PROFILE ANALYSIS OF NON-TEACHING STAFF IN AKWA IBOM STATE UNIVERSITY, NIGERIA.

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ABSTRACT: There is no gainsaying the fact that every academic institution conducts annual appraisal of teaching and non-teaching staff either for the purpose of promotion or annual salary increment. Like other tertiary institutions, Akwa Ibom State University Appointment and Promotion Committee evaluates senior and junior staff based on certain performance criteria, which include qualifications, work experience, attitude, initiative, community service, rewards/sanctions for the junior staff, and work output, communication, human relations, character traits, work habits, leadership attainment, reward/sanctions for the senior staff. The aim of this work was to subject the overall assessment to statistical analysis as a mathematical approach of evaluating staff performances in the university. Staff that were promoted based on the overall assessment were grouped into two categories, namely senior and junior staff with their respective appraisal scores for 2024/2025 appraisal year. Method of analysis adopted was multiple regression analysis with appraisal score as response variable, while the selected performance criteria for each category constituted predictor variables in the regression model. The justification for the multiple regression analysis was to fit a model as an alternative approach to the staff performance evaluation with a view to compare between the non-mathematical and mathematical approaches to staff appraisal. The analysis produced two different multiple regression models for junior and senior staff in the university. Estimates from the two models were compared with the appraisal scores awarded to staff by their respective reporting officers, and were found to be as good as the overall assessment scores awarded to staff in their appraisal forms. The advantage of the statistical modelling of the appraisal scores over the existing non-statistical method is the ability to identify the non-performing variables characterized by attributes of some staff. The model identified insignificant effect of work experience and initiative among the junior staff, while work-habits was identified as the weakness of the senior staff as shown in the parameter estimates of each model. The outcome of the research is a working instrument to strengthen quality assurance and plan manpower development for higher productivity in the university.

INTRODUCTION

In higher institutions of learning, teaching and non-teaching staff have significant role in students' academic pursuit. Quality human resource is a major factor that characterizes the educational standard of every academic institution in view of its effects on its trainees and the socioeconomic development of the larger society. Akinyokun (2007) opined that man, money, machines, and time are quality assets of a university. The man, while serving as the major driver of other assets, has three components, namely academic staff, administrative staff, and technical staff. Notwithstanding the significant roles of academic staff in every tertiary institution, assessment of the productivity of the non-teaching staff is eminent to promote and high productivity in tertiary institutions. It is often said that students find it difficult when dealing with the non-teaching staff as compared to the teaching professionals in higher educational institutions (Yuliarini, 2012). Institutions are required to attain certain standards by improving the productivity of non-teaching staff to align with such great demands, otherwise, it may lead to service inefficiency and low staff performance (Saxena, 2014). Non-teaching employees of higher institutions of learning play a significant role in achieving the objectives and goals of institutions where they are employed, because they form an essential component for organizational success. Visvizi et al. (2019) underscored the need for management of higher education institutions to consistently assess the quality and productivity of non-teaching staff so as to meet the institutional standard of the new generation. The Akwa Ibom State University is a new university in Nigeria, established about 15 years ago. Like other Nigerian universities, it concerns the management of the Akwa Ibom State University, in line with the National University Commission policy, to always work and sustain acceptable standards in the area of manpower for the university.

With the high premium on the role and contributions of non-teaching staff in the academic system, it is worthwhile for human resources in the Akwa Ibom State University as well as other universities in Nigeria to consistently analyse non-teaching staff profiles to assess their level of inputs as a way to guarantee quality services for optimal productivity. The aim of this research is to analyse non-teaching staff profile in all the departments in the Akwa Ibom State University with the purpose of evaluating and appraising their contributions to the university service. This will help in addressing the challenges of low productivity among the non-teaching staff in the university.

