



Implications of Human Structural Intellectual Capital on Organisational Performance: Evidence from Nigeria Polytechnic Education Sector

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Abstract - *This paper reports finding from a survey on the effect of intellectual capital on organizational performance in the Nigerian Polytechnic Education Sector. A sample of 400 employees from the NPES in Osun state of Nigeria was obtained. Findings indicated a notable similar pattern of intellectual capital –organizational performance link as found in Western countries of North America and Europe. The study findings specifically show that human capital and structural capital have a positive and significant effect on organizational outcomes in the Nigerian education sector. Implication for future research and management practice are considered and recommended in the conclusion.*

Keywords: *Intellectual Capital, Performance, Knowledge, Management, Polytechnic.*

1. Introduction

As a rapidly expanding field of research, intellectual capital has attracted considerable interest from both academics and practitioners. Research and theorising in this area has highlighted the importance of intellectual capital in generating and sustaining organizational competitive advantage (Bontis, Keow, & Richardson, 2000; Mavridis & Kyrmizoglou, 2005). Intellectual capital is generally conceptualized as “intellectual material - knowledge, information, experience, core technique, intellectual property, and customer relationship - that can be put to use to create wealth” (Stewart, 1997). The importance of intellectual capital on organizational success has become crucial in the context of what has become known as the knowledge-based economy which is characterized by a rapid expansion of knowledge-intensive industries and by a marked increase in the importance of creating and exploiting knowledge and information in all sectors of the economy (Nonaka and Takeuchi, 1995). However, despite an increasing recognition of the importance of intellectual capital in the knowledge based economy, little research attention has been devoted to understanding the link between intellectual capital and organizational performance in Nigeria. Much of the studies on intellectual capital has focused on Western countries (particularly North America and Europe). To date, few scholars have focused on the effect of intellectual capital on organizational performance in the Nigerian Polytechnic Education Sector (NPES).

This is surprising given that many scholars (e.g., Ruta, 2009, Yang & Lin, 2009) argue that intellectual capital development is the hidden value that is not reflected in organizational financial statements but has the potential to contribute to organizational profitability and competitive advantage. The Nigerian Polytechnic sector offers a rich avenue for research on intellectual capital given that the majority of individuals that work in the Nigerian Polytechnics are knowledgeable and skill workers. Accordingly, this study seeks to enrich the understanding of intellectual capital by providing empirical evidence of the link

between key components of intellectual capital and organizational performance in the South- Western Polytechnics sector in Nigeria.

Intellectual capital

Intellectual capital arguably is one of the most popular concepts in the field of human resource management. The concept has attracted a growing interest in recent years in the management field, especially due to its association with organizational performance. As noted above, it is broadly conceptualized as the aggregate sum of intangible value which comprises: *Human capital* (knowledge skills and capabilities), *Structural capital* (*supportive infrastructure, processes and database of an organization that enable the human capital function effectively*), *Customer capital* (is the relationship built up with the customers and is a significant part of structural capital) and *Relational capital* (reflected in the reputation of organization and customer loyalty). For the purposes of this study two key components of intellectual capital (*Human capital and structural capital*) will be analyzed. The links between intellectual capital and performance is now a major area of interest for research and policy.

Human capital and Organisation performance

The term 'human capital' is defined as a combination of the following four factors: genetic inheritance; education; experience; and attitudes about life and business (Bontis, 2001). Similarly, Hines, (2000) defines it as the combined knowledge, skills, innovativeness and ability of the company's individual employees to meet the task at hand. It obviously includes intangibilities such as the company values, culture and philosophy. A logical deduction is that when an enterprise educates its employees, it increases its human capital. This does not mean that the company will have more control over its assets. As Edvinsson, (2007) states in a free society the enterprise cannot own, only rent, its human capital. Seviby (2008) argues that people should be seen as the only true agents in business; all tangible physical products, assets as well as the intangible relations, are results of human action and depend ultimately on people for their continued existence.

