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Ergonomics of Job Design and Academic Staff Performance: The Nigerian South- South Federal Universities' Experience

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Abstract: *This study explores the experiences of university academics in order to have a clear insight into how ergonomics of job design influences work performance. A sample of 1,236 academic staff of six federal universities in Nigeria south-south region wererandomly drawn into the study.Primary data were collected through the structured questionnaire and analysed using both descriptive and inferential statistics. Results revealed that academic staff performance improvedsignificantly in universities where jobs are designed taking six basic ergonomic elements into consideration:1). task autonomy, 2). control over assigned responsibility,3). knowledge sharing,4). opportunity for positive feedback, 5). opportunity for knowledge expansion in completed task, and 6). teaching variety of courses to enhance skill development. Consequently, in designing job task, management of universities areentreated to consider their ergonomicimplications; and also implement policies that would encourage research collaboration among academic staff.*

Key Terms:*Ergonomics, Job Design, Task Autonomy, Staff Performance, Research Output*

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I. Introduction

The initial purpose of ergonomics was to enhance the efficiency and safety of the workforce. Today, organisational ergonomics has gone beyond employees' safety to integrate the process of optimising organisation's socio-technical systems, including its policies, processes, as well as organisational structures in order to optimise the wellbeing of humans and overall system of performance (Canas, Velichkovsky and Velichkovsky, 2011).The practice of organisational ergonomics aims at improving the commitment and overall performance of employees by designing jobs with performance convenience in mind.

Job design essentially relates to changing the content, structure and processes of a job in order to increase an employee's motivation, performance, and satisfaction (Knapp and Mujtaba 2010). In today's highly globalised work place, improving the performance and productivity of an employee requires a careful and conscious organisation of a set of tasks, or an entire position. When this is done, employees who have been assigned properly designed jobs no longer find them confusing. Oldham (1996) defined work design as the "content and structure of jobs that employees perform,Morgeson and Humphrey (2008) view work design as the process of creating and modifying the components, configuration, structure and the surrounding in which tasks and duties are performed. Morgeson and Humphrey's (2008) definition gives great attention to those who perform a job, what they do at work, and how the different work components interrelate. Job design is, therefore, the identification, specification of job contents, and determination of the requirements for performing task in an effective manner. Job design is closely related to Job engineering- an approach of job that focuses on the tasks to be performed, methods to be applied, layouts of the workplace, workflows among employees, interdependencies between people and machines, and performance standards (Knapp andMujtaba, 2010).

Effective implementation of job design requires the practice of organisational ergonomics. Organisational ergonomics is not only practiced in business organisations. Saklani and Jha, (2014) noted that there is an overwhelming practice of single or multiple organisational ergonomic dimensions in both service and manufacturing organisations as well as public and private institutions. In academic institutions for instance, academic staff are exposed to performing jobs such as; preparation of course outlines, teaching, research supervision, computation of results, and so on. Also, assignment of multiple courses to lecturers to expand their scope of duties is a common practice in higher institutions of learning. The advantage that ensues from this job design is not onlyincreased job satisfaction, but also the creation of better qualified workforce and improved academic staff performance (Evans, 1990; Zareen et al., 2013).

Over the years, universities have served as training ground for manpower development for national economies, including that of Nigeria (Oyekan, 2014). This explains why there is a great concern about the performance of universities with particular reference to academic staff and students (Boateng, 2003). The global and local ranking of universities is an expression of one of such concerns by international and local tertiary

education stakeholders (Idaka and Joshua, 2009; Abdulkareem and Oyeniran, 2011). Academic staff performance is a major factor in the achievement of academics goals and objectives. On this note, The National Universities Commission (NUC) has provided guidelines for the assessment of academic staff performance in Nigerian Universities to include publication, teaching and contribution to community development (Oyekan, 2014). The number of research publications is a major criterion used for the assessment of academic staff during promotion exercises. The career growth of academic staff in every Federal University is tied to their performances in research publication. At local and international levels, contribution to knowledge and the provision of solution to human problems through research and development by both students and lecturers of Universities are some of the variables considered for ranking of Universities. Other performance indicators used as criteria for ranking of universities include: teaching (teaching effectiveness of lecturers, infrastructure and learning environment); research (quality, volume, income and reputation); citations (research influence); international outlook (staff, students and research) and industry income (knowledge transfer). These indicators have supported academic staff performance, a necessary factor in the ranking of universities.