Statement of Problem

Researches have been carried out on the profiles of non-academic staff in tertiary institutions purposely to find out areas of challenges so as to proffer solutions for better services. Mengistu (2022) assessed the non-academic staff performance and its impact on the students' satisfaction. Usoro and Edeminam (2023) carried out analysis of academic staff profiles for the assessment of productivity in Akwa Ibom State University, Mkpat Enin, Nigeria. The academic staff were categorized into three groups, namely, Professor/Associate Professors, Senior Lecturer and Lecturer1/below with adoption of discriminant analysis to appraise the staff and re-classify them where necessary. So far none of the previous works on the performance of non-academic staff in tertiary institutions has considered mathematical approach to the assessment of non-teaching staff performance using some determinant factors. Like every other organization, appraisals for promotion of non-teaching staff to higher ranks in Akwa Ibom State University have always been the working documents, and the overall assessment is based on preliminary evaluations of staff using some quality characteristics and performance

parameters. These include Work Output, Communication, Human Relations, Character Traits, Work Habits, Leadership Attainment, Rewards/Sanctions. These are the determinant factors used for the overall assessment. As a problem, these factors have no mathematical relation with the overall assessment to justify the final percentage score awarded to each staff as an index for promotion. Given this fact, one can not substantiate the contributions of the pre-determinant factors to the overall assessment. This justify the need for mathematical approach to the overall assessment of staff on the basis of the quality characteristics and performance factors.

Objectives

The objectives of this research are:

- To identify the quality and performance characteristics which form the parameters as pre-determinant factors for the overall assessment of staff in the Akwa Ibom State University.

- To model overall assessment of non-teaching staff in Akwa Ibom State University using the identified quality and performance characteristics.

- To compare the mathematical and non-mathematical approaches of appraising staff for promotion and recommend a more accurate approach with justifications to the university.

REVIEW OF RELATED RESEARCH

Yusuf et al. (2010) conducted a retrospective study to see if there was a significant change in the profile of academic and senior non-teaching staff recruited at the University of Ibadan between 1961 and 2000. The measurement parameters for the academic staff were qualifications, date of first appointment, and year of promotions to the ranks of Assistant Lecturer, Lecturer II, Lecturer I, Senior Lecturer, and Associate Professor, as well as year of promotions of non-teaching senior staff to the ranks of Administrative Officer, Assistant Registrar, Senior Assistant Registrar, and Principal Assistant Registrar. The mean time intervals for promotions from one rank to another were calculated for the two categories of staff. The results showed that there has been a change in the career progression of both academic and non-teaching staff with increasing cohorts. Zainudin and Junaidah (2010) investigated factors contributing to job satisfaction, namely promotional opportunities, renumeration, working environment, workload, relationship with colleagues, and management style in UITM Kelantan. The work used simple descriptive statistics and a structural equation model (SEM). The study found out that promotional opportunities, workload, and relationships with colleagues significantly affected job satisfaction of lecturers. Ochoti et al (2012) investigated the multifaceted factors influencing employee Performance Appraisal System (PAS) in the Ministry of State for Provincial Administration, Nyamira District, Kenya. Multiple regression analysis technique was used to explain the nature of the relationship between PAS and the factors that influence it. Results of the study showed that all the five factors: Implementation process, interpersonal relationships, rater accuracy, informational factors, and employee attitudes had a significant positive relationship with the performance appraisal system. The regression results also showed that 55.1% of the variation in performance appraisal system can be explained by the changes in implementation process, interpersonal relationships, rater accuracy, informational factors and employee attitudes. These findings

showed that if these factors are taken into consideration by the appraised staff, the raters and the government policy makers, then the PAS can be a good performance management tool. Kumari (2015) aimed at developing a strong impact of perceived fairness of performance appraisal on employee performance. The analysis of responses was done by using correlation and regression analysis. Correlation analysis says that there exists a relationship between perceived fairness of performance appraisal and employee performance. In regression analysis, the nature of the relationship between the dependent and the independent variables was analyzed and the result was that there exists a significant impact of perceived fairness of performance appraisal on employee performance.

