

RELATIONSHIP BETWEEN WORKPLACE DESIGN, ERGONOMICS AND ORGANIZATIONAL PERFORMANCE: A CASE STUDY OF WEST AFRICAN EXAMINATION COUNCIL (WAEC)

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Abstract

In this paper, we examine the influence of ergonomics and workplace design on organizational performance in WAEC, Lagos with the entire workforce of the organization making up the study population. By using a descriptive survey design, a questionnaire was designed and administered on all 83 staff of the organization. Chi-square(X^2) data analysis shows that organizational culture and structure, desk heights in relation to monitors and key boards, poor seating, lighting, workflow, etc., are important workplace design factors that can influence performance. Results suggest that good ergonomics and workplace design practices can significantly improve profitability of WAEC, Lagos. Furthermore, well designed workstations significantly relate to organizational performance in WAEC. The authors recommend that organizations should pay more attention to their work environment as it impacts on their overall performance.

Keywords: workplace design, ergonomics, organizational performance, WAEC, employee productivity,

JEL codes: L20, M10

INTRODUCTION

Business leaders are faced with coping with the needs of employees and the ever-changing needs of business (Kahler, 2016). Adapting to new technologies, supporting health, and reducing stress while keeping a close eye on costs, offers an unheralded challenge. Value creation metrics such as productivity can be difficult to measure in a knowledge-based environment, and facility management metrics have often focused on real estate costs and savings, rather than driving performance and productivity. Bangwal, Tiwari & Chamola (2017), assert that poor workplace design lead to low productivity, low satisfaction, low commitment level, and various health issues. Adopting green workplace design and enacting laws to encourage employers to provide harmless and healthy place of work for their employees is important to manage these problems (Bangwal, Tiwari & Chamola, 2017). Arguably, well designed work environment can reduce absenteeism and improve employees' productivity as well as the overall performance of the organization. A healthy workplace environment makes good business sense, supports employee engagement and creates a culture that encourages innovation and creativity (Kohun, 2002). Organisations with good work environment are more likely to attract and retain highly skilled employees (Gitahi et al., 2015; O'Neill, 2007 Cunnen, 2006), and experience low employee turnover, fewer cases of fraud, better safety practices and improved employees' wellbeing (Cunnen, 2006). However, most times top management of organizations fail to realize that favorable and healthy arrangement of workplace environment can motivate employees to work. Nonetheless, link between the work, office place, tools of work had become the most important aspect in the employees' work itself (Chandrasekar (2011). Arguably, workplace design can enhance employees' productivity as well as the overall success of any organization. Similarly, applying good ergonomic practices can reduce medical costs, decrease absenteeism, and positively affect firm profitability. Indeed, the workplace design have serious implications on how employees

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perform their job and organizational performance. Unsafe and unhealthy work environment is manifested in poorly designed workstations, unsuitable furniture, lack of ventilation, inappropriate lighting, excessive noise, insufficient safety measures in fire emergencies and lack of personal protective equipment etc. People working in such environment are prone to occupational and health hazards that impact on employees' performance. This lower productivity at workplace and poor organizational performance. Previous studies suggest that employees who are satisfied with their workplace and departmental design gave better results, outcomes, and productivity ([Leather, Beale, & Sullivan, 2003](#); [Lee & Brand, 2005](#)). [In Nigeria, Nwachukwu and Chladkova, \(2017\) reported an insignificant positive relationship between work environment and employee satisfaction, suggesting that research on the subject is mixed and inconclusive.](#) Nevertheless, it is strategically important for firms to adopt favourable workplace design and good ergonomics practices to achieve high-level organizational outcomes, such as, satisfaction, organizational commitment among others. The office of West African Examination Council, Lagos is located in a high-rise building. It is therefore important to examine the extent to which workplace design in existence has supported the productivity of staff which will culminate in the performance of the organization. The study contributes to management research by examining the relationship between workplace design, ergonomics practices and organizational performance. Specifically, the study attempted to identify the workplace design factors that can affect organizational performance, explore the relationship between good ergonomics practices and improve profitability of WAEC, Lagos. Ascertain the extent to which workplace design affects productivity of employees and establish the relationship between workstations and organizational performance.

