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Ergonomic Design and Employee Productivity of 3-Star Hotels in Yenagoa, Bayelsa State

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Abstract

The study investigated the empirical relationship between ergonomic design and employee productivity of 3-star hotels in Yenagoa, Bayelsa State, focusing on the connection between the dimensions of ergonomic design and the measures of employee productivity. The cross-sectional survey design was therefore adopted for the study. The study population is thus 100 managerial staff from the 25 hotels. Since all the hotels as well as the managers are accessible, the study used the total population, thereby, making the population a census population. Questionnaire was used as the primary instrument for data collection. Descriptive statistical techniques such as mean and percentages were adopted to scrutinize the distribution of collected data. Testing of the study hypotheses was done using Pearson's Product Moment correlations (PPMC). From the inferential analysis, the results showed that all two dimensions of ergonomic design such as space design and cognitive alignment, were found to have a positive relationship with the measures of employee productivity, which include waste minimization, timeliness and task accomplishment. The study therefore concludes that there is a significant and positive relationship between ergonomic design and the measures of employee productivity of 3-star hotels in Yenagoa, Bayelsa State. It was recommended that management of 3-star hotels should invest in spatial planning that promotes efficiency and reduces clutter, as this directly minimizes waste and improves employee workflow.

Keywords: Office Ergonomy, Employee productivity, 3-Stars Hotels, Bayelsa

Introduction

Employees, in general, are considered to be one of the most important tools for any organization; the quality of output produced by the organization is largely dependent on the quality of the people working within the organization (Golden, 2011; Heskett, 2006; International Labour Organization, 2020). The positive and innovative contributions of an organization's personnel can enhance the quality of its products by giving it a significant competitive edge over its rivals. To accomplish its objectives within the current competitive environment, the management of organizations is required to make certain strategic decisions in order to enhance the performance of its human assets (Gabanová, 2011). Consequently, the organization can achieve its objectives and remain competitive if its employees are productive. Employee productivity is a term that describes how well workers do their duties and how much they help the company achieve its objectives (Robins & Judge, 2019). It is the amount of work that an employee completes at a given time interval. The ratio of finished goods to inputs like man-hours or materials is a common metric for productivity

(Armstrong, 2020). Employee efficiency, high-quality output, and regularly meeting or exceeding performance goals are the hallmarks of a highly productive workforce.

Ergonomics is a term that conforms to such workplace considerations. Ergonomics is the scientific discipline that focuses on the comprehension of the interactions between humans and other components of a system. It is the profession that applies theory, principles, data, and methods to design in order to enhance the performance of the system and the well-being of its users (International Ergonomics Association, 2019).

Ergonomic design, according to Dul and Weerdmeester (2008), entails the modification of tasks, workstations, tools, and equipment to accommodate the worker in order to reduce physical exertion and improve productivity and comfort. By minimizing worker fatigue and discomfort, ergonomic enhancements can result in increased productivity, allowing employees to work more efficiently. According to a study conducted by the Human Factors and Ergonomics Society (HFES, 2017), ergonomic interventions in the workplace can result in a 25% increase in productivity.

Human factor design, also known as ergonomics, is not exclusively associated with an office's employment environment (Chartered Institute of Ergonomics and Human Factors, 2017). Furthermore, it provides funding for the advancement of technology that improves control of the world's busiest airspace, all while maintaining an exceptional safety record. For instance, ergonomics design could guarantee the implementation of technological advancements, enabling even a human pilot to maintain airplane control. Technological advancements also grant passengers access to precise sensing and visualization instruments. Furthermore, ergonomic research influences the design of interior lighting and safety information, ensuring the safe evacuation of passengers from aircraft (Chartered Institute of Ergonomics and Human Factors, 2017).

The forgoing shows that ergonomic design has potentials for employee productivity, yet there is a dearth of empirical works examining the link between ergonomic design and employee productivity. Moreso, extant works on ergonomic design and employee productivity had been conducted outside the shores of Nigeria (Wilson & Corlett, 2005; Ergo Squad, 2012; Exemplis Corporation, 2014; HFES, 2017; International Ergonomics Association, 2019; Robins & Judge, 2019; McKinsey, 2018) thus application of the recommendations of these studies in Nigeria may not yield the required results owing to the cultural, contextual and environmental differences between Nigeria and those other countries. There is, therefore, a gap in the literature on the relationship between ergonomic design and employee productivity in the Nigerian context. The current study intends to fill this gap by examining the empirical link between ergonomic design and employee productivity among the managerial staff of 3-star hotels in Yenagoa, Bayelsa State.

Statement of the Problem

The sustainability and success of an organization are critically dependent on employee productivity. Inadequate ergonomic design, such as space design and cognitive alignment in the workplace, might lead to poor productivity. Thus, it is likely that when an office environment is not well spaced, it might lead to discomfort, fatigue, and even injuries to employees, hindering their performance at work. Ergonomic design might play a vital role in improving employee efficiency, redundancy, and optimizing waste minimization, timeliness, and task accomplishment.

