NAS Journal of Multidisciplinary Research (NASJMR)

Homepage: https://naspublisher.com/nasjmr/

eISSN: XXXX-XXXX [Online] | ISSN: XXXX-XXXX [Print]

Volume 1 • Issue 1 • Nov-Dec, 2026

A Systematic Review of Office Environment, Ergonomic Design and Secretaries' Job Satisfaction in Colleges of Education in Northeast Nigeria

Mohammed Abubakar Bojude[1], Victoria A. Enemali[2], Umar Inuwa[2], Ahaza Yakubu Tari[1], Naomi John Waya[1]

[1]Department of Office Technology and Management Education, School of Secondary Education (Business), Federal College of Education (Technical), Potiskum, Yobe State, Nigeria

[2]Department of Vocational Education, Faculty of Technology Education, Abubakar Tafawa Balewa University, Bauchi, Nigeria

*Corresponding Author: Mohammed Abubakar Bojude | ORCID: [0000-0000-0000-0000]

Received	Accepted	Published
10.09.2026	10.10.2026	01.11.2026

Copyright © 2026 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).

Abstract

Better physical working conditions are widely expected to raise job satisfaction, yet little of the evidence comes from secretaries. This review asks what the published record says about office environment, ergonomic design and job satisfaction, and whether it holds for secretaries in Nigerian colleges of education. Of 43 empirical studies summarised in a doctoral literature review, 19 met the eligibility criteria. Seventeen reported a positive association, two a conditional one, and none a null result. No included study sampled secretaries, only one was set in Northeast Nigeria, and four of the 18 primary studies described probability or census sampling. A companion survey of 338 secretaries in fifteen colleges found no association for office environment ($\beta = .036$, $p = .511$) and a very small one for

ergonomic design (β = .111, p = .042). Physical conditions seem to matter less for satisfaction than the literature implies.

Keywords: office environment, ergonomic design, job satisfaction, secretaries, systematic review.

1. Introduction

Job satisfaction has a long association with performance and wellbeing in the occupational literature (Petrovski, 2024; Salgado & Moscoso, 2022), and much of the research on it asks what an organisation can actually change. Pay and supervision get most of the attention. The physical workplace gets less, although it is one of the few features a manager can alter without redesigning anyone's job.

Secretaries make a useful test case. Most of the working day is spent at a single desk, typing, reading a screen and handling paper, so the chair, the monitor and the room are there for every hour of work. Mohammadian et al. (2025) assessed 99 office workers and found musculoskeletal symptoms in 80.81% of them, with the chair the most strain-producing part of the workstation. Jaklin et al. (2022) pointed the same way in a systematic review and meta-analysis, which reported an association between workstation design and musculoskeletal disorders. The physical cost of a poorly fitted workstation is, in other words, fairly well documented. That it also brings about a change in employment attitudes is not established and is more debatable.

The theories are not in agreement. According to Herzberg et al. (1959) working condition is a hygiene factor, which means that if a person is satisfied, it means that the working condition is adequate but if he is not satisfied, it is because of the inadequacy of working condition. If that's the way you see it, a good office lifts a complaint, that's about it. Person-environment fit theory requires more. A person's satisfaction should increase with the provision of what they desire (Kristof, 1996; Kristof-Brown et al., 2023). There is a physical route in Ergonomic theory: A poor fit between an individual and a workstation produces strain and discomfort (McCormick & Sanders, 1982). The two out of three accounts assume a link between conditions and satisfaction, with the third a weak link.

The area provides another motivation to peer. The conflict has been in the Northeast region of Nigeria for over 10 years, resulting in damage to public infrastructure such as schools and other education facilities (Agence France-Presse, 2017; Global Coalition to Protect Education from Attack, 2026). There are also limited budgets for maintenance in the public institutions there (Babalola & Olawuyi, 2021; Okonkwo et al., 2021). An indoor environmental quality assessment study was conducted on the Colleges of Education in the region (Mohammed & Ibrahim, 2023). Furniture and offices tend to deteriorate early under such conditions and to be replaced late, so the physical workplace is plausibly a live concern for secretaries in these colleges.

