

**THE EFFECT OF ERGONOMIC DESIGNS ON WORKERS'
PERFORMANCE AT THE FAIRMONT THE NORFOLK IN NAIROBI**

BY

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SCIENCE IN HUMAN RESOURCE DEVELOPMENT**

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DECLARATION

Declaration by Candidate

This thesis is my original work and has not been submitted or published by any institution, for any purpose.

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DEDICATION

I would like to dedicate this research project to my parents for their selflessness in raising me. You taught me the values of resilience, hard work and love. Nobody has been more important to me in the pursuit of this thesis than the members of my family. I would like to thank my parents, whose love and guidance are with me in whatever I pursue, they are the ultimate role models. Most importantly, I wish to thank my loving and supportive wife, Dalphine Chepngeno, and my wonderful son Derrick who have provided me unending inspiration.

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ABSTRACT

Many companies have utilized performance reviews for years. Performance appraisal systems are essential to organizational functioning, despite debate regarding their efficacy. However, companies rarely invest in ergonomics to improve employee performance and efficiency. Thus, the study's objectives were to examine work module techniques and work design processes and how they affect work performance; analyze ergonomics-related organizational practices and their effects on improved quality of work and performance; and assess the impact of ergonomic designs on employee performance. The research explored Taylor and the Gilbreths theory of 'motion Study' by exploring Taylor's principles of motion economy as key ergonomic aspect in design of equipment, workplaces and systems of work. Study reviewed Gilbreths philosophy of using ergonomic artifacts for safety and comfort towards efficient productivity through right selection of people and tools. To achieve the objectives, the researcher adopted an explanatory research design, at Fairmont The Norfolk Nairobi. The research targeted a population of 405 employees. Stratified sampling method was used to stratify the sample into 8 departments. Krejcie & Morgan table of sample determination was used to draw a sample size of 196 employees. The population was sampled from the stratified proportional to the number of employees per department. Primary Data collection was conducted using a 5 point Likert scale questionnaires, of both open ended and close ended questions, where the response rate was 86.7%. Pearson's Correlation was used to determine the relationship between the variables, therefore, the relationship between the variables and results showed: a positive correlation and a significant relationship of ($\beta= 0.13$; $\rho<0.05$, $r=0.793$) between work module techniques and work design processes on productivity, which means that the design and implementation of effective work system enhances productivity; additionally, a positive correlation and a significant relationship of ($\beta= 0.235$; $\rho<0.05$, $r=0.623$) between organizational practices and improved quality of work and performance, which means organizational practices, have direct impact on organizational performance; however a significant relationship and correlation of ($\beta= 0.067$; $\rho<0.05$, $r=-0.981$) on the impact of ergonomic designs on employee's health and safety, which means improved ergonomics determine health and safety of employees and vice versa, thus both factors are not strongly correlated with employee performance, but increase or decrease in the both factors may relate to employee performance. Hence, there is a significant relationship between workstations arrangement and organizational performance. Therefore, study recommended designing jobs to match the worker instead of matching the worker to the job and integrating employee/human elements into ergonomics design with focus on improving employee performance and productivity.

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ACRONYMS AND ABBREVIATIONS

| | |
|----------------|---|
| ADA | Allowance for Doubtful Debt |
| ANOVA | Analysis of Variance |
| IEA | International Ergonomics Association |
| JCM | Job Characteristics Model |
| HR | Human Resource |
| KCPE | Kenya Certificate of Primary Education |
| KCSE | Kenya Certificate of Secondary Education |
| NACOSTI | National Commission for Science, Technology and Innovation. |
| SPSS | Statistical Package for the Social Sciences |
| Kshs. | Kenya Shillings |

OPERATIONAL DEFINITION OF TERMS

- Ergonomics Practices** It is the process through which workplaces, goods, and systems are created or reorganized to fit the people who use them. Ergonomics is the study of people in their workplace. It tries to enhance working conditions and surroundings to lower the chance of injury (Heidarimoghadam, et al, 2022).
- Operational effectiveness** doing the proper actions is key to operational effectiveness. It centers on ensuring that the firm's core Value Stream is properly planned and that all core work performed by the organization adds value for their end client. The idea of organizational effectiveness refers to how successfully a company produces the results it wants to (Armstrong, 2020).
- Organizational Practices** Organizational practices are the acts and behaviors that occur within a company. The organizational practices translate the ideas and values in a company's culture into real-world activities and motions that keep the company active and, more crucially, on an upward trajectory in terms of revenue and profit margins (Stewart & Brown, (2019)
- Professional experience** Professional experience is paid employment that is pertinent to a certain position or sector of the economy. Professional experience often refers to experience gained

via full-time employment in an area where a professional license is required or where associated education is required (Numonjonov, 2020).