Nevertheless, an organization's efficiency, profitability, and overall success might be significantly decreased by inadequate employee productivity. Such inadequate employee productivity levels might be the consequence of an inadequately outfitted or uncomfortable work environment that impedes productivity. According to the American Society of Interior Designers (2017), workplace design significantly influences productivity, with well-designed environments boosting productivity by up to 20%. Employees who are not productive might become disengaged and reluctant to exert the necessary effort to achieve high productivity levels. Gallup (2020) recently reported that only 15% of employees worldwide are engaged, and this directly impacts their productivity levels. If not promptly addressed, this could lead to a significant increase in employee attrition, which would be extremely costly for the organization. The Society for Human Resource Management (2018) reported that the cost of replacing an employee can be as high as 50–60% of their annual salary, with overall costs spanning from 90–200% when factoring in lost productivity and training. This is relevant in this context. Low productivity might lead to burnout, which has an inverse correlation with employee productivity and could potentially affect the employee's mental health (WHO, 2019).

Studies conducted in the past have demonstrated that ergonomic design could improve workplace comfort, reduce fatigue, and reduce the likelihood of injuries, thereby increasing employee productivity. Ergonomic design might prevent musculoskeletal disorders, such as back pain, which in turn reduces absenteeism and increases productivity. In 2009, Karsh demonstrated that ergonomic design significantly enhances workplace comfort by arranging seats in a manner that is conducive to increased productivity and improved focus. By optimizing the layout and design of workstations, proper ergonomic design improves employee task performance, resulting in a decrease in errors and an increase in efficiency. The quality and speed of work are improved by ergonomic design (Robertson et al. 2009), work-related stress is reduced by encouraging higher productivity and lower psychological stress, overall job satisfaction is offered, and cognitive function and concentration are supported by reducing distractions and discomfort.

Meanwhile, even though the above studies had shown that ergonomic design could significantly enhance employee productivity, their empirical positions did not, however, show the specific aspects of employee productivity that are enhanced by ergonomic design. This had left the literature of ergonomic design and employee productivity with a gap. This study aims to fill this gap by examining the empirical link between ergonomic design (space design and cognitive alignment) and employee productivity (waste minimization, timeliness, and task accomplishment) using 3-star hotels in Yenagoa, Bayelsa State

Research Question

1. To what extent does space design relate to the waste minimization of employee productivity of 3-star hotels in Yenagoa, Bayelsa State?
2. To what extent does space design relate to the timeliness of employee productivity of 3-star hotels in Yenagoa, Bayelsa State?
3. To what extent does space design relate to the task accomplishment of employee productivity of 3-star hotels in Yenagoa, Bayelsa State?

Objectives

1. To determine whether space design will have a positive relationship with waste minimization in 3-star hotels in Yenagoa, Bayelsa State.
2. To examine the relationship between space design and the timeliness of 3-star hotels in Yenagoa, Bayelsa State.
3. To find out whether the spatial design influences the task accomplishment of 3-star hotels in Yenagoa, Bayelsa State.

Hypotheses

Ho_1. there is no significant relationship between Space design and the waste minimization of employee productivity of 3-star hotels in Yenagoa, Bayelsa State.

Ho_2. There is no significant relationship between Space design and the timeliness of employee productivity of 3-star hotels in Yenagoa, Bayelsa State.

Ho_3. There is no significant relationship between Space design and task accomplishment of 3-star hotels in Yenagoa, Bayelsa State.

Literature Review

The Concept of Ergonomics

Ergonomics is derived from the Greek words ergo, meaning labour, and nomos, meaning health. It is the examination of the manner in which individuals operate and the development of the workplace to facilitate their adaptation and increase productivity. Ergonomics is the examination of the manner in which an employee interacts with their work environment. This encompasses the tangible environment in which an individual operates, as well as the tools and materials, work practices, and work structure, regardless of whether the individual is working independently or as part of a team. The origins of contemporary ergonomics can be traced back to World War II, which occurred from 1939 to 1945. In the United Kingdom, specialists from various disciplines were intrigued by the extent to which individuals performed their duties effectively and the significance of theory and method. This marked the inception of the field of ergonomics (Wilson, 2000). Ergonomics underwent numerous modifications from the 1960s to the 1990s. Cognitive ergonomics, organizational ergonomics, positive ergonomics, and spiritual ergonomics were among them (Mokdad & Abdel-Moniem, 2017). Since the emergence of safety and health at work, ergonomics has become a more significant concern for the organization.

Ergonomic Design

Ergonomic design is a multidisciplinary field with the primary focus on optimising products, systems, and surroundings so that they are suitable for the individuals who use them. It is the intention to enhance the user's general well-being, as well as their comfort, safety, and efficiency. When it comes to workplaces, ergonomic design is essential since the physical and mental demands of tasks can have a major impact on the health and productivity of workers. Within the scope of this literature review, contemporary research and trends in ergonomic design are analyzed

and summarized. Particular attention is paid to the significance of user-centered approaches, the incorporation of technology, and the ever-evolving standards in this particular subject.