The review has three aims. It collects the empirical evidence on whether office environment and ergonomic design are associated with job satisfaction, and codes the direction of each finding. Second, it evaluates the uniformity of evidence, accurate reporting and the location of the studies. Finally, it asks whether any of it speaks to secretaries in Colleges of Education in Northeast Nigeria, by comparing it with a survey of that group. Every aim is converted into a question.

RQ1. Which direction of association between office environment, ergonomic design and job satisfaction do published studies report?

RQ2. How consistent is that evidence, how well is it reported, and how widely was it sampled?

RQ3. Does the evidence cover secretaries in Colleges of Education in Northeast Nigeria, and does a survey of that group agree with it?

2. Materials and Methods

2.1 Review design and its limits

This is a corpus-based systematic review. Where the design allows, it follows the reporting structure of the PRISMA 2020 statement (Page et al., 2021), and findings are combined in a narrative synthesis (Popay et al., 2006). No protocol was registered, and no new search of bibliographic databases was run. The evidence base is the empirical review written for a doctoral dissertation on office environment, ergonomic design and the performance, health and job satisfaction of secretaries (Abubakar, 2026). The literature search behind that review was purposive, and its strategy was not recorded. For that reason the present review cannot claim to have retrieved the literature exhaustively. The Discussion returns to the consequences.

2.2 Eligibility criteria

A study was eligible if it met four conditions. First, the exposure had to be the physical office or work environment (space, layout, lighting, noise, ventilation, air quality, facilities) or ergonomic design (furniture, workstation arrangement, equipment); social, motivational and training exposures were excluded. Second, the outcome had to be job satisfaction or contentment with work, measured either as an outcome or as a mediator. Satisfaction with the space or layout alone did not count, because it records how people rate the room and not how they rate the job. Third, the study had to be an empirical investigation or a review of empirical studies. Fourth, it had to be reported in English. Every study in the corpus was published between 2020 and 2025.

2.3 Selection and coding

The dissertation summarises 43 empirical studies in structured entries, each giving the aim, design, sample, analysis and findings. In each of the studies included, I recorded one reviewer did the screening, working from the entries and not from the full texts. In four cases (Afolayan et al., 2020; Anekwe et al., 2024; Lokman & Habidin, 2024; Zhuang et al., 2022) another section of the dissertation described the study's outcome differently from its structured entry, and I followed the structured entry as the fuller account. I identified each study that made the cut and recorded the location of the study, who was sampled, the design, the sample size and sampling method. I also indicated if the reliability or validity was reported and the type of analysis used, the type of exposure measured, and the direction of the finding on job satisfaction (as reported by the original authors). Four groups were formed, one for each direction, positive, conditional, null and negative. The entries gave no effect sizes for job satisfaction, so magnitude was not coded.

2.4 Reporting appraisal and synthesis

Full texts were not retrieved, which ruled out a formal risk-of-bias tool. I instead counted five reporting features that inform the distance to a finding can be trusted. These included whether the sample size was stated, whether a probability or census procedure was mentioned, whether the reliability or validity of the instrument was reported, whether regression or structural modelling was mentioned, whether any objective, observational or experimental procedure accompanied the questionnaire. The numbers do not necessarily give an accurate picture of what the original authors did; they are only what has been recorded in the dissertation. There were no effect sizes and measures were not the same, so no point in doing a meta-analysis. I organized the results according to exposure and setting and wrote words to describe the results.

2.5 The survey of secretaries

RQ3 is answered with a cross-sectional survey done for the same dissertation (Abubakar, 2026). It covered every full-time secretary on a permanent appointment in fifteen public Colleges of Education (five federal, ten state) across the six Northeast states of Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe: 417 people in all. Questionnaires went to all 417 and 338 came back, a response rate of 81.06%. Collection ran for ten weeks in the 2025/2026 academic year, and each college had one trained research assistant.

