



## Staff Age Perception on Vice Chancellors Management of Resources in Public Universities, Bayelsa State, Nigeria

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### ABSTRACT

This study investigated the impact of staff age on perceptions of vice chancellors' resource management in Bayelsa State public universities, employing a descriptive survey design with a sample of 1,382 employees (30% of the 4,606 population) selected through proportionate stratified random sampling, utilizing a validated 15-item questionnaire (SPRVMVUQ); the research revealed significant variations in staff ratings across age groups (27-70), with the 38-48 age group consistently providing higher mean ratings, as confirmed by a statistically significant ANOVA result ( $F=31.629$ ,  $p<0.05$ ), leading to the rejection of the null hypothesis and supporting the alternative that age significantly influences perceptions, further detailed by post-hoc Scheffe tests; notably, certain questionnaire items regarding transparency, infrastructure, and leadership style were not uniformly accepted across age groups, indicating varied interpretations; ultimately, the study concluded that staff age is a crucial factor in evaluating vice chancellors' resource management, necessitating that universities acknowledge these age-related perceptual differences and adapt management practices accordingly

## INTRODUCTION

Extending working life is generally considered an economic requirement in a society where populations are aging (Lefteroff, 2022). Organizations must make sure their workplaces are inclusive in order to prevent harm to individuals, relationships, and the business as a whole, especially when up to four generations are working side by side. According to Sharon Raj, age discrimination can result in the creation of ingroups and outgroups at work, which hinders cooperation and information exchange. She talks about how to deal with ageism at work (Young, 2022a). Our physical attributes, such as gender, look, or race, have the potential to be a significant benefit or disadvantage in the workplace due to biased opinions or presumptions held by others. Age is one such trait that could have an impact on almost every employee during their career. There is a definition of ageism. according to Ingersoll and Collins (2018), as "stereotypes, prejudice, or discrimination against people because of their chronological age." Ageism typically carries negative connotations, yet it can have beneficial or negative effects on an individual. According to Inuwa (2016), the average ageism experience is U-shaped across life, with age-based discrimination more likely to affect both the youngest and oldest employees. However, the degree of harm resulting from being outside of the ideal "middle age" will differ depending on the function, industry, and current economic climate (Young, 2022b).

## LITERATURE REVIEW

Age is frequently not the only factor that counts. Another important factor may be intersectionality with regard to gender, race, or other traits (Laosebikan et al., 2018). Age and gender interacted to influence access to training opportunities in nine European nations, with older female workers experiencing the greatest disadvantage (Wen, 2017). According to a different study, older African American workers experienced higher rates of downward mobility from managerial and professional positions than their white counterparts. (Janani and Sankar, 2021).

Universities like other organizations depend on their human resources for the achievement of their goals and missions. One of the major challenges facing the Universities generally is the question of management of human resources. Thus, Ezeanyim and Ufoaroh, (2019) asserted that adequate library resources, equipment availability, and research skills and motivation are the cornerstones of research. Universities are not extremely motivated to conduct high-quality research and maybe publish their findings. Despite being available, research funding are not sought because most of our academic ovens aren't producing anything novel. (Irina and Tomlin, 2022). The management of Universities in Nigeria has often been indicted for failing in this regard in terms of human resources development. Many Universities fail to deal with the issues of human resource in a logical way which resulted to brain drain, academic staff strike, inadequate training of staff, poor motivation and others (Febus and Karen, 2022). Consequently, if these problems are not addressed properly, what will be the future of Universities in Bayelsa State?

In addition to any other responsibilities granted to him by university statute or otherwise, the vice chancellor is in charge of overseeing the institution's operations. Robert and Spruch, 2022). He serves as the Senate's chairman as well as the university's chief academic and executive officer. According to Tomaszewska (2020), the Vice-Chancellor is specifically tasked with ensuring the smooth operation of the university. He performs duties that may be assigned to him or mandated by the university's laws, statutes, and regulations. He also oversees all academic programs and keeps an eye on the effectiveness and orderliness of the university.