Generally, ergonomics is believed to contribute to the optimization of both human wellbeing (a social goal) and total system performance (an economic goal) (Nuemann, 2006). Prior studies have also shown that, the used of some organisational ergonomics could help in improving employees' performance in organisations (Taiwo, 2010; Saklani and Jha, 2014). The application of organizational ergonomics is known for increasing job satisfaction and morale. However, there seems to be insufficient knowledge of what dimensions of job design ergonomics has influenced performance as far as academic staff of universities are concern. Moreover, the mechanisms through which job design ergonomics leads to improved academic staff performance has not been sufficiently investigated and documented.This study is therefore aimed at contributing to knowledge by identifying the dimensions of job design ergonomics that could influence academic staff performance. The outcome is likely toprovide a clearer insight into the nature of job design ergonomics through the perspective of academic staff in Nigerian federal universities.

II. Methodology

2.1 Design

This study adopted the survey research design. The choice of this research design was informed by the nature of the research problem and the objectives of the study. This design has provided an efficient and accurate means of obtaining data about a population parameters of academic staff in South-South Nigerian federal universities.

2.2 Population and Sample

The population for this study was made up of all academic staff of select federal universities in the South-South region of Nigeria. The universities selected for the study and their population of academic staff as at the time of this is as shown in Table 1.

Table 1: Population Distribution of the Study

Name of Federal University	**Number of Academic Staff**
University of Uyo	1,451
University of Calabar	1,284
University of Port Harcourt	1,561
University of Benin	1418
Federal University, Otuoke	650
Federal University of Petroleum Resources, Effurun	722
Total	**7086**

Given the large population size, a sample of 1751 respondents were chosen using the Yamane model. They were randomly selected from the population distribution to respond to the research instrument.

2.3 Research Instrument

The research instrument for this study was the structured questionnaire which was developed by the researcher. The instrument was made up of the profile of respondents and Likert scale-type questions on job design ergonomics and the performance of academic staff in federal universities in the South-South region of Nigeria. Inputs were taken from extensive review of relevant organisational ergonomics and job design literature. It consisted of statements designed to prompt responses on the dimensions of job design and its

ergonomics factors that influence staff performance in universities. The instrument was accordingly evaluated for face and content validity. For ease of analysis, job design was conceptualised in terms of job autonomy, teaching of variety of courses, feedback on past performance, ability to share knowledge and learning from others while research output was taken as a measure of academic performance.

2.4 Techniques of Data Analysis

Data collected from survey were subjected to descriptive analysis and interpretation. Respondents' personal data were analysed using frequency counts and simple percentages. The multiple regression and Pearson product moment correlation techniques were used in the analysis of data at 0.05 level of significance.

III. Results andDiscussion

Table 2: Analysis of Personal Data of Respondents

Characteristics	Frequency	Percentage
Gender		
Male	849	68.7
Female	387	31.3
Total	**1236**	**100.0**
Educational Qualification		
B.Sc.	53	4.3
Masters	544	44.0
Doctorate Degree	639	51.7
Total	**1236**	**100.0**
Years in Service		
1-5 years	226	18.3
6-10 years	420	34.0
11-15years	237	19.2
16 years and above	353	28.5
Total	**1236**	**100.0**
Rank		
Graduate Assistant	53	4.3
Assistant Lecturer	198	16.0
Lecturer 11	296	24.0
Lecturer 1	115	9.3
Senior Lecturer	519	42.0
Associate Professor	46	3.7
Professor	9	0.7
Total	**1236**	**100.0**

