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Office Layout and Employee Efficiency of Manufacturing Companies in Port Harcourt

Dr. Ebikebina Tantua (Jnr.)

Department of Office and Information Management, Faculty of Management Sciences, Rivers, State University, Nkpolu-Oroworukwo, PMB 5080, Port Harcourt, Nigeria.

and

Gloria Osaro
Department of Office and Information Management, Faculty of Management Sciences, Rivers, State University, Nkpolu- Oroworukwo, PMB 5080, Port Harcourt, Nigeria.

ABSTRACT

This study examined the relationship between office layout and employee efficiency of manufacturing companies in Port Harcourt. The study adopted the cross-sectional survey design. Primary data was generated through structured questionnaire. The population of the study was 253 employees of seven (7) selected manufacturing companies in Port Harcourt. The sample size of 154 was determined using the Taro Yamane's formula for sample size determination. The reliability of the instrument was achieved by the use of the Cronbach Alpha coefficient with all the items scoring above 0.70. The hypotheses were tested using the Spearman's Rank Order Correlation Coefficient. The tests were carried out at a 95% confidence interval and a 0.05 level of significance. The findings of the study revealed that there is a significant relationship between office layout and employee efficiency of manufacturing companies in Port Harcourt. The study recommends that manufacturing companies should solve workplace design problems and provide employees with comfortable, attractive workplace that support employee satisfaction and well being.

Keywords: Office Layout, Employee Efficiency, Task Accomplishment, Timeliness Manufacturing Companies

INTRODUCTION

In modern terms, an office usually refers to the location where white collar workers are employed. As per James Stephenson, "office is the part of business enterprise which is devoted to the direction and co-ordination of its various activities". In modern times, organizations need to recognize the importance of the work force of their organizations and need to pay more

attention on the requirements of the employees. In that context organizations need to pay more attention on the arrangement and designing of the work place. Actually it should be arrange in a favorable manner in which employees are motivated enough to perform well in the organization. The workplace environment has a direct impact towards the employees' productivity both positively and negatively. If the workplace environment can arrange in a better way it will contribute to increase the productivity of the employees. But on the other ground when the arrangement of office environment is not up to a standard it will decrease the employees' productivity. Better outcomes and increased productivity is assumed to be the result of better workplace environment. Better physical environment of office will boost the employees and ultimately improve their productivity. Most people spend fifty percent of their lives within indoor environments, which greatly influence their mental status, actions, abilities and performance (Sundstrom, 1994).

According to Boles, Pelletier and Lynch, (2004), when there is a proper office environment, it helps in reducing the number of absenteeism and thus can increase the employees' productivity which will leads to the increasing performance of the organization. According to Boles et al. (2004), when the employees' are physically and emotionally have the desire to work, then their performance outcomes shall be increased. But most of times top management of the organization do not realize favorable and healthy arrangement of workplace environment which generate employees' physical and emotional desire to work (Chandrasekar, 2011) Therefore it is required to give the careful attention on designing the workplace environment in to the extent to which employees are motivated to perform better within the organization.

Research has established that employee behaviour is influenced by office layout (e.g., Becker and Sims, 2001; Kraut, Fussell, Brennan, and Siege, 1990). Consequently, office layouts are constantly being designed and redesigned to improve effectiveness (Baldry and Barnes, 2012), aesthetic appeal (Elsbach and Bechky, 2007; Ridoutt, Ball, and Killerby, 2002) and work efficiency (Jahncke and Halin, 2012). However, there is limited research that explores the impact of office layout on employee efficiency. This study therefore examined the relationship between

office layout and employee efficiency of manufacturing companies in Port Harcourt. Furthermore**,** this study was guided by the following research questions:

i. What is the relationship between office layout and task accomplishment in manufacturing companies in Port Harcourt, Nigeria?
ii. What is the relationship between office layout and service quality in manufacturing companies in Port Harcourt, Nigeria?
iii. What is the relationship between office layout and timeliness in manufacturing companies in Port Harcourt, Nigeria?

