

Role Of Human Capital Development In Firm Performance: The Mediating Effect Of Innovation. A Case Of Manufacturing Firms In Plateau State, Nigeria.

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Abstract

An organization's competitive strategy is strengthened when it has a greater specialized human expertise which will help it establish and maintain meaningful differences over and above its competitors. The main objective of this study is to examine the role of human capital development on firm performance in Plateau State, Nigeria and the mediating effect of innovation. A cross-sectional and ex-post factor research design was used for the study. The population consists of manufacturing firms in Plateau State, Nigeria totaling 231. A sample size of 146 owners/managers of MSMEs was used as respondents. The partial least square structural equation model (PLS-SEM) was used with the of SmartPLS application software package v. 4.0.9.6. The findings of the study revealed that there is no significant relationship between human capital development and firm performance but there is a significant relationship between human capital development and innovation. There is also a significant relationship between innovation and firm performance. Innovation was also found to mediate the effect of human capital development on performance. The study recommended that the management of business organizations reconsider the particular aspect of human capital to develop in order not to waste resources without any improvement in performance. The management of manufacturing firms should channel their resources more on aspects of human capital that will have an impact on innovation because it is a good predictor of firm performance. They should also adopt a technology that is well-suited for the organization and is innovative to meet future needs.

Keywords: *Human Capital Development, Innovation, Firm Performance*

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I. Introduction

The assessment of a firm's performance is a prominent concept in the realm of business, particularly in strategic management research worldwide. Over the past few years, the pursuit of continuous improvement in performance has become the primary objective of any given firm. This is due to the fact that progress and growth can only be achieved through performance. The measurement and evaluation of a company's performance hold significant importance, as businesses are constantly striving for effective and efficient outcomes. As a result, the manufacturing industry is viewed as the catalyst for economic advancement and poverty reduction (Afolabi and Laseinde, 2019). In the light of this, most companies are exploring various avenues to enhance their performance.

The Nigerian manufacturing sector is one of the largest in Africa (Nigeria Economic Summit Group NESG, 2021). Manufacturing is Nigeria's third largest sector in terms of employment, after Agriculture and Trade. Before the year 2020, the sector has incessantly faced structural challenges causing manufacturing organizations to shut down which limits investments and growth in the sector (NESG, 2021). In years past Nigeria has not given the needed attention to human capital development which could be linked to its poor economic growth rate (UNDP, 2023).

An organization's competitive strategy is strengthened when it has a greater specialized human expertise (Rozman et al, 2023) which will help them establish and maintain meaningful differences between their organization and that of their competitors. A firm's internal sources of competitive advantages have been considered as a relevant factor to attaining superior firm performance. Some empirical evidences reveal that human capital development is a crucial factor to firms' performance (Alqershi et al., 2019; Banabo & Wariowei, 2021). While some studies show that no nation can develop without investing in its human capital which is a vital index for economic growth because for every increase in human capital development, there is an increase in

economic performance. The winning card can be held by those who endeavor to innovate, to obtain and sustain performance. Thus, competing in a continuously changing environment is very necessary to comprehend and monitor performance (Taouab & Issor, 2019) and this cannot be achieved without developing human capital.

Human Capital Development (HCD) is the process of adding values to human beings in a nation in order to have a qualified, knowledgeable and healthy workforce that can give solution to national economic challenges on a continuous basis. It is the process by which organizations help their employees in a continuous and planned way in order to: acquire or sharpen the abilities required to perform various functions associated with their present or expected future roles; develop their general skills as individuals, discover and utilize their inner potential for their own and/or organizational development purposes (Alnachef & Alnajjar 2015).

Human capital is the genetic product of learning which translates into special talents, capacities and technical know-how found in a nation's labor force for national economic expansion. It consists of knowledge, skills, and wealth that people accumulate throughout their lives, enabling them to realize their potential as productive members of society (the world bank, 2019).

