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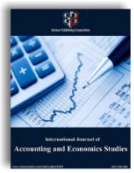

Human Capital Potency and Earning Potentials of Firms in Nigeria

Kingsley Nze Ashibogwu [1] *, Monday Chukwugeku Isoso [2], Lucky Nmamefune Ogbolu [1], Monye Osita [3], Monday John Onyeme [3], Michael Rerhime Atokpe [4]

[1] Department of Accounting, Delta State University of Science and Technology. Ozoro, Nigeria
[2] Department of Accounting, Dennis Osadebay University. Asaba, Delta State. Nigeria
[3] Department of Accounting, Novena University, Ogume, Delta State. Nigeria
[4] Department of Accounting, Dennis Osadebay University. Asaba, Delta State. Nigeria
**Corresponding author E-mail: monday.isoso@dou.edu.ng*

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Abstract

Despite that, human capital has over the years become a major subject of inquiry and discourse, and will continue to elicit overwhelming interest in management science research. It is against this backdrop that this paper investigated human capital potency (HCP) and earning potentials of firms in Nigeria. HCP measures used are Expenditure on education, Expenditure on training, Expenditure on skill acquisition, and Expenditure on research and development, while earning potential was measured by return on equity (ROE). Data were analyzed using the panel autoregressive distributed lag model (PARDL). The findings suggest that it is human capital and not non–human capital that drives firms earning potential of Nigerian firms. Based on this finding, the paper recommended that there is need for improved human capital potency via enhanced expenditure on education, expenditure on training, expenditure on skill acquisition, and expenditure on research and development that should be sustained and improve firms' value in Nigeria.

Keywords: *Human Capital; Earnings Potential; Enhanced Expenditure; Firm Value; Nigeria.*

1. Introduction

Human capital has, over the years, become a major subject of inquiry and discourse and will continue to elicit an overwhelming area of interest in management science research. However, the relevance of human capital in achieving firm value is passively treated since no firm theory captures the effect of knowledge capital alongside human capital on the firm's earning potential (Kurfi, Noraza & Saleh, 2022). In most cases, extant theories consider human capital as a key resource (Muhammad, 2020) or subordinate human capital to machines (Ajike & Danjuma, 2022). Nonetheless, human capital fused in a firm's employees is critical, just as machines are. The reason is that humans are given more attention than machines in present times (Ewereoke, 2018). Hence, the relevance of human capital is key to a firm's going concern. Therefore, human capital has initiated a significant analytical shift, which is the primary focus of this paper.

Overall, existing studies stressed that the greatest assets of a firm that are fundamental to value creation are not necessarily non-human capital like crude oil, gold, diamonds, and uranium, among others, but the extent a firm's human capital influences value creation is key to a firm's going concern (Ozkan, Cakan, & Kayacan, 2021; Onovwiona & Okiti, 2025; Sun, 2025). The reasons are that these non-human capitals are depleting and, of late, have mostly become sources of conflicts and political strife across most of the developing nations. Second, most of the poorest nations on earth today (especially in Africa) are those endowed with non-human capital resources but are largely bereft of adequate human capital (Ognjanović & Aleksandra, 2020; Adeyemi et al., 2025).

Although human resources or workforces are managed via human capital accounting to contribute meaningfully to firm productivity and value creation (Ngoc & Duc, 2020). Most Nigerian firms have yet to develop a sound accounting structure that values, measures, and harnesses the potential of the firm's human capital. Arising from the knowledge gap caused by the inability of human capital potential (HCP) to improve the value of African firms, this paper investigates the effect of HCP on firms' earning potentials in Nigeria.

Other specific objectives are to:

i) Investigate the effect of indicators of HCP on firms' earning potentials in Nigeria.
ii) To ascertain which indicator (s) of HCP contribute more to firms' earnings potentials in Nigeria.

2. Research hypothesis

This paper is guided by the following null hypothesis.
$H0_1$: Indicators of HCP do not affect firms' earning potentials in Nigeria.
$H0_2$: All the indicators of HCP contribute the same to firms' earning potentials in Nigeria.