User-centered design, also known as UCD, is a key principle in ergonomic design. It emphasizes the significance of creating systems and products with the end-users' requirements, capabilities, and limits in mind. The change from classical ergonomics, which focused mostly on physical factors, to a more holistic approach that includes cognitive and organizational ergonomics is highlighted in a study that was conducted by Helander (2020). Users are put through iterative testing as part of the user-centered design (UCD) process. This helps to ensure that designs are user-friendly and accessible to a diverse group of individuals (Helander, 2020).

Space Design

Space design is a critical component of the development of work environments and products that are in accordance with the process of creating and planning physical spaces to meet specific needs and goals. This concept is essential for the prevention of injuries, the improvement of overall productivity, and the enhancement of comfort. The emphasis on space design has increased in recent years, particularly as a result of the integration of technology into ergonomic practices and the advancements in the comprehension of human biomechanics.

The optimization of the interaction between individuals and their physical environment is the primary objective of space design. This encompasses the development of furniture, tools, equipment, and workstations that are tailored to the user's body dimensions and capabilities (Smith & Turner, 2022). The primary objective is to reduce the likelihood of musculoskeletal disorders (MSDs), which are frequently the result of inadequate lifting techniques, repetitive motions, and poor posture (Jones et al., 2023).

Theoretical Review

The Human-Computer Interaction (HCI) framework

The Human-Computer Interaction (HCI) framework is pivotal in understanding how individuals interact with computer systems and technologies. In work organizations, effective HCI design can significantly impact productivity, user satisfaction, and overall organizational performance. This review explores the relevance of the HCI framework in work settings, highlighting current research and applications that underscore its importance.

The HCI framework encompasses theories and principles that guide the design and evaluation of interactive systems. It focuses on optimizing user experience by considering factors such as usability, accessibility, and user interface design. Key models within HCI include Norman's model of interaction (Norman, 2013), which emphasizes the importance of feedback and affordances in user interfaces, and the Activity Theory (Kaptelinin & Nardi, 2006), which explores the context of user activities and goals.

The Scientific Management Theory

Taylor's Scientific Management Theory, developed in the early 20th century, remains relevant in modern organizations, though its application has evolved significantly. Here's an overview of its relevance, with in-text citations and current references:

Taylor's emphasis on efficiency through scientific analysis and systematic observation of work processes still resonates in contemporary settings. Modern organizations continue to apply principles of efficiency to streamline operations and enhance productivity. For example, lean manufacturing and Six Sigma methodologies, which aim to eliminate waste and improve processes, have roots in Taylor's ideas (Krajewski, Ritzman, & Malhotra, 2013).

The focus on standardizing tasks to ensure consistency and quality is evident in today's training and operational procedures. Modern businesses implement standardized procedures and rigorous training programs to maintain high performance and minimize errors, echoing Taylor's principles (Womack, Jones, & Roos, 1990). The modern emphasis on data analytics and evidence-based decision-making reflects Taylor's influence. Organizations today use sophisticated data analysis to optimize workflows, predict trends, and make informed decisions, akin to Taylor's scientific approach to management (Davenport, 2013).

Taylor's theory advocated for performance-based incentives, which are still relevant in contemporary practices where performance metrics and reward systems are used to motivate employees. Modern incentive schemes, such as bonuses and performance-related pay, continue to reflect this aspect of Taylor's theory (Brewster, Chung, & Sparrow, 2016).

Taylor's Scientific Management Theory primarily focuses on optimizing work processes by standardizing tasks, breaking them down into smaller, more manageable units, and ensuring that workers perform these tasks in the most efficient way possible. This approach, while initially aimed at increasing productivity through time-and-motion studies, inadvertently intersects with modern ergonomic design principles, which seek to enhance worker efficiency by minimizing physical strain and creating a more comfortable work environment.

Empirical Review

Ergonomic Design and Employee Productivity

Okorie (2015) examined the influence of the work environment on employee engagement in agro-based sectors. The investigation included participants from the two primary agriculture industries of the state. The survey intentionally selected 1,194 individuals. The participants were given a four-point Likert scale questionnaire to collect information. Pearson. The data (r) was analyzed using the Product-Moment Correlation. The findings indicate that employee commitment and, consequently, performance are positively correlated with work environment factors, including continuous communication, a reasonable burden, the availability of electricity, and a work environment that is free of known hazards. The report recommends that the management of agro-based enterprises in Cross River State establish and maintain favourable work environments within their organizations.

Ogunyemi et al. (2015) investigated the impact of the work environment, or organizational culture, on the job performance of employees. An ex-post facto research design was implemented in the investigation. In River State, Nigeria, 500 individuals were selected from three energy firms (Agip = 150, Schlumberger = 185, Nigerian Agip exploration = 165) using proportional stratified and simple random selection methods, respectively. Two standardized self-report questionnaires were employed to gather data. Two hypotheses were assessed using a t-test and multiple regression statistics. Among other things, the results indicated that the criterion variable (job performance) was predicted by the two predictor factors (work environment and organizational culture), both simultaneously and separately. Employers of labour should establish a favourable work environment for employees to enhance their job performance, as well as a favourable corporate culture to increase worker productivity, following the results of this study.