Prasad et al (2016) showed the results on the employee core competencies influencing the evaluation performance appraisal system using multiple regression analysis with reference to Agriculture Research Institutes employees in Hyderabad Metro, India. The descriptive analysis, correlation techniques and parametric statistics like t-test and multiple regression analysis were carried out to arrive at the conclusions. Inuwa et al (2017) examined the impact of job satisfaction, job attitude and job equity on the performance of non – academic staff of Bauchi state University Gadau Nigeria with physical working environment as the moderator variable. The research adopted satisfaction, job attitude and job equity as independent variables and employee performance as the dependent variable. Expectancy theory, equity theory and person fit environment theory were used to back up the study. Akinyemi (2021) investigated the prediction of a dependent variable, job performance of workers, based on a set of five independent variables viz: age, work experience, motivation and compensation, job satisfaction, organizational support and justice. The relationship between job performance and each of these predictors was examined and analyzed, the Multiple Regression Model developed was used to predict job performance based on the influence of the five independent variables.

Duru et al (2022) investigated the relationship between motivation and workers' performance at the University of Abuja. It utilized a descriptive research design. Both primary and secondary data were utilized in the study. Descriptive statistics and multiple regression methodology were employed on a sample of 337 workers obtained from 2145 workers through the stratified sampling method. The findings revealed that salary increase, promotions, allowances, regular timely salary and involvement in decision-making had a positive and significant effect on workers' performance at the University of Abuja. Mengistu (2022) assessed the non –academic staff's performance and its impact on the students' satisfaction with chi – square goodness of fit test, t – test correlation and regression analysis as statistical tools. The findings confirmed that the extent of non – academic staffs' performance and the student's satisfaction is limited. The outcome found out that the degree of student's satisfaction is highly predicted by the staff's performance.

RESEARCH METHOD

(A) Data Collection

The data for this research is the profiles of non-teaching staff which are classified in senior and junior staff categories, and shall be sourced from Human Resources Directorate of the Akwa Ibom State University. The population of the study is N= 220, which includes 65 junior and 155 senior staff promoted in 2024/2025 appraisal year. The interest in the number of staff promoted in the appraisal year is to subject the promotion criteria to statistical analysis to check the conformity between the mathematical and non-mathematical methodologies. Data for the research are collected without staff identities.

(i) Junior Staff Work Performance Assessment Variables: The variables for the assessment of the senior staff by the Akwa Ibom State University Appraisal Committee are Overall Assessment, Qualification, Work Experience, General Work Output, Attitude to Work, Initiative, Community Service and Reward and Sanctions.

(ii) Parameters Scores for Junior Staff:

Qualification = 6%

Work Experience = 9%

General Work Output = 57%

Attitude to Work = 10%

Initiative = 10%

Community Service = 6%

Rewards and Sanctions = 3%

Overall Assessment (Y_j)= 100%

This research limits the predictive variables to work experience (X_{j1}), work output (X_{j2}), Attitude (X_{j3}) and Initiative (X_{j4}). The subscript 'j' represents the junior category.

(iii) Senior Staff Work Performance Assessment Variables: The variables for the assessment of the senior staff by the Akwa Ibom State University Appraisal Committee are Overall Assessment, Work Output, Communication, Human Relations, Character Traits, Work Habits, Leadership Attainment and Reward and Sanctions. The subscript 's' represents the senior category. From the Akwa Ibom State University appraisal score template, each of the variables has its percentage score, with the maximum total score of 100%.

Maximum Parameters Scores for Senior Staff:

Work Output = 20%

Communication = 10%

Human Relations = 10%

Character Traits = 12%

Work Habits = 15%

Leadership Attainment = 28%

Rewards and Sanctions = 5%

Overall Assessment (Ys) = 100%

For the Senior category, the predictive variables are reduced to salient ones which include, Work Output (X_{s1}), Communication (X_{s2}), Human Relations (X_{s3}), Work Habits (X_{s4}) and Leadership Attainment (X_{s5}).