Work designs

Work design is the process of determining the roles and duties of employees as well as the methods and practices that they should employ or adhere to. Coordination and process optimization are the key goals of work design or redesign in order to generate value and maximize performance (Stewart & Brown, (2019).

CHAPTER ONE

INTRODUCTION

1.0 Overview

The chapter provides the background of the study which aims at exploring the effects of ergonomics design on performance of employees. It also explains statement of the problem. This chapter further gives both general and specific objectives of the study, while it identifies research questions that the study sought to answer, that lead to significance and mission of the study by stating of hypothesis.

1.1 Background of the Study

There is a general perception by scholars that a better workplace environment produces better results since most of the workplaces or offices are designed according to the nature of the job, and not the individual who is performing the job, this prompted us to investigate why and how can ergonomics artefacts impact employee performance and productivity (Babapour, Hultberg & Bozic Yams, 2022).

According to Nguyen, Yandi & Mahaputra, 2020), performance only refers to actions that have the potential to influence the achievement of organizational goals. The achievement of organizational goals may be impacted by both positive and bad actions, which are included in the performance domain. As a result, behavioral episodes in the performance domain for any given person may have varying expected values for the organization that range from slightly to extremely positive for behaviors that can aid in the achievement of organizational goals and from slightly to extremely negative for behaviors that can do the opposite (Werdhiastutie, Suhariadi & Partiw, 2020).

The idea that performance is defined as predicted behavioral value over a predetermined amount of time is completely consistent with the notion advanced by

others that an individual's performance can alter over time depending on situational restrictions and shifts in motivational factors. Nothing in the definition rules out the possibility of studying variations in individual distributions of performance episodes and typical vs maximum performance levels of individuals over time to be philosophically and practically meaningful and interesting (Maryani, Entang & Tukiran, 2021). Nevertheless, when scaling the total expected value of behaviors carried out over the course of the performance period, the expected behavioral value definition of performance does not take distributional differences into account.

Therefore this chapter contained the goalmouth of ergonomics in designing the work place to fit the worker so that they perform as required and expected so as to achieve organizational objectives of performance and productivity, therefore forming the objectives and questions of the study. As a result a problem emerges, which is to find out how ergonomics designs at work affects performance of a worker.

Therefore, the back ground focused on ergonomic systems, usability and designed systems interfaces which are aimed at optimizing the users' ability to accomplish their tasks with error-free results, with an aim of trying to support and proving the research hypothesis which explains in detail the expectation of the research objectives, so as to understand how people use tools, products, and systems to accomplish desired tasks, which is not a fact well understood in terms of its contribution to performance, and how integral it is to business success.

The word ergonomics was derived from ancient Greek word meaning the study of work. It concerns it-self with designing of workers environments to make them safe for employees. It contributes its knowledge base for human sciences, to match jobs to environments, mental capabilities to output and limitations people have to

machine/tool's usage. In doing so it seeks to enhance health and safety (Christian, Garza & Slaughter 2014). It is the quality of the workplace environment that most impacts the employee at any given work undertaking (Rao *et al* 2015; Das *et al* 2013). Thus, this study also looks into how employees engage with the workplace especially immediate workplace, which includes the tools and machines. The discipline of ergonomics is generally considered to have originated during the first and second World Wars, although advances that contributed to its foundations can be traced to the turn of 20th century. As performance problems continue to plague many industries and the challenges emanate with significant cost implications. Many organizations never seem to be aware that ergonomics deficiencies are endemic (Eklund 1995; Drury 1997, Getty and Getty 1999, Gonzalez *et.al.*, 2012). Less attention has therefore been accorded to investigating the relationship between ergonomics design and their effect on performance. Hence the main question under investigation is the manner in which performance challenges would be altered by use of ergonomic designs at work. In addition to this it was be vital to also examine the influence of task demands on the individual (Wartenberg, *et al* 2014; De Been & Beijer, 2015). This calls for further research on this subject to establish if there are tangible correlations between ergonomic designs and performance of an individual acknowledging that the task and the worker are interrelated elements.

1.2 Statement of the Problem

Employee performance reviews have been utilized for many years in various businesses. Although there has been much debate on the efficacy of performance appraisal systems, the general consensus is that they are a necessary part of organizational life. To improve employee performance and productivity, corporations have made very little effort in changing workplace ergonomics. Ergonomics is a rapidly

growing discipline that has gradually invaded modern industries especially in developing countries in sub-Saharan Africa (Neill 2005), unlike the developed countries. This growth is fueled by the literature that aims to improve working conditions, including health and safety of workers while simultaneously achieving organizational objectives (Pheasant 2012). However, numerous tasks in the industries and offices are performed using these ergonomic designs with a focus on health and safety of workers, without a consideration of how that affects performance. Moreover ergonomics design contain aspects that help correct, ill-structured jobs, mismatch between worker abilities and job demands, poor human-machine system design, inappropriate management procedures and management requirements that are likely to affect performance. At Fairmont the Norfolk, the Hotel has invested considerably towards having an Ergonomically complaint work place so as to be in congruent with her sister branches around the globe, with an aim of addressing health and safety issues, thus becoming an ideal place to conduct the research. Therefore, the ergonomics link to performance triggered the interest to study, and moreover to investigate whether ergonomic designs affect directly or indirectly the performance of workers thus forming the basis of this study

1.3 Research Objectives

1.3.1 General objective

The general objective of the study was to examine the effect of ergonomics designs on workers' performance at the Fairmont the Norfolk in Nairobi.