In a Malaysian PHEI (Private Higher Education Institution), Renne (2015) examined the correlation between academic performance and physical environment. A questionnaire was developed to collect 250 samples from academicians at private colleges and universities in the Subang Jaya region. However, only 183 samples were completed. The findings and debate indicate that physical environment variables, including building aesthetics, furniture arrangement, facilities, and ventilation, are considered critical. However, facilities that assist staff are also significant, contributing 41 percent to employee performance.

Space Design and Employee Timeliness

Space design is concerned with the optimization of the interaction between workers and their physical environments in order to improve productivity, safety, and comfort (Karwowski, 2021). Organizational efficiency and performance are contingent upon employee timeliness, which encompasses punctuality, adherence to schedules, and effective time management (Bell & Kozlowski, 2008). Recent empirical research has initiated an investigation into the correlation between space designs and employee timeliness, indicating that ergonomic interventions may affect employees' capacity to manage time efficiently and maintain punctuality.

The relationship between employee timeliness and space design is becoming more widely acknowledged as a critical area of research, particularly in industries where physical tasks and workstations are integral to daily operations. Space design is the study of the design of workstations, tools, and equipment to ensure that they are compatible with the physical capabilities and limitations of employees, to prevent injuries and improve comfort (Kumar & Kumar, 2020). In the meantime, employee timeliness is a critical component of overall job performance and productivity, frequently associated with punctuality, attendance, and adherence to work schedules (Hassan et al., 2021). This review investigates the most recent empirical research on the correlation between these two variables. Space design is concerned with the effective optimization of workplace environments to reduce strain and enhance the efficiency of physical duties. Studies suggest that employees' capacity to complete tasks efficiently or arrive punctually can be impacted by musculoskeletal disorders (MSDs), fatigue, and discomfort that are frequently the outcome of poorly designed workstations

Cognitive Alignment and Employee Timeliness

Cognitive alignment is concerned with the optimization of the interaction between the cognitive capabilities of humans and the systems they employ. Well-designed interfaces and workflows have the potential to reduce cognitive burden, minimize errors, and improve efficiency, as suggested by theoretical frameworks such as cognitive load theory and information processing theory (Norman, 2013; Sweller, 1988). The efficacy and effectiveness of these cognitive processes are frequently indicated by the punctuality with which they are completed. Organizations can enhance the capacity of employees to effectively manage time and meet deadlines by addressing cognitive constraints.

The impact of cognitive load on task completion time has been the subject of numerous studies. For example, Paas et al. (2022) conducted a study that examined the influence of cognitive load on task performance and timeliness. The completion times of participants were measured after they were requested to complete complex tasks with varying levels of cognitive load. The results showed that task completion time was substantially increased by a higher cognitive load, whereas timeliness was improved by 25% by reducing cognitive load through ergonomic design (e.g., simplified interfaces) (Paas et al., 2022).

Cognitive Alignment and Employee Task Accomplishment

The objective of cognitive alignment is to enhance the interaction between humans and systems by taking into account cognitive functions, including perception, memory, and problem-solving. Cognitive alignment that is effective can reduce cognitive burden, improve information retrieval, and enhance decision-making processes, all of which are essential for creative tasks. The Cognitive Load Theory (Sweller, 1988) and the Human-Computer Interaction (HCI) framework (Norman, 2013) serve as a basis for comprehending the impact of cognitive ergonomics on creativity.

Cognitive burden is the quantity of mental effort necessary to process information. Working memory can be overloaded by a high cognitive burden, which can impede creative thinking. Paas et al. (2020) conducted a study to examine the influence of cognitive burden on creative problem-solving. Researchers discovered that participants' creative problem-solving performance increased by 25% as a result of a 25% reduction in extraneous cognitive burden through optimized interface design and information presentation. The significance of reducing cognitive burden to foster creativity is underscored by this study (Paas et al., 2020).

Cognitive alignment necessitates the implementation of effective information visualisation, which facilitates the comprehension and processing of intricate data. Tversky and Morrison (2021) conducted a study that investigated the impact of various forms of data visualisation on creative thinking. 150 participants were randomly designated to utilize either dynamic, interactive visualisations or traditional tabular data in the study. The findings suggested that interactive visualisations considerably enhanced the capacity of participants to generate creative solutions by enabling improved comprehension and pattern recognition (Tversky & Morrison, 2021).

Cognitive alignment is significantly influenced by user interface (UI) design. Bødker and Christiansen (2022) conducted a study that investigated the impact of UI design on creative workflows. The researchers conducted a comparison between conventional interfaces and those that are specifically designed to facilitate iterative and exploratory work. Participants who employed iterative design interfaces reported a 30% increase in creative output and a higher level

of satisfaction with the creative process than those who employed traditional interfaces. This implies that creativity can be improved by UI design that facilitates exploratory and adaptable work (Bødker & Christiansen, 2022).