Human capital is one of the important variables in the study of intellectual capital. It is the dimension of intellectual capital which deals with the human knowledge and its experience, which is based on other elements and which will influence a firm's value by affecting the other elements. Employee knowledge and capabilities are the important sources of innovation (Van Buren, 2008; Wang, 2005). It can be argued that human capital closely influences innovation capital. Employees are needed to carry out the internal process of a firm. Employees are also required to perform all customer services. By providing quality of service while implementing internal processes, the capability of employees would affect process efficiency and customer satisfaction (Wang, 2005). According to Wang & Chang, (2005) human capital affects business performance through innovation capital, process capital and customer capital. According to the Skandia's model, the hidden factor of human and structural capital is a mixture of intellectual capital added together. On the other hand, human capital is explained as the combination of innovation capital, process capital and customer capital. Human capital is the ability of company's individual employees to meet the task at hand (Bhatt, 2005). Overall, while there is no shortage of claims that human capital is linked to organizational performance, there has been scant empirical examination of this linkage in the Polytechnic sector in Nigeria. On the basis of extant studies reviewed above, which suggest that human capital influences organizational performance, it is possible to propose that:

H₁: Human capital is positively associated with organisational performance in Nigerian Polytechnics.

Structural capital and employees' performance

Bontis (2002) defines structural capital as the non-human assets or organisational capabilities used to meet market requirement. Bontis (*op cit*) points out that structural capital is the hardware, software, databases, organizational structure, patents, trademarks and everything else that employees use to support their business activities and processes that will finally lead to an effective competition among other organizations. Roos, Roos, Edvinsson,&Dragonetti(1997: 42) describe structural capital as "what remains

in the company when employees go home for the night”. Structural capital focuses on the knowledge embedded within an organizational routine. Structural capital is identifiable through the embedded knowledge that the organization owns. Knowledge is embedded in obvious media such as documents and databases but it is also within the routines of an organization, within the products and services of the organization and within the product innovations. Structural capital includes technological factors and technical competencies and is highly tacit and enables knowledge to be captured and shared.

Overall, the literature on structural capital generally claims that structural capital is the critical link that allows the link between intellectual capital and organizational performance to be measured. This suggests the need to further investigate the relationship between structural capital and organizational performance in the Nigerian context. This leads to this other relevant hypothesis:

H₂: Structural capital is positively associated with organizational performance in Nigerian Polytechnics.

2. Research methodology

The survey method was adopted. From a population of averagely 10,000 academic workers (researcher’s intellectual assumption) in the Nigerian Polytechnic education sector in South-Western States of Nigeria, a sample size of 400 workers was obtained using random and convenient sampling. The intellectual capital questionnaire developed by Bontis (1997) was re-administered to lecturer in the South-Westernstates of Nigeria through both physical distribution and e-mail correspondence. The questionnaire contained statements to which respondents indicated the extent of their agreement on a seven-point Likert scale (1= strongly disagree and 7= strongly agree). The researchers conducted a pre-test to check the validity of the research instruments. Concerns raised were resolved by clarification of the statements contained in the questionnaire. The total number of copies of questionnaire distributed was four hundred (400). Three hundred and sixty (360) copies were completely filled and returned representing 90% while forty (40) copies wereincompletely filled, mutilated, or not filled at all; these sets were discarded. Although a rigorous psychometric evaluation of the intellectual capital instrument has been conducted in various studies, the current study used Cronbach alpha test to further evaluate the reliability of the measures. The values were above 0.7 and confirmed the results of previous studies which suggest the high reliability of the instrument. The statistical tool used in testing the hypotheses is the Chi-Square statistical test which is helpful in cause and effect situation or to show the causal relationship between events.