University governance is how universities are formally organized and managed. The way universities are run is simply known as university governance. Although there are significant differences in university governance models across the globe, they all have a similar history. Private non-profit, private for-profit, and public universities with various management forms are all included in the global university education landscape. With variations in identifying the linkages between staff traits and efficient resource management, university governance and administration become even more diversified (Kertiriasih et al., 2018). Current discussions on corporate and business forms of institutional governance vs collegial and shared forms of governance exacerbate the challenges. (Serhii et al; 2020).

This is prone to the occurrence of conflicts in the university community because of their different backgrounds, needs, values and aspirations (Patrahau et al; 2020). Differences in the background of staff results in differences in their age, could determine the perception on the effective management of resources in the university. However, the effective management of resources in universities depends on the strategies that the vice chancellors employ in managing the resources and staff at various levels (Golinska-Dawson, 2019). Against this background, this study focusses on establishing the differences in variation of age, gender, marital status, educational qualification, rank, staff status and characteristics and effective resource management by vice chancellor in Bayelsa State, Nigeria.

## **METHODOLOGY**

Analytical descriptive survey design was adopted in this study. According to Analytical In this study, a descriptive survey design was used. An analytical descriptive survey methodology helps an investigator evaluate various demographic facts of the population utilizing hypotheses, claim Tomlin and Irina (2022) (Ezeanvim and Ufoard, 2019). The demographic information of importance in this study is the staff members' ages, which were used to compare their perspectives on the topic being studied. The fact that this design prevents an investigator from influencing the study's independent variable is another important justification for using it.

The target population of this study was made up of 4606 staff from three public Universities Bayelsa State during the 2021/2022 academic session (Office of the Establishment Officer of the three, 2023). This is distributed as 2223, 1994

and 389 staff from Niger Delta University (NDU), Federal University of Otuoke (FUO) and University of Africa, Toru-Orua (UAT) respectively.

A sample size of 1382 staff (representing 30%) of the total population was selected through proportionate stratified random sampling technique from three Universities in Bayelsa State, Nigeria during the 2021/2022 academic session. This was distributed as 667, 598 and 117 staff from Niger Delta University (NDU), Federal University of Otuoke (FUO) and University of Africa, Toru-Orua (UAT) respectively. Table 1 indicates the sample frame and distribution of sample into the sample into the three (3) Universities.

Table 1: Sample Frame and Distribution of Sample into the Three (3) Universities

S/N	Name of University	Population of Staff	Sample of Staff
1	Niger Delta University	2223	667
2	Federal University, Otuoke	1994	598
3	University of Africa, Toru-Orua	389	117
4	Total	4606	1382

Staff Perception and Resources Management by Vice-Chancellors in Universities Questionnaire (SPRMVUQ) was constructed by the investigator of this study. The SPRMVUQ instrument has two basic segments A and B. The first segment A sought information on the demographic details of the respondents, on the other hand segment B seeks for information on Vice-Chancellors management of resources in universities. In addition, segment B was not re-categorized into further sectors; rather it contained a single variable with fifteen items on it. This simply implies that items 1-15 sought information on resources management by Vice-Chancellors in Universities. All the items were measured on a 4-point rating scale of:

- Strongly Agree (SA) 4-points.
- Agree (A) 3-points
- Disagree (D) 2-points and
- Strongly Disagree (SD) 1-point

The Two experts and the investigator's supervisor implemented the validity of the instrument. The other expert came from the Department of Educational Foundations' measurement and evaluation unit at Niger Delta University on Wilberforce Island in Bayelsa State, while the first one is from educational administration and planning. Under the guidance of the instrument's face validity, the supervisor carried out the validity procedure. The educational management and planning expert worked on the instrument's usability and clarity in relation to the content. On the other hand, the measurement and assessment specialist took into account the instrument's validity on the construction angle. The instrument's final draft appropriately included and applied all of the helpful criticisms, changes, recommendations, and observations. In alignment with the resultant outcome of the validity process as earlier indicated, out of the original 18 items drafted, a total of 15 items were finally approved in the instrument for utilization.

30 employees of Bayelsa State Medical University (BMU), Yenagoa, who were not included in the study's primary population, were given the instrument's reliability test, the Staff Perception and Management of Resources by Vice-Chancellors in Universities Questionnaire (SPMRVUQ). The staff was given the instrument once, and the results were used to determine the internal consistency of the instrument reliability coefficient value. Cronbach's Alpha analysis was then applied. The reliability coefficient's internal consistency, as determined by the instrument, was 0.82. The functionality of the instrument used for data collection in the study was significantly influenced by the obtained reliability coefficient value.

