

Electronic Human Resource Management and Organizational Performance of North-Western Nigerian Federal Universities: A Moderating Effect of Digital Literacy

Sonny Emmanuel Braide¹, Associate Prof Olusegun Kazeem Lekan², & Dr. John Ogbu Orinya³

Department of Business Management, Faculty of Management Science, Federal University Dutsin-Ma, Katsina State, Nigeria.

DOI: <https://doi.org/10.47772/IJRISS.2026.100601297>

Received: 04 July 2026; Accepted: 10 July 2026; Published: 17 July 2026

ABSTRACT

The purpose of this study is to empirically examine how electronic human resource management affects organizational performance of North-Western Nigerian Federal Universities. The research hinged on Technology Acceptance Model and Resource-based View Theories. The study adopts a descriptive cross-sectional survey research design. The study collected a total sample size of 448 respondents from employees of university includes Deans of Faculty, Heads of Departments, lecturers, and non-academic staff. The data are analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM), which is suitable for predictive analysis and theory extension in emerging research contexts. The findings revealed that for the direct relationship, digital literacy, electronic compensation and electronic learning have positive and significant influence on organizational performance. While digital literacy moderates the relationship between electronic compensation and organizational performance. In contrast digital literacy does not moderate the relationship between electronic learning and organizational performance. Therefore, it is recommended that Federal Universities in North-Western Nigeria should strengthen employees' digital literacy through continuous digital skills training and capacity-building programmes to enhance effective technology use and improve organizational performance.

Keywords: electronic human resource management, organizational performance, digital literacy, electronic compensation, electronic learning

INTRODUCTION

The growth of digital technologies has reinforced the importance of higher education institutions in producing competent and competitive graduates (Obama et al., 2020). This has made Universities in Nigeria face increasing pressure to improve performance and align their outputs with labour market needs. Federal universities are central to knowledge creation, research advancement, and societal development, with organizational performance reflecting their success in achieving these objectives (Gede & Huluka, 2024). The implementation of e-HRM has become a strategic approach to enhancing HR operations and institutional effectiveness (AlHamad et al., 2022).

According to a survey by United Nations Educational, Social, and Cultural Organization, (UNESCO), (2024), Harvard University and the University of Leeds have achieved high levels of e-HRM integration, estimated at 80%–90% and 70%–85%, respectively. However, World Bank's African Higher Education, (WBAHE), (2024) revealed that universities in Rivers, Bayelsa, and Sokoto States, including Federal University Dutsin-Ma, exhibit relatively low e-HRM adoption levels of between 20% and 40%. The global and African e-HRM adoption comparison highlights a clear digital divide in higher education. While universities in developed countries have made substantial progress in integrating e-HRM systems, those in Africa, particularly Nigeria, face significant barriers to full adoption. The lower adoption rates may have limited the ability to take maximum advantage of the possibility of e-HRM systems moving operational efficiencies and improving human resource management quality (Antoninis et al., 2023).

Despite evidence showing a positive relationship between e-HRM and organizational performance (AlHamad et al., 2022; Hosain, 2017; Varadaraj & Al Wadi, 2021), much of the literature is based on developed economies.

In addition, limited attention has been given to contextual factors that may influence this relationship in developing countries. Therefore, this study introduces digital literacy as a moderating variable to explain how regulatory, technological, and infrastructural conditions shape the effectiveness of e-HRM in Nigerian federal universities.

E-HRM is the application of digital technologies to HR activities, enabling organizations to manage employee-related processes more effectively. It improves administrative efficiency, facilitates data management, and supports informed decision-making. In universities, e-HRM is particularly valuable for handling complex workforce structures and enhancing institutional performance. This is not like earlier studies that employed dimensions such as e-selection, e-productivity, and e-grievance tracking; this study adopts e-compensation and e-learning as key measures of e-HRM. The choice of these proxies is because using them to measure e-HRM in the university system performance provides a comprehensive view of its implementation and effectiveness which are all integral to managing a diverse and complex workforce in higher education. E-learning involves the use of electronic platforms to support learning and information sharing without geographical or time constraints. It allows employees to participate in training through digital tools such as self-paced learning modules and virtual classrooms, making it an effective approach to workforce development in modern organizations. While Elsayy (2021) stated that e-compensation is the integration of software solutions for modelling employee pay structures and designing both cash and non-cash reward systems is a strategic initiative aimed at boosting organizational outcomes (Al-kasasbeh et al., 2016).

E-HRM facilitates systematic performance evaluation by enabling the monitoring of employee goals, achievements, and appraisal outcomes. This supports merit-based rewards and continuous performance improvement. It provides real-time HR data and analytics that assist management in making informed decisions regarding staffing, promotions, workforce planning, and employee development particularly in Nigerian education sector. Federal universities in Nigeria have experienced varying levels of e-HRM adoption. Some institutions have integrated digital HR systems to enhance workforce management and operations, whereas others still face barriers affecting successful implementation. These challenges include inadequate funding as federal universities often struggle with limited budgets, prioritizing teaching, research, and infrastructure over administrative technology, which requires substantial financial investment for e-HRM software and staff training. Poor technological infrastructure hardware and software limits the maintenance of complex e-HRM systems due to poor internet connectivity, obsolete IT equipment, and out-dated systems. Limited technical expertise as many HR personnel and university administrators lack the technical skills needed to operate and manage e-HRM systems effectively. It is against this background, that this study is conducted to investigate the moderating role of electronic human resource management in relation to organizational performance of federal university in northwest zone, Nigeria.

Statement of the Problem

The effectiveness of Nigerian federal universities depends greatly on efficient human resource management. However, many institutions still use traditional HR practices, resulting in inefficiency and poor workforce management. The introduction of e-HRM can improve HR operations and organizational performance, but limited implementation challenges reduce its effectiveness. Several empirical studies (Alqarni et al., 2023; Bhatt & Poduval, 2023; Umar et al., 2020) adopted organizational agility sustainable innovation, sustainable competitive advantage, e-training and e-selection as proxies by e-HRM in relation to university performance. Assessing these intangible outcomes capable of having measurement complexity challenges and requires robust metrics which created empirical gap this research seeks to address by align with broader goals to fostering innovation, and enhancing global competitiveness such as improving higher education quality.

Similarly, extant literatures (Elsawy, 2021; Hosain, 2017; Obama et al., 2020) hinged Social Systems Theory and others utilised theory of Planned Behaviour (TPB) in their studies, this theory only emphasizes the system as a whole rather than individual actors within it while, TPB places less emphasis on external or environmental factors for instance, organizational culture, technical infrastructure, leadership support, which can heavily influence the adoption of systems like e-HRM and downplay the role of personal decision-making, motivation, or resistance in system adoption created a theoretical gap. Therefore, this study seeks to address the deficiency by using Technology Acceptance Model (TAM) and DeLone and McLean IS Success Model.

Despite the identified challenges, previous empirical studies (Al Haziazi, 2020; Elsayy, 2021; Epebinu et al., 2024; Shamaileh et al., 2022) have revealed inconsistent findings regarding the relationship between E-HRM and OP, while some studies established a positive relationship, others works (Ahmed, 2019; Hosain, 2017; William & Singh, 2023), found negative effects. The negative findings suggest that the implementation of E-HRM does not automatically guarantee improved organizational outcomes, particularly when organizations lack adequate technological infrastructure, employee competencies, and effective change management practices. Similarly, the positive findings indicate that E-HRM enhances organizational performance by improving access to timely employee information, facilitating efficient decision-making, and strengthening HR service delivery. The divergence in empirical evidence highlights a significant research gap, indicating that the effect of E-HRM on OP may depend on certain contextual factors. Therefore, this study extends existing knowledge by introducing moderating variables to explain the conditions under which E-HRM contributes to improve OP.

