

Influence of Ergonomic Practice on Workplace Productivity: A Study of Yaba College of Technology, Lagos, Nigeria

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ABSTRACT

This study investigated the influence of ergonomic practice on workplace productivity among administrative staff of Yaba College of Technology, Lagos, Nigeria. A descriptive survey research design was adopted. Data were collected using a structured questionnaire from 110 administrative staff selected through stratified random sampling. Descriptive statistics (frequency and percentage) were used to analyze data, while the chi-square statistic tested the hypothesis at 0.05 significance level. Administrative staff demonstrated high awareness of ergonomic principles (83.8%-88.9% agreement levels). However, implementation was poor due to inadequate furniture (77.8%), insufficient funding (78.8%), low management priority (68.7%), and workload pressure (62.6%). The chi-square test revealed no significant relationship between ergonomic practice and self-reported productivity ($\chi^2_{cal}=6.13 < \chi^2_{tab}=21.03$). The institution should prioritize investment in ergonomic facilities, establish comprehensive ergonomic policies, allocate dedicated funding, conduct periodic workstation assessments, and organize capacity-building programmes. This study addresses a significant gap in ergonomic research within Nigerian tertiary institutions, specifically examining the unique context of the country's oldest higher education institution.

Keywords: Ergonomic Practice, Workplace Productivity, Administrative Staff, Higher Education, Nigeria

INTRODUCTION

The contemporary workplace has undergone profound transformation over the past decade, driven by technological advancement and increasing recognition of the nexus between employee well-being and organizational performance. Ergonomics is the scientific discipline concerned with understanding interactions among humans and other elements of a system has emerged as a critical determinant of workplace productivity, employee health, and organizational effectiveness (Bentley et al., 2021). The application of ergonomic principles in workplace design represents not merely a compliance issue but a strategic imperative for optimizing human capital and achieving sustainable competitive advantage (Butlewski, 2026).

Ergonomics, derived from the Greek words *ergon* (work) and *nomos* (natural laws), encompasses the systematic study of people at work with the objective of reducing physical and psychological stress, preventing work-related musculoskeletal disorders, and enhancing overall system performance (Karwowski & Zhang, 2021). Research has consistently demonstrated that poor ergonomic conditions contribute to musculoskeletal disorders, visual fatigue, cognitive overload, and decreased job satisfaction. The World Health Organization (2021) has identified work-related musculoskeletal disorders as a leading cause of disability and lost productivity globally.

Workplace productivity in knowledge-intensive environments such as higher education institutions encompasses both quantitative and qualitative dimensions (Shea et al., 2022). Quantitative productivity includes measurable

outputs such as research publications and administrative tasks processed, while qualitative productivity encompasses the quality of teaching, research rigour, and value of contributions to institutional governance.

Yaba College of Technology (YABATECH), established in 1947 as Nigeria's first higher educational institution, provides an appropriate setting for investigating ergonomic practices. The institution employs a diverse workforce of academic and administrative staff across multiple campuses. Recent administrative initiatives, including the ERECT agenda emphasizing staff welfare, progressive stakeholder engagement, and continuous staff development, align with ergonomic principles (Yaba College of Technology, 2023).

Despite these initiatives, systematic assessment of ergonomic practices at YABATECH and their relationship to workplace productivity remains lacking. This study investigates the influence of ergonomic practices on workplace productivity among administrative staff of Yaba College of Technology, addressing four research objectives: assessing awareness levels, examining current practice states, identifying barriers, and proposing improvement strategies.

Literature Review

Ergonomics is defined as the profession that applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance (Bentley et al., 2020). Contemporary ergonomics encompasses physical, cognitive, and organizational domains (Martínez Álvarez et al., 2025).

Ergonomic Practice refers to the systematic application of ergonomic principles in workplace design, equipment selection, work organization, and individual work behaviours. Reiman et al. (2024) argue that ergonomics has frequently been narrowed conceptually to individual health and well-being, consequently being excluded from strategic management.

Workplace Productivity refers to the efficiency and effectiveness with which employees accomplish work tasks and contribute to organizational goals. Martínez Álvarez et al. (2025) documented consistent productivity increases of approximately 2-3% following ergonomic interventions.

THEORETICAL FRAMEWORK

This study is anchored on three complementary theories:

Sociotechnical Systems Theory (Trist & Bamforth, 1951) posits that organizational performance depends on the effective integration of social and technical subsystems. This theory explains that workplace productivity is enhanced when ergonomic practices effectively align work environments, organizational processes, and employees' needs.