B. Multivariate Linear Regression Model

The general multivariate linear regression model will be expressed as:

$$Y_j = \beta_{j0} + \beta_{j1}X_1 + \beta_{j2}X_2 + \cdots + \beta_{jP}X_P + \varepsilon_j \tag{1}$$

$$Y_s = \beta_{s0} + \beta_{s1}X_1 + \beta_{s2}X_2 + \cdots + \beta_{sp}X_P + \varepsilon_s \tag{2}$$

where

Y_j = overall assessment score for junior staff

Y_s = overall assessment score for senior staff

$\beta_{j0}, \beta_{j1}, \ldots, \beta_{jp}$ are coefficients of junior staff overall assessment model

$\beta_{s0}, \beta_{s1}, \ldots, \beta_{sp}$ are coefficients of senior staff overall assessment model

ε_j = error term associated with the overall assessment score for junior staff

ε_s = error term associated with the overall assessment score for senior staff

The general model can be expressed in a matrix form as:

$$Y = X\beta + \varepsilon \tag{3}$$

where

$$\varepsilon = Y - X\beta \tag{4}$$

$$\varepsilon'\varepsilon = (Y - X\beta)'(Y - X\beta)$$

$$= Y'Y - Y'X\beta - X'\beta'Y - X'\beta'X\beta \tag{5}$$

$$\frac{\delta\varepsilon'\varepsilon}{\delta\beta'} = -X'Y + X'X\beta = 0$$

$$\beta X'X = X'Y$$

$$\hat{\beta} = (X'X)^{-1}X'Y \tag{6}$$

$$\hat{e}'\hat{e} = Y'Y - \hat{\beta}'X'Y \tag{7}$$

$$\sigma^2 = \frac{\hat{e}'\hat{e}}{(n-k)} \tag{8}$$

$$Var - Cov(\hat{\beta}) = (X'X)^{-1}\sigma^2 \tag{9}$$

$$\text{Standard error of Beta} = \sqrt{(X'X)^{-1}\sigma^2} \tag{10}$$

$$\text{T-Statistics} = \frac{\hat{\beta}}{SE(\hat{\beta})} \tag{11}$$

$$X'X = \begin{pmatrix} n & \sum X_1 & \sum X_2 & \sum X_3 & \sum X_4 \\ \sum X_1 & \sum X_1^2 & \sum X_1 X_2 & \sum X_1 X_3 & \sum X_1 X_4 \\ \sum X_2 & \sum X_2 X_1 & \sum X_2^2 & \sum X_2 X_3 & \sum X_2 X_4 \\ \sum X_3 & \sum X_3 X_1 & \sum X_3 X_2 & \sum X_3^2 & \sum X_3 X_4 \\ \sum X_4 & \sum X_4 X_1 & \sum X_4 X_2 & \sum X_4 X_3 & \sum X_4^2 \end{pmatrix}$$

Multiple regression model in matrix form

Test for significance of the junior staff overall assessment score model

Hypotheses for appraisal scores are:

1. $H_0: \hat{\beta}_{j0} = 0$, against $H_1: \hat{\beta}_{j0} \neq 0$

2. $H_0: \hat{\beta}_{j1} = 0$, against $H_1: \hat{\beta}_{j1} \neq 0$

3. $H_0: \hat{\beta}_{j2} = 0$, against $H_1: \hat{\beta}_{j2} \neq 0$

4. $H_0: \hat{\beta}_{j3} = 0$, against $H_1: \hat{\beta}_{j3} \neq 0$

5. $H_0: \hat{\beta}_{j4} = 0$, against $H_1: \hat{\beta}_{j4} \neq 0$

6. $H_0: \hat{\beta}_{j5} = 0$, against $H_{j5}: \hat{\beta}_{j5} \neq 0$

7. $H_0: \hat{\beta}_{j6} = 0$, against $H_{j6}: \hat{\beta}_{j6} \neq 0$

8. $H_0: \hat{\beta}_{j7} = 0$, against $H_{j7}: \hat{\beta}_{j7} \neq 0$

Test for significance of the senior staff overall assessment score model

Hypotheses for grade levels are:

1. $H_0: \hat{\beta}_{s0} = 0$, against $H_1: \hat{\beta}_{s0} \neq 0$

2. $H_0: \hat{\beta}_{s1} = 0$, against $H_1: \hat{\beta}_{s1} \neq 0$

3. $H_0: \hat{\beta}_{s2} = 0$, against $H_1: \hat{\beta}_{s2} \neq 0$

4. $H_0: \hat{\beta}_{s3} = 0$, against $H_1: \hat{\beta}_{s3} \neq 0$

5. $H_0: \hat{\beta}_{s4} = 0$, against $H_1: \hat{\beta}_{s4} \neq 0$

6. $H_0: \hat{\beta}_{s5} = 0$, against $H_1: \hat{\beta}_{s5} \neq 0$

7. $H_0: \hat{\beta}_{s6} = 0$, against $H_1: \hat{\beta}_{s6} \neq 0$

8. $H_0: \hat{\beta}_{s7} = 0$, against $H_1: \hat{\beta}_{s7} \neq 0$

The test statistic to be used is:

$$t = \frac{\hat{\beta}_r}{s(\hat{\beta}_r)} \sim t_{n-1-k} \quad r = 0,1 \dots 7, n = 1,2,3 \dots 350, k = 6$$

Decision rule: If $t_{cal} > t_{tab}$, H_0 is rejected otherwise H_0 is accepted.

The calculation of F-statistic will be summarized in the Analysis of Variance (ANOVA) table given below

Decision rule: If $F_{cal} > F_{tab}$, reject H_0 otherwise accept H_0.

RESULTS

Analysis of Junior Staff

The analysis of junior staff produces the following regression equation:

$$Y_j = 0.496X_{j1} + 1.3632X_{j2} + 0.920X_{j3} + 0.415X_{j4} \tag{12}$$

Equation 12 is the estimated model for the overall assessment of junior staff with four predictive factors including work experience, general work output, attitude and initiative. Furthermore, the parameter estimates, model summary and analysis of variance indicating the overall fitness of the models for the junior staff are presented in Tables 1, 2 & 3.

Table 1: Parameter Estimates

Variable	Coeff	SE. Coeff	T- Value	P-Value
X_{j1}	0.496	0.325	1.53	0.132
X_{j2}	1.363	0.0620	21.99	0.000
X_{j3}	0.920	0.286	3.22	0.002
X_{j4}	0.415	0.282	1.47	0.146

Table 2: Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
2.424	99.88%	99.88%	99.85%

Table 3: Analysis of Variance for the Parameter Estimates

Source VIF	DF	Adj SS	Adj MS	F- Value	P-Value
Regression	4	307851	76962.7	13102.35	0.000
X_{j1}	1	14	13.7	2.33	0.132
X_{j2}	1	2840	2839.9	483.47	0.000
X_{j3}	1	61	60.8	10.35	0.002
X_{j4}	1	13	12.7	2.17	0.146
Error	61	358	5.9		
Lack of Fit	47	337	7.2	4.63	0.002
Pure Error	14	22	1.5		
Total	65	308209			

Analysis of Senior Staff

The analysis of senior staff produces the following regression equation:

$$Y_s = 1.782X_{s1} + 2.247X_{s2} + 0.579X_{s3} + 1.190X_{j4} + 0.9487X_{s5} \tag{13}$$

Equation 13 is the estimated model for the overall assessment of senior staff with the following components of explanatory variables: work output, communication, human relations, work habits and leadership attainment. The parameter estimates, model summary and analysis of variance indicating the overall fitness of the models for the senior staff are presented in Tables 4, 5 & 6.