Research Hypotheses

- H01:** Digital Literacy has no significant effect on organisational performance of north-western federal universities in Nigeria
- H02:** E-Compensation has no significant effect on organisational performance of north-western federal universities in Nigeria
- H03:** E-Learning has no significant effect on organisational performance of north-western federal universities in Nigeria
- H04:** Digital Literacy does not significantly moderate the effect of e-compensation on organisational performance of north-western federal universities in Nigeria
- H05:** Digital Literacy does not significantly moderate the effect of e-learning on organisational performance of north-western federal universities in Nigeria

LITERATURE REVIEW

Organizational Performance

Organizational performance has remained a significant area of interest in both academic research and professional practice. However, despite extensive investigation, scholars continue to debate its meaning, conceptual boundaries, and appropriate methods of measurement (Stannack, 2023). According to Stannack (2023), many researchers have adopted approaches that assess organizational performance based on the extent to which organizations achieve their financial objectives through the efficient and effective utilization of available resources. The definition of El-Borsaly and Hassan (2020) views organizational performance as the organization's capability to execute a particular strategy successfully and also a collective result of employees' performance. Kalogiannidis (2021) defines organizational performance as the extent to which an organization effectively executes its activities and achieves its predetermined objectives by comparing actual outcomes with expected results. Organizational performance is commonly assessed through dimensions such as financial outcomes, business performance, organizational effectiveness, operational efficiency, and employee productivity (Bolton et al., 2024; Ahmed, 2019; Stannack, 2023). However, this study focuses on selected dimensions influenced by specific e-HRM practices, including e-recruitment, e-learning, e-salary processing, e-performance evaluation, and e-communication..

This study conceptualizes organizational performance as the capacity of an organization to fulfil its goals, address stakeholder requirements, and meet expectations in an effective and efficient manner. It encompasses the outcomes and results generated by an organization's activities, processes, and strategies over a specific period, reflecting its overall success and sustainability.

Digital Literacy

Digital literacy refers to the ability to effectively use digital technologies by combining technical skills with

cognitive abilities to access, evaluate, create, and communicate information (Gilster, 1997; Bawden, 2008). It enables individuals to utilize ICT for collaboration, innovation, problem-solving, and improved productivity. In organizations, employees with strong digital literacy can maximize digital tools to enhance performance, while limited digital skills may reduce efficiency and work outcomes (Ojobo et al., 2023; Nikou et al., 2022). Digital literacy, as defined by Matindale et al. (2024) and Kabakus et al. (2023), involves an individual's competence in discovering, accessing, managing, integrating, and critically evaluating digital content, as well as producing new knowledge, creating media outputs, and communicating ideas within both organizational and everyday settings. It also includes the cognitive and behavioural capacity to use digital technologies ethically and effectively to promote social good. Within higher education institutions, the cultivation of digital literacy among teachers, students, and staff is vital for achieving digital transformation, integrating technology into institutional practices, and enhancing professional development.

This study refers to digital literacy as the ability of students, faculty, and administrative staff to use effectively, digital tools, technologies, and platforms for teaching, learning, research, and administrative purposes. It encompasses that one is skilled, knowledgeable, and with the right attitude for navigating, evaluating, creating, and communicating information in a digitalised environment, while maintaining ethical and responsible digital behaviour. This includes being able to handle devices like computers, tablets, and smartphones proficiency in using software applications (e.g., word processors, spread sheets, and learning management systems (LMS) such as Moodle, Blackboard, or Canvas (Irielle, 2024; Xia & Zhang, 2024).

Electronic-Human Resource Management Practices

The adoption of e-HRM provides universities with opportunities to improve human resource management practices by centralizing HR activities, increasing administrative efficiency, and enhancing service delivery. Through ICT-enabled systems, e-HRM supports effective management of recruitment, employee records, performance evaluation, payroll, and staff development while promoting informed decision-making (AlHamad et al., 2022; Almashyakhi, 2022).

According to Khammadee (2023), e-HRM refers to the use of information technology for the design, execution, and facilitation of interactions between at least two actors either individuals or organizational units for performing HR tasks collectively. It relies on various internet-based tools and protocols to simplify and enhance human resource operations. Elsayy (2021) notes that e-HRM encompasses both administrative functions such as staffing, development, remuneration, and evaluation, and strategic activities that contribute to organizational growth. It enables end-to-end HR management throughout an employee's career path. Through the adoption of digital self-service platforms, organizations are able to deliver HR services efficiently to their workforce and leadership.

Girisha and Nagendrababu (2019) define e-HRM as a strategy that aligns human resources and practices with organizational goals through the use of integrated technological solutions. They further note that e-HRM involves the automation of HR functions by incorporating various internet technologies and protocols. For this study, e-HRM is defined as the integration of digital technologies and internet-based systems into human resource practices to improve organizational efficiency and operational effectiveness. It involves the use of HRIS, online platforms, mobile applications, and cloud-based systems to automate HR activities such as recruitment, performance appraisal, communication, payroll, training, employee engagement, and decision-making (Nath et al., 2022).

Electronic Compensation

Human Resource Management is crucial in managing compensation and reward, which includes both monetary and non-monetary benefits offered to employees in exchange for their work (Bashir et al., 2024). Digital rewards, such as badges, points, virtual currency, or exclusive content, are increasingly being used to recognize achievements and motivate employees. However, digital compensation systems may be time consuming in terms of implementation. Nonetheless, digital HRM is not just about digitalization, but, also considers factors like industry type, human learning of technology, and job skills. The execution of digital HRM is essential for organizations to remain competitive and retain the best employees (Bashir et al., 2024).

Elsawy (2021) defines e-compensation as the integration of software solutions for modelling employee pay structures and designing both cash and non-cash reward systems is a strategic initiative aimed at boosting organizational outcomes (Al-kasasbeh et al., 2016). As noted by Bashir et al. (2024), when managers utilize digital compensation tools to produce on-demand payroll information, employee retention tends to improve, and the workforce becomes more agile. This digitization of compensation systems has led to reductions in both administrative costs and processing time. Dulebohn and Marler (2005) characterize e-compensation as web-enabled platforms that allow for more efficient development, administration, and communication of compensation and benefit plans. Their study indicates that digital access to compensation data empowers HR managers to refine and enhance reward strategies. This study defines e-compensation as electronic and digital systems to manage, administer, and streamline compensation-related processes for university employees. It is a component of electronic Human Resource Management (e-HRM), designed to enhance efficiency, transparency, and accuracy in managing employee benefits, salaries, and rewards. In the university system e-compensation helps streamline and modernize compensation management processes in a complex organizational environment.

Electronic Learning

E-learning and digital training programs leverage modern technologies to provide learners with flexible access to educational content at any time and from any location. This approach promotes continuous knowledge exchange without the constraints of time or limited resources. Commonly used methods include virtual classrooms, asynchronous learning modules, online conferencing tools, and professional networking platforms. As multinational corporations continue to expand, e-learning has emerged as a preferred strategy for delivering scalable and effective training across diverse geographical regions. It enhances organizational efficiency and workforce flexibility while simultaneously reducing costs and saving time (Bansal et al., 2021). In the context of workplace learning, this integration delivers learning materials to employees through various platforms, such as desktop computers, laptops, smartphones, and portable digital devices like e-readers and media players. These resources, used by employees to acquire work-related knowledge and skills, are referred to as e-learning, which continues to expand in its adoption within the workplace (Patel, 2016).

In this study, e-learning is operationalized as the use of electronic technologies to facilitate, manage, and deliver educational content. This approach is becoming increasingly vital in higher education institutions due to its flexibility, accessibility, and capacity to accommodate the varied requirements of learners. E-learning platforms allow students to access course materials at their own convenience, which is particularly advantageous for part-time students or those managing additional responsibilities. These platforms are engineered to be compatible with a range of devices, including laptops, tablets, and smartphones. The integration of multimedia components such as videos, animations, and gamification significantly boosts student engagement. Additionally, online discussion forums and collaborative projects promote interaction between students and instructors (Tîrziu & Vrabie, 2020).