Model estimation and Presentation

Generated hypotheses were tested using chi-square model. Given as:

$$X^2 = \frac{\sum (of - \sum f)^2}{\sum f(i)} \quad \text{i.e} \quad \therefore \sum f = \frac{RowTotalXCcolumnTotal}{GroundTotal}$$

Table 1. Human capital influences on employees’ performance

RESPONSE	CATEGORIES		TOTAL	PERCENTAGE
	Observed Frequency & Observed Frequency			
	Senior Academic Staff	Senior Non-Academic Staff		
Yes	100 (76.3667)	74 (97.6333)	174	48%
No	58(81.6333)	128 (104.3667)	186	52%
Total	158	202	360	100%

Table 2. Chi-Square Test Statistics for the Relationship between HumanCapital and Employees' Performance

Of	Ef	(of - ef)	(of - ef) ²	(of - ef) ^{2/ef}
100	76.3667	23.6333	558.5329	7.3138
58	81.6333	23.6333	558.5329	6.8420
74	97.6333	-23.6333	558.5329	5.7207
128	104.3667	23.6333	558.5329	5.3516
Total				25.2281

Similarly, the result related to H₂ shows that there is a positive relationship between human capital and organizational performance of Polytechnic employees' in South-Western States of Nigeria.

Table 3. Relationship between Structural Capital and Organisational Competitiveness

RESPONSE	CATEGORIES		TOTAL	PERCENTAGE
	Male Staff	Female Staff		
Yes	96(73.3444)	65(87.6556)	161	45%
No	68(90.6556)	131(108.3444)	199	55%
Total	164	196	360	100%

Table 4. Chi-Square Test Statistics for the Relationship between Structural Capital and Organizational Competitiveness

Of	Ef	(of - ef)	(of - ef) ²	(of - ef) ^{2/ef}
96	73.3444	22.6556	513.2762	6.9982
68	90.6556	-22.6556	513.2762	5.6618
65	87.6556	-22.6556	513.2762	5.8556
131	108.3444	22.6556	513.2762	4.7375
Total				23.2531

Since the calculated Chi-Square (X^2) value of 23.2531 is greater than the critical value of 3.84, we reject null hypothesis (Ho) and accept the alternative hypothesis (H1) which state that there is a relationship between structural capital and organisational competitiveness in Polytechnics sector in South-Western States of Nigeria.

3. Results and Discussions

The results related to H1 shows that the relationship between human capital and organizational performance is positive and significant. Given that the calculated Chi-Square (X^2) value of 25.2281 is greater than the critical value of 3.84, we rejected null hypothesis (Ho) and accepted the alternative hypothesis (H1) which state that there is a relationship between human capital and organisational performance of Polytechnics in South-Western States of Nigeria. Same applied to structural capital and organisational competitiveness where the value calculated 23.2531 is greater than the critical value of 3.84. The study therefore submits that there is a strong relationship organisational structural capital and its competitiveness. This aligns with the works of Bontis (2002), Bhatt (2005), Wang and Chang (2005), as well as, Van Buren (2008) that opined that human capital affects business performance through innovation capital, process capital, and customer capital.

Conclusion

The purpose of this study was to explore two hypotheses concerning intellectual capital and organizational performance link. The result of this study indicates that intellectual capital and structural

capital have a positive and substantive relationship with organizational performance. The findings are consistent with much of the findings of extant study on intellectual capital-organizational performance link in different national and industry context. The findings suggest that Polytechnics in the South-Western States of Nigeria seem to have recognized the value of intellectual capital in their competitiveness and have put in place structures and processes for knowledge management to mitigate against high staff turnover.

4. Recommendations and Suggestions for Further Studies

The positive effects of intellectual capital on organizational performance suggest the need for Polytechnics, as well as other higher education institutions, to continue to pay attention to human capital and structural capital as potential sources of competitive advantage. This may entail institutionalizing continuous professional development programmes and the development of an effective knowledge management system to capture and retain knowledge of their knowledge workers. While this study is designed to provide empirical evidence of the links between intellectual capital and organizational performance in South-Western States of Nigeria, the cross sectional nature of the study preclude causality. Future, longitudinal studies will provide interesting insight into the direction of the association. It will also be interesting to replicate this study in different national and industry context given that the finding of this study may be bounded by the context of the study.

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