To actualize effective In order to distribute and retrieve copies of the instrument, the researcher directly used three (3) research assistants who had been instructed or trained to assist with the distribution of questionnaire copies. Ensuring a high rate of return of the numerous copies of the questionnaire instrument provided was the primary goal of using research assistants. Although 1410 copies of the instrument were distributed, 1382 (98%) of them were fully administered by the respondents, and the remaining 28 (2%) were improperly administered and, therefore, were not used for the study's analysis. The time frame for distributing and retrieving copies of the data collection instrument was ten (10) weeks long.

The Both descriptive and inferential statistical approaches were used to evaluate the data gathered for this investigation. The study's demographic data was analyzed using the descriptive statistical method of simple percentage analysis. To address the research issues, descriptive statistical methods such as the mean and standard deviation were also utilized. The Z-test was the relevant inferential statistical method for the study's data analysis of the hypotheses. Every hypothesis was examined at the significance level of 0.05. Additionally, the main tool used for all of the studies was the Statistical Package for Social Sciences (SPSS) version 25. (Koloğlu et al; 2017).

## RESULTS

Table 2: Simple Percentage Analysis of Respondents by Age

S/N	Age	Frequency	Percentage
1	27-37 years	263	19
2	38-48 years	359	26
3	49-59 years	418	30
4	60-70 years	342	25
5	<b>Total</b>	<b>1382</b>	<b>100</b>

The data presented in Table 2 reveals that 263 (19%) of the total respondents were within 27-37 years, 359 (26%) were within 38-48 years, 418 (30%) were 49-59 years and 342 (25%) were of 60 -70 years. This simply means that respondents within the age of 49-59 years were more in number than their other age range counterparts in the study.

**Research Question**

What difference exist among staff within 27-37, 38-48, 49-59 and 60 70 years of age mean rating of resources management by Vice-Chancellors of public Universities in Bayelsa State, Nigeria?

Table 3: Summary of Mean and Standard Deviation Scores of the Difference Among Staff within 27-37, 38-48, 49-59 and 60 70 Years of Age Mean Rating of Resources Management by Vice-Chancellors of Public Universities

S/N	Resources management by Vice-Chancellors in Universities	27-37 Mean	38-48 Mean	49-59 Mean	60-70 Mean	Total Mean	Decision
1	Financial resources are properly managed by the Vice-Chancellor in my institution	2.86	2.60	2.65	2.23	2.57	Accepted
2	Internally generated revenue are adequately managed by Vice chancellors in the institution	3.21	3.13	3.06	3.08	3.11	Accepted
3	Funds reached by the government are utilized by Vice-Chancellor in the institution for all.	2.84	2.94	2.96	2.64	2.85	Accepted
4	The Vice-Chancellor ensures that funds provided by TETFUND are well managed in my institution	3.05	3.16	3.00	3.02	3.06	Accepted
5	Funds received from Philanthropies are adequately used by Vice-Chancellor in my institution	2.58	3.06	2.75	2.57	2.75	Accepted
6	Adequate provision of furniture a priority by the Vice-Chancellor in my institution.	2.78	3.02	2.72	2.77	2.82	Accepted
7	Inadequate classrooms affect effective management of students by the Vice-Chancellor in the institution.	2.95	2.90	3.17	2.99	3.01	Accepted
8	The Vice-Chancellor supports effective provision of teaching facilities in my institution.	2.83	3.59	3.06	2.98	3.13	Accepted
9	Lack of well-equipped laboratories makes the management of facilities difficult for the Vice-Chancellor in my institution.	2.67	2.95	2.61	2.49	2.68	Accepted