REVIEW OF EMPIRICAL STUDIES

Effect of Electronic Compensation and Organisational Performance

Alfawareh et al. (2025) conducted a study to assess the relationship between digital payments, ownership structure, and the performance of banks in Jordan. The analysis was based on data from 12 commercial banks listed on the Amman Stock Exchange, spanning the period from 2010 to 2023. Using panel data and applying the ordinary least squares (OLS) regression method, the study found that both digital payment adoption and ownership structure were significantly and positively associated with bank performance. Moreover, the presence of independent directors was found to strengthen the positive relationship between institutional ownership and bank performance.

Calderon (2025) assessed the role of digital payment systems in improving financial transaction efficiency, analysing data from a sample of 47 businesses. The results revealed several key benefits: a 7% decrease in transaction time, 50% lower transaction costs, a 150% rise in transaction frequency, and an 80% reduction in transaction-related errors. These improvements led to a 6% increase in user satisfaction scores. Furthermore, 66% of participants reported PTSD symptoms. Qualitative data complemented the quantitative results by providing practical insights from both consumers and business owners.

In a related study, Fijabi et al. (2024) explored the impact of e-payment systems on competitive advantage and customer satisfaction in the Nigerian banking sector. The study used a sample of 200 customers from five different banks and found that users were generally pleased with existing e-payment platforms. The analysis showed that all three hypotheses had statistically significant outcomes ($p < 0.05$), leading to the acceptance of the alternative hypotheses. One of the key recommendations was the need for banks to improve network quality to support better app functionality.

The Effect Electronic Learning and Organisational Performance

Čevra et al. (2022) conducted a study on the impact of e-learning on individual job performance within organizational settings. Their results indicated that the foremost factor affecting job performance was the intention to participate in e-learning, closely succeeded by knowledge sharing. Furthermore, the research highlighted that both knowledge sharing and personal innovativeness were significant elements that shaped the perceived usefulness of e-learning. Alam et al. (2021) explored the effects of e-learning services on sustainable learning and academic achievement, concentrating on 397 participants from the leading five public universities in southern Saudi Arabia. By employing Partial Least Squares regression analysis, the research pinpointed five critical factors Learner's Quality, Instructor's Quality, Information's Quality, System's Quality, and Institutional Quality that affect the performance of e-learning services. These factors accounted for 48.7% of the variance in the perceived usefulness of e-learning systems and 71.2% in their actual utilization. Additionally, the study revealed that perceived usefulness and system usage collectively explained 70.6% of students' learning and academic performance, thereby establishing a robust framework for the effective and sustainable integration of e-learning services.

Artüz and Bayraktar (2021) investigated the influence of digital leadership practices and characteristics of learning organizations on perceptions of individual performance, utilizing an online survey with 193 participants. The data were analysed using SPSS 25.0. Their results indicated a statistically significant correlation between digital leadership and learning organizations, impacting individual performance ($p=0.000$; $p<0.001$). Moreover, when demographic variables were assessed in relation to individual performance perceptions, no statistically significant differences emerged. The originality of the study is reflected in its theoretical contribution to the field of digital leadership and its innovative examination of the connection between digital leadership and learning organizations within the banking sector.

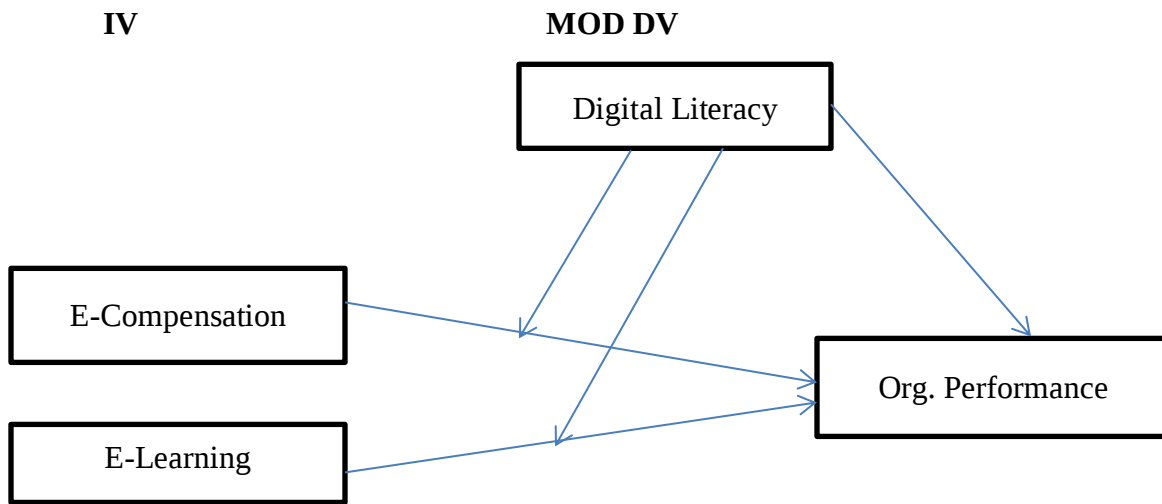
Moderating Effect of Digital Literacy

Sitaniapessy et al. (2024) examined the influence of digital literacy strategies on enhancing the business performance of MSMEs in the Maluku province, conducting a survey involving 125 MSMEs across three city districts. Through structural model analysis utilizing AMOS SEM version 26, they determined that all three proposed hypotheses exhibited a positive and statistically significant impact on the business performance of MSMEs in the area. Zheng (2024) investigated the effects of innovation adoption, digital competencies, and digital literacy on the efficacy of management information systems, while also considering the moderating influence of organizational support, based on a sample of 305 SME owners in China. Employing Smart-PLS 4.00 for hypothesis testing, the findings indicated that although innovation adoption did not affect the effectiveness of management information systems, both digital competencies and digital literacy were significantly related to the system's effectiveness. Furthermore, the research found no moderating effect of organizational support on the relationship between innovation adoption, digital literacy, and the effectiveness of management information systems. The study concluded that increasing awareness of digitalization among employees and the general public could facilitate the transition of Chinese SMEs to new digital practices.

Chatterjee et al. (2023) explored the connection between digital workplaces and organizational performance, emphasizing the moderating role of digital leadership capability, with a sample of 335 participants from organizations undergoing digital transformation. The research employed the PLS-SEM technique for analysis and discovered that dynamic organizational capabilities positively affected digital workplace transformation, which in turn enhanced employees' work-life balance and led to improved performance. The study highlighted the essential role of digital leadership in propelling digital transformation within organizations.

Conceptual framework

The conceptual framework shows the relationship between the independent, dependent and moderating variables in the study. The Electronic Human Resources Management (E-HRM) depicting the relationship by pointing to the direction of Organisational Performance (OP) while Digital Literacy (DL) serves as moderating variable pointing to middle IV and DV which explained the model.



(Source: Researcher, 2026)

The conceptual framework for this study illustrates the independent variable which is Electronic Human Resources Management, which is proxy by (E-Compensation and E-Learning) and the dependent variable, Organisational Performance, while Digital Literacy, the moderating variable.

Theoretical Framework

Technology Acceptance Model

This used Technology Acceptance Model (TAM) and Resource-based View (RBV), propounded by Fred Davis in the year 1986 and later refined in 1989 and RBV by Jay Barney in 1991. TAM assumes that an individual's willingness to adopt and use a technology is primarily influenced by Perceived Usefulness (PU), meaning that those individuals are more likely to accept a technology when they believe that using it will improve their job performance, productivity, or effectiveness and Perceived Ease of Use (PEOU), stated that individuals are more willing to use a technology when they perceive it as easy to learn, understand, and operate without excessive effort. Some scholars such as Benbasat and Barki (2007) mainly focuses on individual perceptions and does not sufficiently consider external conditions such as organizational readiness, technological infrastructure, training, leadership support, and resources. However, in spite of the criticisms, TAM best fit in this study, because it addresses the variables under investigation. In application to this study based on TAM, e-compensation and e-learning improve organizational performance when employees accept and effectively use these technologies. However, such acceptance is influenced by employees' digital literacy, which determines their ability to perceive, adopt, and utilize electronic HR systems. Thus, digital literacy can serve as an important condition that strengthens the effect of e-HRM practices on organizational performance.