1.3.2 Specific objectives

To fulfill the research objectives the researcher developed the following hypotheses.

- i. To examine technological designs of machines, tools and ergonomics artifacts on workers performance at the Fairmont the Norfolk in Nairobi.
- ii. To establish the relationship between ergonomics designs, work place posture and range on workers performance at the Fairmont the Norfolk in Nairobi.
- iii. To assess the impact of work place design and spatial requirement on employee's performance at the Fairmont the Norfolk in Nairobi.

1.4 Hypotheses of the Study

H₀₁: There is no significant effect of examine technological designs of machines, tools and ergonomics artifacts on workers performance at the Fairmont the Norfolk in Nairobi.

H₀₂: There is no significant effect of ergonomics designs, work place posture and range on workers performance at the Fairmont the Norfolk in Nairobi.

H₀₃: There is no significant effect of work place design and spatial requirement on workers performance at the Fairmont the Norfolk in Nairobi.

1.5 Scope of the Study

This study sought to examine the effect of ergonomics designs on workers' performance at the Fairmont the Norfolk in Nairobi. The study targeted a population of 406 employees, thus in this case the adequate sample size for this study was 196 employees. The study period was 2015 where primary data through the use of questionnaires was collected within the same period. The dimensions of ergonomics designs that were investigated in the study include; technological designs of machines,

tools and ergonomics artifacts, ergonomics designs, work place posture and range, work place design and spatial requirement and their direct effect on workers performance.

1.6 Significance of the Study

It is hoped that the study will be significant to human resource professionals in the organizations as well as bringing awareness of the importance of ergonomics integration to the work place to trigger positive results in performance. In the context of Kenya and probably the region of East Africa, this is still a relatively new topic. Very few researchers have addressed ergonomics in the context of human resource performance, thus, this huge gap needs to be filled by new research scholars. In Kenya, workplace environment and its related issues are significantly neglected. It is evident that there is less importance to workplace design and assisting facilities as well as lack of access of information, as a result, employees cannot demand these from employers. These circumstances are affecting the performance of the employees greatly, in the form of delay in work completion, frustration, and effects on personal growth as a result directly and indirectly affecting organizational growth. Thus, this study will bring in great contributions to organizational performance in industries and offices.

At industrial level it leads to improved quality of goods and services as a result of design of machine/tools and equipment used at work that results in decreased errors, fewer product defects and Improved efficiency, this can come about by bringing items closer to the work area or completing a task with fewer motions. In each case, the task can take less time and there is a lessened chance of fatigue. Reduced downtime maintenance tasks can be optimized by improving access points during changeover tasks this allows for a faster task time, which leads to a decrease in machine downtime; Improved employee morale; finally it was lead to reduced turnover and absenteeism. More over

the study was be contribute knowledge to sub-Saharan Africa where the phenomenon hasn't been well studied and documented

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter presents the concept of workers performance, concept of ergonomics design, concept of financial literacy, theoretical review, empirical review and conceptual framework.

2.1 Concept of the Study

2.1.1 Concept of employee performance

Any corporation must constantly assess the performance of its employees in order to determine whether they are improving or not and to understand their place within the company. This is one of the fundamental and significant requirements. There are a variety of approaches for evaluating performance that are appropriate for certain circumstances and organizational traits (Jafari, Bourouni & Amiri, 2009).

According to Jankingthong & Rurkkhum, (2012), performance evaluation is a component of human resource management that aims to boost business performance while damaging the individuals who are being targeted and even eroding the survivors' resolve and drive. A clearer, more reasonable set of performance expectations will also help managers, supervisors, and employees communicate more effectively when providing performance review feedback. Retaining newly hired personnel in a business is one of the biggest challenges modern employees face. Every firm makes every effort to provide the greatest amenities to its employees in the age of fierce competition.

One of the most difficult tasks that the majority of firms confront nowadays is satisfying their human resources. It is really challenging to comprehend and understand what is happening in the human mind. In addition, there are so many opportunities for qualified

and talented workers that it is getting more and harder for employers to keep them happy and motivated. There isn't a single retention strategy or plan that can satisfy every employee in a company. We each have various demands and expectations from the organization because of our diverse personalities (Das & Baruah, 2013).