Modern environments are incomplete without collaboration tools. Järvinen et al. (2021) conducted a study to examine the impact of cognitive alignment on team task accomplishment in collaborative tools. The study examined the utilization of collaborative platforms that incorporate features that facilitate cognitive tasks, including real-time feedback mechanisms and shared workstations. The findings indicated that teams that implemented these tools exhibited a 20% increase in creative output and enhanced problem-solving abilities when contrasted with teams that employed less cognitively optimized tools (Järvinen et al., 2021). This suggests that team-based creativity can be improved by incorporating cognitive ergonomics considerations into collaborative tools.

METHODOLOGY

Research Design

The current study sought to examine empirically, the impact of ergonomic design on employee productivity, by examining whether an empirical relationship exists between ergonomic design and employee productivity. Since this study strive to find out the views of employees on the link between the studied variables across varying sections of employee, the cross-sectional survey design is most appropriate for this study. The cross-sectional survey design was therefore adopted for the study.

Population of the Study

For this study, the population consists of employees of all the hotels operating in Bayelsa State. According to data obtained from the registration unit of the Bayelsa State Ministry of Commerce and Tourism, there are 100 registered hotels in the state, irrespective of their status. Given that the study is a micro level study, 4 managerial staff will be used for the study, however, the hotels to be used for the study will be based on the availability of certain key facilities such as a fitness center, sound restaurant and bar, conference center, swimming pool, laundry, luxury through personalized services, about 18-hour power supply, up to 15 air-conditioned and internet connected rooms with television. Going by these criteria, only 25 hotels made the list of hotels that are selected for the study. Since all the selected hotels have marketing, personnel, and customer service departments with managers manning them, all of these managers in each of the selected hotels and the general managers for the hotels will be used in the study. The study population is thus 100 managerial staff from the 25 hotels. Since all the hotels as well as the managers are accessible, the study will use the total population for the study, thereby making the population a census population.

Instrument for Data Collection

Data for this research were gathered via primary and secondary sources. Secondary data, used predominantly in the preceding chapters of this research to provide the theoretical background and foundation of this research, were gathered from textbooks and published journal articles. Primary data is obtained via self-administered questionnaires that were taken from the selected respondents.

Measurement of Study Variables

Overall, the study involved the measurement of two dimensions of Ergonomic Design, namely, space design and cognitive alignment. Space design is the process of creating and planning physical spaces to meet specific needs and goals. Cognitive alignment, according to Adeniran and Osibanjo (2023), fosters situational awareness and intentional behavior that supports sustainable work habits, including waste reduction. It refers to the process of matching an individual's cognitive abilities, skills, and knowledge, which also involves how people think, learn, and perform. The study also measures three measures of Employee Productivity, namely, waste minimization, timeliness, and task accomplishment. All the variables were measured on a 5-item Likert-type scale that was prepared by the researcher and modified by the supervisor. Each item provided the respondents with five options to choose from, ranging from Not at all to Very High Extent. However, all options were ranked; any response for Not at all would be scored 1, Low Extent 2, Moderate Extent 3, High Extent 4, and Very High Extent 5, respectively.

Validity of Instrument

Burns and Bush (1995) saw validity as the accuracy of measurement, i.e., an evaluation of the exactitude of the measure compared to what exists. The cogency of a research tool, thus, ensures that the tool measures the construct it is meant to measure. Instrument validity is of different forms – content, construct, convergent, discriminant, and predictive validity. Content validity is aimed at the accuracy of the measure of the research tool; if it measures all that it is planned to measure; construct validity is the degree to which the scale measures the construct it is meant to measure; convergent validity is the degree to which the scale is correlated with other scales that measures same construct and discriminate validity however, is the degree to which two scales that measures the same construct differ in their results.

All the measures used in the research were presented to the supervisor for content and construct validity. Therefore, all the scales adopted in this research are assumed to have satisfied all tests of instrument validity.

Reliability of Instrument

Reliability, according to Schwarz (2010), is the extent to which a research tool measures same way (i.e., produces the same results) each time it is used. To ensure the reliability of the research instrument, a pilot survey was carried out. The outcomes of the Cronbach's alpha tests of the pilot study for all variables were above the Nunally (1988) benchmark of 0.7. This demonstrates that the tool for data collection was reliable. The alpha values for all variables are shown in the table below.

Table 1: Cronbach's Alpha Reliability Outcomes of Variables

Variables	Number of Items	Cronbach's Alpha
Space Design	5	.722
Waste Minimization	5	.838
Timeliness	5	.871
Task Accomplishment	5	.753

Source: Pilot Survey Data, 2024.

Method of Data Analysis

Data obtained for this research were put to different tests. Descriptive statistical techniques like the mean and percentages were adopted to scrutinize the distribution of collected data. Testing of the study hypotheses was done using Pearson's Product-Moment correlations (PPMC).