Person-Environment Fit Theory posits that employees' satisfaction, well-being, and performance depend on the degree of congruence between individual characteristics and their work environment (Caplan, 1983; Edwards, 2008). The theory explains how ergonomic practices reduce discomfort and enable staff to perform tasks more efficiently.

Job Demands-Resources Model (Bakker & Demerouti, 2007) explains that a balance between job demands and available resources is essential for improving employee well-being. Poor ergonomic practices increase job demands, while ergonomically designed workplaces provide valuable job resources.

Empirical Review

Martínez Álvarez et al. (2025) conducted a systematic review of ergonomic interventions, documenting a shift from purely physical approaches to multicomponent strategies integrating technological and psychosocial elements. Critical implementation factors included worker participation, regular supervision, and continuous monitoring.

Jufri et al. (2022) investigated ergonomic workstation environments among 295 officers, finding acoustic conditions (0.928) and lighting (0.898) to be most crucial factors. Hassan et al. (2024) appraised office ergonomic measures at Federal University of Technology, Minna, finding a positive moderate significant relationship between standard ergonomic measures and staff assessment ($r = 0.561, p < 0.001$).

Olabode et al. (2022) examined organizational ergonomics and academic staff performance at Lagos State University, finding moderate positive relationships between teamwork and participatory design and performance indicators ($R = 0.540$ and 0.535 respectively). Fadipe et al. (2017) assessed ergonomics knowledge among engineering students at Yaba College of Technology, finding 81.20% had no knowledge or awareness of ergonomics.

While studies have examined ergonomic practice in Nigerian universities, no published research has specifically investigated the influence of ergonomic practice on workplace productivity at Yaba College of Technology. Existing Nigerian studies have focused primarily on academic staff or students, with limited attention to administrative staff. This study addresses these gaps by systematically investigating ergonomic practice among administrative staff at YABATECH.

METHODOLOGY

This study adopted a descriptive survey research design, appropriate for collecting data from a sample to describe the current state of ergonomic practice and its relationship with workplace productivity. This design has been effectively used in similar studies in Nigerian higher education institutions (Hassan et al., 2024; Olabode et al., 2022).

The target population comprised 1,900 staff of Yaba College of Technology (www.yabatech.edu.ng). A sample of 110 staff was selected using multistage sampling technique. In the first stage, administrative units were identified; in the second stage, proportionate sampling allocated respondents to each unit; in the final stage, simple random sampling using balloting was adopted to select respondents. A total of 110 questionnaires were administered; 99 were correctly completed and returned, representing a 90.0% response rate.

The instrument was a structured questionnaire titled "Ergonomic Practice and Workplace Productivity Questionnaire" organized into two sections: demographic information and research questions. Validity was ensured through review by supervisor and two experts. Reliability was established through a pilot study with 20 administrative staff from Lagos City Polytechnic, yielding a Cronbach's alpha coefficient of 0.84.

Data were collected physically over four weeks by the researcher and two trained research assistants.

Data were analyzed descriptively using frequency and percentage ratios, while the single hypothesis was tested using chi-square statistics at 0.05 significance level.

RESULTS

Demographic Characteristics

Table 1: Demographic Profile of Respondents

Gender	Respondents	Percentage
Male	54	54.5
Female	45	45.5
Total	99	100

Source: Field Survey, 2026

The table above shows that 54 respondents representing 54.5% of the total respondents were male while 45 representing 45.5% were female. This implies that more males participated in the study than females.

Table 2: Age

Gender	Respondents	Percentage
21-30 years	18	18.2
31-40 years	42	42.4
41-50 years	27	27.3
51 years and above	12	12.1
Total	99	100

Source: *Field Survey, 2026*

The table above shows that 18 respondents representing 18.2% of the total respondents were aged 21-30 years, 42 respondents representing 42.4% were aged 31-40 years, 27 respondents representing 27.3% were aged 41-50 years, while 12 respondents representing 12.1% were aged 51 years and above. This implies that the majority of the respondents (42.4%) were within the 31-40 years age bracket, indicating that most administrative staff are in their active and productive working years.

Table 3: Administrative Unit

Gender	Respondents	Percentage
Registry	23	23.2
Bursary	15	15.2
Student Affairs	32	32.3
Physical Planning	9	9.1
Works and Services	13	13.1
Total	99	100

Source: *Field Survey, 2026*

The table above shows that 23 respondents representing 23.2% of the total respondents were from the Registry, 15 respondents representing 15.2% were from the Bursary, 32 respondents representing 32.3% were from Student Affairs, 9 respondents representing 9.1% were from Physical Planning, while 13 respondents representing 13.1% were from Works and Services. The remaining 7 respondents (7.1%) belonged to other units (ICT and Medical) not shown in the table. This implies that Student Affairs had the highest representation in the study, followed by Registry.