2.1.2 Concept of Ergonomics Design

Ergonomics, which means the study of work, was originally defined and proposed by the Polish scientist B. W. Jastrzebowski *et.al.*, 1857, as a scientific discipline with a very broad scope and a wide range of interests and applications, encompassing all aspects of human activity, including labor, entertainment, reasoning, and dedication (Karwowski 1991;2001). The International Ergonomics Association (IEA, 2003) defines ergonomics as the scientific discipline concerned with the understanding of the interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimize workers wellbeing at work. Therefore, work can be divided into two main categories: Useful work, which brings improvements for the common good. Useful work, aims to improve things, the organization and people, is classified into physical, aesthetic, rational, and moral work (Wilson and Corlett, 1990).

Thus Ergonomists design is a contribution to useful work is based on the evaluation of tasks, jobs, products, environments, and systems to make them compatible with the needs, abilities, and limitations of people/workers. Ergonomics discipline promotes a holistic, human-centered approach to work systems design that considers physical, cognitive, social, organizational, environmental, and other relevant factors (Grandjean, 1986) Sanders and McCormick, 1993; Chapanis, 1999; Salvendy, 1997; Karwowski, 2001; Vicente, 2004; Stanton et al., 2004). Consequently a general perception is that a better workplace environment produces better results. Most of the workplaces or offices

are designed according to the nature of the job. In corporate level, productivity is affected by many factors such as workers, work environment health and safety moral and cultural aspects. The quality and quantity of work generated by employees are influenced by the work environment (Keeling and Kallaus, 1996), while Quible (2008) points out those poor environmental conditions can cause inefficient workers' which in turn was impact on the financial well-being of the organization.

2.2 Theoretical Framework

2.2.1 Gilbreths theory

We use Gilbreths theory in this study because it a took a rigorously scientific approach to understanding the way employees carried out work, it exemplifies fatigue in order to attack the waste of human energy that workers were all too often compelled to endure (Dean, 1997). The duo believed that it was the management's responsibility, not the worker's responsibility to design the job to ensure safety and comfort towards higher levels of productivity (Tietjen and, 1998). They also believed that one of the best ways to do something is to ascertain it, and then coupled it with the right selection of people and tools for a direct pathway to efficiently in productivity (Hartley, 2006). Lillian and Frank Gilbreth were two of the first people to work on ergonomic activity in the workplace. Ergonomics is the act of applying both psychological and physiological principles to the design of products, processes, and systems in an attempt to reduce human error as well as improve the safety and comfort of the operator or worker. In short, ergonomics makes for happier and healthier employees.

Frank and Lillian Gilbreths theory of human motion, investigated scientifically the "best way" for completing a tasks, with focus on improvements which considered the human aspects, of workers as well as welfare of the workers and prioritized efficiency

over profit. The theory therefore established the need for more ergonomic working conditions for employees to reduce fatigue and be more successful at performing their tasks, by reducing physical and mental strain. Therefore the design of workplace, equipment, machine, tool, product, environment and system, taking into consideration the human's physical, physiological capabilities and optimizing the effectiveness and productivity of work system while assuring the safety, health and wellbeing of the workers (Jeffrey, 1995), has been the basis of Ergonomics argument.

Therefore, we shall further explore the activities of workers, scientific management discovered methods to make every worker more efficient, as well as analyze work operations in terms of efficiency and effectiveness ways to perform jobs.

Engineers and psychologists are working together in collaboration to improve our daily lives through better design. A multi-disciplinary approach has been taken to include anthropologists, industrial engineers, cognitive scientists and physiologists in order to understand the human operators and to design systems and machines to fit said user Wright, (2006).

Today, most of us know ergonomics in a workplace context. As the average worker in America works for about 8 hours a day, the need for ergonomic office furniture and practices is of the utmost importance. Thus the study will investigate for sure that as technology and design possibilities to make our homes and offices safer and more comfortable, and our focus will be in the case of the workplace, to increase productivity, increase comfort and prevent injuries and fatigue.

2.3 Empirical Review

2.3.1 Technological Design on employee performance

As formal representations of work, jobs exist at various hierarchical levels and provide a range of specific tasks. They are related to particular occupational type, demand various equipment's and furniture designs, spatial requirements, working distance and height and machine/ tools. However, although heterogeneous in nature, jobs can be conceived, analyzed and compared in broader terms; work design offers both holistic and analytical view for studying jobs. Simply defined as the system of arrangements and procedures for organizing work (Sinha & Van de Ven, 2009), it explains how work is translated across organizational levels, structured for the units and the individuals who perform the work (Torraco, 2005). Additionally, work design identifies certain objective characteristics of work that describe its task, job, social, and organizational environment.