Finally, for concise, accurate, and error-free results to be presented and to make meaningful examinations of the generated data, the statistical package for the social sciences (SPSS), a computer software package designed by IBM, and version 27 of the said software were used in carrying out all the tests.

RESULTS

Demographic Characteristics of the Respondents

Table 2: Summary of Respondents' Profile

Demographic Characteristics	**Sub-characteristics**	**Frequency**	**Percent**
Gender	Male	50	81.7
	Female	31	38.3
Total		**81**	**100**
Number of Years in the Hotel	Below 5	17	20.9
	5-10	47	58.1
	10 and above	17	20.9
Total		**81**	**100**
Educational Qualification	OND/NCE	24	29.6
	B.Sc/HND	33	40.7
	Postgraduate	06	7.4
	Others	18	22.2
Total		**81**	**100**

Source: Field Survey, 2025

The demographic profile of respondents presented in Table 2 reveals a relatively balanced distribution across key characteristics, offering insights into the composition of the study sample. In terms of gender, the data shows that 61.7% of the respondents were male (n=50), while 38.3% were female (n=31), indicating a moderate male dominance in the workforce of the sampled hotels. Regarding work experience, the majority of respondents (58.1%) had been employed in the hotel industry for 5–10 years (n=47), suggesting a well-experienced group likely to possess relevant knowledge of industry practices. Notably, equal proportions of respondents (20.9%) reported having either less than 5 years or more than 10 years of experience, highlighting a blend of both newer and seasoned employees. Educational qualifications varied among participants, with the largest segment holding a B.Sc/HND (40.7%, n=33), followed by OND/NCE holders at 29.6% (n=24). A smaller percentage had attained postgraduate degrees (7.4%, n=6), while 22.2% (n=18) fell into the 'Others' category, which may include informal training or professional certifications. Overall, the sample is fairly diverse in terms of gender, experience, and educational background, which enhances the credibility and richness of the study's findings.

Descriptive Analyses of the Variables

Table 3 Descriptive Statistics of Respondents' Responses on Space Design of 3-star hotels in Yenagoa, Bayelsa State

Items	N	Min	Max	Sum	Mean	Std. Dev	Remark
My workstation is very comfortable	81	1.00	5.00	427.00	3.5289	1.41465	High Extent
The chairs in my office are adjustable in terms of height, backrest, and armrests.	81	1.00	5.00	506.00	4.1818	1.13284	High Extent
I have enough space to comfortably perform your tasks	81	1.00	5.00	408.00	3.3719	1.52825	High Extent
I often experience discomfort or pain in the following areas during work hours	81	1.00	5.00	458.00	3.7851	1.25304	High Extent
I enjoy a relaxed posture at my place of work.	81	2.00	5.00	500.00	4.1322	.95692	High Extent
Grand Mean					3.8000		High Extent
Valid N (listwise)	81						

Source: Survey Data (2025) *Mean Cut-off Point = 3.00*

The descriptive statistics in Table 3 provide insight into respondents' perceptions of the space designs within 3-star hotels in Yenagoa, Bayelsa State, with all measured items receiving favorable ratings. The item "The chairs in my office are adjustable in terms of height, backrest, armrests" recorded the highest mean score of 4.18 (SD = 1.13), suggesting that most respondents Very High Extent with the availability of ergonomically adjustable seating, which is essential for reducing work-related strain. Closely following this, the statement "I enjoy a relaxed posture at my place of work" also received a high mean of 4.13 (SD = 0.96), indicating that a majority of respondents maintain a comfortable and health-supportive sitting posture. Additionally, the mean score of **3.79** (SD = 1.25) for experiencing discomfort or pain implies that while some level of discomfort exists, it is not overwhelmingly frequent, possibly mitigated by other ergonomic factors. Meanwhile, the comfort of workstations and adequacy of workspace received mean scores of 3.53 and 3.37, respectively, with slightly higher standard deviations (1.41 and 1.53), pointing to a more varied perception among respondents. The overall grand mean of 3.80 supports a general agreement that the space designs in these hotels are adequate, promoting employee well-being and operational comfort, although some areas may still benefit from further enhancement.

Table 4 Descriptive Statistics of Respondents' Response on Timeliness of 3-star hotels in Yenagoa, Bayelsa State

Items	N	Min	Max	Sum	Mean	Std. Dev.	Remark
I often arrive at work on time	81	2.00	5.00	519.00	4.2893	.87975	High Extent
I always strive to meet deadlines for tasks and assignments	81	1.00	5.00	348.00	2.8760	1.53063	Low Extent

I feel that your current work schedule supports my punctuality	81	3.00	5.00	520.00	4.2975	.73762	High Extent
I can manage my time effectively during work hours	81	1.00	5.00	323.00	2.6694	1.58844	Low Extent
I strongly believe that timeliness could affect my overall job performance and productivity	81	1.00	5.00	369.00	3.0496	1.60650	High Extent
Grand Mean					3.4364		High Extent
Valid N (listwise)	81						

