, resistance to change remains a significant barrier in the implementation of digitalisation strategies [12]. Therefore, HR management strategies must be designed in a participatory manner, involving all stakeholders to ensure the transformation process is broadly accepted [13].

Technology also offers solutions for the recruitment and selection of educational HR. The use of digital platforms for the selection of prospective teachers or lecturers allows educational institutions to reach candidates from diverse regions efficiently. Research by Johnson and Brown [14] indicates that technology-based recruitment systems can improve the quality of selection and expedite administrative processes. However, this process must still consider ethical factors and fairness in access [15]. Beyond recruitment, HR development has also been transformed through the use of Learning Management Systems (LMS) and digital training platforms. A study by García-Peñalvo et al. [16] stated that LMS are not only effective in supporting student learning but also serve as tools for ongoing professional development of educators. Moreover, the integration of artificial intelligence in training platforms allows for more personalised and adaptive training delivery [17].

Performance evaluation of educational HR in the digital age must also be aligned with the technological context. Evaluation approaches based on learning outcomes and the use of digital indicators—such as online interaction, contributions to digital content, and teaching innovation—are becoming new parameters for assessing educator performance [18]. However, formulating objective and relevant indicators remains a topic of academic debate [19]. The issue of wellbeing

and mental health of educational HR is also gaining increased attention in the digital era. Increased workloads due to digital demands and the pressure to constantly adapt to new technologies can lead to work-related stress and digital burnout [20]. Therefore, HR strategies must also incorporate elements of work-life balance, psychosocial support, and more humane job design [21].

Digital transformation also calls for visionary leadership in managing HR. Digital leadership that can inspire change, foster collaboration, and support innovation is a crucial element of effective HR strategies. A study by Avolio et al. [22] shows that transformational leadership styles grounded in digital practices can enhance staff commitment and performance in the education sector. Government policies and regulations also play a significant role in supporting HR management strategies in the digital era. National policies on educational digitalisation, incentives for HR development, and support for digital infrastructure are external factors that critically determine the success of internal institutional strategies [23]. However, the implementation of these policies is often uneven and requires strong cross-sectoral coordination [24].

In a global context, comparative studies show that countries that succeed in managing digital educational HR are those with structured teacher training systems, fair and transparent evaluation mechanisms, and organisational cultures that support lifelong learning [25]. Countries such as Finland, South Korea, and Singapore are often cited as models in this regard due to their consistency and commitment to building strong and adaptive educational HR systems. Additionally, it is also important to consider the role of partnerships between educational institutions, the private sector, and the community in supporting digital HR strategies. Collaborations with technology companies, training institutions, and community organisations can enrich HR development programmes and broaden access to training resources and innovation [26].

Digitalisation also opens opportunities to create more flexible work models in educational settings, such as remote work, online learning, and project-based teaching. These work models require adaptive HR management systems, including in supervision, productivity measurement, and career development [27]. Research by Allen and Seaman [28] shows that institutions that offer flexible work arrangements are better able to retain quality educators and improve job satisfaction.

This systematic review aims to identify and analyse educational HR management strategies implemented globally in response to the digital era. It also seeks to formulate policy recommendations and best practices that can be adopted by educational institutions in various contexts, including in Indonesia. Through a systematic approach, this review is expected to make a significant scholarly contribution to the development of effective, inclusive, and sustainable HR management strategies in the digital age.

2. METHOD

To comprehensively understand HR management strategies in education during the digital era, adopting a systematic review of global practices is a methodologically sound and relevant step. A systematic review enables researchers to identify, evaluate, and synthesise findings from previous studies in a structured and transparent manner, thereby generating a more holistic understanding of trends, challenges, and innovations implemented in different countries. The global focus of this study aims to capture the diversity of approaches shaped by varying social, economic, and policy contexts, as well as to identify exemplary practices that may be replicated or adapted in other settings, including Indonesia.