Resource-based View

The RBV theory assumes that organizational performance and competitive advantage depend on the possession and effective utilization of valuable internal resources which has to do with possession of different resources and capabilities, which influence their ability to achieve superior performance. The resources must be valuable, rare, inimitable, and non-substitutable for effective resource utilization improves performance to ensure human and technological capabilities. Godfrey and Hill (1995) criticised that RBV theory is difficult in measuring strategic resources that it provides limited guidance on how these characteristics should be objectively measured. There could be no better theory to fit the foundation of this study, reason that RBV explains that E-HRM can enhance

organizational performance when digital HR systems, employee competencies, and technological capabilities are effectively integrated as strategic resources. Universities and organizations that successfully develop these capabilities may achieve improved efficiency, better decision-making, and stronger organizational outcomes.

METHODOLOGY

This study employed a descriptive survey research design using a cross-sectional approach to collect data on the variables of interest at a single point in time. The design was considered appropriate because it enables the efficient collection of data from a large population while minimizing the time and financial resources required compared to longitudinal studies that involve repeated observations over an extended period. The target population for this study was 19,134 employees from university includes all Deans of Faculty, Heads of Departments (HODs), lecturers, and non-academic staff at universities in the Northwest of Nigeria, covering Kano, Kaduna, Katsina, Kebbi, Jigawa, Sokoto, and Zamfara states. However, due to logistical constraints of time, financial limitations which may not allow for all seven states to be studied, hence the study focused on four federal universities with Ahmadu Bello University Zaria in Kaduna State, Bayero University Kano in Kano State, Usman Danfodio University, Sokoto in Sokoto State, and Federal University Dutsinma in Katsina State. These universities were selected based on the broader explanations earlier made in Section 1.6 of this proposal.

The study obtained a sample size of 392 using Yamane (1977) determination formula. However, to address some concerns on non-return of the study instrument and invalid cases, the study increased the sample size by 50% (196) giving a total sample size of 588 as recommended by Bryman and Bell (2015). The assumption of this study is that the sample will be representative of the population. The Yamane (1977) sample size determination formula is given below.

Sample size formula:

$$n = \frac{N}{1 + N(e^2)}$$

Where:

n = Sample size

N = Population size

e = Margin of error (usually 0.05 or 5% if not specified)

N= 19,134 and assuming e = 0.05

$$= \frac{19134}{1 + 19134 (0.05)^2}$$

$$= \frac{19134}{1 + 19134 (0.0025)}$$

$$n = \frac{19134}{1 + 47.835}$$

$$n = \frac{19134}{48.835}$$

$$n = 391.809$$

$$n = 391.81$$

Approximately 392

The study utilized a final sample size of 448 respondents. Out of the 588 questionnaires distributed, 527 were returned, 79 were discarded due to incompleteness or invalid responses, and 61 were not returned. Primary data were collected through a structured questionnaire administered to employees of the selected universities. The instrument comprised demographic questions and items measuring the study constructs, including organizational performance, e-recruitment, e-performance appraisal, e-communication, e-compensation, e-learning, and digital literacy, using a five-point Likert scale. Data were analysed using descriptive statistics and multiple regression techniques, while Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed for inferential analysis.

Model specification

To estimate the model parameters, a simple linear specification for a multivariable function was applied. Electronic Human Resource Management (E-HRM) is represented by its proxies: Electronic Compensation (EC), and Electronic Learning (EL). The dependent variable is Organisational Performance (OP), while Digital Literacy (DL) functions as the moderating variable. Accordingly, the relationship is expressed using a standard multiple regression framework as presented below.

This functional effect is operationalized through the following:

$$\text{Organisational Performance} = F(\text{Electronic Human Resource Management}) \dots\dots\dots (1)$$

Where:

$$\text{Electronic Human Resource Management} = F(\text{Electronic Compensation, Electronic Learning})$$

$$\text{Therefore OP} = (EC, EL) \dots\dots\dots (2)$$

Where:

OP = Organisational Performance

EC = Electronic Compensation

EL = Electronic Learning

The above function simply states that organisational performance is a function of Electronic Compensation, and Electronic Learning. This function is transformed into an econometric form as:

$$CR = \beta_0 + \beta_1 EC + \beta_2 EL + \beta_3 OP * EC + \beta_4 OP * EL + \mu_t \dots\dots\dots (3)$$

Where:

OP = Organisational Performance

EC = Electronic Compensation

EL = Electronic Learning

DL = Digital Literacy

$\beta_1 - \beta_2$ = Coefficient

β_0 = Intercept

μ_t = Error of Term

Thus, organisational performance is examined by the two explanatory variables with moderating variable and by other unobserved factors which are contained in the error term (u). The study is still primarily interested in the

relationships between electronic human resource management and organisational performance as well as moderating variable, that is, this study is interested in the parameter β_1 - β_2 and $-\beta_4$.

RESULTS AND DISCUSSION

Rate of Response

From the 588 questionnaires distributed, representing 100% of the target sample, 90% was successfully retrieved. After removing 13% of the returned questionnaires due to incomplete responses, 76% of the questionnaires were considered valid and appropriate for data analysis. This response rate is regarded as sufficient for conducting organizational and social science research (Dillman et al., 2014; Saunders et al., 2019).

Table 1 Response Rate of the Questionnaires

Response Rate Category	Frequency	Percentage (%)
No. of distributed questionnaires	588	100%
Returned questionnaires	527	90%
Usable questionnaires	448	76%
Excluded questionnaires	79	13%
Questionnaires not returned	61	10%
Overall Response Rate	527	90%
Valid (Usable) Response Rate	448	76%

(Source: Author 2026)

Measurement Model Assessment

The evaluation of reflective constructs in PLS-SEM focuses on establishing measurement reliability and construct validity. Indicator reliability is assessed by examining outer loading values, while internal consistency reliability is evaluated using Cronbach's Alpha and Composite Reliability coefficients, with acceptable values ranging from 0.70 to 0.90. Convergent validity is supported when the AVE exceeds the threshold of 0.50, and discriminant validity is verified using the Fornell-Larcker criterion, whereby the square root of each construct's AVE should be greater than its correlations with all other constructs (Hair et al., 2010; 2014; 2018; Henseler et al., 2009).

Individual Item Reliability

Indicator reliability refers to the degree to which each observed indicator accurately measures the latent construct it is designed to represent. Within the PLS-SEM framework, this is determined by examining indicator outer loadings, with higher values demonstrating stronger measurement reliability (Hair et al., 2017; 2022). The measurement model consisted of 26 questionnaire items, including six items each for e-recruitment, e-learning, and organisational performance, as well as eight items measuring digital literacy. Since all indicator loadings were greater than 0.70, none of the questionnaire items was removed. According to Hair et al. (2014), indicators with loadings between 0.40 and 0.70 should only be eliminated if doing so enhances Composite Reliability (ρ_A and ρ_C) and Average Variance Extracted. As shown in Table 2 and Figure 1, every indicator surpassed the recommended loading threshold of 0.70, indicating that the measurement items reliably captured their intended constructs (Hair et al., 2022).

Internal Consistency Reliability

The measurement model's reliability was determined through the assessment of Cronbach's alpha and composite reliability, both of which are commonly used to evaluate internal consistency among measurement items. This is not like Cronbach's alpha that assumes equal indicator contributions; composite reliability permits indicators to have different loadings (Hair et al., 2014). The adoption of both reliability indices is supported by methodological literature and enhances confidence in the study findings (Hair et al., 2022). As revealed in Table 2, all constructs achieved values substantially above the recommended threshold of 0.70, with Cronbach's alpha values ranging from 0.911 to 0.949 (Nunnally, 1978; Hair et al., 2014). Additionally, ρ_A and ρ_C values between 0.914

and 0.949, together with composite reliability values ranging from 0.931 to 0.957, indicate excellent internal consistency across all constructs (Hair et al., 2014, 2018, 2021).