The questionnaire held 13 items on office environment, 14 on ergonomic design and 19 on job satisfaction. Items were adapted from earlier instruments and worded so that a higher score always meant a better condition. Face and content validity were judged by vocational education experts at Abubakar Tafawa Balewa University, Bauchi, and Modibbo Adama University, Yola. A pilot with 39 secretaries from two colleges outside the study area returned Cronbach’s alpha values of .920 for office environment, .881 for ergonomic design and .930 for job satisfaction. Analysis was done in SPSS. Means and standard deviations described the responses, and a mean of 3.00 or above was read as agreement. Simple linear regression tested each predictor against job satisfaction, and multiple linear regression tested the two predictors together, all at the .05 level.

3. Results

3.1 Study selection

Forty-three structured entries were screened, 24 were excluded and 19 were included (Table 1). Outcome accounted for most exclusions: seventeen studies measured performance, productivity or effectiveness and two measured health, and neither group had a job satisfaction outcome. Three studies examined exposures that were neither physical nor ergonomic, and two measured satisfaction with the space rather than the job. Supplementary Table S1 lists every decision.

Table 1. *Screening of structured entries and reasons for exclusion*

Stage or reason	Studies (n)
Structured entries screened	43
Excluded: exposure not physical or ergonomic (social, motivational or training factors)	3
Excluded: outcome was performance, productivity or effectiveness	17
Excluded: outcome was health	2
Excluded: outcome was satisfaction with space or layout, not job satisfaction	2
Included in the synthesis	**19**

Note. No records were identified through database searching for this review. Entries come from the empirical review in the dissertation (Abubakar, 2026).

3.2 Characteristics of included studies

Table 2 lists the nineteen included studies. Fifteen were quantitative surveys, three used mixed methods and one was a review of 46 empirical studies. Five were set in Nigeria and five in other named countries (China, Indonesia twice, Iran and Jordan); the entries for the remaining nine gave no country. Only one of the Nigerian studies was in the Northeast (Haruna & Pongri, 2024). The samples were a mixed lot: university academic and administrative staff, librarians, factory and hospitality workers, bank and ministry employees, and groups drawn from several sectors.

***Table** 2. The nineteen included studies, newest first and alphabetical within each year*

Study	Setting, design and sample	Exposure	Finding for job satisfaction
Dumitriu et al. (2025)	Country not stated. Survey of administrative and academic staff in education, healthcare and corporate settings. Sample size not stated. Regression.	Ergonomics, lighting, air quality, organisational culture	Positive. Staff in ergonomically designed offices reported higher satisfaction.
Haristianti & Raja (2025)	Country not stated. Mixed methods, public and private organisations with biophilic offices. Sample size not stated.	Ergonomic furniture, layout, daylight, greenery, air quality	Positive. These features significantly raised satisfaction.

Study	Setting, design and sample	Exposure	Finding for job satisfaction
Ogunleye et al. (2025)	Nigeria (Lagos, Abuja, Port Harcourt). Survey, N = 278, ministries, banks and private offices. Multiple regression.	Spatial arrangement, furniture position, circulation, accessibility	Positive, indirect. Layout affected comfort, which influenced satisfaction.
Sari et al. (2025)	Indonesia. Garment company, census, N = 32. Path analysis with mediation tests.	Work environment: facilities, managerial support, relationships	Positive. Environment raised satisfaction, which mediated its effect on performance.
Zhang (2025), doctoral dissertation	China. PRISMA review of 55 studies, survey of 1,131 workers in 108 office buildings, and experiments with 636 and 488 participants.	Physical and perceived environmental qualities, including biophilic features	Positive. Satisfaction was shaped by physical and perceived attributes, partly through psychosocial factors.
Anekwe et al. (2024)	Nigeria (Anambra State). Pharmaceutical company, N = 110. Pearson correlation.	Physical and cognitive ergonomics	Conditional. Cognitive ergonomics was linked to satisfaction, physical ergonomics to staff efficiency.
Fadaei et al. (2024)	Iran. University employees, n = 196 of 315, simple random sampling, validated questionnaire. Structural equation modelling.	Layout, posture, equipment, office chair, environmental conditions	Positive. Environmental and ergonomic factors were significantly related to satisfaction.
Gerlitz & Hülsbeck (2024)	Review of 46 empirical studies drawn from 429 papers, 2005 to 2022.	Open-plan, activity-based and single-office concepts	Conditional. Effects on satisfaction depended on office concept, culture and employee fit.
Haruna & Pongri (2024)	Nigeria (Northeast). State universities, academic and non-academic staff. Sample size not stated. Regression.	Office space, lighting, ventilation, noise	Positive. Significant effect on satisfaction and performance.

