International Journal of Management and Administrative Sciences (IJMAS)
(ISSN: 2225-7225)
Vol. 3, No. 02, (64-72)
www.ijmas.org

Relationship between Organizational Learning and Construction Waste Management among Construction Organizations in Nigeria

Yusuf Nasidi [1], Ahmed Mohammed Kamaruddeen[2] and Ahmad Yusni Bahaudin[3]
School of Technology Management and Logistics Universiti Utara Malaysia,
06010 Sintok, Kedah Darul Aman,
Malaysia
y.nasidi580@gmail.com

ABSTRACT:
In recent, the increased in economic growth as well as urbanization in Nigeria has led into extensive construction activities that create large amounts of wastes. Material wastage in construction projects resulted in huge financial setbacks in construction organizations. It may also cause significant effects over aesthetics, health, and the environment. These wastes need to be managed as well as their impacts need to be ascertained to pave way for proper management. The aim of this paper is to examine the relationship between organizational learning and construction waste management among construction organizations in Nigeria. A cross sectional design and quantitative method was employed to obtain data from 310 construction organization managers, out of which one hundred and seventy eight (178) we returned and used for the analysis. The tool used in the data analysis for this study was the structural equation model Smart PLS. The Cronbach's Alpha value of all the variables ranges from 0.793 - 0903. The findings of the study indicate that the hypothesis is significant at 5% significance level.
KEYWORDS: Organizational Learning, Construction Waste Management

1. INTRODUCTION

It is significant to appreciate how learning as a key process contributes to successful innovation, efficiency and effectiveness, for the determination and supports an organization's success (Verdonschot, 2005). Organizational learning is the process of acquiring, integrating, distributing, and creating knowledge and information among organizational members (Dixon, 1992; Huber, 1991). An organization's knowledge is an asset that can be managed to contribute to the organizations's innovation performance (Pham & Swierczek, 2006). Consequently, organizational learning is one foundational source of competitive advantage and has also become associated with efficiency in the innovation literature (Lopez, Peon, & Ordas, 2005).

According to Hoornweg & Tata- Bhada (2012) states that 1.3billion tons of waste are currently generated by cities around the world and this value is anticipated to increase by 2025 to about 2.2billion tons. The increase is anticipated to be greatest in lower-income countries. Related to this is the annual global waste management cost that is expected to increase from $ 205 billion to about $ 376 billion in 2025, (Hoornweg & Bhada-Tata, 2001)

In the mid-nineties, nearly one million ton of waste was sent to landfill each year (Red, drop & Ryan, 1997), hence Bell, (1998) said that the construction and demolition waste was estimated to account for about 16percent to 40percent of the total waste generated in Australia. Furthermore, in Hong Kong, annually the construction and demolition waste generated in nine years from 1993-2002 is more than twice of the waste generated to about 20 million tons as of 2004 (Poon, 2007). However, in Nigeria, management of waste materials is still a problem.

Hence, this paper examines the relationship between organizational learning and construction waste management among construction organizations in Nigeria

2. LITERATURE REVIEW

2.1 Construction waste management

Protecting the environment from the pollution effects of waste materials in order to protect public health and the natural environment. Thus, the priority of a waste management system must always be the provision of a cleaning service which helps to maintain the health and safety of citizens and their environment (Hwang, 2011).

Construction waste Management, renovation and demolition or destruction of projects are part of the growing movement to better manage materials and make sustainable communities. Building and demolition exercises are integrating "sustainability" or "green" management strategy design to ensure the environment, saves resources (including financial resources), and monitor energy to guarantee the prosperity of current and future generations (Hwang, 2011).

In Vietnam Ling and Nguyen (2013) found out that there is a lack of awareness in construction and waste minimization. Subcontractors with waste management knowledge were employed for effective waste management, providing close supervision of subcontractors and workers, conducting of training, audit and sequence activities to reduce damage to completed work, set the level of wastage allowance, and enforce these through rewards and punishments. In addition, Hwang (2011) "established key materials used in projects, project size in terms of total installed costs, and type of project have perceptual impacts on benefits from construction waste management". Whereas, based on a guideline, the 'three Rs' standard of waste "reduction, re-use and recycle", known as the waste hierarchy, broadly approve in the UK (Vijayaraghavan, 2013).