THEORETICAL FRAMEWORK

The study draws from Fredrick Taylor's theory concerning standardization of office layouts, Tom Peter's perspective with emphasis on workplace design implications of business drivers and priorities, DEGW's efficiency, effectiveness and expression (three Es) and Balanced Scorecard. Office design can be traced to the scientific management school as proposed by Frederick Taylor, with standardization of office layouts (Laing, 1991, 1993; Duffy, 2000). Laing (1993) argued that flexibility is designed into the office environment by creating a range of different work areas. Grimshaw (1999) suggest that Facilities Management (FM) manage the relationships between organisations, employees and space. Tom Peters focused on office design implications of business drivers and priorities rather than on consequences of design variables on business. Commission for Architecture and Built Environment (CABE) and British Council for Office (2005) conducted their study using two different but highly compatible analytical frameworks. The first framework is DEGW's 'three e's', a means of measuring the potential of the office environment to help businesses become more efficient, more effective and more expressive. The second is the widely respected 'Balanced Score Card', which they found to be a useful means of communicating to management the importance of office environment to human capital, customer relations and business process. These frameworks provide useful insights on the efficiency of expenditure towards the effectiveness of the way people can work.

Workplace Environment

Kohun (2002) defines workplace environment as the sum of the interrelationships that exists within the employees and the environment in which they work. According to Heath (2009), this environment involves the physical location as well as the immediate surroundings, behavioral procedures, policies, rules, culture, resources, working relationships, work location, that influence the ways employees perform their work. Workplace design

fosters high level of satisfaction, positive attitude and desire in employees toward the environment ([Monfared & Sharples, 2011](#); [Deuble & de Dear, 2012](#)). The quality of the workplace environment enhances employee's performance and organization competitiveness. Maris (2016) views workplace design to mean a choice of workspaces for all important aversion to the one size fits all approach to workplace design, or agile working. It also means adoption of a bespoke approach to the business, the culture, its people, its rewards and structure. How an organization utilizes their facilities can determine the difference between spaces that create expense versus spaces that are an asset. Successful workplace design strategies are chosen through a process that directly and indirectly links that strategy to the core resources of the business: strategy, structure, processes, people and reward systems (Maris 2016). Arguably, an effective workplace environment management involves creating attractive, comfortable and satisfactory work environment that motivate employees and give them a sense of pride and purpose.

Organizational Performance

Top level managers use different strategies (Ezenwa 2005; Osuagwu, 1999), enabling environment and resources to achieve superior organizational performance (Lawal, 2000). Lawal (2000) opines that organizational performance, otherwise known as organizational success is the ability of an organization to achieve the desired goals. He further stated that it can be measured in terms of Profitability, Survival, Stability, Growth and Ability to adapt to changes in the environmental. In this study, authors used profitability and employee productivity to measure organizational performance.

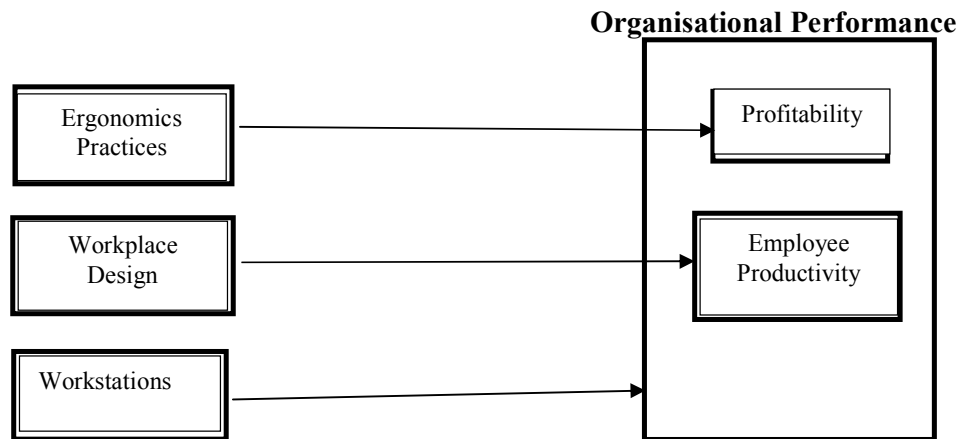
Work place design and employee productivity