3. Literature review

3.1. Theoretical literature review

The paper is anchored on human capital theory as developed by Romer in 1986 and Lucas in 1988 (Ezinne et al., 2024). The theory has it that education leads to an increase in productivity and efficiency of workers by increasing the level of their cognitive skills. According to the theory, individuals invest in education to enhance their skills (Yusuf & Mamman, 2024). Examples of such investment include spending on education, spending on-the-job training, spending on health, and nutrition. These expenditures are indicators of human capital in extant studies. The provision of education is seen as a productive investment in human capital, which is equally or even more worthwhile than that of physical capital.
Thus, the theory of human capital has stimulated accounting interests in the extent of the association between human capital formation and the firm's value. This is because human capital theory views human capital as an input in the process of production and therefore, envisages a positive relationship between firms' value and the stock of human capital. Consequently, the buildup of human capital involves opportunity costs of current consumption, to enhance education acquisition, or less current consumption goods to acquire more on-the-job training.

3.2. Empirical literature

Careful evaluation of studies on the effect of HCP on firm performance, though reporting nuanced outcomes across different sectors and regions, yielded contradictory outcomes. Justifiably, while some studies support a positive relationship, few studies reported a negative relationship instead. These variations in outcomes could be attributed to methodological divergences and contextual differences. For instance, Davydenko, Gulnara, and Ovechkin (2021) investigated the effect of HCP on the profitability of agricultural firms in Russia using the dynamic panel approach. They reported that HCP improved financial profitability. In another related study, Garima, Nemiraja and Anto Joseph (2021) confirmed that a firm's human capital contributes meaningfully to firm performance and valuation.
Using the panel regression, Nguyen and Doan (2020) found that value-added intellectual capital improves a firm's profitability. Thus, the paper concludes that intellectual capital (IC) equips managers with how to improve the value of manufacturing firms listed on the Vietnam stock market.
Muhammad (2020) studied the effect of IC affect the performance of 152 Pakistan firms over seven years. The paper found that IC is highly significant and positively related to firms' financial performance.
Sedeaq (2020) investigated the degree of association between HCP and firms 'corporate financial performance. The paper by using the Panel data method of analysis, found that human capital efficiency is reckoned as the utmost influential element of IC in value creation than physical capital employed. Based on this finding, the paper concludes that a relationship exists between financial performance proxied by ROA and human capital efficiency, and should be improved upon. Again, Olaoye and Afolalu (2020) confirmed that HCP (pension, training, and development) has a substantial positive effect on EPS, while Xu and Liu (2020) confirmed that human capital serves as a veritable performance-enhancing measure.
Nevertheless, studies conducted by Halawi, Rasheed, and Al Belushi (2024) proved that HCP improved the performance of profit-oriented Lebanese firms but reduced the performance of non-profit-making Lebanese firms even within the same context. This suggests that a firm's objectives and structural orientation play a decisive role in determining whether HCP will improve performance or reduce it. Also, Egolum (2021) confirmed that HCP improves the gross profit margin of listed Nigerian service firms significantly, but reduces the net profit margin of listed Nigerian service firms minimally. Likewise, Mustafa and Stella (2023) reported that higher staff training cost reduces firm growth and profitability insignificantly. By implication, HCE reduces the profitability of ICT firms minimally. Again, Masuluke and Ngwakwe (2018) reported that HCE reduces the net profit even though they controlled for sales turnover (STO). Lastly, HCP shows a significant negative effect on the market outcomes (share price performance) of the Nigerian insurance sector.
From the above controversies, it is evident that existing studies fall within two divides as to how HCP should be treated. One major contention is whether HCE should be treated as intangible assets or considered as period costs. Again, HCE responds to firm performance depending on the firm's profitability measure and sector of interest. Hence, the current study is motivated to provide a nuanced understanding of the role of HCP in improving firm performance, especially in Nigeria's human-capital-dependent context.

4. Methodology

The research design adopted is an ex post facto type because the variables for expenditure on education, expenditure on training, expenditure on skill acquisition, and expenditure on research and development, as well as firms' value, proxied by ROE. Data were drawn from the audited annual financial reports of 31 firms across the consumer goods and industrial goods sectors over a six-year (6-year) period spanning from 2017 to 2022. This culminated in a total of 186 firm-year observations, as evidenced in Table 3. The firms sampled were chosen due to consistency in reporting the required variables.
The data were sourced from the official website of the sampled firms in the Nigerian exchange group's official portal. The annual reports provided standardized disclosures of financial and non-financial information, including income statements, statement of financial position, and notes to the accounts. Specifically, data on expenditure on education (EED) and expenditure on skill acquisition (ESA) were extracted from both notes to the financial statements and sustainability reporting sections. Human Capital Potential (HCP), as operationalised through expenditures on education, training, skill acquisition, and research and development, is closely linked to human capital accounting (HCA). Although accounting standards such as IAS 1 and 38 treat investment in human capital as period expenses rather than capitalized assets, recent studies stress their long-term value relevance (Ogundajo, Kujore, & Kassim, 2022; Mukolo, Jeroh, & Ideh, 2022). For example, expenditures on education (EED) and training appear under either administrative or personnel expenses even though they are considered

as strategic investments in workforce capability. However, HCA frameworks stressed the need for firms to voluntarily disclose the extent to which they invest in staff development. This can influence investor perceptions, especially in knowledge-intensive sectors where employee expertise drives firms' competitive advantage. Hence, for the sampled firms to enhance investor confidence, they need to invest more in staff development.