Table 2 Individual Item Reliability, Internal Consistency Reliability, Convergent Validity and Discriminant Validity

	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
DL		0.949	0.949	0.957	0.735
DL1	0.857				
DL2	0.854				
DL3	0.858				
DL4	0.857				
DL5	0.853				
DL6	0.867				
DL7	0.855				
DL8	0.858				
EC		0.911	0.914	0.931	0.693
EC1	0.831				
EC2	0.828				
EC3	0.826				
EC4	0.838				
EC5	0.850				
EC6	0.821				
EL		0.916	0.918	0.935	0.705
EL1	0.833				
EL2	0.850				
EL3	0.844				
EL4	0.825				
EL5	0.855				
EL6	0.830				
OP		0.919	0.920	0.937	0.713
OP1	0.843				
OP2	0.841				
OP3	0.833				
OP4	0.861				
OP5	0.834				
OP6	0.853				

Source: Author's Computation (2026) using Smart PLS 4.0.9.9

The estimated results of the PLS-SEM for the model described in Equation 1 are presented in Figures 1 and 2. The computations and model estimations were conducted utilizing SmartPLS statistical software

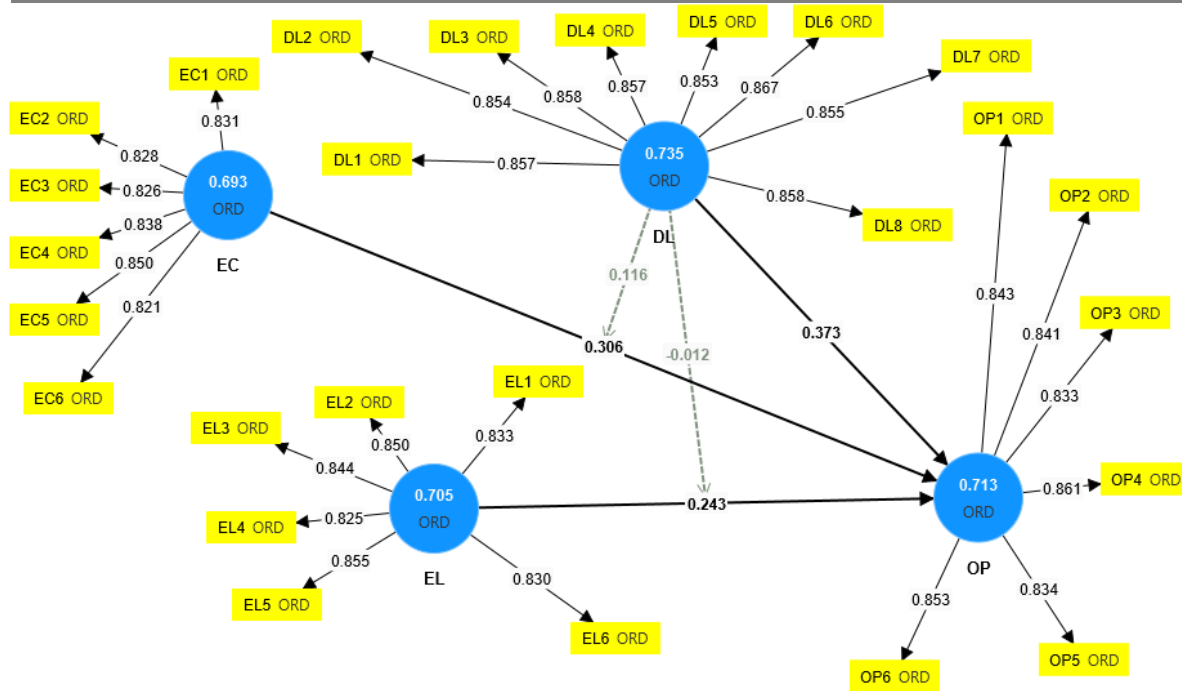


Figure 1: Path Diagram of Measurement (Outer) Model

Convergent Validity

Convergent validity evaluates whether the indicators of a construct are highly correlated and consistently reflect the same underlying theoretical concept (Hair et al., 2022; Fornell & Larcker, 1981). It is commonly assessed using the Average Variance Extracted (AVE), derived from the squared factor loadings. As recommended by Hair et al. (2014), an AVE of 0.50 or above indicates satisfactory convergent validity. As presented in Table 2, all constructs attained AVE values ranging from 0.693 to 0.735, accounting for 70% of the variance in their indicators and confirming adequate convergent validity.

Discriminant Validity

Discriminant validity measures how well a construct is empirically distinct from other constructs in a model, ensuring that each captures a unique dimension of the studied phenomenon without excessive overlap. This study assessed discriminant validity using the Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT) (Hair et al., 2014). As noted by Hair et al. (2022) and Henseler et al. (2015), discriminant validity is established when the indicators of a construct exhibit the highest loadings on their respective constructs relative to all other constructs. Additionally, according to the Fornell-Larcker criterion, the square root of a construct's AVE must exceed its correlations with other constructs.

Table 3 Depicting Discriminant Validity- Fornell-Lacker Criterion

	DL	EC	EL	OP
DL	0.857			
EC	0.460	0.832		
EL	0.482	0.063	0.839	
OP	0.633	0.496	0.445	0.844

Source: Author's Computation (2026) using Smart PLS 4.0.9.9

The results show that the square roots of the AVE for DL (0.857), EC (0.832), EL (0.839), and OP (0.844) are higher than their corresponding inter-construct correlations. The correlations indicate that DL is positively related to EC (0.460), EL (0.482), and OP (0.633). EC is moderately correlated with OP (0.496) but has a very weak relationship with EL (0.063), while EL is moderately associated with OP (0.445). The strongest correlation is between DL and OP (0.633), whereas the weakest is between EC and EL (0.063). Since all diagonal values

(0.832–0.857) exceed the inter construct correlations (0.063–0.633), discriminant validity is established according to the Fornell–Larcker criterion.

Discriminant Validity: Heterotrait-Monotrait Ratio (HTMT)

In partial least squares structural equation modelling (PLS-SEM), the Heterotrait–Monotrait (HTMT) ratio is used to verify discriminant validity by ensuring that each construct captures a unique phenomenon. Values below the recommended thresholds of 0.85 (strict criterion) or 0.90 (liberal criterion) indicate satisfactory discriminant validity. Moreover, the bootstrapping assessment strengthens the evidence when the HTMT confidence intervals do not include 1.00, confirming that the constructs are statistically different.

Table 4 Discriminant Validity: Heterotrait-Monotrait Ratio (HTMT)

	DL	EC	EL	OP
DL				
EC	0.492			
EL	0.517	0.075		
OP	0.676	0.539	0.483	

Source: Author’s Computation (2026) using Smart PLS 4.0.9.9

The HTMT results presented in Table 4, indicate that all construct relationships are below the recommended threshold values of 0.85 and 0.90, confirming discriminant validity. The HTMT values are 0.492 (DL–EC), 0.517 (DL–EL), 0.676 (DL–OP), 0.075 (EC–EL), 0.539 (EC–OP), and 0.483 (EL–OP). The strongest relationship exists between DL and OP (0.676), while the weakest is between EC and EL (0.075). These results confirm that the constructs are empirically distinct

Structural (or Inner) Model

The structural model was analysed after validating the measurement model to investigate the relationships between digital literacy, electronic compensation, electronic learning, and organizational performance. The analysis utilized 448 observations and applied bootstrapping with 5,000 resamples based on the guidelines of Hair et al. and Henseler et al. The hypothesized paths were examined through β coefficients, t-values, and p-values, with model assessment conducted using R^2 , Q^2 , and effect size (f^2) indicators.