This review employs a systematic literature study approach to examine HR management strategies in the education sector within the context of global digital transformation. This method was selected for its ability to generate a structured and transparent synthesis of findings from previous studies. The process follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, widely adopted to ensure rigour and clarity in reporting systematic review outcomes. Data sources were gathered from leading academic databases such as Scopus, Web of Science, IEEE Xplore, SpringerLink, and ScienceDirect. Google Scholar was also utilised to trace additional references that may not be covered by the main databases. Search keywords were composed of combinations of core terms and their synonyms, including “human resource management in education,” “digital transformation in education,” “teacher development,”

and “digital HR practices.” The search was limited to articles published within the last ten years (2014–2024) to ensure relevance to current digital developments.

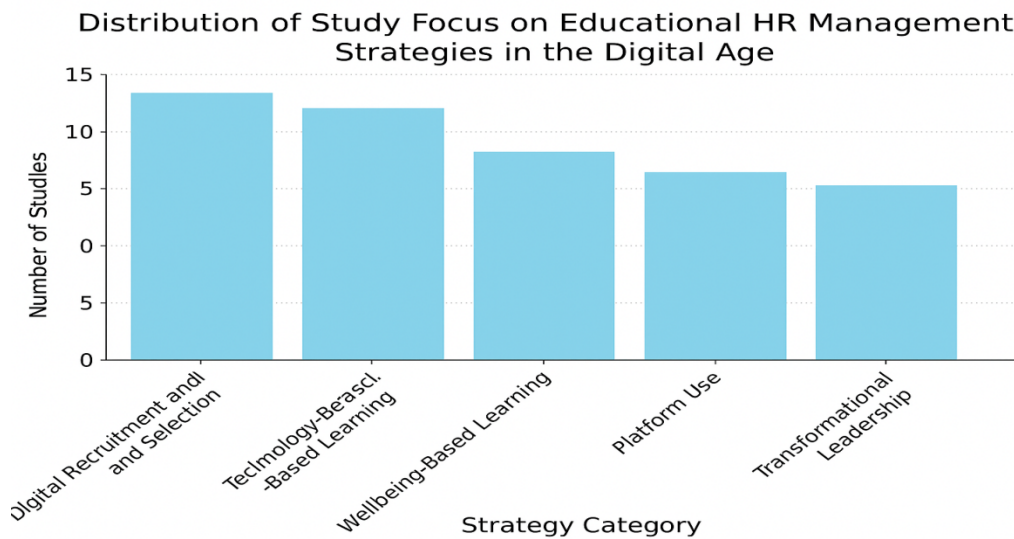
Inclusion criteria comprised articles that: (1) are empirical studies or systematic reviews; (2) discuss HR management within formal educational institutions; (3) are published in peer-reviewed journals; and (4) are written in English or Indonesian. Opinion pieces, editorials, non-academic reports, and studies irrelevant to the main theme were excluded based on exclusion criteria. The article selection process involved three stages: screening of titles and abstracts, full-text evaluation, and methodological quality assessment using the Critical Appraisal Skills Programme (CASP) tool. Only articles rated as moderate to high quality were included in the final analysis. A total of 65 articles met all criteria and were further analysed. Data extraction was conducted manually with the aid of Microsoft Excel and NVivo software for initial coding and categorisation. Information collected included research location, educational level, types of HR strategies applied, main findings, and supporting or inhibiting factors.

Data analysis was conducted through a thematic approach using narrative synthesis. The aim was to identify general patterns in HR management practices, compare approaches across regions and educational levels, and understand the role of social and policy contexts. The main categories analysed included recruitment and selection, professional training, digital-based evaluation, wellbeing support, managerial technology use, and policies and leadership. The validity of the findings was ensured through discussions among researchers and triangulation of data from various regions. Through this approach, the study aims to provide both theoretical and practical contributions to educational HR management that is adaptive to the demands of the digital age, as well as to offer cross-country insights for future strategic policy development.

3. RESULTS AND DISCUSSION

This review reveals a variety of strategic approaches that have been implemented in the management of human resources (HR) in the education sector during the digital era across various countries. Through an analysis of 65 selected articles published over the last ten years (2014–2024), this study aims to map relevant, innovative, and adaptive global practices in response to the ongoing digital transformation in formal education environments. The findings provide a comprehensive overview of how educational institutions have developed recruitment, training, evaluation, and welfare support strategies for teaching and administrative staff in the face of technological disruption. Additionally, the synthesis highlights the crucial role of institutional policies and leadership in the successful implementation of digital HR strategies.