2.2 Organizational Learning

Organizational learning is "the process by which an organization continuously adjusts and/or changes itself by utilizing and enriching organizational knowledge resources in an effort to adapt to both external and internal environmental changes to maintain a sustainable competitive advantage" (Chen, 2005, p. 472). Organizational learning is also viewed as a dynamic process of knowledge creation, acquisition and integration for the development of resources and capabilities contributing to better organizational performance. In the present study, organizational learning is an organization's ability to acquire, disseminate and use knowledge in order to adapt to a changing for effective and efficient construction waste management among construction organizations in Nigeria. Following (Hoe and McShane's 2010).

It has been observed by scholars that there is a significant relationship between output increase relative to inputs on the experience gained by workers over time (Argote 2001; Argote and MironSpektor

2011). Equally, Members of the organization will be more knowledgeable about the organizations in which their organization competed and about their company business model (Hoy 2008). The model explains the organization's internal capacity by learning from experience, for the purpose of examining and adopting of new ideas to be transformed into policy and action plans to be able to achieve a competitive advantage (Lipshitz, Friedman et al. 2007; Mitki, Herstein et al. 2007).

Organizational learning is the assembly and processing of information within, and about, the organization, the way and manner the acquisition, interpretation, distribution and storage of potential knowledge and information (March & Simon 1958; Deng and Tsacle 2003; Huber 1991). Huber (1991) through some process elaborates: "knowledge acquisition, information distribution, information interpretation, and organizational memory. Knowledge is acquired through the knowledge inherited from members of the organization and by new staff recruitment with external knowledge. This knowledge, therefore requires be distributing and interpreting extensively across the organization for the improvement of organizational performance.

2.3 Organizational Learning and Construction Waste Management

The relationship between organizational learning and organizational performance have been investigated by many previous researchers (i.e., Lloréns Montes, Ruiz Moreno et al. 2005; Di Milia and Birdi 2010; López, Peón et al. 2004; Yeung, Lai et al. 2007; Wang, Wang et al. 2010; Garcıá-Morales 2008; Jyothibabu, Farooq et al. 2010; Jiménez-Jiménez and Sanz-Valle 2011; GarcíaMorales, Jiménez-Barrionuevo et al. 2011). Among which some of the studies have supported the positive relationship between organizational learning and efficient and effective organizational performance (López, Peón et al. 2004; Bontis, Crossan et al. 2002; Lloréns Montes, Ruiz Moreno et al. 2005; Jiménez-Jiménez and Sanz-Valle 2011). Goh & Ryan (2008) studied the link between learning capability and competitive advantage, They found that organizations with an organizational learning characteristic performed better than their competitors in relation to construction waste management. Equally, van Gils and Zwart (2004) found that knowledge sharing and learning, increased turnover, produced higher profits and extended the product range. A similar study of Alegre and Chiva (2008) found that experimentation, risk taking, interaction with the external environment, dialogue and participative decision making, influenced the construction waste management organizational performance. Panagiotakopoulos (2011) found that a continuous effort to acquire and manipulate knowledge, for instance, in construction organizations had a significant influence on construction waste management survival and growth towards efficient and effective performance. Additionally, he found that organizational learning reduced errors, introduced advanced technology, enhanced worker employability and met shortage needs in the construction waste management practice among construction organizations. Some researchers, conversely, found that organizational learning in relation to construction waste management practice.

3. FRAMEWORK

In this model organizational learning is the independent variable, while construction waste management is the dependent variable is showing the relationship between the independent and the dependent variable.

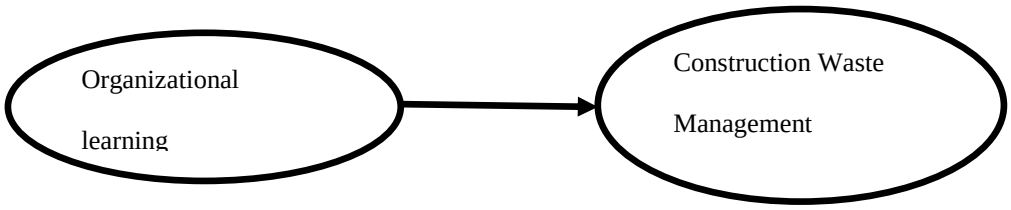

Figure1.Framework

4. HYPOTHESIS

H1 Organizational learning is significantly related to construction waste management.