Study	Setting, design and sample	Exposure	Finding for job satisfaction
Ikonne & Yacob (2024)	Nigeria (South). Librarians in federal and state university libraries, N = 224. Correlation and regression.	Spatial comfort, lighting, ventilation, noise control	Positive. Both spatial comfort and environmental ergonomics were significant.
Irwanti et al. (2024)	Indonesia (Bali). Hospitality employees. Survey with structural equation modelling. Sample size not stated.	Physical and ergonomic design	Positive. Better ergonomics raised wellbeing, including contentment.
Mahasneh et al. (2024)	Jordan. Employees across sectors. Multiple regression. Sample size not stated.	Lighting, noise control, ventilation, ergonomic furniture	Positive. Significant effects on health and satisfaction.
Westover (2024)	Country not stated. Survey, N = 115.	Workload and physical working conditions	Positive, conditional. Favourable conditions buffered stress and raised satisfaction, while heavy workload lowered it.
Voordt & Jensen (2023)	Country not stated. Mixed methods, several industries. Sample size not stated.	Natural light, air quality, ergonomic design, outdoor space	Positive. Healthy workplaces raised satisfaction.
Mișca (2022)	Country not stated. Survey, n = 200 of 500, stratified random sampling, several industries. Structural equation modelling.	Physical, psychological and social conditions, including ergonomic design	Positive. Healthy environments raised satisfaction and productivity.
Taheri et al. (2022)	Country not stated. Survey, N = 500, several sectors. Regression.	Workspace design, lighting, ventilation, noise	Positive. Significant positive effects on satisfaction.
Tamar et al. (2022)	Country not stated. Survey, N = 300, several sectors. Regression.	Layout, lighting, noise, air quality	Positive. Satisfaction rose with better conditions and carried through to performance.

Study	Setting, design and sample	Exposure	Finding for job satisfaction
Zhenjing et al. (2022)	Country not stated. Survey, N = 350, service and manufacturing. Structural equation modelling.	Physical and psychological aspects of the workplace	Positive, mediated. Environment improved performance through satisfaction and commitment.
Olagunju et al. (2020)	Nigeria (Southwest). Tertiary institutions, N = 312, stratified random sampling. Correlation and multiple regression.	Ergonomic furniture, spatial layout	Positive. Significant relationship with satisfaction and productivity.

3.3 Direction and consistency of findings

Seventeen of the nineteen studies found a positive link between the physical environment or ergonomic design and job satisfaction. The other two discovered links that required another factor. Gerlitz and Hülsbeck (2024) found that the effect was dependent on the nature of the office concept: Open-plan offices were seen to benefit collaboration but marginalize concentration. Anekwe et al. (2024) associated cognitive ergonomics with satisfaction and physical ergonomics with staff efficiency. There were no null or negative findings reported in any studies.

The positive pattern was observed regardless of the exposure. Studies of lighting, noise, ventilation and air quality (Haruna & Pongri, 2024; Mahasneh et al., 2024; Taheri et al., 2022; Tamar et al., 2022) all found it, as did studies of ergonomic provision (Fadaei et al., 2024; Olagunju et al., 2020; Irwanti et al., 2024) and of layout and spatial comfort (Ikonne & Yacob, 2024; Ogunleye et al., 2025). Two studies treated satisfaction as a route to performance rather than an end point (Sari et al., 2025; Zhenjing et al., 2022). Four of the five Nigerian studies were positive and one was conditional, and the single Northeast study was positive.

The Corpus provides only a direction and that's all. An effect size was not reported for any entry in the job satisfaction relationship, so it is unknown how large each of these relationships is.