Source: Survey Data (2025) *Mean Cut-off Point = 3.00*

Table 4 outlines the descriptive statistics of respondents' responses regarding the timeliness of hotel staff in Yenagoa, though the items measured appear to focus more on time management and punctuality, which are important facilitators of creative productivity. The item with the highest mean score was "I feel that my current work schedule supports my punctuality" (Mean = 4.30, SD = 0.74), closely followed by "I often arrive at work on time" (Mean = 4.29, SD = 0.88). These responses suggest that the majority of employees maintain punctuality and that their work schedules are structured in a way that supports timely attendance of which is essential for creating a stable work environment that encourages task accomplishment. On the other hand, two statements recorded mean scores below the neutral midpoint of 3.00. These include "I always strive to meet deadlines for tasks and assignments" (Mean = 2.88, SD = 1.53) and "I can manage my time effectively during work hours" (Mean = 2.67, SD = 1.59). These low scores highlight perceived weaknesses in deadline adherence and time management, which may hinder the consistent implementation of creative ideas and innovative problem-solving.The item "I strongly believe that timeliness could affect my overall job performance and productivity" had a moderate mean of 3.05 (SD = 1.61), suggesting a general acknowledgment of the importance of timeliness, albeit with mixed levels of personal experience or conviction. Despite the lower scores on time management aspects, the grand mean of 3.44 indicates a general agreement among respondents that the time-related structures in place do contribute positively to performance, which is indirectly linked to task accomplishment. However, the relatively lower scores on internal time management and meeting deadlines suggest that while the environment may be conducive, individual execution might be lagging signaling the need for support strategies like time management training or workload adjustments.

Table 5: Descriptive Statistics of Respondents' Response on Task Accomplishment of 3-star hotels in Yenagoa, Bayelsa State, Bayelsa State

Items	**N**	**Min**	**Max**	**Sum**	**Mean**	**Std. Dev.**	**Remark**
I try my best to complete my work on time	81	1.00	5.00	444.00	3.6694	1.33159	High Extent
My work roles allow me to be effective	81	3.00	5.00	536.00	4.4298	.65608	High Extent

I am confident in presenting your creative ideas to my team or supervisor	81	3.00	5.00	529.00	4.3719	.68474	High	Extent
I have a supportive work environment for creative thinking	81	1.00	5.00	480.00	3.9669	1.09494	High	Extent
I enjoy ample freedom to experiment with new ideas at work	81	1.00	5.00	519.00	4.2893	1.08350	High	Extent
Grand Mean					4.1455		High	Extent
Valid N (listwise)	81							

Source: Survey Data (2025) *Mean Cut-off Point = 3.00*

Table 5 presents the descriptive statistics of respondents' responses regarding the task accomplishment of 3-star hotels in Yenagoa, Bayelsa State, focusing on how well the work environment supports creative expression and task effectiveness among staff. All five items received mean scores above the neutral midpoint (3.00), indicating overall agreement with the statements and suggesting a task accomplishment-supportive atmosphere in the hotel work environment. The item "My work role allows me to be effective" recorded the highest mean score of 4.43 (SD = 0.66), highlighting that employees feel empowered by the structure and clarity of their roles, which is fundamental to creative performance. Similarly, a high extent was observed with the items "I am confident in presenting my creative ideas to my team or supervisor" (Mean = 4.37, SD = 0.68) and "I enjoy ample freedom to experiment with new ideas at work" (Mean = 4.29, SD = 1.08). These responses reflect a psychologically safe and open environment where innovation is encouraged, and staff feel confident in sharing their input. The item "I have a supportive work environment for creative thinking" also scored well (Mean = 3.97, SD = 1.09), though with slightly more variation in responses, suggesting that while most staff perceive the environment as supportive, some may have differing experiences. Even the item with the lowest mean "I try my best to complete my work on time"—still garnered a positive score (Mean = 3.67, SD = 1.33), reinforcing the idea that employees are committed to timeliness, which contributes to a productive, creative workflow. Overall, the grand mean of 4.15 underscores a strong consensus that 5-star hotels in Yenagoa, Bayelsa State, foster a work environment conducive to task accomplishment, characterized by effective roles, freedom to innovate, supportive leadership, and a culture of open idea-sharing.

Inferential Analyses

Ho_1: Space design will not have a significant relationship with waste minimization of employee productivity of 3-star hotels in Yenagoa, Bayelsa State, Bayelsa State.

Table 6: Correlation Result on the Relationship Between Space Design and Waste Minimization of 3-star hotels in Yenagoa, Bayelsa State, Bayelsa State.

Correlations		**Space Design**	**Waste Minimization**
Space Design	Pearson Correlation	1	.521**
	Sig. (2-tailed)		.000
	N	81	81

Correlations		Space Design	Waste Minimization
Waste Minimisation	Pearson Correlation	.521**	1
	Sig. (2-tailed)	.000	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

Source:SPSS Version 23 Output of Survey Data, 2025.