5. METHODOLOGY

A cross- sectional and quantitative approach was used for this study. The stratified random sampling was employed. Data was obtained by means of a structured survey questionnaire from the construction organizations, managers in Abuja, Nigeria. Going by previous literatures the questions were adapted and the items for measuring Organizational learning were adapted from Garcia-Morale (2006) and Construction waste management was adapted from (Vleck, 2001). A5 point liker scale scoring format ranges from (1 = Strongly disagree to 5 = strongly agree) was employed for all the items. The structural equation model (SEM) smart PLS statistical package was used for the data analysis. 310 questionnaires were administered in this study out of which 178 were duly completed, returned and retained for the analysis, That is representing 57.4 percent response rate.

5.1 Statistical Analysis and Result

In this study the structural equation model Smart PLS 2.0 statistical software package was used for the data analysis, primarily in the validity and reliability testing for measures of the construct. This model consists of organizational learning and construction waste management.

5.2 The Measurement Model (Outer model)

The measurement model is used for filtering of data, is also used for the confirmation and assessment of the validity and reliability for the construct before the establishment of goodness, is also used for the assessment of the reliability of indicators. The loading with 0.4 and for the internal consistency 0.7 are acceptable level. According to Chin (1998), the cronbach's Alpha, composite reliability and the Average Variance Explain (AVE) must be 0.5 and above, and for the convergent validity and factor loading, for discriminate validity used, the item (s) loading that is higher on the other construct than their mother construct should be deleted (Chin,1988; Hair et.ai.,2010). Thus, it can be seen that all the instruments adapted in this study are reliable; this is because all the items are above 0.4. The items loaded on their individual construct range from 0.748 to 0.915; they are acceptable because they are above the cut-off mark value of 0.4 which is in consistence with (Hair 2011; Chin, 1988). Equally, the composite reliability values range from 0.906 to 0.924 and these are greater than the Value of the cut-off value 0.7 (Hair et, al., 2011). The average variance extracted AVE is used to determine the convergent validity. The average variance extracted AVE ranges from 0.635 to 0.829, equally above the minimum cutoff value of 0.5 (Hair, 2011). Last, the average variance extracted (AVE) is compared to the correlation squared of the interrelated variables of the constructs concerned to determine the discriminant, the model also indicates that there is adequate discriminant validity. The factor loading, composite reliability cronbach Alpha, and the AVE are shown in table one below, and table 2 shows the discriminate validity.

Items	Factor Loading	Composite Reliability	Cronbach's Alpha	AVE
OGL 02	**0.915**			
OGL06	**0.906**	**0.906**	**0.793**	**0.829**
WREC01	**0.752**			
WREC02	**0.789**			
WREC03	**0.884**			
WREC05	**0.758**			
WRED01	**0.748**	**0.924**	**0.903**	**0.635**
WRED03	**0.796**			
WRED05	**0.781**			

Table1: Factor Loadi

	CWR	OGL
CWM	**0.796**	
OGL	0.772	**0.910**

Table2: Discriminant validity

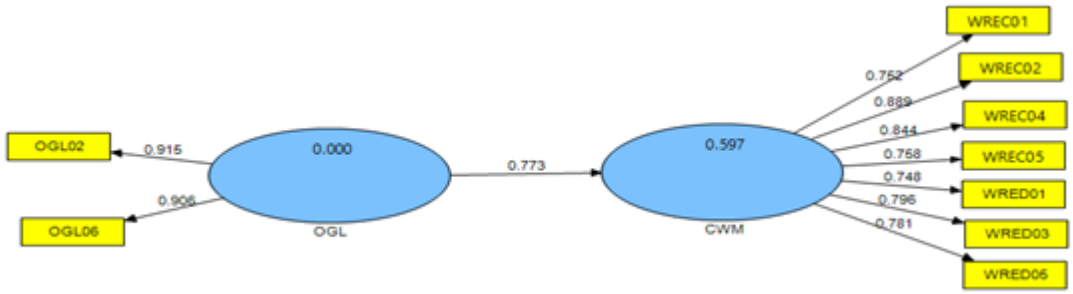

Figure 2 ***Algorithm (Measurement model)***

5.3 Structural Model

After the measurement model were the construct validity and the reliability have been achieved Structural model: as required, the next step is the structural model assessment the result, then the interpretation of the path coefficient. For testing the hypothesis of the study the PLS algorithms and Bootstrapping were run by using smart PLS 2.0. The hypothesis result is presented in table 3 below