3.4 The reporting quality was good and the studies conducted in various regions

Table 3 reports the features that were reported in the eighteen studies that collected primary data. This review does not include the review by Gerlitz and Hülsbeck (2024). Twelve studies stated their sample size. Four stated a probability or census procedure (Fadaei et al., 2024; Mișca, 2022; Olagunju et al., 2020; Sari et al., 2025), and two stated the reliability or validity of their instrument. Thirteen reported regression or structural modelling. Only two combined questionnaires with observation or on-site assessment (Haristianti & Raja, 2025; Zhang, 2025), and Zhang (2025) alone included an experimental element.

Table 3. *Reporting features and coverage of the eighteen primary-data studies*

Feature	Studies (n)	Share of 18
Sample size stated	12	67%
Probability or census sampling stated	4	22%
Instrument reliability or validity stated	2	11%
Regression or structural modelling reported	13	72%
Observational or on-site measures alongside questionnaire	2	11%
Experimental element	1	6%
Secretaries as the sampled population	0	0%
Set in Northeast Nigeria	1	6%
Set in Nigeria	5	28%

Note. Counts describe what the dissertation recorded about each study and may understate what the original authors reported.

3.5 The survey of secretaries

Secretaries in the survey agreed with all nineteen job satisfaction statements. Item means ranged from 3.42 to 3.70, with a grand mean of 3.55 (SD = 0.66) and item standard deviations between 0.63 and 0.83. Agreement was highest for the institution's commitment to career development (3.70), safety measures (3.65), access to technological resources (3.62) and constructive feedback (3.61). It was lowest for variety in the work (3.42), adequacy of equipment (3.48) and security in the position (3.49).

Table 4 gives the regression results. Office environment had no significant influence on job satisfaction and explained 0.1% of the variance. Ergonomic design had a significant but very small influence, explaining 1.2%. Together the two predictors did not significantly predict job satisfaction, and they explained 1.4%. The ergonomic design coefficient in the joint model reached significance (p = .039) although the model as a whole did not (p = .096), so that coefficient needs cautious reading.

Table 4. *Regression of job satisfaction on office environment and ergonomic design (N = 338)*

Model and predictor	B	SE	β	t	p	R^2	Decision on null
Office environment alone	.019	.030	.036	.658	.511	.001	Retained
Ergonomic design alone	.064	.031	.111	2.044	.042	.012	Rejected

Model and predictor	B	SE	β	t	p	R^2	Decision on null
Joint model: office environment	−.027	.037	−.050	−.735	.463	.014	Retained
Joint model: ergonomic design	.081	.039	.141	2.067	.039	.014	Rejected

Note. Joint model: R = .118, adjusted R^2 = .008, F(2, 335) = 2.355, p = .096. B = unstandardised coefficient; SE = standard error; β = standardised coefficient.

The same survey found much stronger effects on other outcomes. Office environment (β = .466) and ergonomic design (β = .537) each influenced secretaries' performance significantly, and together they explained 31.9% of its variance. Both also influenced health, more modestly (β = .222 and β = .260). The one exception was job satisfaction. The only element that was not part of the physical setting that moved was it.

4. Discussion

There are conflicting views between published studies and the survey. Of a total of 19 studies, 17 showed a correlation between improved physical conditions and greater job satisfaction, none resulted in no association. The one dataset that tracked the satisfaction of secretaries in Northeast Nigerian colleges, however, failed to show any correlation with office environment, nor was there any correlation with ergonomic design. Neither result cancels the other, but they cannot be pooled into a single body of evidence either, and the gap between them is the main finding of this review.

There are three or more possibilities of reading the gap: the data cannot choose which one to use. The first is a theoretical one. Herzberg et al. (1959) would predict that good levels of hygiene would eradicate dissatisfaction but not create satisfaction, and this is what the survey shows. The statements that secretaries agreed with the most had to do with career development, feedback and motivators; it had nothing to do with the office. The line between hygienic and motivational is not clear cut, as the residual effect of ergonomic design is small. The second reading is of the statistical type. Secretaries' ratings were fairly positive, being clustered around agreement on nearly all items. The narrow range makes any regression seem weaker, but may actually be slightly stronger. The third reading is on the topics of measurement and population. The majority of literature reviewed sampled mixed groups and used various scales and in many cases provided no sampling procedure. In institutions, in which one would expect to find low requirements for conditions, secretaries are working at one predetermined work station. It's not known if this would be the same among mixed employees.