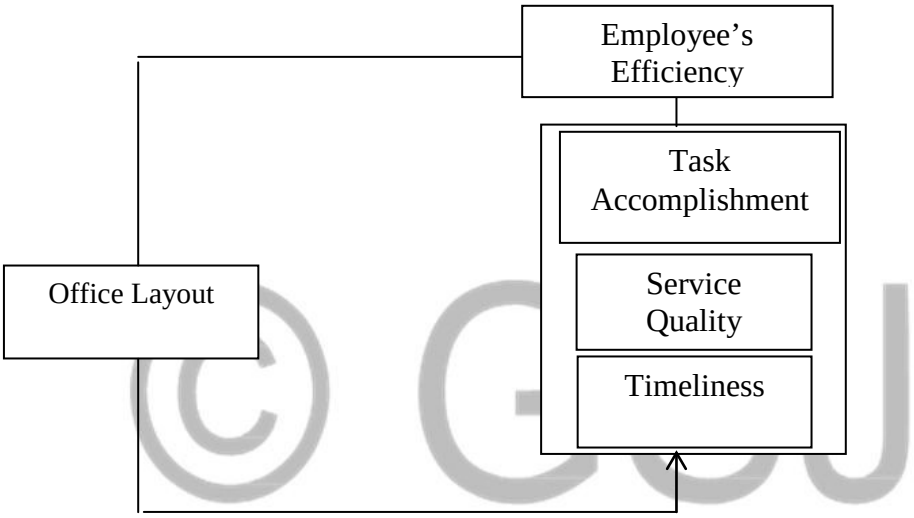

Fig.1 Conceptual Framework for the relationship between office layout and employee efficiency

Source: Author's Desk Research, 2019

LITERATURE REVIEW

Office Layout

Office layout refers to the physical office space and the way that objects within it are arranged (Lee, 2010). Elements of office layout include workstation positioning and the boundaries that are created by physical barriers such as walls and objects. Much of the research on office layout has focused on the differences between closed-plan and alternative forms of open-plan office layouts (Maher and Von Hippel, 2005; Oldham and Rotchford, 1983). Given that work spaces

can be configured in multiple ways within each office layout type, the office layouts features, such as levels of privacy can also vary, and determining their influence on the workplace culture is of interest. Office layout is an element of the physical environment that can act as a symbolic representation that can influence employees' attitudes and behaviours (Ornstein, 1989).

Offices with fewer physical barriers and internal walls are described as being more open, with lower levels of architectural privacy and higher levels of visual access and physical proximity to other employees. Less studied is a fourth office layout feature, 'workstation equality', which refers to similarities between employee workstations. Workstation equality is often discussed in terms of what it symbolises (Zhang and Spicer, 2014), as opposed to its direct impact on behaviour. Employees within the same workplace can differ in terms of the privacy and space offered by their workstation, and this symbolically represents differences in status between employees (Elsbach, 2003; Zhang and Spicer, 2014). Status difference can, in turn, affect the way people within the organization communicate with one another (Welch, 1980).

Employee Efficiency

Efficiency refers to how an organization uses its resources such as available funding and staff to achieve organization objectives. Efficiency measures include, per unit costs which refers to a measure of per unit cost and reveals how many resources are consumed in producing a unit of service, Cycle time: Measures the amount of time it takes for a process to be completed. Response time: Measures the amount of time it takes to respond to a request for service. Backlog: Measures the amount of work in queue, waiting to be processed. One way is to measure total work in queue waiting to be processed. Another way is to measure backlog as the amount of work not processed within a required or targeted time frame. Staffing ratios: Another way of looking at staffing is computing a ratio of staffing to a particular function or in

comparison to the total organization and per unit equipment utilization: Measures the efficient use of equipment. Efficiency is all about resource allocation across alternative uses (Kumar and Gulati, 2010).