In recent years, there has been a noticeable trend among manufacturers in developed markets to engage in service-led innovation in order to establish a foundation for sustainable growth and to enhance their competitive stance. Innovation enriches opportunities to respond to the changes created by the environment and discover new changes that significantly benefit the firm's survival. It can further stimulate competitive advantage because it enables the firm to produce and market new or better products; as a result, satisfying customer needs. In firms, innovation-related practices facilitate robust culture for life-long learning, growth and personal advancement (Mathushan & Kengatharan, 2022).

By reviewing results of several empirical studies, a gap has been identified that is based on the insufficient literature on the mediating effect of innovation on firm performance and human capital development among manufacturing firms in Plateau State, Nigeria. Again, this study is unique in the sense that most studies on human capital development are linked to education and very few are related to manufacturing firm performance. There is also a geographical gap because no such precise studies have been known to be carried out in Plateau State, hence the need for this study. Accordingly, the aim of this research article is to explain the effect of innovation, as a mediator of the relationship between human capital components and manufacturing firm performance in Plateau State, Nigeria.

Research Question

Based on the foregoing, the study sought answers to the following questions:

- i. What is the effect of human capital development on manufacturing firm performance in Plateau State, Nigeria?
- ii. What is the effect of Human capital development on innovation amongst manufacturing firms in Plateau State, Nigeria?
- iii. What is the effect of innovation on manufacturing firm performance in Plateau State, Nigeria?
- iv. Does innovation mediate the relationship between human capital development and firm performance of manufacturing firms in Plateau State, Nigeria?

Research Objective

The main objective of the study is to examine the role of human capital development on firm performance in Plateau State, the mediating effect of innovation.

However, the specific objectives are to:

- i. examine the effect of human capital development on manufacturing firm performance in Plateau State, Nigeria;
- ii. establish the effect of human capital development on innovation amongst manufacturing firms in Plateau State, Nigeria;
- iii. ascertain the effect of innovation on manufacturing firm performance in Plateau State, Nigeria; and
- iv. evaluate the mediating role of innovation in the effect of Human capital development on manufacturing firm performance in Plateau State, Nigeria.

Hypotheses

The following research hypotheses were formulated and tested:-

Ho₁: There is no significant effect of human capital development on manufacturing firm performance in Plateau State, Nigeria.

Ho₂: There is no significant effect of human capital development on innovation among manufacturing firms in Plateau State, Nigeria.

Ho₃: There is no significant effect of innovation on manufacturing firm performance in Plateau State, Nigeria.

Ho4: innovation does not significantly mediate the relationship between Human capital development and manufacturing firm performance in Plateau State.

II. Literature Review

Manufacturing Firm Performance

Assessing the performance of organizations has always been of interest to management teams and researchers. Measuring business performance in today's economic environment is a critical issue for academic scholars and practicing managers. Researchers have extended efforts to determine measures for the concept of performance. In this regard, there are conflicting findings and an on-going debate on the issue of firms' performance (Taouab & Issor, 2019).

The manufacturing industry focuses on the development and processing of raw materials and indulges in either the creation of new commodities or value addition. In his analysis of the factors that affect the manufacturing sector's performance in Nigeria between 1994 and 2019, Olusegun (2021) found that the real exchange rate, tax rate, and trade openness all had a direct and significant impact on the sector's production. While interest rate and money supply were found to be insignificant, the study found that increases in consumption taxes, real exchange rates, and economic liberation were the factors that most significantly affected the performance of the manufacturing sector. Okoror, et al. (2022) investigated the impact of working capital policy on firm performance using publicly traded manufacturing/industrial firms in Nigeria and found out that the cash conversion cycle has a positive and significant impact on financial performance.

It is also vital to note that the performance of a company is an important consideration by investors; it also determines the monetary value of a company (Makwe, et al., 2021). They posit that strengthening of the Naira and increase in tax rates with equivalent improvements in infrastructure and human capital development must be maintained to preserve the performance of manufacturing enterprise.