Table 4: Years of Experience

Gender	Respondents	Percentage
Less than 5 years	12	12.1
5-10 years	31	31.3
11-15 years	28	28.3
16-20 years	18	18.2
21 years and above	10	10.1
Total	99	100

Source: *Field Survey, 2026*

The table above shows that 12 respondents representing 12.1% of the total respondents had less than 5 years of work experience, 31 respondents representing 31.3% had 5-10 years, 28 respondents representing 28.3% had 11-15 years, 18 respondents representing 18.2% had 16-20 years, while 10 respondents representing 10.1% had 21 years and above. This implies that the majority of the respondents (31.3%) had between 5 and 10 years of work experience, indicating that most administrative staff possess substantial work experience.

Research Question 1: Level of Awareness of Ergonomic Principles

Table 5: Awareness of Ergonomic Principles

S/N	Statement	SA/A (%)	D/SD (%)
1	Ergonomics is the science of designing work to fit the worker	83.8%	16.2%
2	Poor workstation design can cause musculoskeletal disorders	87.9%	12.1%
3	Proper chair height and back support reduce back pain	88.9%	11.1%
4	Computer screen should be at eye level to prevent strain	88.9%	11.1%
5	Taking regular breaks improves health and productivity	85.8%	14.2%

Source: Field Survey, 2026

The results reveal a generally high level of awareness of ergonomic principles among administrative staff, with agreement levels ranging from 83.8% to 88.9%. The strongest areas of awareness relate to practical applications, with 88.9% agreeing that proper chair height and monitor position reduce back and neck pain.

Research Question 2: Current State of Ergonomic Practice

Table 3: Current State of Ergonomic Practice

S/N	Statement	SA/A (%)	D/SD (%)
6	My office chair provides adequate back support	43.5%	56.6%
7	My computer monitor is positioned at eye level	48.5%	51.5%
8	My office has adequate lighting	52.5%	47.5%
9	My office has good ventilation and comfortable temperature	37.4%	62.6%
10	I take regular breaks to stretch and rest my eyes	40.4%	59.6%

Source: Field Survey, 2026

The current state of ergonomic practice is generally poor, with negative responses outweighing positive ones across all statements. The most critical concerns were ventilation/temperature (62.6% negative) and break compliance (59.6% negative).

Research Question 3: Barriers to Effective Implementation

Table 4: Barriers to Ergonomic Implementation

S/N	Barrier	SA/A (%)	D/SD (%)
11	Lack of knowledge about ergonomics	60.7%	39.4%
12	Inadequate funding	78.8%	21.2%
13	Management does not prioritise ergonomics	68.7%	31.3%
14	Lack of ergonomic furniture	77.8%	22.2%
15	Workload pressure prevents workstation adjustment	62.6%	37.4%

Source: Field Survey, 2026

Inadequate funding (78.8%) and lack of ergonomic furniture (77.8%) emerged as the top barriers, followed by low management priority (68.7%) and workload pressure (62.6%).

Research Question 4: Strategies for Improvement

Table 5: Strategies for Ergonomic Improvement

S/N	Strategy	SA/A (%)	D/SD (%)
16	Provide regular ergonomic training	87.9%	12.1%
17	Purchase ergonomic furniture	88.9%	11.1%
18	Conduct regular workplace assessments	86.9%	13.1%
19	Develop institutional ergonomic policy	85.9%	14.1%
20	Increase funding for equipment maintenance	85.9%	14.1%

Source: Field Survey, 2026

All proposed strategies received strong support (85.9%-88.9%), with purchase of ergonomic furniture receiving the highest endorsement.

Hypothesis Testing

H_0 : There is no significant relationship between ergonomic practice and self-reported productivity among administrative staff.

Table 6: Chi-Square Test Results

Statistic	Value
Calculated Chi-Square (χ^2_{cal})	6.13
Table Chi-Square (χ^2_{tab})	21.03
Degrees of Freedom	12
Significance Level	0.05
Decision	Accept H_0

Since χ^2_{cal} (6.13) < χ^2_{tab} (21.03), the null hypothesis was accepted. There is no statistically significant relationship between ergonomic practice and self-reported productivity among administrative staff at Yaba College of Technology.