The Pearson correlation result in Table 6 reveals a statistically significant moderate positive relationship between space design and waste minimization in 3-star hotels in Yenagoa, Bayelsa State. Specifically, the correlation coefficient (r) is **0.521**, which indicates a moderate strength of association between the two variables. The positive direction of the relationship implies that improvements in space design are associated with corresponding enhancements in waste minimization strategies. This suggests that hotels with better-designed spaces tend to have more efficient waste reduction processes. The significance value (p = 0.000) is well below the standard alpha level of 0.05, indicating that the observed relationship is not due to random chance and is statistically significant. The moderate strength of the correlation also indicates that while space design is an important factor, other variables may also influence waste minimization, suggesting the need for a holistic approach to sustainability practices in hospitality management.

Ho_2. There is no significant relationship between Space design and the timeliness of employee productivity of 3-star hotels in Yenagoa, Bayelsa State.

Table 7: Correlation Result on the Relationship Between Space Design and Timeliness of 3-star hotels in Yenagoa, Bayelsa State, Bayelsa State.

Correlations		Space Design	Timeliness
Space Design	Pearson Correlation	1	.482**
	Sig. (2-tailed)		.000
	N	81	81
Timeliness	Pearson Correlation	.482**	1
	Sig. (2-tailed)	.000	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Version 23 Output of Survey Data, 2025.

The Pearson correlation result presented in Table 7 shows a moderate positive relationship between space design and timeliness in 3-star hotels located in Yenagoa, Bayelsa State. The correlation coefficient (r = 0.482) suggests that as the quality and efficiency of space design improve, there is a corresponding improvement in the timeliness of hotel operations, such as service delivery, housekeeping, and guest response time. The statistical significance value (p = 0.000) confirms that this relationship is not due to chance and is therefore statistically significant at the 0.01 level. This finding indicates that the design and layout of hotel spaces play a meaningful role in enhancing operational timeliness, which is critical in maintaining high standards of customer service in luxury hospitality settings. The result implies that well-structured spatial arrangements as logical pathways for staff movement, appropriately placed service points, and unobstructed access routes can facilitate faster service execution and coordination within hotel departments. This not only

improves internal efficiency but also enhances the overall guest experience. However, the moderate nature of the correlation also suggests that while space design is influential, other factors—such as staff training, use of technology, and management systems—may also significantly affect timeliness. Therefore, hotel managers are encouraged to integrate efficient space planning with other operational strategies to fully optimize service delivery timelines.

H_{O3}. There is no significant relationship between Space design and task accomplishment of 3-star hotels in Yenagoa, Bayelsa State.

Table 8: Correlation Result on the Relationship between Space Design and Task Accomplishment of 3-star hotels in Yenagoa, Bayelsa State, Bayelsa State.

Correlations		**Space Design**	**Task Accomplishment**
Space Design	Pearson Correlation	1	.502**
	Sig. (2-tailed)		.000
	N	81	81
Task Accomplishment	Pearson Correlation	.502**	1
	Sig. (2-tailed)	.000	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Version 23 Output of Survey Data, 2025.

The Pearson correlation result in Table 8 indicates a moderate positive and statistically significant relationship between space design and task accomplishment in 3-star hotels in Yenagoa, Bayelsa State. The correlation coefficient is 0.502, suggesting that improvements in space design are moderately associated with better task accomplishment by hotel staff. This means that when the spatial layout of hotel facilities is well-planned—considering elements like ease of navigation, accessibility to resources, and logical flow of workspaces—employees are more likely to perform their duties effectively and efficiently. The significance value ($p = \mathbf{0.000}$) further reinforces the validity of this relationship, confirming that it is not a result of random variation but a genuine association. The implication is that efficient space design can reduce physical barriers, eliminate unnecessary movement, and promote seamless coordination among hotel departments, all of which enhance staff productivity and successful task execution. This finding holds practical importance for hotel managers and facility designers, as it suggests that functional and user-friendly environments contribute significantly to staff performance. Nonetheless, given the moderate level of correlation, it also indicates that while space design plays a vital role, other factors such as employee motivation, training, and management practices may also contribute to how well tasks are accomplished within hotel operations.

Conclusion

The study explored the empirical relationship between ergonomic design and employee productivity of 3-star hotels in Yenagoa, Bayelsa State, focusing on the connection between the dimensions of ergonomic design and the measures of employee productivity. From the inferential analysis, the results showed that all four dimensions of ergonomic design, such as space design and cognitive alignment, were found to have a positive relationship with the measures of employee productivity, which include waste minimization, timeliness, and task accomplishment. The study,

therefore, concludes that there is a significant and positive relationship between ergonomic design and the measures of employee productivity of 3-star hotels in Yenagoa, Bayelsa State.

Recommendation

Based on the findings, the study recommends the following:

1. Management of 5-star hotels should invest in spatial planning that promotes efficiency and reduces clutter, as this directly minimizes waste and improves employee workflow.
2. Hotels should adopt workplace designs that consider employee movement, comfort, and accessibility to support task accomplishment and timeliness.
3. Continuous professional development and ergonomic training programs should be implemented to align employees' mental models with their work environments.

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