Table 4: Parameter Estimates

Variable	Coeff	SE. Coeff	T- Value	P-Value
X_{s1}	1.782	0.160	11.12	0.000
X_{s2}	2.247	0.354	6.34	0.000
X_{s3}	0.579	0.300	1.93	0.055
X_{s4}	1.190	0.182	6.53	0.000
X_{s5}	0.949	0.091	10.38	0.000

Table 5: Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.848	99.95%	99.94%	99.94%

Table 6: Analysis of Variance for the Parameter Estimates

Source VIF	DF	Adj SS	Adj MS	F- Value	P-Value
Regression	5	961470	192294	56306.99	0.000
X_{s1}	1	423	423	123.73	0.000
X_{s2}	1	137	137	40.22	0.000

Xs_3	1	13	13	3.73	0.055
Xs_4	1	146	146	42.61	0.000
Xs5	1	368	368	107.80	0.000
Error	150	512	3		
Lack of Fit	37	477	13	41.25	0.000
Pure Error	113	35	0		
Total	155	961982			

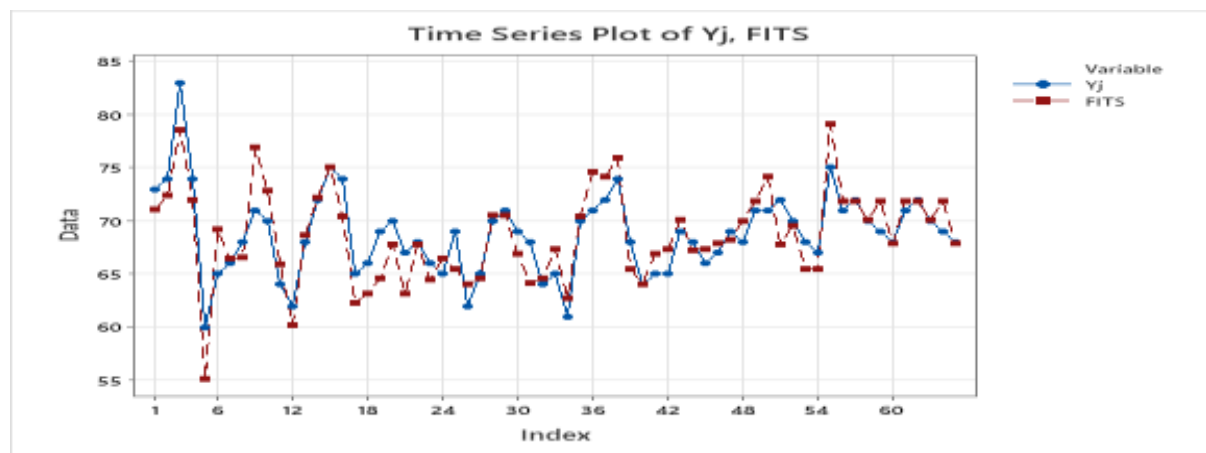**Figure 1: Number Plots of Original Overall Assessment Scores and Estimates for Junior Staff**

Figure 1 shows the number plots of the original overall assessment scores of the junior staff and estimates. Competitive evidence in the plots shows that estimates are as good as the original overall assessment scores, indicating good fitness of the multiple regression model to the data.