According to Carmen (2013) the work place design considerations include thermal comfort which indicates the right combination of temperature, airflow and humidity. Over the years, many companies have been adopting new designs and techniques in office buildings to improve productivity and attract more employees (Hameed & Amjad, 2009). In their study of the effect of workplace environment on the Performance of commercial banks employees in Nakuru, Gitahi et al (2015) found that the physical aspects did not have a significant effect on employee performance whereas the psychosocial and work life balance factors were significant. They concluded that psychosocial aspects showed the strongest association with employee performance while physical aspects and psychosocial aspects were moderate. Using the survey method and descriptive statistics, Chandrasekar (2011) reported that workplace environment has impact on employee engagement, error rate, level of innovation and collaboration with other employees, absenteeism and employee turnover in Public Sector Organizations. Hameed and Amjad (2009) examined the impact of office Design on employees' performance in Banking Organizations of Abbottabad, Pakistan using survey approach and descriptive statistics. It was observed that office design is very vital in terms of increasing employees' productivity. Gensler (2005) of 200 UK business managers showed that an improved workplace would boost employee productivity by 19 per cent and their own productivity by 17 per cent. In a follow up research survey of 2,000 of employees in the USA, Gensler (2006) observed that 90 per cent of the respondents believed that better interior design and layout result improve employee performance. It was observed that good workplace layout, ventilation, lighting, establishment of equipment and thermal comfort leads to increase job performance of operational level employees. He concluded that a strong correlation exists between elements of workplace design and job performance of employees. Evidently, creating a work environment that encourage employee productivity is essential to increased profits for your organization, corporation or small business.

The Concept of Ergonomics

Asante's (2012) reported that poor ergonomics design and input variables have varying negative impact on the performance of employees. A survey of 350 major corporations, both professional services and small businesses, found that 82.5% believe that good ergonomics makes employees more productive (Danner, 2001). Ergonomics involves adapting jobs and workspaces to the worker. By applying good ergonomic practices, the employer can reduce medical costs, decrease absenteeism, and positively contribute to their employee's wellbeing. Ergonomics reduces strains, worker fatigue and improve productivity. Ergonomics is a comprehensive approach that involves physical, cognitive, social, organisational, environmental and other relevant factors that enhance the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of employees (International Ergonomics Association, 2017). Indeed, comfortable and ergonomic office design reduces physical discomfort, fatigue, tension, motivates employees and increases their performance substantially.

Figure 1. Conceptual Model showing the relationship of the study variables



RESEARCH HYPOTHESES

The following are the research hypotheses, presented in null form.

H₀₁: Good ergonomics practices does not significantly relate to increased profitability of WAEC, Lagos.

H₀₂: Workplace design does not have significant effect on productivity of employees in WAEC.

H₀₃: There is no significant relationship between workstations and organizational performance in WAEC.

Methodology

Descriptive survey research design was used. Primary data were obtained using questionnaire administered to employees of West African Examination Council, Lagos State of Nigeria. Books, journals and the internet were used for literature review. The population of the study was 105 drawn from staff of West African Examination Council, Lagos State of Nigeria. A sample of size of 83 was determined from the population using Taro Yamane's sample size determination method. A 5-point Likert scale was used to collect data from respondents. Out of 83 copies of questionnaire distributed, 75 copies were returned and used for our analysis. The instrument was validated by a panel of management scholars and practitioners for face validity and comprehensiveness. The reliability test was done using Cronbach alpha. The reliability coefficient results of 0.89, suggest a high degree of internal consistency. We descriptive statistic in form of frequency tables and chi square to test three hypotheses formulated at 0.05 level of significance. SPSS version 22 was used for different analyses conducted.

Results and Discussion

Table 1. Design Factors that can affect Organizational Performance

Response variables	Frequency	Percentage (%)
Strongly Agree	40	53.3
Agree	20	26.7
Undecided	6	8.0
Disagree	5	6.7
Strongly disagree	4	5.3
TOTAL	75	100

Source: Field Survey, 2016

Table 1 shows that 40 respondents representing 53.3% of the study sample strongly agreed that workplace design factors that can affect organizational performance in WAEC Lagos are organizational culture, organizational structure, desk heights in relation to monitors and key boards, poor seating, lighting, workflow, space within the workplace, way finding design and temperature amongst others. Twenty respondents or 26.7% of the same study sample agreed, 6 or 8% were undecided in their opinions, 5 or 6.7% of them disagreed while 4 or 5.3% strongly disagreed. The above distribution suggests that majority of the respondents believe that the above-mentioned factors can affect performance of their organization.