Human Capital Development

Studies on human capital in organisations focus on the way employees and managers accumulate knowledge and skills and how such stock of knowledge and skills enable organisations to improve performance (Timothy, 2022). Sisodia et al. (2021) stated that it is difficult for a firm to create competitive advantage without efficient labour force, even when the firm has adequate financial resources, advanced technologies and sophisticated infrastructure. Human capital aids in the achievement of organizational goals with the overarching goal of fostering regional and national development. The knowledge, abilities, and attitudes acquired through the building of human capital are direct results of conscious investments in people. The higher a person's ability to create more relevant intellectual capital, the higher they are considered as being of higher human capital (Ameyau et al., 2019).

Innovation

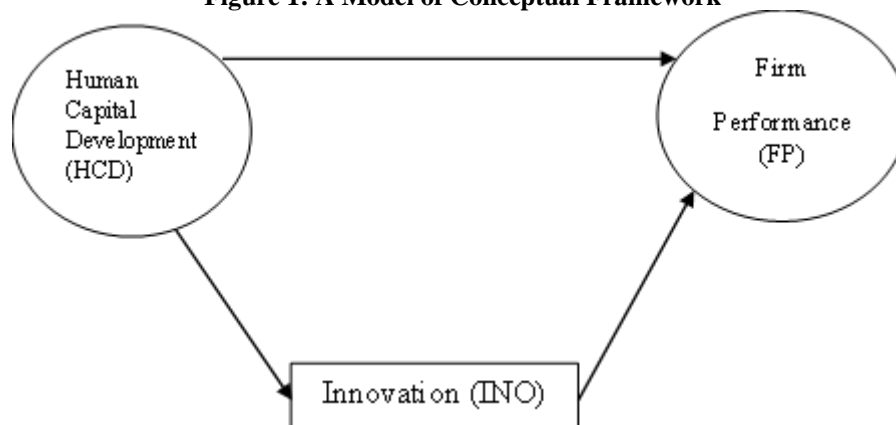
The Global Innovation Index between 2020-2022 shows that Nigeria performed better in innovation outputs (knowledge and technology-based products; creative products) than innovation inputs (institutions, human resources and market research, infrastructure, market sophistication, and business sophistication). It ranked Nigeria as 113th in innovation input and 107th implying that Nigeria is performing just moderately enough to compete favorably with the highly industrialized nations of the World. Although against other lower middle group economies and sub-Saharan Africa, Nigeria performs above the regional average in three pillars; Human Capital and research, business sophistication and creative outputs but that is not enough because it is expected that manufacturing firms perform above expectations if they must compete.

Innovative businesses incorporate cutting-edge technology into their systems and procedures to boost cost effectiveness and added value capable of generating more efficient work processes that lead to higher productivity and performance levels (Tuamyil et al., 2022). In comparison to their counterparts, introducing innovation within a business setting can result in considerable time and cost savings, thereby conferring a competitive edge that augments the enterprise's position in the marketplace (Zhu et al., 2023).

Dehbi (2018) reveals that innovation is intrinsically linked to productivity, as evidenced by a comprehensive analysis of the interconnection between the two. Measuring the correlation between productivity and various drivers of innovation such as human capital, research and development, and machinery and equipment investments (Dani & Gandhi, 2021) indicate that innovation is a fundamental impetus for productivity in both micro and macro environments. There are three types of innovation which include; product innovation, which entails generating revenue, process innovation which offers a way to preserve and improve quality and reduce costs, and market innovation, which broadens the target market mix and selects the best market to take into account served by the business (Septain & SWahyudi, 2019).

Conceptual Framework

Figure 1: A Model of Conceptual Framework



Theoretical Review

Human Capital Theory (Becker, 1962)

This theory was propounded by Becker in 1962. According to the human capital idea, a country's ability to prosper economically depends on its people. People in the labor market bring varying degrees of education, knowledge, skill, and ability, as well as their expectations, to the office. An organization relies on employees' talent, knowledge, and ability as a major idea of value creation hence the importance of human capital theory is widely recognized to boost organizational performance (Wuttaphan, 2017). This study therefore hinges on this theory.