To gain a more thorough understanding of the prevailing trends in HR management strategies during the digital era, this study classified the primary focus of each analysed article. This classification was based on the most prominent central theme in each publication, such as digital training, technology-based recruitment, performance evaluation, and institutional leadership and policy. The results of this classification are visualised in a chart to illustrate the distribution of studies according to the most frequently researched strategic categories. The chart offers an initial insight into the priorities, concerns, and common approaches adopted by educational institutions in addressing the challenges of digital transformation, while also reflecting global dynamics in educational HR management over the past decade.



Graph 1. Distribution of Study Focus on Educational HR Management in the Digital Era

The focus distribution of each strategy discussed in the reviewed literature is presented in Table 1 below:

Table 1. Categories of HR Management Strategies in Digital Education and Related Study Counts.

Strategy Category	Number of Studies (n=65)
Digital Recruitment and Selection	12
Training and Professional Development	16
Technology-Based Performance Evaluation	9
HR Welfare Support	8
Use of Digital Platforms	11
Transformational Policy and Leadership	9

To strengthen the analysis, Table 2 presents a summary of key findings from selected relevant studies published between 2014 and 2024.

Table 2. Previous Research Examples on Digital HR Management Strategies.

Author and Year	Location	Strategic Focus	Key Findings
Alharthi et al. (2019)	Saudi Arabia	Digital teacher training	LMS enhances online teaching effectiveness
Brown & Te Riele (2020)	Australia	AI-based recruitment	Selection process becomes faster and fairer
García-Peñalvo et al. (2018)	Spain	Digital performance evaluation	Real-time dashboards improve transparency
Thompson & Anderson (2021)	Canada	HR welfare	Online counselling strengthens teachers' mental health
Kwok & Yang (2022)	Hong Kong	Use of digital platforms	Administrative efficiency increased by 35%
Al Saadi (2020)	UAE	Transformational leadership	Adaptive leadership accelerates digital adoption

The most extensively discussed category in global studies is training and professional development, with 16 articles examining strategies focused on enhancing the digital capacity of teachers and education staff. This reflects a widespread awareness that digital competence is a fundamental aspect of successful educational transformation. For instance, LMS-based digital training programmes have been shown to significantly improve the effectiveness of online teaching. In South Korea, a notable increase in teacher confidence was observed following participation in microlearning-based educational technology training.

Digital training is also found to be more flexible and accessible to a larger number of educators compared to conventional training. In the context of higher education in Indonesia, regularly organised webinar-based training not only improves lecturers' digital literacy but also strengthens collaborative networks between institutions. On the other hand, the biggest challenges in digital training include low self-directed learning motivation and the need for technical support during the learning process.

The second most frequently published category relates to digital recruitment and selection strategies. A total of 12 studies highlighted how educational institutions leverage technology to streamline selection processes and broaden candidate reach. In Australia, AI-based recruitment can screen candidates at high speed and reduce subjective bias. This strategy is also widely implemented in Europe, where the integration of digital assessment systems in early selection stages has led to improved HR quality in education. Similar findings were reported in Malaysia, where the use of digital platforms in teacher recruitment has expanded inclusivity, particularly in attracting candidates from rural and remote areas.

Technology-based performance evaluation is another key category, with 9 articles addressing this topic. Technology is considered to enhance objectivity and transparency in performance assessments, particularly through dashboard systems and automated reporting. In Spain, educational institutions have successfully implemented real-time performance evaluations using LMS data. In Indonesia, the integration of e-reporting and online attendance systems provides a more comprehensive, data-driven picture of teaching staff performance. Digital performance evaluations also enable quicker self-reflection among teachers and assist management in making promotion and career development decisions.

HR welfare support is another prominent theme in the literature, with 8 articles exploring how educational institutions provide psychological, social, and digital health support to maintain the well-being of teaching staff. In Canada, virtual counselling and mental health training played key roles in maintaining teacher motivation during the transition to online learning. Other studies indicate that emotional well-being has a direct impact on attendance and productivity. Thus, successful digital transformation in education requires institutions to design holistic welfare strategies, encompassing psychosocial support, adequate access to digital services, and protection from technology-induced workload burdens.