Efficiency measures relationship between inputs and outputs or how successfully the inputs have been transformed into outputs (Low, 2000). To maximize the output Porter's Total Productive Maintenance system suggests the elimination of six losses, which are: reduced yield –from start up to stable production; process defects; reduced speed; idling and minor stoppages; set-up and adjustment; and equipment failure. The fewer the inputs used to generate outputs, the greater the efficiency. According to Pinprayong and Siengthai (2012) there is a difference between business efficiency and organizational efficiency. Business efficiency reveals the performance of input and output ratio, while organizational efficiency reflects the improvement of internal processes of the organization, such as organizational structure, culture and Community.

Measures of Employees' Efficiency

Task Accomplishment

Task accomplishment is a measure of an employee's productivity and involves their contribution to overall organizational productivity and effectiveness, it refers to actions that are part of the formal reward system and addresses the prescription as indicated in the descriptions of the role (Williams and Karau, 1991). It shows the level or the extent an employee achieves a given target. In general, task accomplishment comprises of activities that translates the organizations policies, missions and resources into tangible and intangible goods produced by the organization and to enable efficient operation of the organization (Motowidlo, Packard & Managing, 1997). Thus, task accomplishment covers the fulfilment of the requirements that are part of the agreement between the employee and the organisation. Borman and Motowidlo (1993) pointed out that task accomplishment is the effectiveness and efficiency with which job incumbents perform activities that contribute to the organization's technical core and assist in moulding the psychological state of the organization (Borman & Motowidlo, 1993). They further suggested that in accomplishing

a given task there are two aspects to it, which are interpersonal facilitation and job dedication. Interpersonal facilitation includes cooperative and helpful acts that help the effectiveness of co-employee. While job dedication includes self-disciplined and motivation to support organizational objectives and goals (Van Scotter & Motowidlo, 1996).

Service Quality

Service delivery is a continuous, cyclic process for developing and delivering user focused services. It is further defined in four stages as user engagement, service design and development, service delivery and lastly assessment and positive change of service (Dachs, Ebersberger & Pyka, 2004). Other scholars have propounded other definitions and according to Carrillat, Jaramillo and Mulki (2007), service delivery is the physical access or reachability of services that meet a base standard. The later regularly requires detail as far as the components of service delivery, for example, essential equipment, medications and products, healthy workforce, and rules for treatment. Service delivery denotes the ability of the client to pay for the services where data can be collected by facility visits or by household interviews (Berghman *et al*., 2006). In this study, service delivery was defined as the willingness and readiness of a workforce to provide services in a dependable, accurate and responsive manner while utilizing the available resources.

The SERVQUAL model was developed by Parasuraman, Zeithaml and Berry (1988) to define service quality by means of the gap between the customers' perceptions and the expectations about organization's service quality performance. The model distinguishes five determinants of administration quality as effects, unwavering quality, responsiveness, confirmation and sympathy. It is measured administration conveyance since it is a settled instrument that has been utilized as a part of different reviews and its psychometric properties have been examined by some of the studies (Asubonteng, McCleary & Swan, 1996). Consequently, service quality is composed of perceived quality and expected quality.

Timeliness

When the employees are productive, they accomplish more in a given amount of time. In turn, efficiency saves their company money in time and labour. When employees are unproductive, they take longer time to complete projects, which cost employee's more money due to the time lost (Olajide, 2000). The importance of higher productivity of the employees in public enterprise

cannot be overemphasized, which include the following; Higher incomes and profit; Higher earnings; Increased supplies of both consumer and capital goods at lower costs and lower prices; Ultimate shorter hours of work and improvements in working and living conditions; Strengthening the general economic foundation of workers (Banjoko, 1996). Armstrong (2006) stated that productivity is the time spent by an employee actively participating in his/her job that he or she was hired for, in order to produce the required outcomes according to the employers' job descriptions. As suggested by Bloisi (2003) the core cause of the productivity problems in the South African society are people's motivation levels and their work ethics. Time is an essential resource since it is irrecoverable, limited and dynamic (Downs, 2008) Irrecoverable because every minute spent is gone forever, limited because only 24hours exist in a day and dynamic because it's never static (Claessens, Roe & Rutte, 2009)