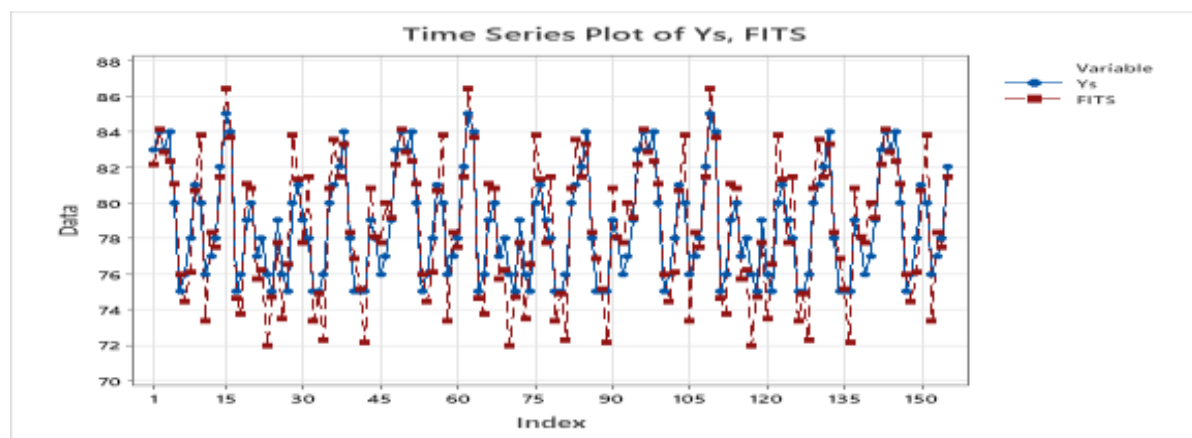**Figure 2: Number Plots of Original Overall Assessment Scores and Estimates for Senior Staff**

Figure 2 is the plots of the original overall assessment scores and estimates for the senior category. Evidence has it that the two sets of data compete favourably, suggesting model adequacy to the predictive variables.

DISCUSSION

Staff appraisal for promotion and annual salary increment is a routine exercise in every government organization, including tertiary institutions. Apart from promotion, staff could be evaluated to assess performance as a way to encourage hard work and promote higher productivity in service. This underscores the need to constantly and consistently evaluate staff performance in other to identify areas of strength and weakness. There are certain criteria for the appraisal of staff, and these include qualifications, years of experience, work output, attitude, initiative, community service, human relations, character traits, work habits, leadership attainment etc. These performance characteristics are used to assess staff and identify areas of challenges with the view to promote hard-work and increase productivity in the system. Akwa Ibom State University Appointment and Promotion Committee relies on the staff overall assessment score for promotion on the basis of the aforementioned factors as criteria for promotion and annual salary increment. This research grouped the non-teaching staff into two categories, namely senior and junior staff with their respective appraisal scores for 2024/2025 appraisal year. Method of analysis used was multiple regression analysis with appraisal score as response variable, while the components for each category constituted predictor variables in the regression model. The analysis produced two sets of regression models from which the estimates of the overall assessment scores were obtained for the junior and senior staff. Among the junior staff, it has revealed that parameters for years of experience and initiative as shown in Table 1 are not significant, the summary of the percentage of the total variation accounted for by the explanatory variables is very high as indicated in Table 2. Analysis of Variance estimates in Table 3 have revealed overall fitness of the model to the data. From the Senior staff model, estimates in Table 4 shows the weakness of senior staff in the area of work habits, as the parameter of the model suggest insignificant effect of the work habits to the overall assessment of the senior staff in the university. The percentage of the total variation accounted for by the predictive variables as indicated in Table 5 is very high. Evidence in Table 6 suggests that overall model fitness of the appraisal score in the senior category is equally good as the junior category. Estimates from the two models have been compared with the appraisal scores awarded to staff by their respective reporting officers. The advantage of the statistical modelling of the appraisal scores over the existing method is that, the model could help identify some insignificant parameters among the junior and senior staff in the Akwa Ibom State University.

CONCLUSION

The analysis of senior and junior staff profiles in Akwa Ibom State University was very necessary. Besides, the mathematical approach adopted in the analysis was apt and very revealing, as some performance characteristics that are not significantly contributing to the overall assessment scores are identified. The attributes of staff which need to be improved upon for better performance and higher productivity are work experience and initiative among the junior staff, and work habits among the senior staff. The findings in the course of the research have it that the junior staff are not exposed to working in different units and departments as much as it should be. Work habits among the senior staff who are not Head of Departments or units are evident not to contribute significantly to the overall assessment score. This research recommends routine redeployment of staff to various units and departments in a cycle of three years minimum to give staff opportunity to acquire experience, which will in turn have positive

affect on their initiative. Encouragement of senior staff to improve on their work habits in Akwa Ibom State University is very eminent.

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