10	Availability of adequate infrastructural facilities enhances Vice-Chancellor effectiveness in the institution,	2.69	2.37	2.45	2.56	2.50	Accepted
11	The Vice Chancellor relates cordially with staff in the institution.	2.83	2.74	2.65	2.43	2.65	Accepted
12	Lack of transparency in resources management by the Vice-Chancellor is a problem in my institution.	2.49	3.01	2.49	2.04	2.51	Accepted
13	Vice-Chancellor use of diplomatic ways of cautioning erring staff motivates growth in the institution.	2.76	2.73	2.82	2.85	2.79	Accepted
14	The Vice-Chancellor use of democratic style of leadership promotes management of resources in the institution effectively.	2.76	2.58	2.53	2.16	2.49	Rejected
15	Vice-Chancellor use of autocratic style of leadership is detrimental to the well-being of staff in my institution	2.86	2.74	2.73	2.39	2.68	Accepted
	<b>Grand mean</b>	<b>2.81</b>	<b>2.90</b>	<b>2.78</b>	<b>2.61</b>	<b>2.77</b>	<b>Accepted</b>

\*Cut-off mean = 2.50; 27-37 = 263; 38-48 = 359; 49-59 = 418; 60-70 = 342 and Total = 1382

With the exception of item 12, which had mean rating scores of 2.86, 3.21, 2.84, 3.05, 2.58, 2.78, 2.95, 2.83, 2.67, 2.69, 2.83, 2.49, 2.76, 2.76, and 2.86, respectively, the data in Table 3 indicates that the mean rating scores of staff members aged 27 to 37 years were higher than the cut-off mean score of 2.50. This suggests that over 27-37 years, the staff approved all items except item 12. With the exception of item 10, which had mean rating scores of 2.60, 3.13, 2.94, 3.16, 3.06, 3.02, 2.90, 2.90, 2.90, 3.59, 2.37, 2.74, 3.01, 2.73, 2.58, and 2.74, respectively, the mean rating scores for staff members aged 38 to 48 years were higher than the cut-off mean score of 2.50. This only indicates that everything was approved except that of item 10. With the exception of items 10 and 12, which had mean rating scores of 2.65, 3.06, 2.96, 3.00, 2.75, 2.72, 3.17, 3.06, 2.61, 2.49, 2.82, 2.53, and 2.73, respectively, the mean rating scores of staff members aged 49 to 59 years were higher than the cut-off mean rating score of 2.50. This means that everything was approved, with the exception of items 10 and 12.

With the exception of items 1, 9, 11, 12, 14, and 15, which had mean rating scores of 2.23, 3.08, 2.64, 3.02, 2.57, 2.77, 2.99, 2.98, 2.49, 2.56, 2.43, 2.04, 2.85, 2.16, and 2.39, respectively, Table 3 continues to show that the mean rating scores of

staff members aged 60 to 70 years were higher than the cut-off mean score of 2.50. This suggests that six items were rejected and only nine were accepted. With the exception of item 14, which had mean rating scores of 2.57, 3.11, 2.85, 3.06, 2.75, 2.82, 3.01, 3.13, 2.65, 2.51, 2.49, and 2.68 respectively, Table 4.9 still shows that, overall, the mean rating ratings for all items were similarly higher than the cut-off mean score of 2.50. This suggests that Everything but item 14 was accepted. With a total grand mean rating score of 2.77, which was higher than the cut-off mean score of 2.50, the grand mean rating score of employees aged 38–48 years (2.90) was higher than that of employees aged 1–12 years (2.81), who in turn were higher than those aged 49–59 years (2.78), and those aged 60–70 years (2.61). This only indicates that vice chancellors of public universities have a higher mean rating score for resource management among staff members aged 38 to 48 than their counterparts. In order to determine whether or not the observed difference in the mean rating scores is significant, one-way analysis of variance (ANOVA) was applied. (see .

Hypothesis:

There is no significant difference among staff within 27-37, 38-48, 49-59 and 60-70 years of age mean rating of resources management by Vice-Chancellors of public Universities in Bayelsa State, Nigeria?

Table 4: One-Way Analysis of Variance (ANOVA) Difference Among Staff within 27-37, 38-48, 49-59 and 60-70 Years of Age Mean Rating of Resources Management by Vice-Chancellors of Public Universities

Model	Sum of Squares	df	Mean Square	F	Sig.	Decision at P < 0.05
Between groups	14.916	3	4.912	31.629	0.000	*
Within groups	216.623	1378	0.157			
Total	231.539	1381				

\* = Significant at 0.05 alpha Level; Critical F 3, 1378 = 2.60: N = 1382.