Theanalysis inTable 2 indicates that 68.7 percent of the respondents were males while 31.3 percent of the respondents were females. 53 respondents representing 4.3 percent were B.Sc holders, 544 respondents (44.0%) were Master Degree holders while 639 respondents (51.7%) were Doctorate Degree holders. 226 (18.3%) respondents have worked for a period of one to five (1-5) years in their respective universities, 420 respondents (34.0%) have worked for about six to ten (6-10) years, 237 respondents (19.2%) have worked for a period of eleven to fifteen (11-15) years, and 353 respondents (28.3%) have worked as academic staff for more than sixteen (16) years.The above analysis indicates that respondents cut across all categories of academic staff with a majority of male lecturers.

3.1 Dimension of Job Design Ergonomics

Table 3: Descriptive Analysis of Job Design(N= 1, 236)

Variables	Percentage	Mean	SD	Remark
Task autonomy	73.3	4.18	0.79	High
Control over assigned responsibility	73.3	4.35	0.94	High
Teaching variety of courses	43.8	3.45	1.02	Moderate
Completion of assigned task	51.3	4.38	0.89	High
Sharing of knowledge for improved performance	72.1	4.48	0.98	High
Performance feedback	78.3	4.37	0.24	High
Teaching to enhance knowledge and skills	75.1	4.20	0.85	High
Average	71.6	4.06	0.84	High

NB: 5 = Very high, 4 – High, 3 = Moderate, 2 = Low, 1 = Very low.

Results in Table 3 shows the extent of importance of job design variables on the research output of academic staff. On the average, respondents rated job design as a highly important (% = 71.6, M = 4.06, SD = 0.84) organisational ergonomic variable for enhancing staff research output. It can also be observed that sharing of research knowledge scored highest amongst all dimensions of job design (M = 4.48, SD = 0.98). Thus, sharing of research knowledge could be an important policy consideration when designing jobs for university academic staff. Results also disclose that teaching variety of courses was scored moderately (% = 43.8, M = 3.45, SD = 1.02) in the organizational ergonomics of job design. Respondents appear not to attach much importance to the teaching of variety of courses as a way of enhancing academic staff research output.

3.2 Effect of Job design ergonomics on academic staff performance

Empirical results were analysed to assess the effect of job design on performance of universities academic staff. First, the Pearson correlational analysis of all variables (Table 4) was carried out, and thereafter, multiple regression analyses were performed as can be seen in Table 5.

Table 4: Pearson Correlation Matrix of key Variables

Variables	1	2	3	4	5	6	7	8
Task autonomy	1.0							
Control over assigned responsibility	0.56*	1.0						
Teaching variety of courses	0.69**	0.68*	1.0					
Completion of assigned task	0.65*	0.81*	0.16	1.0				
Knowledge sharing	0.19	0.51*	0.88*	0.57*	.1.0			
Performance feedback	0.67*	0.81*	0.86*	0.76*	0.68*	.1.0		
Teaching for skill and knowledge enhancement	0.14	0.22*	0.43*	0.21*	0.45*	0.43*	.1.0	
Academic Performance	0.50*	0.34*	0.43*	0.24**	0.44*	0.27**	0.46*	.1.0

*Correlation is significant at P < 0.01 level

**Correlation is significant at P < 0.05 level

Results in Table 4 revealed that there is significant positive influence of job design and academic staff research output interms of task autonomy (r = 0.50, P < 0.05),control over assigned responsibility (r = 0.34, P < 0.05), teaching variety of courses (r = 0.43, P < 0.05), completion of assigned task (r = 0.24, P < 0.05), knowledge sharing (r = 0.44, P < 0.05),performance feedback (r = 0.27, P < 0.05), and teaching for skill and knowledge enhancement(r = 0.46, P < 0.05). It can be observed that task autonomy and the need to enhance knowledge and skills through teaching were the most viable design ergonomic variables under study.