Technological work design has a central part in ergonomics work design research. They represent measurable dimensions of work and reflect conceptually distinct design features (e.g., Morgeson & Campion, 2003). During the years, numerous models have been developed based on the measurement of objective work characteristics. The most influential one was *The Job Characteristics Model (JCM)* introduced by Hackman and Oldham (1976) and cited over 4.080 times (*Google Scholar*, accessed 10th Feb 2014). The authors identified five core task characteristics (autonomy, task variety, task identity, task significance, feedback) that are primarily concerned with how the work itself is accomplished and the range and nature of tasks associated with a particular job (Morgeson & Humphrey, 2006). The basic idea of JCM was to build into jobs those attributes that create conditions for high work motivation, satisfaction, and performance. It recognized additional work characteristics and outcomes that had not

previously been documented in psychological and organizational research on work design, especially from the standpoints of ergonomics and industrial engineering (Grant et al., 2010a). Warr (1987) concurrently created his extensive Vitamin Model, while several years later Parker et al. (2001) developed their Elaborated Model of Work Design, distinguishing among five categories of variables (antecedents, work characteristics, outcomes in terms of performance, mechanisms, and contingencies). Finally, Humphrey et al. (2007) conducted the meta-analysis and developed an integrative work design typology. They placed 18 work characteristics into three major categories: motivational, social, and contextual.

The contextual work characteristics were chosen for the purposes of this study, since they provide an important role in understanding work design practices. However, the rest was excluded from this study as they represent attributes of the broader work environment, not exclusively of a particular work position, which are not the focus of this research.

Workers are assigned to handle specific jobs with a particular set of work characteristics. Their workplace efforts can be more or less motivated, productive, satisfied or committed. The nature of employees' work outcomes depends on the person-job fit (e.g., Edwards, 1991; Cable & Judge, 1996; Kristof-Brown, Zimmerman, & Johnson, 2005). While we can hardly change the personal traits, values of our employees in a short run, ergonomics technology on work design choices are much more reconfigurable. This means that the adjustment of work characteristics can result either in positive or negative outcomes. The range of outcomes usually considered in work design research has been criticized as being too limited. However, some additional measures should be also included such as contextual performance, proactive

performance, group performance, and adaptive performance by use of technology. In the last two decades an increasing number of authors (e.g., Campbell, 1990; Borman & Motowidlo, 1993, 1997; Motowidlo & Van Scotter, 1994; Motowidlo & Schmit, 1999) strongly suggested that work performance should be measured as behavioral outcomes that consist of task performance and contextual performance.

Task performance can be defined as the effectiveness with which employees perform activities that contribute to the organization's technical core (Borman & Motowidlo, 1997).

The concept of Employee Performance Competitive advantage and accomplishment of organization's goal is achieved through high performing staff. Therefore, accomplishment by this high performing staff might lead to high level of staff satisfaction. Many researchers concluded that employee performance relates to job satisfaction. While Sonnentag (2002), differentiates the differences between action (behavior) and outcome as the performance. However, Holman (2003) posits that working environment increases anxiety and depression among employees, which relatively affect their performance. Meanwhile, Al-Anzi (2009) claimed that there are two factors that influence employee performance that is one, management driven factor containing organization planning in staff responsibilities, administrative support/tools, working patterns/hours, health and safety policies, training etc. and two, a factor that arises from workplace and premise design such as furniture, workspace or the setting, lighting, ventilation, noise level, premise hygiene and facilities that effect staff performance.

Employees can add value either directly by designing and implementing a part of its technological process, such as creating product prototype, delivering and improving

service, managing subordinates, or indirectly by providing it with the needed knowledge support. Such kind of performance refers to activities that are formally part of a job description and evaluates the basic required duties of a particular job (Ng & Feldman, Frank 2012).

It can be defined as an extra-role performance, a construct very similar in nature to organizational citizenship behavior (e.g., Organ, 1988, 1997), represents behavior that does not necessarily support the organization's technical core as much as it supports the organization's climate and culture (Motowidlo & Van Scotter, 1994; Conway, 1996; Borman & Motowidlo, 1997; Motowidlo, Borman, & Schmit, 1997; Edwards, Bell, Decuir, & Decuir, 2008; Jex & Britt, 2008). Contextual activities are important because they contribute to organizational effectiveness by shaping the organizational, social, and psychological context and for serving as a catalyst for task activities and processes. Such activities include volunteering to carry out task activities that are not formally part of the job, as well as helping and cooperating with the others in the organization to get the tasks accomplished (Borman & Motowidlo, 1997).