Empirical Review

Human Capital Development and Firm Performance

Amma-Ullah (2022), using partial least square structural equation modelling, demonstrates that human capital capacity, human capital knowledge and human capital skills have a significant positive relationship with organizational performance. The results also confirmed the moderating effect of innovative leadership between human capital knowledge and organizational performance.

Aman-Ullah (2022) also demonstrates a notable correlation between human skills and organizational performance in the banking industry. Similarly, in the SME industry, the relationship between human knowledge and organizational performance has been explored (Maijana, et al., 2020). Marchiori, et al. (2022) examined the relationship between human capital, IT capability, innovativeness and organizational performance. Data was analyzed using IBM SPSS, and the findings indicated that human capital indirectly impacts organizational performance through the mediating effect of entrepreneurial leadership.

Human Capital Development and Innovation

Xia et al. (2012) Using survey data, analysed the path relationship between human capital and technological innovation using regression analysis. The findings reveal that human capital has positive impact on technological innovation.

Fonseca et al, (2019) suggested that more attention needs to be given to how advancement in technology affects innovation activities and eventually results in outputs. The decision to undertake innovation activities is primarily contingent on a firm's creative organization and aptitude for knowledge conversion (Anderson et al., 2014), while a firm's success in innovation is determined by its efficacy in translating innovation activities into market triumph (Baik & Kang, 2020), Their study investigated the relationship between Small Knowledge-Intensive Firms' Innovation and Performance with the moderating effects of organizational change in south Korean small firms and result show that innovation has a positive influence on long-term performance.

Even with constant invention generation, a company may not be successful in the market. When human capital investment is given more consideration, the creativeness of an organization has a considerable impact on its capacity for innovation (Aljuboori, et al., 2022). Firms can explore new position by using an innovative approach, which helps them deal with highly complicated, unexpected, and uncertain settings better (Lartey et al., 2020).

Innovation and Firm Performance

Innovation is widely regarded as one of the most important sources of firm's competitiveness because it allows continuous improvement in products, services and processes that helps firms to survive and grow (Timothy,

2022), he further asserts that Studies that examine the relation between firm innovativeness and performance generally find positive association. Throughout the course of history, there have been numerous attempts at innovation, many of which have proven to be unsuccessful. Even highly regarded organizations that were once pioneers and leaders in their respective industries have struggled to maintain their competitive edge in the face of major technological advancements.

Results presented by Vixathep and Phonvisav (2019) from their study of 179 MSMEs in Laos in South East Asia, suggests that a greater degree of human capital, when combined with innovation, has a positive impact on productivity levels within Lao MSMEs. This observation is consistent with previous research in the field of business innovation, which has generated considerable evidence highlighting the positive correlation between innovation and performance (Alqershi et al., 2019; Ameyau et al., 2019, Tuamyil et al., 2022)).

Mediating Role of Innovation in the Relationship between Human Capital Development and Firm Performance

Using an extensive database comprising 6,331 firms from 78 countries, Kuzey et al. (2021) conducted a study of the influence of investments in human capital, specifically employee training and development, on firm financial performance and the impact of research and development intensity of innovation capital which reveals that innovation capital played a partial mediating role in the relationship between human capital investment and firm performance, as determined by accounting-based return on assets. However, when market-based Tobin's Q was utilized for performance measurement, the role of innovation capital was observed to fully mediate performance. Fratiwi and Fanani (2019) examined the mediating role of innovation on the relationship between organizational learning and company performance. The result shows that innovation can mediate the influence of organizational learning on company.

The degree of openness of the innovation process always plays a role of partial mediator in the relationship between strategic vision and overall performance (Chabbouh & Boujelbene, 2020). Conversely, Aljuboori et al. (2022) investigated the relationship between intellectual capital, and firm performance with the mediating role of innovation capability in manufacturing SMEs in Malaysia, result indicated that the higher the level of innovation capability within a firm, the greater the performance that can be achieved by the firm.