The dependent variable is earning potential. This variable (earning potential) is suitable for the study as it serves as a vital indicator of a firm's financial performance and long-term viability. Further, it captures a firm's ability to generate consistent and sustainable earnings (income) over time. By deriving earning potential from both the income statement (net profit) and the statement of financial position (total equity), it reflects both the sampled firms' operational efficiency and how effectively the sampled firms use their financial and intellectual resources to create more value.

To improve the accuracy of our model and account for firm-specific attributes, the study added five (5) key control variables. The key five 5) key control variables added to the short-run estimate of the model are leverage (LEV), net profit margin (PROF), liquidity (LIQ), audit committee independence (ACI), and audit fees (AF). First, leverage (LEV) was measured by the ratio of total debts to equity. Second, profitability was proxied by net profit margin, measured by the ratio of net profit to total turnover. Third, liquidity (LIQ) accounted for the firm's ability to meet maturing obligations and is expressed as the proportion of current assets to current liabilities. Fourth, audit committee independence (ACI) was measured as the proportion of non-executive members serving on the audit committee of the sampled firms. Lastly, the audit fees (AF) were measured by the natural logarithm of audit fees paid.

The panel data on variables of interest to the study, such as expenditure on education, expenditure on training, expenditure on skill acquisition, and expenditure on research and development, as well as firms' value proxied by ROE, were obtained from the listed firms' annual reports for various years. The main estimation techniques adopted pooled mean group (PMG), the mean group (MG), and PARDL model, and the correlation coefficients matrix. Also, descriptive statistics were utilized to ascertain the behaviour of the variables employed in the estimation, and panel unit root was carried out using Pesaran and Shin, Breitung and Levin Linchu (1995).

The PARDL model in error correction is specified thus:

$$\gamma_{it} = \propto_1 + \beta_i C_{it-1} + \lambda_i X_{it-1} + \cup_{it} \quad (1)$$

Where i= individual firm and i=1,2,3….n. The long-run parameter $\cup_{it}$ becomes

$$\cup_i = {}^{\lambda_i}/_{1 - X_i} \quad (2)$$

Given equation (3.2), the MG estimator for the PARDL becomes

$$\cup_i = {}^{1}/_{\gamma} \sum_{i=1}^{n} \cup i. \quad (3)$$

Equation (3) shows how the MG formulated by Pesaran & Smith (1996) and the PMG model propounded by Pesaran (1999) are further specified, thus

$$\Delta ROE_{it} = \alpha^{ROE} + \sum_{I=1}^{K} \beta_i^{ROE} \Delta ROE_{it-1} + \sum_{i=1}^{K} \gamma_i^{ROE} \Delta EED_{it-i} + \sum_{i=1}^{K} \delta_i^{ROE} \Delta ETR_{it-i} + \sum_{i=1}^{K} \theta_i^{ROE} \Delta ESA_{it-i} + \sum_{i=1}^{K} \vartheta_i^{ROE} \Delta ERD_{it-i} + \upsilon_{it}^{ROE} \quad (4)$$

Where ROE = Return on equity, EED = Expenditure on education, ETR Expenditure on training, ESA = Expenditure on skill acquisition, ERD = Expenditure on research and development, and $\cup_{it}$ = Error term.

The justification for this method is that the MG and PMG in the PARDL model estimate distinct regressions for each firm as well as an unweighted mean coefficient for the individual firms. The PMG was employed to ascertain the long and short run relationship among the indicators of HCP and the possibility of heterogeneous dynamic firms' earning potentials in Nigeria.

5. Result estimations and discussions

5.1. Correlation coefficient matrix

Table 1 presents the intercorrelation coefficient of the studied variables:

Table 1: Inter–Correlation

Variable	ROE	EED	ESA	ETR	ERD
ROE	1.00				
EED	0.687*	1.00			
ESA	0.530**	.273*	1.00		
ETR	0.481**	.410*	0.623**	1.00	
ERD	0.426**	.384*	0.284**	0.321**	1.00

Note * =0.01, ** = 0.05 and *** =0.10 Significant Level.