Relationship between Office Layout and Employee Efficiency

Ilozor *et al.* (2002) who attempted to make the connection between the use of innovative work settings and improved organisational performance. The research was based on 102 work settings, with several null hypotheses on innovative work settings and organisational performance being tested for statistical differences using the Kruskal-Wallis H-test. In contrast to previous published research (Ilozor & Oluwoye, 1999), Ilozor et al. (2002) included a measure of the level of productivity. The study illustrates the use of innovative environments as a means of enabling greater interaction between office occupiers. This result also starts to give an indication as to the ingredients required when considering a creative and productive workplace. Ilozor et al. (2002) concluded that the physical properties of the office environments can be used to influence organisational performance. While this analysis is more developed than previous research undertaken (Ilozor and Oluwoye, 1999), it does suffer from the same main critique, which is that the data appear to be collected from facilities managers and not from the office occupiers themselves.

Van der Voordt (2004) evaluated two Dutch case studies that had attempted to measure the effects of innovative workplace design on productivity. While Van der Voordt (2004) identified the potential weakness of using perceptional measures of productivity, and calls for a number of indicators to be used, the case studies used adopted a perceived productivity measure. One of the case studies reported an increase in perceived productivity, with the others reporting a decrease in productivity. Van der Voordt (2004) concluded that the differing responses can partly be explained by different initial situations. Although it is not explicitly stated, it appears that the inference is that the case study reporting a positive result was initially in an open-plan environment, whereas the negative case study was probably in cellular offices. This clearly illustrates the need to integrate a change management process into a relocation project (Laframboise et al., 2003).

From the foregoing point of view, the study thus hypothesized that:

Ho_1 There is no significant relationship between office layout and employee task accomplishment in manufacturing companies in Port Harcourt, Nigeria.

Ho_2: There is no significant relationship between office layout and employee service quality in manufacturing companies in Port Harcourt, Nigeria.

Ho_3: There is no significant relationship between office layout and employee timeliness in manufacturing companies in Port Harcourt, Nigeria.

METHODOLOGY

The study adopted the cross-sectional survey design. Primary data was generated through structured questionnaire. The population of the study was 253 employees of seven (7) selected manufacturing companies in Port Harcourt. The sample size of 154 was determined using the Taro Yamane's formula for sample size determination. The research instrument was validated through supervisor's vetting and approval while the reliability of the instrument was achieved by the use of the Cronbach Alpha coefficient with all the items scoring above 0.70. The hypotheses

were tested using the Spearman's Rank Order Correlation Coefficient. The tests were carried out at a 95% confidence interval and a 0.05 level of significance.

DATA ANALYSIS AND RESULTS

We commenced by first presenting a proof of existing relationships. According to Neuman (2000) cited in Asawo (2009), Scatter graph is one of the techniques used in deciding whether a bivariate relationship does exist between interval scaled variables. In our bid to determine the existence and trend of this relationship, we plotted a scatter diagram as presented in Figure 1.1 office layout as the independent variable is plotted on the X axis whereas employee efficiency as the dependent variable is on the Y axis.