Table 2. Good Ergonomics Practices and Improvement in Profitability of WAEC, Lagos.

Response Variables	Frequency	Percentage (%)
Strongly Agree	40	53.3
Agree	20	26.7
Undecided	8	10.7
Disagree	4	5.3
Strongly disagree	3	4
TOTAL	75	100

Source: Field Survey, 2016

Table 2 shows that 40 respondents representing 53.3% of the study sample strongly agreed that good ergonomics practices can improve profitability of WAEC, Lagos. Twenty respondents or 26.7 % of the same study sample agreed 8 or 10.7 % were undecided in their opinions. Four or 5.3% disagreed while 3 or 4% strongly disagreed. The distribution above shows that majority of the respondents believed that good ergonomics practices can improve profitability of WAEC, Lagos. This is possible because when an organization considers purchasing adjustable tables and chairs for their workforce it will reduce back pains that may be experienced by the employees resulting in cost savings. Even, if light from the computer desktops is shaded it reduces eye pains which might bring about low productivity. The data were further analysed using chi-square and the result shown below.

Table 3. Result of Chi-square Analysis

	Value	Df.	Asymp. Sig. 2-Sided
Pearson Chi-square	64.284	4	.001
No of Valid Cases	75		

Table value at degree of freedom (d.f) of 4 and 0.05 alpha level = 9.49

Interpretation

Chi-square(X^2) calculated value of 64.284 was greater than the table value of 9.49 at degree of freedom (d.f) of 4 and 0.05 alpha level. We reject the null hypothesis (H_0) in this case; indicating that there is good ergonomics practices and improvement of profitability in WAEC.

Table 4. Effect of Workplace Design on Employees' Productivity

Response Variables	Frequency	Percentage (%)
Strongly Agree	45	60
Agree	17	22.7
Undecided	7	9.3
Disagree	3	4
Strongly disagree	3	4
TOTAL	75	100

Source: Field survey, 2016

Table 4 shows that 45 respondents representing 60% of the study sample strongly agreed that workplace design affects employees' productivity. Seventeen or 22.7% of the same study sample agreed. Seven or 9.3% were undecided in their opinions, 3 or 4% disagreed while 3 or 4% strongly disagreed. The above distribution shows that majority of the respondents believed that workplace design affects productivity of employees. Lack of motivation emanating from the type of organizational culture, structural problems, poor seating, poor lighting are amongst the workplace design factors that can impact negatively on productivity of staff. The data were further analysed using chi-square and the result was shown below.

Table 5. Result of Chi-square Analysis

	Value	Df.	Asymp. Sig. 2-Sided
Pearson Chi-square	83.734	4	.001
No of Valid Cases	75		

Table value at degree of freedom (d.f) of 4 and 0.05 alpha level = 9.49

Interpretation

Chi-square(X^2) calculated value of 83.734 was greater than the table value of 9.49 at degree of freedom (d.f) of 4 and 0.05 alpha level. The null hypothesis (H_0) will be rejected in this case; indicating that workplace design has significant effect on employee productivity

Table 6. Relationship between Workstations and Organizational Performance

Response Variables	Frequency	Percentage (%)
Strongly Agree	47	62.7
Agree	16	21.3
Undecided	7	9.3
Disagree	3	4
Strongly disagree	2	2.7
TOTAL	75	100

Source: Field survey, 2016

Table 6 shows that 47 respondents representing 62.7% of the study sample strongly agreed that there is relationship between workstations and organizational performance. Sixteen or 21.3% of the same study sample agreed. Seven or 9.3% were undecided in their opinions, 3 or 4% disagreed while 2 or 2.7 % strongly disagreed. The above distribution shows that majority of the respondents believed that there is relationship between

workstations and organizational performance. The data were further analyzed using chi-square and the result was shown below.