Hypo. No.	Hypo. Path	Beta	Std Error	T-Stat.	P-Value	Decision
H1	OGL-> CWM	0.77	0.02	30.54	0.05	Supported

Table 3: Hypotheses Testing Results

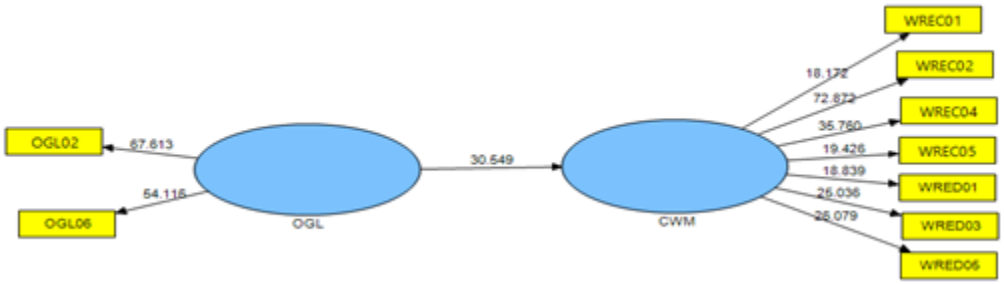

Figure 3: *Bootstrapping (Structural Model)*

5.4 Predictive Relevance of the model

Cross validation redundancy is used in evaluating predictive relevance. The Smart PLS blindfolding procedures were used to generate cross validation commonality and cross validation redundancy. Therefore, the value of the cross validated relevance of this model is 0.346, which is consistent with Stone (1974)and Geisser (1974), who stated that for a model to have predictive relevance, the Q^2 has to be above zero. Furthermore, a benchmark standard for judging the predictive relevance of a model using the value of cross validation redundancy are presented thus: 0.02 ; 0.15 and 0.35 as small medium and Large respectively. Hence, the model has medium predictive relevance based on Chin (1998);Geisser (1974) and Stone (1974).

Total	SSO	SSE	1-SSE/SSO
CWM	1246	814.3506	0.346

Table 4: Cross validation redundancy

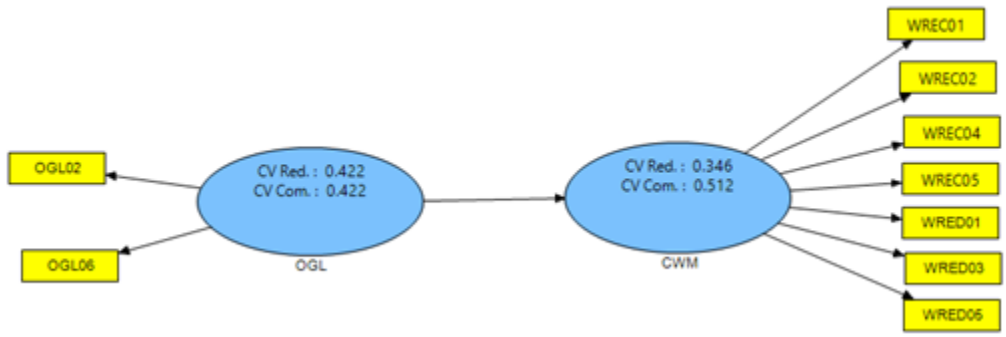

Figure 4*: Blindfolding (Predictive Relevance)*

6. CONCLUSION

The relationship between the organizational learning (OGL) and construction waste management (CWM) has been examined as the objective of this study. Based on the statistical findings, the hypothesis was supported. The hypothesis, organizational learning are significantly related to construction waste management (OGL – CWM) is significant (β =0. 77, t=30. 54, P-Value=0. 05), and this is consistent with the finding of; Garcıá-Morales (2008) which is significant and positive; however the concept of organizational learning used in different contexts, their finding is in line with that of the current study. Therefore, this entails the fact that the maximum level of effectiveness and efficiency of the construction waste management practice will be achieved by a higher level and commitment to organizational learning among construction organization in Nigeria.