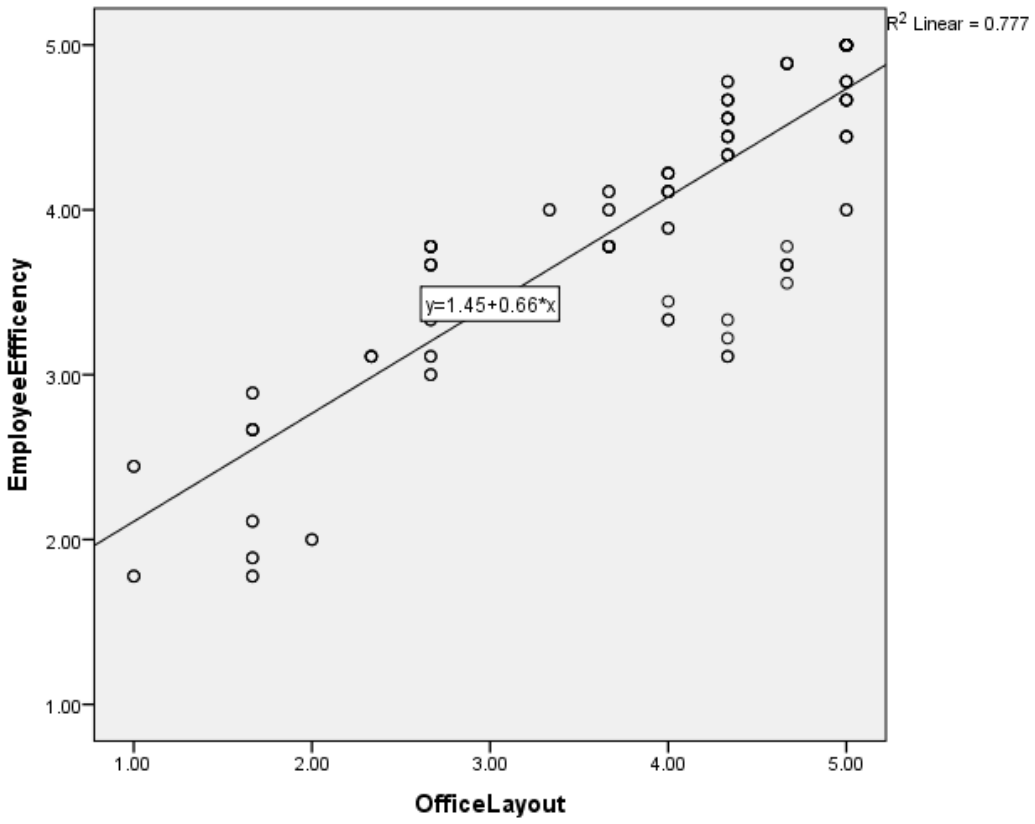

Figure 1.1 Evidence of linear relationship between the constructs

Figure 1.1 shows a strong relationship between office layout (independent variable) and employee efficiency (dependent variable). The scatter plot graph shows at R^2 linear value of (0.777) depicting a positive relationship between the two constructs. The implication is that an increase in office layout simultaneously brings about an increase in the level of employee efficiency.

Tests of Hypotheses

Table 1: Correlation for Office Layout And Employee Efficiency

			Office Layout	Task accomplishment	Service Quality	Timeliness
Spearman's rho	Office Layout	Correlation Coefficient	1.000	.767**	.878**	.630**
		Sig. (2-tailed)	.	.000	.000	.000
		N	138	138	138	138
	Task accomplishment	Correlation Coefficient	.767**	1.000	.846**	.469**
		Sig. (2-tailed)	.000	.	.000	.000
		N	138	138	138	138
	Service Quality	Correlation Coefficient	.878**	.846**	1.000	.342**
		Sig. (2-tailed)	.000	.000	.	.000
		N	138	138	138	138
	Timeliness	Correlation Coefficient	.630**	.469**	.342**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	138	138	138	138

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data 2019 and SPSS output version 23.0

The table 1: illustrates the test for the three previously postulated bivariate hypothetical statements.

Ho_1: There is no significant relationship between office layout and employee task accomplishment in manufacturing companies in Port Harcourt, Nigeria

The correlation coefficient (r) shows that there is a significant and positive relationship between office layout and employee task accomplishment. The *rho* value 0.767 indicates this relationship and it is significant at p 0.000<0.05. The correlation coefficient represents a strong relationship. Therefore, based on empirical findings the null hypothesis earlier stated is hereby rejected and the alternate held. Thus, there is a significant relationship between office layout and employee task accomplishment in manufacturing companies in Port Harcourt, Nigeria.