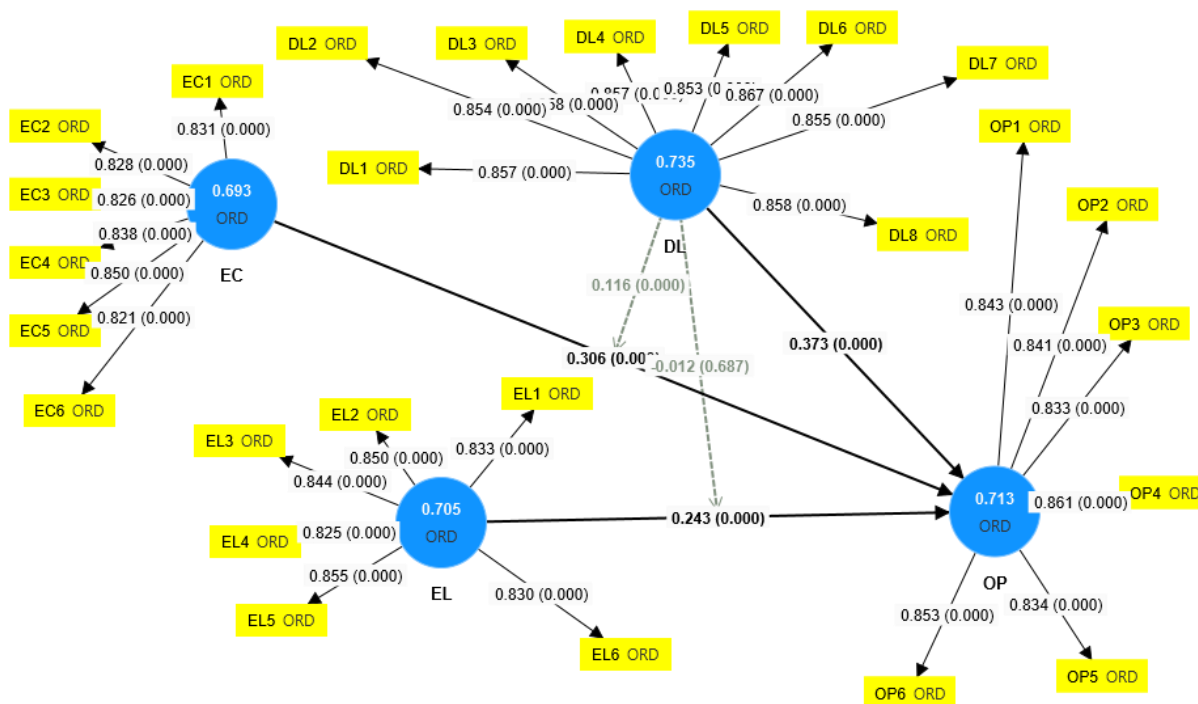


Figure 2: Path Diagram of Structural (Inner) Model

Hypothesis testing for direct Relationship

This section assesses the direct relationship between electronic human resource management construct on the endogenous variable, organizational performance. As outlined in the research framework, Table 5 provides a summary of the estimated β coefficients, t-statistics, and p-values for the direct paths under investigation. The null hypothesis (H_0) states that product digital literacy, electronic compensation, and electronic learning have no significant impact on organisational performance, implying that the estimated path coefficients are not statistically significant.

Table 5 Path Coefficients for Direct Effects in the Inner Model

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Remarks
DL -> OP	0.373	0.372	0.043	8.694	0.000	Rejected
EC -> OP	0.306	0.307	0.037	8.282	0.000	Rejected
EL -> OP	0.243	0.244	0.041	5.951	0.000	Rejected

Source: Author's Computation (2026) using Smart PLS 4.0.9.9

The H_{01} presented in Table 5 reveal that digital literacy has a positive and significant influence on organisational performance with ($\beta = 0.373$, $t = 8.694$, $p < .001$). Since the p-value is below 0.05 and the t-value exceeds 1.96, the effect is statistically significant; indicating that digital literacy significantly influences on organizational performance of North-Western Nigerian Federal Universities. Therefore the null hypothesis is rejected while the alternative one is accepted

H_{02} , Electronic compensation has a positive and statistically significant effect on organizational performance with ($\beta = 0.306$, $t = 8.282$, $p < .001$). As the p-value is less than 0.05 and the t-statistic exceeds the critical value of 1.96, the relationship is statistically significant. Therefore the null hypothesis was rejected, indicating that there is statistically significant relationship between Electronic Compensation and organisational performance

H_{03} , Electronic learning has a positive and statistically significant influence on organisational performance with path coefficient ($\beta = 0.243$, $t = 5.951$, $p < .001$). For the fact that the p-value is below 0.05, and the t-value is well above 1.96, indicating that the effect is statistically significant. This means that the null hypothesis was rejected; there is statistically significant relationship between Electronic learning and organizational performance.

Hypothesis testing for Moderating Effects

According to Hair et al. (2014), moderation occurs when an independent variable influences a dependent variable through a third variable which is also a factor independent variable. In this study, the objective is to determine whether digital literacy, electronic compensation, and electronic learning as indicators of electronic human resource management moderated effect on organizational performance through digital literacy. This moderating relationship is described and illustrated in Figure 2. Hair et al. (2014) propose calculating the moderating effect as the product of the two path coefficients linking the independent variable to the moderator and the moderator to the dependent variable. Accordingly, the moderating effect path in this study is digital literacy->electronic compensation->electronic learning -> organizational performance. The null hypothesis (H) proposes that is moderation does not exists within this model structure, the below Table 6 presents the results of this test.

Table 6 Path coefficient for indirect effects of the structural model

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Remarks
DL x EC -> OP	0.116	0.115	0.030	3.830	0.000	Rejected
DL x EL -> OP	-0.012	-0.011	0.031	0.403	0.687	Accepted

Source: Author's Computation (2026) using Smart PLS 4.0.9.9

As depicted in table 6, H04: digital literacy moderates the relationship between electronic compensation and organisational performance with ($\beta = 0.116$, $t = 3.830$, $p > .001$). The positive t-statistic suggests that as electronic compensation increases; organisational performance also increases by 0.116, therefore the hypothesis four is rejected.

H05: from table 6, digital literacy does not moderates the relationship electronic learning organisational performance with ($\beta = -0.012$, $t = 0.403$, $p < .001$). The positive t-statistic suggests that as electronic learning decreases; organisational performance also decreases by -0.012; therefore the hypothesis nine is accepted.

Digital literacy does not moderate the relationship between electronic learning and organizational performance. This finding implies that electronic learning may contribute to organizational performance; the level of employees' digital literacy does not strengthen the relationship. In other words, improvements in electronic learning practices may influence organizational performance regardless of employees' level of digital literacy. This may be because Federal Universities have established structured electronic learning systems, training support, or institutional procedures that enable employees to benefit from e-learning platforms even when differences exist in their digital skills. There is no prior study that aligned with current study.

Coefficient of Determination: R-Squared

The coefficient of determination (R^2) represents the proportion of variance in the dependent variable accounted for by the independent variables. Hair Jr. et al. (2017) highlight R^2 as a key indicator of a structural model's explanatory power. According to Hair et al. (2021), R^2 values of 0.75, 0.50, and 0.25 indicate substantial, moderate, and weak explanatory strength, respectively, whereas Cohen (1988) interprets values of approximately 0.26, 0.13, and 0.02 as large, medium, and small effects.

Table 7 Coefficient of Determination: R-Squared

	R-square	R-square adjusted
OP	0.514	0.508

Source: Author's Computation (2026) using Smart PLS 4.0.9.9

The coefficient of determination results show in Table 6, that DL, EC, and EL account for 51.4% of changes in Organizational Performance ($R^2 = 0.514$). The adjusted R^2 value of 0.508 confirms that the model maintains 50.8% explanatory power after considering the predictors included. The small variation between the two values indicates that the structural model is stable and has acceptable predictive strength.