The With 3 and 1378 degrees of freedom, the computed F-value of 31.629 is higher than the crucial F-value of 2.60 at the 0.05 alpha level, indicating that the one-way analysis of variance is significant at the  $p < 0.05$  alpha level, according to the data shown in Table 4. Therefore, it is not possible to accept the null hypothesis. Thus, the alternative hypothesis, according to which vice-chancellors of public universities in Bayelsa State, Nigeria, have a substantial difference in the mean rating of resources management between staff members aged 27–37, 38–48, 49–59, and 60–70 years. To determine the significance direction and staff age order of effectiveness, the mean rating scores were subjected to Scheffe's multiple comparison tests for a post hoc analysis (see Table 5).

Table 5: Summary of Scheffe's Post Hoc Analysis of Staff Mean Rating of Resources Management by Vice-Chancellors in Public Universities Based on Age

Age	Age	Mean difference	Sig.
27-37	38-48	-0.090	0.051
	49-59	0.034	0.753
	60-70	0.197	0.000
38-48	27-37	0.090	0.051
	49-59	0.124	0.000
	60-70	0.287	0.000
49-59	27-37	-0.034	0.753
	38-48	-0.124	0.000
	60-70	0.163	0.000
60-70	27-37	-0.197	0.000
	38-48	-0.287	0.000
	49-59	-0.163	0.000

The data presented in Table 5 indicates scheffe's post hoc test analysis of staff mean rating of resources management by Vice-Chancellors of public Universities based on age. Table 5 shows that the mean difference between the 27-37 and 38-48 age ranges is 0.090, between 27-37 and 49-59 age ranges is 0.034, between 27-37 and 60-70 age ranges is 0.197; between 38-48 and 49-59 age ranges is 0.124; between 38-48 and 60-70 age ranges is 0.287 and between 49-59 and 60-70 age ranges is 0.163. This implies that staff within 38-48 age range is the most effective, followed by 27-37, then 49-59 and the least are the staff within 60-70 age range in their mean rating of resources management by Vice-Chancellors in public Universities. There is a significant difference among staff within 27-37, 38-48, 49-59 and 60-70 years of age mean rating of resources management by Vice-Chancellors of public Universities in Bayelsa State, Nigeria.

The result presented in Table 5 reveals that, the mean score of staff within 38-48 years (2.90) was greater than that of staff within 27-37 years (2.81) which was in turn greater than staff within 49-59 years (2.78) and greater staff within 60-70 years (2.61) on their mean rating of resources management by Vice-Chancellors of public Universities. Statistical analysis in Table 5 indicates that there is a significant difference among staff within 27-37, 38-48, 49-59 and 60-70 years of age mean rating of resources management by Vice-Chancellors of public Universities.

### Summary of Findings

The result implies that age enhances staff mean rating of resources management by Vice-Chancellors of public Universities. The result also reveals that the staff within 38-48 years of age rated higher the resources management by Vice-Chancellors of public Universities than that of their other colleagues. The rating of the staff within ages 38-48 years is expected and not surprising, as a result of their understanding of management issues in the university system.

## **DISCUSSION**

The findings of this study are in conformity with the findings of Wilkinson, 2022, that there is a significant difference among staff within 27-37, 38-48, 49-59 and 60-70 years of age mean rating of resources management by Vice-Chancellors of public Universities. In the contrary, the findings of this study are not in conformity with the findings of Jasper-Abowei and Anderson (2021) that, there is no significant difference among staff within 27-37, 38-48, 49-59 and 60-70 years of age mean rating of resources management by Vice-Chancellors of public Universities.

The result further shows a significant difference among staff within 27-37, 38-48, 49-59 and 60-70 years of age mean rating of resources management by Vice-Chancellors of public Universities.

Age has significant influence on staff mean rating of resources management by Vice-Chancellors of public Universities. University staff should be conscious of their age because of its ability to motivate their rating of resources management by Vice-Chancellors of Universities.

## **CONCLUSIONS AND RECOMMENDATIONS**

Based on the findings of this study, the following conclusions were reached. Age has significant influence on staff mean rating of resources management by Vice-Chancellors of public Universities.

The following recommendations were formulated in the study. Staff in universities should endeavor to rely on their Age, because it has the potential to enhance on their ability to properly rate resources management of Vice-Chancellors in universities.