This study has contributed both theoretical and practical; the extension of the existing literature about organizational learning and construction waste management (OGL– CWM) is the theoretical contribution of this study. In addition, this is one of the few studies that examine the relationship between organizational learning and construction waste management. Practically, stakeholders in policy and decision making in the practice of construction waste management, for example: (governmental and non-governmental organizations) the result of this study will help them. The managers will understand the importance of organizational learning for highest efficient and effective ways of construction waste management practice. Last, for future research a waste reduction and avoidance if possible from conceptualization stage to design stage and to the completion stage of the construction should be considered as one of the best construction waste management practice, and Smart PLS-SEM 3.0 should be used for the re-validation of the model based on the suggestion in this study, which is proposed to be conducted in the near future.

References

[1]. Argote, L. 2001. Organizational Learning: Creating, Retaining, and Transferring Knowledge. Boston, MA: Kluwer Academic Publishers.
[2]. Argote, L. 2011. Organizational learning research: past, present and future. Management Learning.
[3]. Bell, N. (1998). *Waste Minimization and Resource Recovery.* The Environmental Design Guide, Gen 21, Vol. 2. Royal Australian Institute of Architects,
[4]. CanberraBontis, N., Crossan, M. M., & Hulland, J. 2002. Managing an organizational learning system by aligning stocks and flows. Journal of Management Studies, 39(4): 437-469.
[5]. Chen, G. 2005. An organizational learning model based on western and Chinese management thoughts and practices,. Management Decision, 43(4): 479-500.
[6]. Chiva, R., & Alegre, J. (2009). Organizational Learning Capability and Job Satisfaction: an Empirical Assessment in the Ceramic Tile Industry*. *British Journal of Management, 20*(3), 323-340.
[7]. Deng, P. S., & Tsacle, E. G. 2003. A market-based computational approach to collaborative organizational learning. The Journal of the Operational Research Society, 54(9): 924-935.
[8]. Di Milia, L., & Birdi, K. 2010. The relationship between multiple levels of learning practices and objective and subjective organizational financial performance. Journal of Organizational Behavior and Human Decision Processes, 31(4): 481-498.
[9]. Chin, W. W. (1998b). The Partial Least Squares Approach for Structural Equation Modeling. In: MARCOULIDES, G. A. (Ed.) Modern Methods for Business Research. Lawrence Erlbaum.
[10]. Dixon, N. M. (1992). Organizational learning: a review of the literature with implications for HRD professionals. Human Resources Development Quarterly, 3(1), 29-49.
[11]. Garcı´a-Morales, V. J., Llorens-Montes, F. J., & Verdu´-Jover, A. J. (2006). Antecedents and consequences of organizational innovation and organizational learning in entrepreneurship. *Industrial Management & Data Systems, 106* (1), 21-42.
[12]. Garcıá-Morales, V. J., Francisco Javier Lloréns-Montes, Antonio J. Verdú -Jover. 2008. The Effects of Transformational Leadership on Organizational Performance through Knowledge and Innovation. British Journal of Management, 19: 299-319.
[13]. García-Morales, V. J., Jiménez-Barrionuevo, M. M., & Gutiérrez-Gutiérrez, L. 2011. Transformational leadership influence on organizational performance through organizational learning and innovation. Journal of Business Research(0).
[14]. Geisser, S. (1974). A predictive approach to the random effect model. Biometrika, 61, 101-107.
[15]. Goh, S. C., & Ryan, P. J. 2008. The organizational performance of learning companies - a longitudinal and competitor analysis using market and accounting financial data. The Learning Organization, 15(3): 225-239.
[16]. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. 2010. Multivariate Aata Analysis – A Global Perspective (7 ed.). New Jersey: Pearson.
[17]. Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. 2011. An assessment of the use of partial least squares structural equation modelling in marketing research. Journal of the Academy Marketing Science..
[18]. Hoe, S. L., & McShane, S. 2010. Structural and informal knowledge acquisition and dissemination in organizational Learning An exploratory analysis. The Learning Organization, 17(4): 364-386.
[19]. Hoornweg, D., & Bhada-Tata, P. (2012). What a waste: a global review of solid waste management.
[20]. Hoy, F. 2008. Organizational learning at the marketing entrepreneurship interface. Journal of Small Business Management, 46(1): 152-157.
[21]. Huber, G. P. 1991. Organizational learning: the contributing processes and the literature. Organization Science, 2(1): 88-116.
[22]. Hwang, B.-G., & Yeo, Z. B. (2011). Perception on benefits of construction waste management in the Singapore construction industry. *Engineering, Construction and Architectural Management, 18*(4), 394-406.
[23]. Jiménez-Jiménez, D., & Sanz-Valle, R. 2011. Innovation, organizational learning, and performance. Journal of Business Research, 64(4): 408-417.
[24]. Jyothibabu, C., Farooq, A., & Pradhan, B. B. 2010. An integrated scale for measuring an organizational learning system. The Learning Organization, 17(4): 303-327.