F-square effect size

The f-square (f^2) statistic was used to evaluate the individual contribution of each exogenous construct to the variance explained in Organizational Performance. It represents the incremental change in the explained variance resulting from the inclusion of a predictor in the model.

Table 7 showing f-square effect size

Relationship	f-square	Size
DL -> OP	0.165	Medium
EC -> OP	0.146	Medium
EL -> OP	0.087	Small

Source: Author's Computation (2026) using Smart PLS 4.0.9.9

The results in Table 7 indicate the effect size (f^2) of Digital Literacy (DL), Electronic Compensation (EC), and Electronic Learning (EL) on Organizational Performance (OP). The findings show that DL $\rightarrow$ OP (0.165) and EC $\rightarrow$ OP (0.146) have medium effects, indicating meaningful contributions to organizational performance.

However, EL $\rightarrow$ OP (0.087) has a small effect, suggesting a weaker influence. Overall, all predictors contribute positively to OP, with DL (0.165) having the strongest effect, followed by EC (0.146) and EL (0.087).

DISCUSSION OF THE FINDINGS

The study aimed to determine the moderating effect of digital literacy on the relationship between E-HRM practices and organizational performance among Federal Universities in North-Western Nigeria. Following the moderation theory proposed by Hair et al. (2014), the research evaluated the impact of electronic compensation and electronic learning on organizational performance and examined whether digital literacy strengthens the effects of these E-HRM practices.

Digital literacy found to be positive and significant influence on organizational performance of Federal Universities in North-Western Nigeria. The positive path coefficient indicates that an increase in digital literacy among university employees is associated with improved organizational performance. This means that employees' ability to effectively use digital technologies enhances institutional effectiveness by improving work efficiency, information accessibility, communication, decision-making, and the execution of administrative and academic activities. The finding aligns with the Resource-Based View (RBV) theory which emphasizes those organizational resources and capabilities that are valuable, rare, and difficult to imitate can provide competitive advantage. The current study supports prior works (Chatterjee et al., 2023; Sitaniapessy et al., 2024; Zheng, 2024) who revealed that digital literacy has positive effect on organizational performance.

Electronic compensation has a positive and statistically significant effect on organizational performance. This finding implies that effective implementation of electronic compensation systems enhances organizational performance by improving the efficiency, accuracy, transparency, and accessibility of compensation-related processes. The finding is consistent with the Technology Acceptance Model (TAM) which explains that individuals are more likely to adopt and effectively use technology when they perceive it as useful and easy to use. The present study corroborate previous works (Alfawareh et al., 2025; Calderon, 2025; Fijabi et al., 2024) who revealed that electronic compensation is positive with organizational performance.

Electronic learning also found to be positive and significant effect on organizational performance. This finding suggests that the adoption of electronic learning platforms enhances organizational performance by improving employees' knowledge, skills, accessibility to training resources, and ability to adapt to technological changes. This means that through electronic learning systems, university employees can acquire relevant competencies, access learning materials conveniently, and improve their work effectiveness, which contributes to better service delivery and institutional efficiency. The current study aligned with prior literature (Alam et al., 2021; Artüz & Bayraktar, 2021; Čevra et al., 2022) who states that e-learning is positive and significant effect on organizational performance.

Digital literacy moderates the relationship between electronic compensation and organizational performance. This means that digital literacy strengthens the relationship between electronic compensation and organizational performance, such that the effectiveness of electronic compensation practices increases as employees' digital literacy improves. It means that employees with higher digital literacy are more capable of interacting with electronic compensation platforms, interpreting compensation information, and benefiting from automated HR processes, thereby enhancing efficiency, satisfaction, and overall performance. The current study supports prior works (Chatterjee et al., 2023; Sitaniapessy et al., 2024; Zheng, 2024) who revealed that digital literacy has positive effect on organizational performance.

CONCLUSION AND RECOMMENDATION

Conclusion

The study concludes that all dimensions of electronic human resource management (E-HRM) have a positive influence on organizational performance. The findings further reveal that digital literacy significantly moderates the relationship between electronic compensation and organizational performance, while it does not significantly moderate the relationship between electronic learning and organizational performance. This means that

universities should not only implement E-HRM technologies but should also strengthen employees' digital capabilities, particularly for systems requiring active employee interaction such as electronic compensation. Based on this, the study made following recommendations.

Recommendation

- i. Federal Universities in North-Western Nigeria should strengthen employees' digital literacy through continuous digital skills training and capacity-building programmes to enhance effective technology use and improve organizational performance.
- ii. Federal Universities in North-Western Nigeria should invest in reliable digital compensation platforms and ensure employees are trained to effectively utilize these systems for improved organizational performance.
- iii. Federal Universities in North-Western Nigeria should promote continuous e-learning participation and support systems that enhance employees' skills, productivity, and service delivery.
- iv. Federal Universities in North-Western Nigeria should continuously improve electronic learning systems and provide adequate support mechanisms to ensure effective utilization regardless of employees' digital literacy levels.

REFERENCES

1. Ahmed, M. T. (2019). E-HRM Practices and its impact on Organizational Performance: A study on the Manufacturing industry in Bangladesh. *European Journal of Business and management*, 11(6), 50-60. DOI: 10.7176/EJBM/11-6-07.
2. Al Haziati, M. (2020). Impact of e-HRM system on organizational performance in the Sultanate of Oman. *International Journal of Management (IJM)*, 11(8), 446-458. DOI: 10.34218/IJM.11.8.2020.043
3. Alam, M. M., Ahmad, N., Naveed, Q. N., Patel, A., Abohashrh, M., & Khaleel, M. A. (2021). E-learning services to achieve sustainable learning and academic performance: An empirical study. *Sustainability*, 13(5), 2653. 01-20. <https://doi.org/10.3390/su13052653>.
4. Alfawareh, F.S., Al-Kofahi, M., Erman Che Johari, E. and Chai-Aun, O. (2025), "Digital payments, ownership structure, and bank performance: insights from Jordan. *International Journal of Bank Marketing*, 43(2), 262-291. <https://doi.org/10.1108/IJBM-01-2024-0062>
5. AlHamad, A., Alshurideh, M., Alomari, K., Kurdi, B., Alzoubi, H., Hamouche, S., & Al-Hawary, S. (2022). The effect of electronic human resources management on organizational health of telecommunications companies in Jordan. *International Journal of Data and Network Science*, 6(2), 429-438. DOI: 10.5267/j.ijdns.2021.12.011.
6. Al-kasasbeh, M. M., Harada, Y., Omar, K., & Alhusban, M. A. (2016). Factors influencing employees' performance in the Jordanian Islamic banks. *International Journal of Business and Social Science*, 7(7), 191-198.
7. Almashyakhi, A. M. (2022). An evidence-based review of e-hrm and its impact on strategic human resource management. *Journal of Human Resource and Sustainability Studies*, 10(3), 542-556.
8. Alqarni, K., Agina, M. F., Khairy, H. A., Al-Romeedy, B. S., Farrag, D. A., & Abdallah, R. M. (2023). The effect of electronic human resource management systems on sustainable competitive advantages: the roles of sustainable innovation and organizational agility. *Sustainability*, 15(23), 163-182.
9. Artüz, S. D., & Bayraktar, O. (2021). The effect of relation between digital leadership practice and learning organization on the perception of individual performance. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 20(40), 97-120. doi: 10.46928/iticusbe.761479.
10. Bansal, R., Gupta, A., Singh, R., & Nassa, V. K. (2021). Role and impact of digital technologies in E-learning amidst COVID-19 pandemic. In 2021 fourth international conference on computational intelligence and communication technologies 194-20. DOI: 10.1109/CCICT53244.2021.00046.
11. Barney, J. (1991). **Firm resources and sustained competitive advantage**. *Journal of Management*, 17(1), 99-120. <https://doi.org/10.1177/014920639101700108>
12. Bashir, U., Toqeer, R., & Shah, S. M. A. (2024). Exploring the role of digital human resource practices in organizational performance to ensure efficiency. *Bulletin of Business and Economics (BBE)*, 13(2), 226-231. [Doi.org/10.61506/01.00319](https://doi.org/10.61506/01.00319).