Ho_2: There is no significant relationship between office layout and employee service quality in manufacturing companies in Port Harcourt, Nigeria

The correlation coefficient (r) shows that there is a significant and positive relationship between office layout and employee service quality. The *rho* value 0.878 indicates this relationship and it is significant at p 0.000<0.05. The correlation coefficient represents a moderate relationship. Therefore, based on empirical findings the null hypothesis earlier stated is hereby rejected and the alternate held. Thus, there is a significant relationship between office layout and employee service quality in manufacturing companies in Port Harcourt, Nigeria.

Ho_3: There is no significant relationship between office layout and employee timeliness in manufacturing companies in Port Harcourt, Nigeria

The correlation coefficient (r) shows that there is a significant and positive relationship between office layout and employee timeliness. The *rho* value 0.630 indicates this relationship and it is significant at p 0.000<0.05. The correlation coefficient represents a high correlation indicating a strong relationship. Therefore, based on empirical findings the null hypothesis earlier stated is hereby rejected and the alternate held. Thus, there is a significant relationship between office layout and employee timeliness in manufacturing companies in Port Harcourt, Nigeria.

DISCUSSION OF FINDINGS

The tests of hypotheses examined the relationship between office layout and employee efficiency of manufacturing companies in Port Harcourt. The study findings reveal that there is a significant relationship between office layout and employee efficiency of manufacturing companies in Port Harcourt. The study finding agrees with the assertion of Hansika and Amarathunga (2016) that good office design will directly influence employee morale and engagement with your business.

Make a few simple changes or even large ones and you can improve all areas of your business. Today, companies are forced to look harder at what influences their results, to optimize every process and to make the most of their resources. One such influence is office design which plays a large part in the productivity, morale and the overall culture of a brand. Experts in this field confirm that office design directly affects employee health, well-being and productivity within the workforce. Although many people may consider that an office is a simple space where we perform certain tasks, there are many factors influencing the optimal performance of this area. An integrated, well-planned office design and work space significantly affects the productivity of your employees. Important aspects, such as the architecture, lighting or furniture and also the organization of your desktop are essential to the performance of the varying job functions that every employee carries out on a daily basis. Brill et al. (1984) ranked factors, which affect productivity according to their importance. The factors are sequenced based on the significance: furniture, noise, flexibility, comfort, communication, lighting, temperature and the air quality. Springer Inc. (1986) stated that "an insurance company in a study revealed that the best ergonomic furniture improved performance by 10 to 15 percent.

the office design encourages employees to work a certain way by the way their workstations are built. In doing so, the company is answering the firm's business plan while making sure their employees have everything they need to work (Al-Anzi, 2009).

The finding reinforcing previous studies by Ilozor *et al.* (2002) who attempted to make the connection between the use of innovative work settings and improved organisational performance. The research was based on 102 work settings, with several null hypotheses on innovative work settings and organisational performance being tested for statistical differences using the Kruskal-Wallis H-test. In contrast to previous published research (Ilozor & Oluwoye, 1999), Ilozor *et al.* (2002) included a measure of the level of productivity. The study illustrates the use of innovative environments as a means of enabling greater interaction between office occupiers. This result also starts to give an indication as to the ingredients required when considering a creative and productive workplace. Ilozor *et al.* (2002) concluded that the physical properties of the office environments can be used to influence organisational performance. While this analysis is more developed than previous research undertaken (Ilozor & Oluwoye, 1999), it

does suffer from the same main critique, which is that the data appear to be collected from facilities managers and not from the office occupiers themselves.

CONCLUSION AND RECOMMENDATION

This study thus concludes that office layout significantly influences employee efficiency of manufacturing companies in Port Harcourt. Specifically, the study concludes that, office layout significantly influences task accomplishment, service quality and timeliness of manufacturing companies in Port Harcourt.

The study recommends that manufacturing companies should solve workplace design problems and provide employees with comfortable, attractive workplace that support employee satisfaction and well being.

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