The use of digital platforms in HR management appears in 11 studies. Platforms such as Google Workspace, Microsoft Teams, and Moodle are not only used for teaching but also for attendance tracking, internal communication, and monitoring staff professional activity. In Hong Kong, the use of digital systems for HR management significantly improved administrative efficiency. In Indonesia, the use of cloud-based dashboards for managing primary school teachers allows headteachers to monitor learning progress and teacher performance in real time.

Meanwhile, 9 articles examined the themes of transformational policy and leadership. In the United Arab Emirates, adaptive leadership styles towards digital change helped accelerate the integration of technology into HR systems. Clear policies, budgetary support, and long-term digital visions were identified as key supporting factors across various national contexts. In Finland, a collaborative leadership style that welcomed digital participation fostered an innovative work environment focused on sustainable HR development.

These findings demonstrate that HR strategies in the digital era cannot stand alone, but must be aligned with institutional vision, organisational culture, and available technological readiness. The synthesis of 65 articles shows that best practices in digital HR management are characterised by cross-functional integration between technology, training, evaluation, and institutional policy. Countries with decentralised education systems tend to be more flexible in adopting technological innovations, as seen in Finland and the Netherlands, while countries with rigid bureaucracies—such as several in South Asia—face adoption challenges despite having sufficient technological resources.

Data-driven approaches also emerged as key to HR planning and decision-making. The use of big data and predictive analytics for HR development planning has begun in higher education institutions, such as those in China. This enables more precise mapping of staff potential and needs,

and the development of tailored training programmes. Moreover, blockchain technology is being trialled in the management of educators' professional records in Estonia and South Korea, offering transparency in promotion, certification, and performance reporting processes.

The findings from this review support the argument that effective HR management in education during the digital era must be adaptive, technology-based, and participatory. Strengthening digital competencies, empowering leadership, and transforming evaluation and welfare systems are central pillars in building resilient and sustainable educational systems amid global technological disruption. Institutions capable of simultaneously integrating technological, welfare, and policy dimensions show more stable and progressive performance in implementing digital learning. Therefore, future HR strategies should not only focus on efficiency, but also on sustainability, equity, and the humanisation of work within digital education systems.

4. CONCLUSION

The conclusion of this review indicates that educational HR management strategies in the digital era are not uniform but are highly dependent on each country's social, economic, and policy contexts. While there is a global trend towards digitalisation in HR management, the implementation varies in terms of depth, effectiveness, and sustainability. Developed countries tend to have ecosystems that are more ready to support comprehensive digital HR transformation, including aspects of infrastructure, regulation, and institutional support. On the other hand, developing countries, despite facing various limitations, have demonstrated adaptive innovations tailored to local needs. This shows that HR strategies are determined not only by the availability of technology but also by the education system's ability to understand social dynamics and build contextual solutions.

This review highlights the importance of a human-centred approach in the digital transformation of HR management. The success of educational institutions in adopting technology does not solely depend on the digital tools used, but also on the extent to which institutions can facilitate cultural change in the workplace, support the psychological well-being of HR, and cultivate a sense of ownership toward the envisioned transformation. The findings show that digital training focused solely on technical aspects, without incorporating motivational and participatory dimensions, tends to have limited impact. Therefore, successful strategies are those that position digital transformation as part of human capacity strengthening, rather than merely a shift from manual to automated processes.

This study recommends that every educational HR management policy and strategy in the digital era be designed in a systemic, inclusive, and data-driven manner. Collaboration among stakeholders—including governments, educational institutions, technology providers, and academic communities—needs to be strengthened to ensure that HR management is not only efficient, but also fair and sustainable. In doing so, educational institutions across the globe can build resilient HR systems capable of navigating future uncertainties, while upholding the core principle of education as a humanising process that places people at its centre. This review provides an initial contribution towards understanding the global landscape of digital HR management and is expected to serve as a foundation for further research and strategic policymaking at both local and international levels.

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