[25]. Ling, F. Y. Y., & Nguyen, D. S. A. (2013). Strategies for construction waste management in Ho Chi Minh City, Vietnam. *Built Environment Project and Asset Management, 3* (1), 141-156.
[26]. Lipshitz, R., Friedman, V. J., & Popper, M. 2007. Demystifying Organizational Learning. Newbury Park, CA: Sage Publications.
[27]. Lloréns Montes, F. J., Ruiz Moreno, A., & García Morales, V. 2005. Influence of support leadership and teamwork cohesion on organizational learning, innovation and performance: an empirical examination. Technovation, 25(10): 1159-1172.
[28]. López, P. S., Peón, J. M. M., & Ordás, C. J. V. 2004. Managing knowledge: the link between culture and organizational learning. Journal of Knowledge Management, 8(6): 93-104.
[29]. López, P. S., Peón, J. M. M., & Ordás, C. J. V. 2005a. Human resource practices, organizational learning and business performance. Human Resource Development International, 8(2): 147-164.
[30]. March, J. G., & Simon, H. A. 1958. Organizations. New York, NY: Wiley.
[31]. Mitki, Y., Herstein, R., & Jaffe, E. D. 2007. Learning mechanisms for designing corporate identity in the banking industry. International Journal of Bank Marketing, 25(7): 452-468.
[32]. Panagiotakopoulos, A. 2011. Workplace learning and its organizational benefits for small enterprises – evidence from Greek Industrial firms. The Learning Organization, 18(5): 364-374.
[33]. Pham, N. T., & Swierczek, F. W. (2006). Facilitators of organizational learning in design. The Learning Organization, 13(2), 186-201.
[34]. Poon, C. (2007). Management of construction and demolition waste. *Waste Management, 27* (2), 159-160.
[35]. Reddrop, A., Ryan, C (1997). *Housing Construction Waste.* Canberra:Commonwealth Department of Industry, Science and Tourism.
[36]. Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society. Series B (Methodological)*, 111-147.
[37]. Verdonschot, S. (2005). Method for identifying learning processes in innovation processes. Proceedings of the Sixth international conference on HRD research and practice across Europe. Leeds, England.
[38]. Vijayaraghavan, A. Yuan, C. & Diaz,N. (2013) Green Manufacturing. Boston, MA: Springer US, pp. 117–152.
[39]. Vleck, R. (2001). Advanced construction and demolition waste management for Florida builders. *University of Florida, Gainesville, Fla*. Wang, Y.-L.,
[40]. Wang, Y.-D., & Horng, R.-Y. (2010). Learning and innovation in small and medium enterprises. Industrial Management & Data System, 110(2): 175-192.
[41]. Yeung, A. C. L., Lai, K.-H., & Yee, R. W. Y. 2007. Organizational learning, innovativeness, and organizational performance: a qualitative investigation. International Journal of Production Research, 45(11): 2459-2477.