The correlation matrix was used to ascertain if the variables are related at 1% and 5% level or not. The result revealed that all the variables are strong (significant) & are directly (positively) related to firms' value proxied by ROE with the highest degree of association observed between expenditure on education (EED), expenditure on skill acquisition (ESA), and firms' value (ROE). Also, the finding from the correlation result matrix showed that none of the inter–relationships among the variables used in estimation is more than 0.7, implying that there is an absence of the problem of multicollinearity among the variables employed in the estimation.

4.2. Panel unit root test

Table 2 evidenced the extent of integration of the variables that were analyzed:

Table 2: Panel Data Stationarity Test Result

Level			First difference			
Pesaran and Shin	Biretung	Levin, Liu, and Chu-LLC	Pesaran and Shin-P & S	Biretung	LLC	Integration Order
ESA -6.01*	-5.67*	-8.05*	-12.64*	-11.50*	-13.84*	1(0)
EED -1.21	-1.04	-1.12	-4.60**	-3.01**	16.08**	1(1)
ETR -0.64	-0.52	-0.06	-13.91*	-11.43*	21.21*	1(1)
ERD -7.62**	-4.82**	-8.05**	-21.07**	-16.98**	-22.67**	1(0)

Note * =0.01, ** = 0.05 and *** =0.10 Significant Level.

The finding from the results of the panel root test showed that while expenditure on skill acquisition and expenditure on research and development were stationary at levels, expenditure on education and expenditure on training after first difference became stationary at 5% level of significance. This gives a mixed order of integration of purely 1(O) and 1(I). The finding has two statistical implications. First, it implies that possible long-run relationships exist among the variables of interest in the study. Second, panel data analysis using OLS is grossly misfit. Therefore, the most suitable estimation technique for the study becomes the PARDL model. Besides, the order of integration of the variables allows for the estimation of both periods along with the error correction coefficient.
The PARDL regression was used for the analysis. The results are presented in Tables 3 and 4.

Table 3: Result of Long Run PARDL

	PMG	MG	DFE
Variable	Long run	Long run	Long run
EED	0.086**	0.025***	0.06**
	(3.52)	(1.73)	(3.97)
ETR	0.043**	0.032**	0.052**
	(4.32)	(2.57)	(4.33)
ERD	0.042**	0.052*	0.02**
	(6.91)	(4.96)	(6.31)
ESA	0.046***	0.05**	0.012**
	(1.98)	(2.21)	(3.88)
Constant	352**	241**	125**
	(2.31)	(2.38)	(2.72)
Observations	186	186	186
Hausman test[1]			2.74(0.84)
Hausman test[2]			0.16(0.98)

Note * =0.01, ** = 0.05 and *** =0.10 Significant Level.

The Hausman test confirms the consistency and efficiency of PMG in the estimation of the panel dynamic effect. The PARDL long-run estimates, as presented in Table 3, offer robust empirical evidence that HCP investments significantly influence the firms' earning potentials overall. Specifically, the study confirmed that the four HCP indicators (expenditure on education, training, research and development, and skill acquisition) all exhibit positive and significant long-run effects on ROE. However, expenditure on education (EED) stands out with the highest coefficient (coef. = 0.086 & t-value = 3.52 > 1.98). This result underscores the critical role of formal education in building a highly resilient, knowledgeable, strategically capable, and efficient workforce. This outcome aligns with human capital theory, which posits that education improves employee productivity and innovation, which ultimately increases firm earnings. Again, the study aligns with findings of Sedeaq (2020) and Mukolo et al. (2022).
Expenditure on training has the second most significant long-run effect on ROE (coef. = 0.043 & $p < 0.05$). This further confirms that continuous learning and upskilling are essential for firms operating in highly dynamic, capital-intensive, and technologically evolving sectors. However, the study confirmed that though training enhances job-specific competencies and operational efficiency, expenditure on education has more strategic value addition. Similarly, expenditure on research and development (ERD) reported a positive significant long-run effect on ROE (coef. = 0.042 & $p < 0.05$). This underscores that technological adaptation and product differentiation play highly instrumental roles in driving innovation. This finding aligns with the empirical work by Obadan and Ohiorenoya (2021), who emphasised that disclosure of R&D investment plays a critical role in sustaining firm value in highly knowledge-driven firms.
Additionally, expenditure on skill acquisition reported the lowest long-run effect on ROE out of the four HCP indicators, though it was significant (PMG = 0.046 & $p < 0.10$). This underscores that skill acquisition (vocational training, workshops, and internships) is integral towards achieving higher ROE. This finding aligns with the empirical findings of Obadan and Ohiorenoya (2021) and the human capital theory.
Lastly, the study rejected H02 and affirmed that human capital potential indicators significantly contribute to firm earnings potentials. This underscores that HCP indicators are highly strategic for achieving higher ROE in the long run. However, the extent of contributions differs in terms of direction.