III. Research Methodology

Research Design

A cross-sectional research design and ex-post factor was used for this study. The design is appropriate because it includes descriptive elements and further identifies and explores the causes behind effects and nature of relationships between the independent and dependent variable. The study investigated the causal relationship between the variables: - Human Capital Development (HDC), Firm Performance (FP) and Innovation. This study employed quantitative research to examine the relationships between human capital development, manufacturing firm performance and innovation within the scope of structural equation modeling.

Population and Sampling

The population of this study is made up of manufacturing firms in Plateau State totaling 231. The sampling technique used in this study was purposive sampling technique which helps the researcher focus on respondents with the information needed for the study. The units of analysis are managers of manufacturing firms at the organizational level.

Sample Size

Sample size is representative of the population and it is used to make inferences about a population after some statistical analysis (Smith, 2013). The sampling technique is nonprobability sampling in order to select a sample that matches the characteristics of the population. The sample size was determined using Taro Yamene's formula. This enabled the researcher to get data about the population that can be generalized. The Taro Yamene's formula is used to compute the sample size at 5% (0.05) margin of error (ME) and 95% (0.95) confidence interval (CI).

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

Where: n = The Sample size

N = the population of the study

e = level of significance (0.05)

$$n = \frac{231}{1 + 231(0.05)^2}$$
$$n = 146$$

Therefore, the sample size is 146. The sample size for each stratum of Manufacturing Firms is estimated using Bowley's (1906) proportional statistical technique which is given below:

$$nh = \frac{nNh}{N}$$

Where:

- nh = Number of units allocated to each stratum of Manufacturing Firms
- Nh = Number of staff in each stratum of the population
- n = Sample size
- N = The actual or total population under study.

Table 1: Calculation of the Sample size for each Category of Manufacturing Firms in Plateau State

Manufacturing Firms	Population Size	Sample size Computation	Sample Size
Flower Millers	71	$nh = \frac{146 \times 71}{231}$	45
Oil Crushers	62	$nh = \frac{146 \times 62}{231}$	39
Steel	34	$nh = \frac{146 \times 34}{231}$	22
Confectioneries	64	$nh = \frac{146 \times 64}{231}$ 40	
Total	231	146	146

Data Collection Methods

Primary data are obtained directly from the respondents. The questionnaire items are designed to address the purpose of the study. This gives the researcher the expected information about human capital development, innovation and firms' performance. This variables were measured using a five-point Likert-Scale.

Validity and Reliability: Reliability is a test of how consistently a measuring instrument measures whatever variable it is measuring, whereas validity is a test of how well an instrument that is developed measures the particular variable it is intended to measure (Dhawan, 2010). The validity and reliability of instruments used in this study were tested using composite reliability and convergent Validity through Average Variance Extracted (AVE) as shown below.

Table 1: Construct Reliability and Validity (AVE)

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Firm Performance	0.766	0.781	0.850	0.586
Human Capital Development	0.849	0.855	0.898	0.688
Innovation	0.875	0.876	0.915	0.728

Source: SmartPLS v. 4.0.9.6

Table 1 indicates that the Average Variance Extracted (AVE) of all the constructs being measured which are all above the threshold of 0.5 indicating a high convergent validity. Convergent validity of a construct according to Hair et al, (2014), is the extent to which an indicator correlates with other items within the same construct. Table 1 also show that the composite reliability coefficient for all the variables for this study which are all greater than or equal to 0.7.