Table 7. Result of Chi-square Analysis

	Value	Df.	Asymp. Sig. 2-Sided
Pearson Chi-square	93.468	4	.001
No of Valid Cases	75		

Table value at degree of freedom (d.f) of 4 and 0.05 alpha level = 9.49

Interpretation

Chi-square(X^2) calculated value of 93.468 was greater than the table value of 9.49 at degree of freedom (d.f) of 4 and 0.05 alpha level. The null hypothesis (H_0) will be rejected in this case; indicating that there is a significant relationship between workstations arrangement and organizational performance.

Decision Rule

Hypothesis 1(H_0): Since data on table 3 were analysed further using Chi-square, the result shows that the chi-square calculated value of 64.284 was greater than the table value of 9.49 at degree of freedom (d.f) of 4 and 0.05 alpha level. The P-value of $.001 < 0.05$. In this case, we reject the null hypothesis (H_0) and accept the alternative hypothesis. Hence, we conclude that good ergonomics practices can significantly improve profitability of WAEC, Lagos.

Hypothesis 2(H_0): Since data on table 5 were analysed further using Chi-square. The result shows that the chi-square calculated value of 83.734 was greater than the table value of 9.49 at degree of freedom (d.f) of 4 and 0.05 alpha level. The P-value of $.001 < 0.05$. In this case, we reject the null hypothesis (H_0) and accept the alternative hypothesis. Hence, we conclude that workplace design has significant effect on productivity of employees in WAEC.

Hypothesis 3(H_0): Since data on table 7 were analysed using Chi-square, the result shows that the chi-square calculated value of 93.468 was greater than the table value of 9.49 at degree of freedom (d.f) of 4 and 0.05 alpha level. The P-value of $.001 < 0.05$. In this case, we reject the null hypothesis (H_0) and accept the alternative hypothesis. Hence, we conclude that there is significant relationship between workstations and organizational performance in WAEC.

Summary of Findings

The findings established in this study;

I. Workplace design factors that can influence organizational performance in WAEC Lagos are organizational culture, organizational structure, desk heights in relation to monitors and key boards, poor seating, lighting, workflow, space within the workplace, way finding design and temperature amongst others.

II. Good ergonomics practices can significantly improve profitability of WAEC, Lagos.

III. Workplace design has significant effect on productivity of employees in WAEC.

IV. There is significant relationship between workstations and organizational performance in WAEC.

Conclusion

Literature review showed that workplace design has impact on productivity of employees which crystallizes in overall performance of the organization. This therefore follows that the environment in which the organization operates in terms of workplace cannot be toyed with. The identified workplace designed factors should be made in such a way that they should provide the employees better operating environment so that the work can flow freely for enhanced productivity. Based on the analysis of the data obtained in this study one can safely conclude that workplace design and good ergonomics practices, workstation arrangement has significant effect on employee productivity, profitability and organizational performance in WAEC. Lagos.

Recommendations

Based on the conclusion drawn we offer the following recommendations;

- Organizations should pay attention to their work environment because of the impact it has on their overall performance.
- They should be mindful of all the workplace design factors that can hinder employees' productivity and make sure they are put in the right perspective.
- To save costs that may result from poor employee's health conditions due to poor seating in relation to monitors and desktops, poor lighting etc, a good ergonomics practices are suggested.
- organisations should adopt robust organizational culture and structure that will increase employees' productivity and corporate bottom line.