However, the all positive record should also be a good reason for caution. There are no effect sizes, no information on how the studies were located and no null results in nineteen studies. I don't know if there were null findings that were not found in the original search, or never reported, but it doesn't make any difference. The worry is compounded by poor reporting. Less than 25% of the primary studies reported a probability or census sampling procedure, two studies only reported the reliability or validity of the

instruments used, and virtually all studies used self-reported cross-sectional data. Bearing that in mind, this is not as strong a case as it sounds.

The reading is quite narrow in scope for the practical. The survey does allow for the spending of money on the chairs, desks and workstation layout - but on the basis of what they do for performance and health. It gives no support to the expectation that better offices will make secretaries more satisfied. In this group, satisfaction seems more closely tied to items such as career development and feedback, which drew the highest agreement, so administrators who want to raise it may do better to start there. All of this rests on one cross-sectional survey and is better treated as a hypothesis to test than as settled guidance.

4.1 Limitations

The review has limits that bear directly on what it can conclude. It did not search bibliographic databases, so it cannot show that its evidence base is complete, and a protocol-driven search might turn up studies, null ones included, that this corpus lacks. One reviewer did the screening and coding, from summaries and not from full texts. The reporting counts therefore describe the summaries, and four studies that were described inconsistently across sections of the source document were resolved in favour of the structured entry. Effect sizes were unavailable, which ruled out meta-analysis and any judgement about magnitude. The corpus covers 2020 to 2025 and English-language reports only. The companion survey is cross-sectional and self-reported, so it cannot establish cause, and it comes from the author’s own doctoral work, which means it is not independent of the review. Both the review and the survey are by the same author so should be interpreted with caution when comparing the two.

4.2 Further research

The first sentence would be redundant. Three additional steps would help to resolve the issue. A registered search across several databases, with effect sizes extracted as bivariate correlations, would show whether the positive record survives and how large the associations are. Studies of secretaries and similar clerical staff in more than one region could test the hygiene account directly by entering motivators such as career development and feedback alongside physical conditions. And before-and-after studies of workstation upgrades, ideally with objective measures of the workplace, could speak to cause, which none of the studies reviewed here could do.

5. Conclusion

Published studies in this corpus consistently link better physical conditions to higher job satisfaction. The evidence is thinly reported, though, rarely drawn from secretaries and almost never from the Northeast. In a survey of 338 secretaries in fifteen Colleges of Education, office environment showed no relationship with satisfaction and ergonomic design a very small one. Until stronger evidence on secretaries exists, colleges are better placed to justify office and workstation improvements by their effects on performance and health, and to look elsewhere for ways to raise satisfaction.

Acknowledgments

The author thanks Dr. (Mrs.) Victoria A. Enemali, Dr. Umar Inuwa and Prof. A. M. Mshelia for supervising the doctoral dissertation from which this review is drawn, the experts who validated the questionnaire, the research assistants, and the secretaries who completed it.

Funding Information

The author's doctoral programme was sponsored by the Federal College of Education (Technical) Potiskum, Yobe State, Nigeria.

Conflict of Interest

The author declares no conflict of interest.

Author Contributions

Conceptualization, methodology, investigation, data collection, data analysis, writing (original draft, review and editing) and project administration were carried out by the author.

Data Availability Statement

The characteristics and coding of every included study are given in Table 2, and the screening decisions for all 43 entries are in Supplementary Table S1. The survey data analysed in Section 3.5 are available from the author on reasonable request.

Ethical Approval

Participation in the companion survey was voluntary, and respondents were assured that their responses would be treated confidentially and used for academic purposes only. The research assistants were trained in the ethics of research with human participants.