Table 2: Assessment of Discriminant Validity- Fornell and Larcker Criterion

Variables	1	2	3
1. Firm Performance	0.766		
2. Human Capital Development	0.493	0.829	
3. Innovation	0.846	0.540	0.853

Source: SmartPLS v. 4.0.9.6

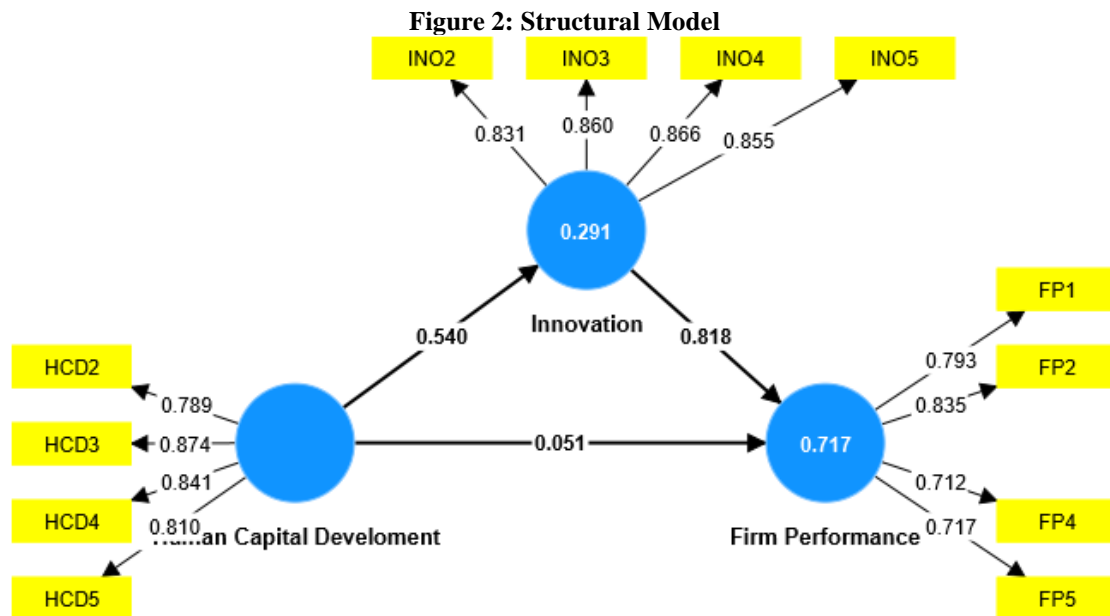
Table 2 shows that discriminant validity is established, since the square root of the AVEs as highlighted in the diagonal are greater than the correlations within the row and the column. Discriminant validity as the name implies, is conducted to establish that a construct as used in a given study is dissimilar to another construct (Henseler, et al., 2016) within the same framework.

Data Analysis Methods

The partial least square structural equation model (PLS-SEM) was used to model the regression analysis used to test the hypothesis to determine if there is an effect relationship between each of the independent construct and the dependent construct. PLS-SEM is a non-parametric method that does not require that the data meet certain distributional assumptions and it has been found to be reliable since the focus is on the changes in the dependent variable when examining a model as in this study. The study made use of SmartPLS application software package v. 4.0.9.6.

Model Specification

The following model is developed to form a linear equation. $Y = \beta_1X_1 + \beta_2X_2 + B_3X_3 + \epsilon$, where: Y = Firm Performance, ϵ = Error term, β_1 to β_3 = Beta coefficient of variable X which measure, whether there is responsiveness of Y to changes in X. X_1 = Human Capital Development, X_2 =Human Capital Development, X_3 = Innovation.



Source: SmartPLS v. 4.0.9.6

The coefficient of determination (R square) in Figure 2 showed that 71.7% (0.717) variance in firm performance is explained by Human Capital Development and Innovation and the remaining 28% variation could be explained by other factors not included in the study. The R-square is considered suitable based on hair et al. (2019).

Table 3: Model Fit

	Saturated model	Estimated Model
SRMR	0.084	0.084
d_ ULS	0.556	0.556
d_ G	0.244	0.244
Chi-square	191.763	191.763
NFI	0.806	0.806

Source: SmartPLS v. 4.0.9.6

Hair et al. (2017) suggested that there is need to assess the goodness of fit of the model in order to validate the PLS model using the standardized root mean square residual (SMRM) because it provides the absolute fit measure where a value of zero indicates a perfect fit. The SMRM of 0.084 approaches zero indicating an acceptable Goodness of Fit.