Multiple regression analysis was also performed to evaluate the extent to which the construct of job design ergonomics individually and altogether predicts research output. The results are presented in Table 5.

Table 5: Multiple Regression Estimates of Academic Staff Research Output

Predictors	**Beta (β)**	**Std. Error**	**T-statistics**	**P- value**
Intercept(α)	3.748	1.636	2.291	0.000
Task autonomy	0.163*	0.043	3.791	0.001
Control over assigned responsibility	0.223**	0.085	2.634	0.000
Teaching variety of courses	0.270**	0.078	3.462	0.000
Completion of assigned task	0.134*	1.234	2.291	0.000
Knowledge sharing	0.182*	0.023	3.791	0.001
Performance feedback	0.236**	0.085	1.334	0.1280
R^2	0.701			
Adjusted R^2	0.688			
Std. Error	2.620			
F- value	52.825			
D. Watson	1.882			

N/B: Dependent Variable: Academic Staff Research Output

Regression coefficient (β) is significant at *P<0.05, **P<0.01

From Table 5, the value of R^2 (0.701) signifies a strong influence of the dependent variables on the independent variable. However, the 0.688 adjusted R^2 value implies that 68.8% of variance in staff research output was due to all the six predictor variables of job design ergonomics. It further implies that holding other exogenous variables constant, at any given time, about 68.8% of improvement in academic staff research output can be achieved by the combination of the six variables, namely: task autonomy, control over assigned responsibility, teaching variety of courses, completion of assigned task, knowledge sharing, performance feedback and teaching for skill and knowledge enhancement. The regression model appears fit with F-value of 52.825 which is significant at 5% level and a Durbin Watson value of 1.882. In other words, the regression

model is a robust predictor of the influence ofjob design ergonomic and academic staff research output in the universities under study. By implication, management of universities could achieve significant increase in academic staff research output by implementing job design ergonomics variables.The result of the Likert-type scale question in Table 3 showed that job design has a significant positive influence on the research output of academic staff. Questions asked in this section of the work were made to reflect the contents of Hackman and Oldham's Job Characteristics Model (JCM). Amongst the variables of job design used in the study, those with high level of influence on academic staff research output were; lecturers enjoy task autonomy have control over their assigned responsibility, completion of assigned task expands their knowledge, sharing research knowledge, having performance feedback, and teaching to enhance knowledge and skills for effective communication. This finding supports the work of Al-Ahmadi (2009) on the impact of job design on the performance of employees in the public service of Kalmunai Zone in Sri Lanka.

IV. Conclusion

Findings in this study have shown that, obviously, job design is a key variable for the enhancement of academic staff performance in the studied area. Academic staff research output is a major deciding factor in the promotion of lecturers, universities ranking, and also one of the determinant factors for students' academic success. Therefore, the research output of lecturers must undoubtedly remain a priority of the management of every university in Nigeria. If this is ensured, it is evident that management of universities in the region will achieve academic goals, lecturers and other stakeholders will derive satisfaction. The results also underscore the fact that performances of employees in organisations that are ergonomically designed are likely to be enhanced through such practices. This is because; the extent of relationship established by the six predictors of organisational ergonomics used in this study has proven that organisations could benefit extensively from the practice of organisational ergonomics. In the area of business, the finding of this study implies that management of business organisations could rely on job design for enhanced research output of their employees. It also implies that management should encourage and provide avenues for job autonomy amongst members of staff as this has been found to have a high influence on the research output of employees. This study has contributed to bridging this knowledge gap by examining the joint influence of multiple job design ergonomic variables on the performance of academic staff in Nigerian federal universities. Managementshould employ organisational ergonomics in order to improve the research output and general performance of their academic staff.

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