DISCUSSION

The findings reveal a sharp disconnect between knowledge and practice. Administrative staff demonstrated high awareness of ergonomic principles (83.8%-88.9%), yet implementation was consistently poor. This aligns with findings by Fadipe et al. (2017), who documented low ergonomics awareness among YABATECH students, though staff awareness appears considerably higher. The gap between knowledge and practice suggests that interventions should move beyond awareness creation to focus on implementation.

The Person-Environment Fit Theory (Edwards, 2008) helps explain this phenomenon: even when individuals understand ergonomic principles, they cannot apply them if the environment does not provide appropriate resources. The Sociotechnical Systems Theory (Trist & Bamforth, 1951) further suggests that workplace productivity depends on the effective integration of social (skills, knowledge) and technical (workstations, equipment) subsystems. At YABATECH, the social subsystem is strong (high awareness), but the technical subsystem is deficient (poor furniture, inadequate lighting).

Inadequate funding (78.8%) and lack of ergonomic furniture (77.8%) emerged as the primary barriers, confirming findings from Hassan et al. (2024) and Jufri et al. (2022). This demonstrates that infrastructure constraints are the most significant obstacles to ergonomic implementation in Nigerian tertiary institutions. The perception that management does not prioritize ergonomics (68.7%) aligns with Reiman et al.'s (2024) observation that employee well-being is rarely integrated into strategic management.

The Job Demands-Resources Model (Bakker & Demerouti, 2007) provides a useful explanation: poor ergonomic practices increase job demands by exposing employees to physical discomfort and fatigue, while ergonomic resources that would reduce these demands are lacking. Workload pressure (62.6%) further compounds the problem by preventing staff from taking breaks or adjusting workstations, increasing job demands while simultaneously limiting access to coping resources.

The chi-square test revealed no statistically significant relationship between ergonomic practice and self-reported productivity. While initially surprising, this finding has several possible explanations:

1. Measurement limitations: Productivity is self-reported and influenced by many factors beyond ergonomics, including workload, supervision, and motivation.
2. Lack of variation: Because ergonomic practice was generally poor across the board, there may not have been enough variation to detect a statistical effect.
3. Time lag: The benefits of good ergonomics often manifest over time in reduced sick leave and musculoskeletal disorders, which a cross-sectional self-report study may not capture.

This finding does not negate the importance of ergonomics but suggests that the relationship is complex and mediated by other factors. As Martínez Álvarez et al. (2025) documented, productivity increases following ergonomic interventions are modest (2-3%) and may require longitudinal designs to detect.

The clear message from this study is that Yaba College of Technology has an aware and experienced workforce that is being undermined by poor infrastructure and low institutional priority. This represents both a health issue and a management issue. Continuing to operate with substandard furniture and ventilation exposes staff to preventable strain and injury.

The strong endorsement of improvement strategies (85.9%-88.9%) indicates that staff have correctly diagnosed the problems and want structural solutions rather than additional awareness campaigns. Support for purchasing ergonomic furniture (88.9%) directly targets the primary barriers identified.

CONCLUSION

This study reveals that administrative staff at Yaba College of Technology demonstrate high awareness of ergonomic principles but face significant institutional barriers to implementation. Inadequate funding, lack of ergonomic furniture, low management priority, and workload pressure prevent staff from applying their knowledge. While no statistically significant relationship was established between ergonomic practice and self-reported productivity, the findings suggest that staff health and comfort remain at risk. The institution must move beyond awareness creation to concrete resource allocation and policy implementation.

RECOMMENDATIONS

Based on the findings, the following recommendations are made:

1. Immediate Procurement: Purchase adjustable ergonomic chairs and desks for all administrative offices, beginning with Student Affairs and Registry units which have the highest staff numbers.
2. Policy Development: Develop and enforce a formal institutional ergonomic policy with mandatory break schedules and workstation standards.
3. Budget Allocation: Allocate a dedicated annual budget for ergonomic equipment purchase and maintenance.

4. Regular Assessment: Conduct quarterly audits of office lighting, ventilation, and furniture conditions.
5. Practical Training: Deliver practical refresher training on workstation setup and break management, addressing the 16.2% who remain unclear on basic ergonomic concepts.

Limitations and Future Research

This study is limited to Yaba College of Technology, restricting generalizability to other Nigerian institutions. It focused only on administrative staff, excluding academic and technical staff who face different ergonomic challenges. Future research should:

1. Conduct comparative studies across public and private tertiary institutions.
2. Examine the impact of specific ergonomic interventions on health outcomes.
3. Investigate management commitment as a determinant of policy implementation.
4. Undertake cost-benefit analyses of ergonomic workplace upgrades.
5. Explore workload pressure as a barrier to ergonomic compliance.

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