Prior Dissemination

This manuscript is derived from the author's doctoral dissertation at Abubakar Tafawa Balewa University, Bauchi (Abubakar, 2026). It is not under consideration by another journal.

Use of AI-Assisted Tools

An AI assistant (Claude, developed by Anthropic) was used to help extract and draft this manuscript from the dissertation text, and again to edit the language of this revised version. The author checked the content against the dissertation and takes responsibility for it.

References

Abubakar, M. B. (2026). *Influence of office environment and ergonomic design on performance, health and job satisfaction of secretaries in colleges of education in Northeast Nigeria* [Doctoral dissertation, Abubakar Tafawa Balewa University, Bauchi].

Afolayan, M., Fadeyi, O., & Nwachukwu, C. (2020). Relationship between workplace design, ergonomics and organizational performance: A case study of West African Examination Council (WAEC).

Agence France-Presse. (2017, September 29). UNICEF warning over school closures in Northeast. *The Guardian Nigeria*. https://guardian.ng/news/unicef-warning-over-school-closures-in-northeast/

Anekwe, I. R., Osarenoma, U. N., & Ifeanyichukwu, N. (2024). Ergonomics and employee performance of pharmaceutical companies in Anambra State, Nigeria. *International Journal of Business and Management Research, 5*(1), 557–573.

Babalola, A., & Olawuyi, D. S. (2021). Advancing environmental education for sustainable development in higher education in Nigeria: Current challenges and future directions. *Sustainability, 13*(19), 10808.

Dumitriu, S., Bocean, C. G., Vărzaru, A. A., Al-Floarei, A. T., Sperdea, N. M., Popescu, F. L., & Băloi, I. C. (2025). The role of the workplace environment in shaping employees' well-being. *Sustainability, 17*(6), 2613.

Fadaei, M., Homayounfar, M., Soufi, M., & Daneshvar, A. (2024). The effect of environmental and ergonomic stimuli of the work environment on employees' behavior by the mediating role of general health. *Iranian Journal of Ergonomics, 10*(1), 36–45.

Gerlitz, A., & Hülsbeck, M. (2024). The productivity tax of new office concepts: A comparative review of open-plan offices, activity-based working and single-office concepts. *Management Review Quarterly, 74*(2), 745–775.

Global Coalition to Protect Education from Attack. (2026). *Education under attack 2026: Nigeria*. https://protectingeducation.org/wp-content/uploads/eua_2026_nigeria.pdf

Haristianti, V., & Raja, T. M. (2025). Implementation of a biophilic design approach in office space design as an attempt to increase employee well-being. *KnE Social Sciences, 10*(2), 32–39. https://doi.org/10.18502/kss.v10i2.1787

Haruna, A., & Pongri, J. (2024). Impact of work environment on job satisfaction and employee performance in selected state universities in North East, Nigeria. *International Journal of Organizational Studies, 15*(3), 234–248.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work* (2nd ed.). John Wiley & Sons.

Ikonne, C. N., & Yacob, H. (2024). Influence of spatial comfort and environmental workplace ergonomics on job satisfaction of librarians in the federal and state university libraries in Southern Nigeria. *Open Access Library Journal, 1*(6), 1–10.

Irwanti, N. K. D., Adiatmika, I. P. G., Muliarta, I. M., & Abdullah, D. (2024). The role of ergonomic interventions in enhancing employee well-being: A case study from the hospitality industry. *Jurnal Info Kesehatan, 22*(4), 735–746.

Jaklin, K., Perica, E., & Benke, G. (2022). The association between workstation design and musculoskeletal disorders: A systematic review and meta-analysis. *Applied Ergonomics, 99*, 103617.

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology, 49*(1), 1–49.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2023). Person–environment fit: A meta-analytic review and future directions. *Annual Review of Organizational Psychology and Organizational Behavior, 10*, 143–174.

Lokman, N. I., & Habidin, N. F. (2024). Relationship between ergonomic factors and employee performance among employees at Proton Holdings Berhad. *International Journal of Academic Research in Business and Social Sciences, 14*(1).