Task and contextual performance reflect different aspects of overall work performance (e.g., Griffin, Neal, & Neale, 2000) and they are predicted differently by individual differences variables (Hatrup et al., 1998). Likewise, we assume that task and contextual performance are affected by work characteristics in a specific manner. Both outcomes were found to be important in determining work quality that is responsible for enhancing individual work performance (e.g., Motowidlo & Van Scotter, 1994). Task and contextual performance as outcome variables represent a starting point in determining overall contribution of worker to a wider, organizational system which are both crucial for organizational success.

Technological work design encompasses both working range and distance is an antecedent of organizational behavior. It is tightly woven into the structure and function of organizations (Torraco, 2005), representing the central pillar of performance. Decisions made about work design can have an enormous, either positive or negative impact on organizational success and individual well-being (Morgeson & Campion, 2003). They can reduce stress, enhance motivation, improve performance and even represent a potential source of competitive advantage (e.g., Pfeffer, 1994; Garg & Rastogi, 2005; Grant, Fried, & Juillerat, 2010a). Due to the importance and significant impact of work design brought about by working range and distance on various work outcomes, not surprisingly it has been one of the most researched topics in the field of organizational psychology and behavior (Pedersen, & Reinholt, 2009). Traditionally conceptualized under the topic of job design, work design used to be defined as the set of opportunities and constraints structured into assigned tasks and responsibilities that affect how an employee accomplishes and experiences work (Hackman & Oldham, 1980). During the 1970s and 1980s jobs were dominantly described and evaluated through task characteristics with a strong emphasis on the motivational aspects of work. Such a limited view of work features was broadly accepted although it neglected other important aspects of work such as the social and physical environment, cognitive requirements and work context.

Therefore design, has an effect on various attitudinal, motivational, and behavioral outcomes. Although relationships between work characteristics and outcomes tend to be in the same direction for all employees (Morgeson & Humphrey, 2006), they nevertheless diverge depending on the nature and size of outcome. The same is valid for work performance as an outcome variable. Extensive research suggests that employees, who work in jobs with enriched work characteristics, tend to manifest

higher task performance and more frequent organizational citizenship behaviors (Grant, 2012). However, previous studies were dominantly focused on traditional job characteristics emphasizing a lack of studies that explicitly compare the effect of various work characteristics (task, social, and knowledge) on two distinctive work outcomes such as task and contextual performance. Although Humphrey et al. (2007) have done the groundwork for such research, by analyzing numerous work characteristics and outcomes; unfortunately they did not emphasize enough work performance, particularly not its contextual dimension. One of the fundamental human requirements in this century is a working environment that allows people to perform their work optimally under comfortable conditions (Roelofsen, 2002).

2.3.2 Effects of work place designs and space on employee performance

However, the world of work is now different than it was then, perhaps fundamentally so (Oldham & Hackman, 2010). There is increased complexity, technological revolution and competitiveness which are dramatically changing the settled ways of organizing and working (e.g., Hernaus, 2013a). Work has become more cognitively demanding and complex, flexible working arrangements are gaining the momentum, teamwork has almost become a norm while workforce composition is much more diverse than it used to be. Knowledgeable workers are becoming an increasingly important and voluminous group of employees, covering a quarter to a half of workers in advanced economies (Davenport, 2006; Levenson, 2012). Substantial changes in the nature of work and the rise of knowledge economy recently revived the academic interest and broadened the focus from job design to work design, and from task characteristics to work characteristics. Theoretical models and empirical studies of job design have been replaced by the ergonomic work design concept, which has drawn attention to the increased importance of studying a wider range of work characteristics

(e.g., Parker, Wall, & Cordery, 2001; Molinsky & Margolis, 2005; Morgeson & Humphrey, 2006; Grant, 2007; Grant, Fried, Parker, & Frese, 2010b; Dierdorff & Morgeson, 2013). Scholars have realized that an overwhelming number of studies were focused solely on a single task characteristic or a few of them, and their influence on individual outcomes such as job satisfaction, organizational commitment but somehow left out job performance. The aim of this study is to capture a broader set of work characteristics and to determine a specific pattern of relationships among various tasks, knowledge and social characteristics of ergonomic work design on work outcomes. It is clearly shown how particular work characteristics influence task and contextual performance.

Research studies showed that many cases of shoulder and neck pain were caused by inappropriate design or use of furniture and equipment which led to occupational disorders that led to absenteeism from work therefore causing loss of productive time (Salvendy 2012). Although a lot of research has been conducted in this area, it is believed implementation of ergonomics in the work environment is somewhat limited, especially in developing nations.

There are a number of technology impacts to productivity and the ones which impact entire organizations and their interaction with other organizations could arguably be considered a part of the workplace. Examples would include voice and data systems, desktop support hardware and software, mobile computing devices, audio/visual tools, document management tools, and collaboration environments. There are additional technologies to support an individual organizations' productivity such as knowledge management databases, business process automation software that this researcher considers part of the firm's intellectual capital and not part of the workplace per se. An

effective partnership is necessary to make the workplace function for the benefit of the occupants (Davenport 2005).