Table 4: Result of Short Run PARDL

	PMG	MG	DFE
Variable	Long run	Long run	Long run
ECM	-0.83**	-0.068**	-0.083
	(0.02)	(0.051)	(0.011)
LEV	0.035**	0.042*	0.006**
	(8.62)	(6.86)	(2.43)
PROF	0.036**	0.083**	0.041**
	(2.16)	(2.81)	(3.42)
LIQ	0.083**	0.032***	0.041**
	(3.61)	(2.02)	(6.02)
ACI	0.020***	0.012***	0.006**
	(2.03)	(2.01)	(2.98)

AF	0.019***	0.025***	0.081**
	(2.00)	(2.12)	(3.41)
Constant	352**	241**	127**
	(2.24)	(2.34)	(2.61)
Observations	186	186	186
Hausman test[1]			2.74(0.84)
Hausman test[2]			0.16(0.98)

Note * =0.01, ** = 0.05 and *** =0.10 Significant Level.

The short-run PARDL results presented in Table 4 evidenced that profitability, liquidity, leverage, audit committee independence, and audit frequency contribute to firm earnings potential significantly in the short term. The error correction term (ECM) is negative and significant in the case of PMG and MG estimations. This underscores that the model is a valid long-run relationship. The results of the PMG, MG, and DFE showed that expenditure on education, expenditure on training, expenditure on skill acquisition, and expenditure on research and development have short-run significant contributory effects or influences in enhancing the earning potentials of listed firms in Nigeria.

Furthermore, the study underscores that education improves employee productivity and innovation, which ultimately increases firm earnings. Another practical implication is that expenditure on training has the second most significant long-run effect on ROE. Further, continuous learning and up-skilling are essential for firms operating in highly dynamic, capital-intensive, and technologically evolving sectors. Lastly, the study confirmed that technological adaptation and product differentiation play a highly instrumental role in driving innovation. This ultimately drives the earning potential of listed firms in Nigeria.

6. Concluding remarks

The paper concludes that the four (4) HCP measures (expenditure on education, expenditure on training, expenditure on skill acquisition and expenditure on research and development) have both long run and short run significant contributory effect on firms' earnings potentials of Nigerian firms though they have varying effects on firms' earnings potentials. This validates that while all HCE measures contribute positively, the extent of their effect differs. Justifiably, expenditure on education reported the strongest impact, training and R&D followed, while skill acquisition reported the least impact. Therefore, the paper recommends that improved HCP via enhanced expenditure on education, expenditure on training, expenditure on skill acquisition, and expenditure on research and development should be sustained and improved upon in Nigeria. Further, management of Nigerian firms can better harness their human resource by institutionalizing disclosure frameworks, policy incentives, and capacity-building mechanisms. They can achieve this through collaboration with professional bodies and regulatory authorities to develop a standardized human capital disclosure framework. Meanwhile, professional bodies should support technical capacity-building programs targeted at improving the human capital capacity of their staff. Lastly, the tax authorities should give firms that invest more in HCP tax incentives. This will reduce the financial burden associated with HCE.

Although the methodology adopted is robust and the current study provides valuable insights on the HCP-Performance nexus, some limitations were recorded. Firstly, the study relied solely on secondary data sourced from available annual reports. The use of primary data would have captured the qualitative aspects of HCP, such as informal training activities, organizational culture, and employee engagement. Hence, the study suggests that future research should incorporate mixed methods. Lastly, the study only restricted to listed firms. Hence, the study may pose sample bias. The inclusion of non-listed firms would have resolved this form of bias. As such, the scope of subsequent research should be broadened as this can deepen understanding of HCE across diverse firms.

References

[1] Egolum, P. U. P. (2021). An evaluation of human capital efficiency on the performance of listed service firms in Nigeria. *Nigerian Journal of Social Development*, *10*(1), 62–73. https://doi.org/10.12816/0060690.