References

- Ansoff, H.I. (1984). *Implementing Strategic Management*. Prentice-Hall: Englewood Cliffs, NJ
- Asante, K. (2012). The impact of office ergonomics on employee performance: A case study of the Ghana National Petroleum Corporation (GNPC). Kumasi: Kwame Nkrumah University of Science and Technology Repository.
- Bangwal, D., Tiwari, P. & Chamola, P. (2017). Workplace design features, job satisfaction, and organization commitment. *Journal of Workplace Rights*, July-September, 1 –12
- Carmen, C. (2013). Office design enhances employee health. wellness & performance. Retrieved from <http://www.carmenrealestate.com/blog/bid/317204/office-design-affects-employee-performance>.
- Chandrasekar, K. (2011) Workplace Environment And Its Impact On Organizational Performance In Public Sector Organizations; *International Journal of Enterprise Computing and Business Systems* (Online) . 1(1). January <http://www.ijecbs.com>
- Changing Minds (2016). http://changingminds.org/disciplines/workplace_design/workplace_design.htm.
- Cunneen, P. (2006). How to Improve Performance Management. *People Management*, 12(1), 12 January. Pp42 design/what-is-workplace-design.
- Deuble, M. P., & de Dear, R. J. (2012). Green occupants for green buildings: The missing link. *Buildings and Environment*. 5, 21-27.
- Duffy, F & Chandor, M (1983): The Orbit Study – Information technology and office design. DEGW/ Eosys, London.
- Duffy, F. (2000). Design and Facilities Management in a time of Change. *Facilities*, 18 Nos
- Ezenwa, J. U(2005). Strategies for Business Success, Vickers Services, Lagos, 1st Edition
- Ezenwa J. U. (2015). Balanced Scorecard; An Article Published on LinkedIn.com
- Gensler Design + Performance Index, the U.S. Workplace Survey. (2006). www.gensler.com
- Gitahi N. J., Waigajo, M. & Koima J. (2015). Effect of Workplace Environment on the Performance of Commercial Banks Employees in Nakuru Town. *International Journal of Managerial Studies and Research (IJMSR)*, 3(12), 76-89.
- Grimshaw, B. (1999). Facilities management: the wider implications of managing change. *Facilities*, 17(1/2).
- Hameed, A and Amjad S (2009) Impact of Office Design on Employees' Performance; A Case Study of Banking Organizations of Abbottabad, Pakistan. *Journal of Public Affairs Administration and Management*, 3(1).
- Heath (2009) The Knowledge Workplace Designing for Interiors and Services
- Hooley & Lynch (1985). Using the Balanced Scorecard to Align Your Organization; Balanced Scorecard Institute, Strategy Group.

- International Ergonomics Association (2017). Definition and domains of ergonomics. Available at: <http://www.iea.cc/whats/>. Accessed 29 May 2017.
- Institute for Quality of Life (2014). The impact of the Physical Workplace on Performance: An Introduction.
- International Facility Management Association (2004), Benchmarks III, Research Report 18, (Houston, TX: IFMA, 2004): 36
- Kanter (1983). The Business Case for Innovative Workplaces, International Facility
- Kahler (2016) Foundations of Behavioral Research, Subject Publications view Delhi
- Kohun, (2002). Workplace Environment and its impact on organizational performance in Public sector organizations, *International Journal of Enterprise Computing and Business System International Systems*, 1(1).
- Laing, A. (1991). The post-Fordist Workplace: Issues of Time and Place. *Facilities*, 98, 13-18.
- Laing, A. (1993). Changing Business: Post-Fordism and the Workplace, in Duffy, F., Laing, A. and Crisp, V. (Eds), *The Responsible Workplace*, Butterworth, Oxford
- Lawal, A. A. (2000). Business Policy: Unpublished Lecture Module for MBA students, Abubakar Tafawa Balewa University (ATBU) Bauchi. Management Association, World Workplace Conference.
- Leather, P., Beale, D., & Sullivan, L. (2003). Noise, psychosocial stress and their interaction in the workplace. *Journal of Environmental Psychology*, 23, 213-222.
- Lee, S. Y., & Brand, J. M. (2005). Effects of control over office workspace on perceptions of the work environment and work outcomes. *Journal of Environmental Psychology*, 25, 323-333.
- Maris Interiors LLP (2016). <http://www.maris-interiors.co.uk/optimisation/workplace->
- Mendis M.V.S (2016). Workplace Design and Job Performance: A Study of Operational Level Employees in the Apparel Industry of Sri Lanka. *International Journal of Scientific and Research Publications*, 6(12).
- Monfared, I. G., & Sharples, C. (2011). Occupants' perceptions and expectations of a green office building: A longitudinal case study. *Architectural Science Review*, 54, 355-344.
- Nwachukwu, C. & Chladkova, H. (2017). Human resource management practices and employee satisfaction in microfinance banks in Nigeria. *Trends Economics and Management*, 28(1), 23-35.
- O'Neill, M. J. (2007). *Measuring Workplace Performance*. New York: Taylor and Francis.
- Osuagwu, L. (1999). *Marketing Management; Principles and Practice*, Grey Resources. 1st Edition Lagos.