Researchers from Pennsylvania State University, the Georgia Institute of Technology, and the Batton Institute have independently found similar productivity increases from mobile work and cite reduction in employee absences, lost time in traffic delays, reduced stress, reduced turnover, and improved job satisfaction as reasons for these improvements (Barber 2011). Ernst & Young has developed processes to institutionalize a mobile work force. They have implemented technologies which allow employees to reserve offices irrespective from which city they are working. The reservation system seamlessly moves their office phone number to the destination work location and updates their location so co-workers can find them at any given time. Feedback has been positive, and many of their younger workers feel this dynamic work space allocation promotes better work/life balance (Barber 2011). Despite these challenges, technology changes are being implemented because of the productivity benefits they enable and the total life cycle cost advantages are greater than cost disadvantages (Harrison 2009).

2.3.3 Ergonomics design on employee performance

Ergonomics research is widely recognized by research in studies related to Health and Safety, in manufacturing environment, however, little has been done into understanding in the office environment. Work stations therefore are the immediate physical surroundings of a worker. They can serve a range of different purposes from being the areas in which the person works all day to an area used by several people for different purposes intermittently. They can be discrete areas such as a computer work station or part of a larger work areas such as a workshop or production area. Workplaces must

conform to basic ergonomic principles to accommodate users Kumar 2011. The workplace its self must be suitable in size.

Research indicates that something as simple as a well-designed office chair can increase job satisfaction by 27% and that ergonomically designed office furniture can have a positive 15.4% impact on productivity (Davies 2005). The assumption behind these performance claims is that the typical office worker knows how to adapt this well-designed office chair to fit their particular physique. Office furniture providers have done a good job in assessing human characteristics and finding effective ways to produce furniture and peripherals to fit many different shapes and sizes, yet there are knowledge gaps for the people who actually purchase, deliver, and use this furniture. Research done by different scholars (Salvendy et al., 2012) provide extensive information about the appropriate posture and chair adjustments needed to prevent muscle strain, but few employers provide an emphasis in making sure employees are aware of this information. Some companies are realizing this void and have organized office safety committees to address the day-to-day issues that can arise in a typical office environment and safety professionals suggest that employees receive basic training on ergonomics and how to adjust the office furniture provided to them as they would receive training on any other tool (Braganza 1994).

Limitations in space, especially after the economic downturn of 2008 and location may be related to cost of rent or building availability or lack of planning. Sometimes functions outgrow spaces, more and more people or equipment is fitted into the same space and arrangements become increasingly ad-hoc. Redundant or infrequently used equipment may not be removed or relocated and may be left to clutter the work area or space. Space is important for any effective or efficient performance to take place, no

matter how adequate the workplace needs or may seem, all workplaces need regular reviews from the user to ensure that they are adequate and that they provide a safe, adequate and healthy surrounding for the user to operate (Frazer et 'al., 2003; Viikari-Juntura 2012). Therefore work space must be adequate for workers function and what they need to perform and the nature of tasks they do. The longer the worker is at the work station during the workday shift, the more the critical the design becomes. The arrangement of the individual workspace is essential especially when work is stationery and performed while seated or standing position. It depends largely on the type of job being done and equipment used. The physical arrangement of work must permit correctness and appropriately support working postures and impeded movements by each worker. Thus the space arrangement modification is vital for performance enhancement. A number of competing demands may make it impossible to have a perfectly arranged workplace or to meet recommendations simultaneously so as to aim to achieve optimum performance overall. In any workplace there needs to be sufficient space for use, stretching and storage of a range of equipment including tools and appliances, components, supplies, manuals and other auxiliary elements (Gallagher., 2007; Aust et'al 2012). The location of auxiliary materials used in at any given work station should be within reach and should give space to the user to do other functions at the same time. This was enable the employee have more space and encourage them to move about within the workplace to stretch this has been proved to boast performance (Broberg, 2010; Harma, 2013). The elements of a work system, such as the worker, equipment, environment, task, and organization interact when work is performed. A research model that incorporated these variables was developed. Workstation designs significantly affect working posture, which in turn, contributes to physical symptoms. Another model of a work system with components, technology,

organization, person, task and environment shows that the objective of work system design is to optimize the whole system rather than maximize just one component. People should be the central focus and the other factors should be designed to help the person work effectively and comfortably.