Mahasneh, J., Ali, H., & Saad, R. A. (2024). An analysis of the workplace environment and its impact on employee health, satisfaction and productivity in Jordan. *Future Cities and Environment*.

McCormick, E. J., & Sanders, M. S. (1982). *Human factors in engineering and design* (5th ed.). McGraw-Hill.

Mișca, R. (2022). The impact of a healthy work environment on employee performance. *BRAND. Broad Research in Accounting, Negotiation, and Distribution*.

Mohammadian, M., Mollahoseini, S., & Naghibzadeh-Tahami, A. (2025). Musculoskeletal disorders among office workers: Prevalence, ergonomic risk factors, and their interrelationships. *Scientific Reports, 15*, Article 45425. https://doi.org/10.1038/s41598-025-30155-6

Mohammed, A., & Ibrahim, S. (2023). Indoor environmental quality assessment in Northeast Nigerian Colleges of Education: Implications for staff health and performance. *Journal of Building Engineering, 66*, 105474.

Ogunleye, V., Imafidon, H. O., Ajayi, O. O., & Daramola, S. A. (2025). Workspace layouts and occupant comfort in Nigerian offices: A quantitative assessment toward sustainable design. *African Journal of Environmental Sciences and Renewable Energy, 18*(1), 217–234.

Okonkwo, C., Aliyu, M., & Mohammed, B. (2021). Budget constraints and ergonomic quality in Nigerian educational institutions: A three-year longitudinal study. *International Journal of Educational Management, 35*(4), 578–593.

Olagunju, O. C., Adepoju, A. O., & Akinbode, M. O. (2020). Effects of office layout and ergonomics on employees' job satisfaction and productivity in selected tertiary institutions in Southwestern Nigeria. *African Journal of Management and Business Research, 12*(3), 45–56.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Petrovski, D. (2024). Meta-analysis: Job satisfaction and job performance moderated by national economic development and performance scales. *Journal of Organizational Psychology, 24*(1). https://doi.org/10.33423/jop.v24i1.6919

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., ... Duffy, S. (2006). *Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme*. Lancaster University.

Salgado, J. F., & Moscoso, S. (2022). Cross-cultural evidence of the relationship between subjective well-being and job performance: A meta-analysis. *Journal of Work and Organizational Psychology, 38*(1), 27–42. https://doi.org/10.5093/jwop2022a3

Sari, N. P. M. P., Mujiati, N. W., & Suwandana, I. G. M. (2025). The role of job satisfaction in mediating the influence of work environment on employee performance at Freestyle Konveksi. *International Journal of Management Research and Economics, 2*(4), 410–427.

Taheri, R., Miah, M., & Kamaruzzaman, M. (2022). Impact of working environment on job satisfaction. *European Journal of Business and Management Research*.

Tamar, M., Alfitra, N. F., Aras, F. U., Rahmat, M. I., Fatihah, N., Albar, M., ... Sunarsi, D. (2022). Relationship between employee job satisfaction and the work environment. In *Interdisciplinary Conference of Psychology, Health and Social Science (ICPHS 2021)* (pp. 48–51). Atlantis Press.

Voordt, T. V. D., & Jensen, P. A. (2023). The impact of healthy workplaces on employee satisfaction, productivity and costs. *Journal of Corporate Real Estate, 25*(1), 29–49.

Westover, J. (2024). The influence of workload and work environment on employee job satisfaction. *Human Capital Leadership Review*.

Zhang, X. (2025). *Perceived environmental qualities and occupants' mental health, cognitive performance and satisfaction at workplaces in China: Survey and experiment* [Doctoral dissertation, University of Liverpool].

Zhenjing, G., Chupradit, S., Ku, K. Y., Nassani, A. A., & Haffar, M. (2022). Impact of employees' workplace environment on employees' performance: A multi-mediation model. *Frontiers in Public Health, 10*, 890400.

Zhuang, D., Wang, T., Gan, V. J., Zhao, X., Yang, Y., & Shi, X. (2022). Supervised learning-based assessment of office layout satisfaction in academic buildings. *Building and Environment, 216*, 109032.