## **FUTURE STUDY**

### **Contribution to Knowledge**

The study provides baseline information/data for further studies and the ministry of education for the effective management of tertiary education in the state.

## **REFERENCES**

- Ezeanyim, E. E and Ufoaroh, E. T. & A. (2019). The Impact of Job Satisfaction on Employee Performance in Selected Public Enterprise in Awka, Anambra State. *Journal of Management and Business Research: Administration and Management*.
- Febus, S, and Karen P (2022). "Checklist for materials management supply contracts." *Healthcare Financial Management*, pp. 10-27,
- Golinska-Dawson P. (2019). "Materials management in remanufacturing of automotive components - a small remanufacturers perspective". *IFAC-Papers Online*. 52 (13): 1738-1743. ISSN 2405-8963.

- Ingersoll, R. and Collins, M. (2018). *Accountability, Control and Teachers' Work in American Schools*. Chapter in the *Handbook of Educational Supervision*. Edited by Judith Ponticell and Sally Zepeda. NY: Wiley-Blackwell.
- Inuwa, M. (2016). *Job Satisfaction and Employee Performance: An Empirical Approach*. *The Millennium University Journal*.
- Janani, R. and Sanka, r A (2021). "Material management and effective utilization of materials". *Materials Today: Proceedings*. 37: 3118–3124. ISSN 2214-7853.
- Jasper-Abowei E.F and Anderson P. Sele (2021). Teachers' perception on the effective management of funds and material resources by principals in public secondary schools in Port Harcourt Local Government Area of Rivers State, Nigeria. *Niger Delta Journal of Education*. Vol.13, No 2. Pp 46-60
- Kertiriasih, N. N. R., Sujana, I. W., &Suardika, I. N. (2018). The Effect of Leadership Style to Job Satisfaction, Employee Engagement and Employee Performance (Study at PT. Interbat, Bali, Nusra, and Ambon). *International Journal of Contemporary Research and Review*, 9(3).
- Koloğlu, Y., Birinci, H., Kanalmaz, S. I., and Özyılmaz, B. (2017). A Multiple Linear Regression Approach for Estimating the Market Value of Football Players in Forward Position.
- Laosebikan, J. O., Odepidan, M. A., Adetunji, and Aderinto, A. V. (2018). Impact of Job Satisfaction on Employees Performance in Selected Microfinance Banks in Osogbo Metropolis, Osun State, Nigeria. *International Journal of Social Sciences and Management Research*.
- Lefteroff, L (2022). "Efficient materials management: design and operations advice for productive supply activity." *Health Facilities Management* 30, no. 3. Pp. 264
- Patrahau, I, Ankita S, Michel R, Hugo V, René K, and Lucia V (2020). "Strategies to Secure Supply." *Securing Critical Materials for Critical Sectors: Policy Options for the Netherlands and the European Union*. Hague Centre for Strategic Studies, 2020.
- Serhii V, Vladyslav K, Viacheslav O and Kateryna O (2020). Realities and prospects of distance learning at higher education institutions of Ukraine. *Ukrainian Journal of Educational Studies and Information Technology*, 8(1).
- Spruch, A, and Robert B (2022). "Investing in materials management: how the right materials and campus design approaches can promote sustainability" *18.51:47-67*.

- Tomaszewska J. P (2020). Transition towards Circular Economy: Materials Management and Implications for the Construction Sector. *Materials (Basel)*. 13(22):5228.
- Tomlin, N and Irina K (2022). "Ready or not? An assessment of shelf-ready materials management practices in US academic libraries." *Library Resources & Technical Services*, 13(22):5228.
- Wen M (2017). "An information system for sustainable materials management with material flow accounting and waste input-output analysis". *Sustainable Environment Research*. 27 (3): 135-145. ISSN 2468-2039.
- Wilkinson, E. S (2022). "An overview of certification programs in the purchasing and materials management field." *International Journal of Purchasing and Materials Management*, 6 (1): 33-49.
- Young, S. T (2022a). "Hospitals materials management: systems and performance." *Journal of Purchasing & Materials Management*, 3, (1) 89-112
- Young, S. T (2022b). "Materials Management - Evolving the Process for an Evolving Marketplace." *Chemical Engineering*, 2, (3) pp 124-132