[2] Masuluke, M.F. & Ngwakwe, C.C. (2018). Relationship between human capital investments and firm's net profit. *Journal of Accounting and Management, 8*(1), 37 – 46

[3] Mustafa, M. O. A., & Stella, U. A. (2023). The Nexus between Human Capital Investment and Firm Growth of Selected Non-Financial Firms in Nigeria. *International Journal of Research and Innovation in Social Science*, *7*(8), 467-481. https://doi.org/10.47772/IJRISS.2023.7833.

[4] Halawi, A., Rasheed, R., & Al Belushi, B. (2024). The Effect of Human Resource Analytics on Employee Performance. *Revista de Gestão Social e Ambiental*, *18*(5), 1-12. https://doi.org/10.24857/rgsa.v18n5-060.

[5] Ajike, A. M. & Danjuma, K. J. (2022). Human Capital Efficiency and Corporate Performance: The Nigerian Perspective. *International Journal of Business & Management, 4*(3), 101-125.

[6] Kurfi, S. A., Noraza M. U., & Saleh, B. (2022). The impact of intellectual capital on the financial performance of listed Nigerian food products companies. *Journal of Accounting and Taxation, 9*(11),147-160. https://doi.org/10.5897/JAT2017.0246.

[7] Aleem, M. (2020). Intellectual Capital and Firms' Financial Performance: Empirical Evidence from Pakistan Stock Exchange. *Journal of Managerial Sciences*, *14*(3), 10-10.

[8] Tran, N. P., & Vo, D. H. (2020). Human capital efficiency and firm performance across sectors in an emerging market. *Cogent Business & Management*, *7*(1), 1738832. https://www.tandfonline.com/doi/full/10.1080/23311975.2020.1738832. https://doi.org/10.1080/23311975.2020.1738832.

[9] Nguyen, A. H., & Doan, D. T. (2020). The impact of intellectual capital on firm value: Empirical evidence from Vietnam. *International Journal of Financial Research*, *11*(4), 74-85. https://ideas.repec.org/a/jfr/ijfr11/v11y2020i4p74-85.html. https://doi.org/10.5430/ijfr.v11n4p74.

[10] Ognjanović, J., & Aleksandra, S. V. (2020). Research on the relationship between intellectual capital and indicators of work results of employees in the banking sector of the Republic of Serbia. *School of Business, 2*(2), 1-22. https://www.vps.ns.ac.rs/wp-content/uploads/2020/03/1-Ognjenovi%C4%87-ispravno.pdf. https://doi.org/10.5937/skolbiz2-22612.

[11] Okeke, I. V. & Udeh, F. N. (2020). Effect of Intellectual Capital on the Profitability of Nigerian Deposit Money Banks. *International Journal of Trend in Scientific Research Development*, *4*(3), 146-158. https://www.ijtsrd.com/papers/ijtsrd30333.pdf.

[12] Olaoye, C. O., & Afolalu, A. B. (2020). Effect of human capital accounting on earnings.per share of equity owners of deposit money banks in Nigeria: *African Journal of Business Management,* 14(11), 485-497. https://doi.org/10.5897/AJBM2020.9008.

[13] Onovwiona, S., & Okiti, S. E. (2025). Corporate Governance and Human Resource Management in Nigeria's Oil and Gas Industry. *Logika: Jurnal Penelitian Universitas Kuningan*, *16*(01), 1-23.

[14] Sun, Z. (2025). Determining human resource management key indicators and their impact on organizational performance using deep reinforcement learning. *Scientific Reports*, *15*(1), 5690. https://doi.org/10.1038/s41598-025-86910-2.

[15] Adeyemi, M. O., Raji, K. A., Alao, T. O., & Onivefu, O. V. (2025). The influence of human resources information system on Talent acquisition and retention in commercial banks in Nigeria. *African Journal of Commercial Studies*, *6*(1), 84-107. https://doi.org/10.59413/ajocs/v6.i.1.8.

[16] Yusuf, N., & Mamman, D. A. Y. A. (2024). Human capital development and performance of manufacturing firms in Kano State, Nigeria. *Bayero Journal of African Entrepreneurship Studies*, *6*(1), 5-18.
[17] Ezinne, A. C., Ikwor, O., Eze, I. O., Eze, A. T., & Agbo, P. C. U. (2024). Dynamics of Human Capital Development and Economic Growth in Nigeria. *Caritas Journal of Management, Social Sciences and Humanities*, *3*(1), 1-8.