13. Bawden, D. (2008). **Origins and concepts of digital literacy** (Eds.), *Digital literacies: Concepts, policies and practices* (pp. 17–32). Peter Lang.
14. Benbasat, I., & Barki, H. (2007). **Quo vadis TAM?** *Journal of the Association for Information Systems*, 8(4), 211–218. <https://doi.org/10.17705/1jais.00126>
15. Bolton, C., Harrison, C., Oyewunmi, A. E., & Adedeji, O. (2024). The dilemma of employee productivity measures and managerialism practices: An empirical exploration in financial institutions. *International Journal of Productivity and Performance Management*, 73(10), 3187–3212. <https://doi.org/10.1108/IJPPM-01-2023-0031>
16. Calderon, A. A. (2025). Digital payments and their role in enhancing financial transactions efficiency. *International Journal of Economics and Financial Issues*, 15(1), 182-189. DOI: <https://doi.org/10.32479/ijefi.17555>.
17. Čevra, B., Kapo, A., Zaimović, T., & Turulja, L. (2022). E-Learning in organizations: Factors affecting individual job performances. *International Journal of Emerging Technologies in Learning (IJET)*, 17(2), 189-208.
18. Chatterjee, S., Chaudhuri, R., Vrontis, D., & Giovando, G. (2023). Digital workplace and organization performance: Moderating role of digital leadership capability. *Journal of Innovation & Knowledge*, 8(1), 100334.
19. Davis, F. D. (1986). **A technology acceptance model for empirically testing new end-user information systems: Theory and results**. Doctoral Dissertation, Massachusetts Institute of Technology (MIT), Sloan School of Management.
20. Davis, F. D. (1989). **Perceived usefulness, perceived ease of use, and user acceptance of information technology**. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
21. Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). **Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method** (4th ed.). Hoboken, NJ: John Wiley & Sons.)
22. El-Borsaly, A., & Hassan, S. (2020). The impact of service quality on organizational performance in the mobile telecommunications sector in Egypt. *Proceedings on Engineering*, 2(1), 93-104.
23. Elsaywy, M. (2021). Assessing the impact of e-HRM on organizational performance: An empirical study. 1(3)3967550. <http://dx.doi.org/10.2139/ssrn.3967550>
24. Epebinu, O., Adepoju, A., & Ajayi, M. (2023). E-Compensation management and organisational performance: An empirical evaluation using partial least squares-structural equation modelling. *International Journal of Management Studies and Social Science Research*, 5(3) 142-148. DOI:10.56293/IJMSSSR.2022.4623.
25. **Gede, T., & Huluka, A. (2024). Electronic human resource management and organizational effectiveness: A systematic review.**
26. Gilster, P. (1997). Digital literacy. Wiley Computer Publishing.
27. Girisha, M. C., & Nagendrababu, K. (2019). E-Human resource management (E-HRM): A growing role in organizations. *International Journal of Management Studies*, 6(1/5), 98-104.
28. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). **A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)**. Thousand Oaks, CA: SAGE Publications.
29. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2018). **A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)** (2nd ed.). Thousand Oaks, CA: SAGE Publications.
30. Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). **Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook**. Cham: Springer. <https://doi.org/10.1007/978-3-030-80519-7>
31. Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2022). **Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook** (2nd ed.). Cham: Springer. <https://doi.org/10.1007/978-3-030-80519-7>
32. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). **When to use and how to report the results of PLS-SEM**. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
33. Hosain, M. S. (2017). The impact of e-HRM on organizational performance: Evidence from selected firms in Bangladesh. *Global Journal of Management and Business Research*, 17(1), 15–24.
34. Kabakus, A. K., Bahcekapili, E., & Ayaz, A. (2023). The effect of digital literacy on technology acceptance: An evaluation on administrative staff in higher education. *Journal of Information Science*, 01655515231160028.

35. Kalogiannidis, S. (2021). Organizational performance through effective strategic management. *International Journal of Business Management and Economic Review*, 4(3), 1–13.
36. Khammadee, P. (2023). The relationship between E-HRM practices and organizational performance: The mediating role of organizational agility and sustainable competitive advantage. *Asian Administration & Management Review*, 6(1), 201-220.
37. Martindale T., Amankwatia, T.B., Cifuentes L., Piña A. A. (2024) Handbook of Research i
38. Nikou, S., De Reuver, M., & Mahboob Kanafi, M. (2022). Workplace literacy skills—how information and digital literacy affect adoption of digital technology. *Journal of Documentation*, 78(7), 371-391. <https://doi.org/10.1108/jd-12-2021-0241>.
39. Nunnally, J. C. (1978). **Psychometric Theory** (2nd ed.). New York, NY: McGraw-Hill. Online Learning", Brill.
40. Patel, C. (2016). E-Learning: concept, features and it's types. *International Journal of Research in Humanities & Soc. Sciences*, 4(1), 1-4.
41. Saunders, M., Lewis, P., & Thornhill, A. (2019). **Research Methods for Business Students** (8th ed.). Harlow, England: Pearson Education.
42. Shamaileh, N., AlHamad, A., Al-Qudah, M., Mohammad, A., Alhalalmeh, M., Al-Azzam, M., & Alshurideh, M. (2022). The effect of e-HRM on organizational performance and talent management: A strategic evolution perspective. *International Journal of Data & Network Science*, 6(4), 1-10 doi: 10.5267/j.ijdns.2022.8.005
43. Shamaileh, N., Alshurideh, M., Al Kurdi, B., & Alzoubi, H. M. (2022). Electronic human resource management and organizational performance: The mediating role of employee engagement. *International Journal of Data and Network Science*, 6(4), 1125–1136. <https://doi.org/10.5267/j.ijdns.2022.7.007>
44. Sitaniapessy, R. H., Latupapua, C. V., Lewaherilla, N., Leuherry, F., Ferdinandus, S. J., Asnawi, A., & Pentury, G. (2024). The Advantages of Digital Literacy Strategies to Improve MSME's Business Performance. *European Journal of Theoretical and Applied Sciences*, 2(1), 504-512.
45. Stannack, P. (1996). Perspectives on employees' performance. *Management Research News*, 19(4/5), 38–40.
46. Tîrziu, A. M., & Vrabie, C. (2020). Education 2.0: E-learning methods. *Procedia-Social and Behavioral Sciences*, 186, 376-380.
47. Umar, T. R., Yammama, B. A., & Shaibu, R. O. (2020). The implications of adopting and implementing electronic human resource management practices on job performance. *Journal of Human Resource Management*, 9(1), 96-108. Doi: 10.11648/j.jhrm.201200802.17.
48. UNESCO. (2023). Global Education Monitoring Report 2023: Technology in education—A tool on whose terms <https://unesdoc.unesco.org>.
49. Varadaraj, A., & Al Wadi, B. M. (2021). A study on contribution of digital human resource management towards organizational performance. *The International Journal of Management Science and Business Administration*, 7(5), 43-51. DOI: 10.18775/ijmsba.1849-5664-5419.2014.75.1004.
50. William, A. A., & Singh, K. (2023). The assessment of e-HRM tools and its impact on HRM system effectiveness and organizational effectiveness: An empirical study of selected multinational companies in Ghana. *The electronic journal of information systems in developing countries*, 89(5), e12267. <https://doi.org/10.1002/isd2.12267>
51. Yamane, T. (1977). **Statistics: An Introductory Analysis** (3rd ed.). New York: Harper and Row.
52. Zheng, L. (2024). Effect of innovation adoption, digital competences and digital literacy on effective management information system: moderating role of organizational support. *Profesional de la información*, 33(4), 23-53