Data analysis

Table 4: Internal Consistency and Convergent Validity Report

Variables	Indicators	Factor Loading	VIF- OUTER Model	Composite Reliability	Convergent Validity (AVE)
Human Capital Development	HCD2	0.789	1.557	0.850	0.586
	HCD3	0.874	2.263		
	HCD4	0.841	2.126		
	HCD5	0.810	1.855		
Innovation	INO2	0.831	1.915	0.898	0.688
	INO3	0.860	2.283		
	INO4	0.866	2.263		
	INO5	0.855	2.229		
Firm Performance	FP1	0.793	1.734	0.915	0.728
	FP2	0.835	1.826		
	FP4	0.712	1.499		
	FP5	0.717	1.545		

Source: SmartPLS v. 4.0.9.6 Criteria: composite Reliability>0.70(Fornell & Larcker, 1991) AVE> 0.5 (Hair et al.,2014)

Table 5: Showing Path Coefficient

HYP.	Relationships	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV)	P values	Decision
HO₁	HCD -> FP	0.051	0.053	0.066	0.769	0.440	Fail to Reject the null hyp.
HO₂	HCD-> Innovation	0.540	0.541	0.08	6.781	0.000	Reject the null Hyp
HO₃	Innovation -> FP	0.818	0.820	0.040	20.591	0.000	Reject the null Hyp

Source: SmartPLS v. 4.0.9.6

In order to assess the path coefficient in line with the hypotheses postulated in this study, a bootstrapping command was carried out using SmartPLS v. 4.0.9.6 and the result displayed the path coefficient in table 1 based on the direct relationships on two tailed-tests at 95% confidence level and 5% margin of error as postulated in the hypotheses. However, table 4 revealed that human capital development had no significant relationship on manufacturing firm performance; on the other hand, human capital development had a significant relationship on innovation, and innovation also had a significant relationship on Manufacturing firm performance.

Decision Criterion

Reject the null hypothesis (HO) when p-value < 0.05 significance level, fail to reject the null hypothesis (HO) when p-value > 0.05 significance level.

IV. Discussion Of Findings

The manufacturing sector in Nigeria has not performed creditably (Gado, 2013; Afolabi and Laseinde, 2019). Gado (2012) had shown the place of innovative strategy in the poor performance of the textile industry in the North West zone of Nigeria. The findings of this study to the effect that human capital development devoid of innovation is not enough to improve performance supports theses earlier works. In a globalized and fast-changing World, human capital development supported by innovation appears to be key to improved performance. Innovation is so central that on its own it improves performance.

The aim of human capital development should be to improve innovation. This explains why countries that are high in innovation appear to be doing well. The emphasis of human development by way of formal education, training and capacity building should be to improve innovation. This explains why producers of primary products without any innovative value addition have remained poor. This has also validated the theory of the ‘natural resource course’ (Auty, 1994). Natural resources when used innovatively, however, can be a blessing (Algharabali & Al-Thaqeb 2023)

V. Summary Of Findings, Conclusion And Recommendation

Summary of Findings

The findings of the study revealed that there is no significant relationship between human capital development and firm performance. This decision was reached based on the t-value of 0.769 and a p-value of 0.44

The findings of the study indicated that there is a significant relationship between human capital development and innovation with a t-statistic of 6.781 and a p-value of 0.000

The findings of the study showed that there is a significant relationship between innovation and firm performance with a t-statistic of 20.591 and a p-value of 0.000.

Conclusion

The findings of the study concluded that human capital development alone does not lead to increase in firm performance.

The findings of the study also concluded that human capital development led to improvement in innovation.

The findings of the study further concluded that innovation led to improvement in firm performance.

Recommendation

The study recommends that management of business organizations need to rethink on the particular aspect of human capital to develop in order not to waste resources without any improvement in its performance

The management of manufacturing firms should channel their resources more on particular aspects of human capital that will have an impact on innovation because it is a good predictor of firm performance.

The management of manufacturing firms should adopt a technology that is well suited for the organization and is scalable to meet future needs.

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