While the workplace has impacts to employee performance, this has an impact on organizational performance in the long run as well, there are a number of other elements which interact to influence an employee's ability to perform well. Organizational psychologists contend that individuals require some element of personal control over their environment, need the ability to utilize their specific skills, and have the organizational support to deliver results with those skills while also be compensated fairly (Clements-Croome, 2006). As per BOSTI research of over 13,000 individuals across many industries to assess design factors and asserted the effects from technology; reward systems, direct supervision, and work/life balance had a 76% impact to job satisfaction but that the workplace still had a significant 24% impact. For the workplace design BOSTI concluded that support for distraction-free individual work in addition to support for impromptu interactions were the two most important factors for not only job satisfaction, but also for individual performance, team performance and organizational performance (Olson, 2002). In business context in which performance must be considered, and was developed based on the literature review and supplemented with the researcher's experience.

While the workplace is the primary element of this research, the other elements which influence productivity and were assessed as below: Work/Life Balance is the company philosophy related to time spent with family, hobbies, and wellness programs relative to time spent focused on work deliverables. It includes the company's position on

flexible work arrangements and any physical provisions such as onsite daycare centers (Harrison, 2006). Technology Implementation is the infrastructure provided by the company to enhance collaboration, support individual work, provide connectivity anywhere to other company employees, the company network, applications and data. (Clements-Croome, 2006). Regulatory Influence includes governments or other regulatory bodies' mandated changes that may require interpretations by the company. Examples include: financial regulations, ADA, and security/safety requirements. Organization Effectiveness addresses the employees' perception of the company and their level of engagement. It includes leadership, performance management, branding, social responsibility, and overall confidence in the organization (Jolton, 2009). Reward systems include the company's philosophy regarding compensation and benefits and any other forms of employee recognition. This is often considered part of organization effectiveness.

Generational Differences include the company demographics and how the organization chooses to respond to any differences that may exist. Profitability includes the financial wellbeing of the company and potential growth opportunities for the employee. Team Collaboration addresses the type of work performed at the company and how collaborative processes are supported. This was later combined into type of work performed. Individual Work Products. This was combined into a single element with team collaboration and labeled "Type of work performed". Individual work examples would include software programs, legal briefs, written documentation, analysis reports. Workplace addresses the physical delivery of the office work space and any amenities which are provided on the property (Brill, 2001).

According to Andreo, 2008, he found out that an average American worker has less time to think in the office due to increasing pressures while over 14% of social time is spent with work activities and colleagues (Andreo, 2008). In a 2002 study, Thomas Davenport, and his colleagues interviewed 41 companies which were in the process of redesigning space for knowledge workers (Davenport, 2005). This research provided insight into what is needed by workers to be effective in a workplace:

There is a preference for an enclosed office, but knowledge workers communicate more effectively in open space. Workers prefer geographic locations where there are others with similar expertise. Workers are mobile, spending up to half their time outside the office while still working productively. This is balanced with time spent in the home office where they connect with each other and fulfill a need to be part of the larger enterprise. Workers both collaborate and concentrate. There is a need for the physical work space to provide solutions for both types of work. Workers communicate to that close by. Furniture designer and manufacturer, Haworth, discovered that workers value dedicated team rooms because they allow the collaboration and cognitive processes required to do their jobs while also providing control over their environment. Some of the features most valued were the portable furniture which enabled flexible working arrangements (Augustin, 2009).

In many organizational cultures view office space, décor, and technology as a form of recognition or status. In a 1988 study at an insurance company employees were temporarily assigned to different types of office space on a random basis. If the employee was assigned to “better” space there was a tendency to perform at a higher level, where if assigned to “lesser” space there was a tendency to perform at a decreased level. For today’s worker the underlying lesson is that if workspace changes are made,

there is likelihood to address performance, productivity and consequently, profitability levels may be adversely impacted.

Organization culture is defined as a part of an organizational life that influences the behaviour, attitudes and overall effectiveness of employees. More recent writers have repeated the assumption that ‘organizational culture impacts significantly on an organization, its employees’ behaviour and motivation and, ultimately, on organizational financial performance’ (Holmes & Marsden, 1996:26). However, despite both the longevity and currency of claims about the association between organizational culture and desired organizational and individual outcomes, little empirical research has been conducted to provide evidence for the claims (Chee W Chow, Graeme L Harrison, Anne Wu, 2001). Organization culture has assumed considerable importance nowadays because of its impact on employee performance and satisfaction (K. Aswathappa, 2000). Robert Kreitner and Angelo Kinicki (1995) indicated how organizational culture affects performance and satisfaction. They indicated organization culture as an intervening variable. Performance evaluation serves many purposes. According to Prasad and Bennerjee’s (1994) prescription, the objectives of the annual or periodical appraisal should be, to evaluate the results and plan for better performance, to understand the gaps in knowledge skills and training needs, to identify men with potential to man higher positions in the future (Opatha,2000). (Furtwongler, 2000) describes five goals of performance evaluation such as performance improvement, employee development, employee satisfaction, compensation, decisions and communication skill (Opatha, 2000).

2.4 Conceptual Framework

INDEPENDENT VARIABLES

DEPENDENT VARIABLE

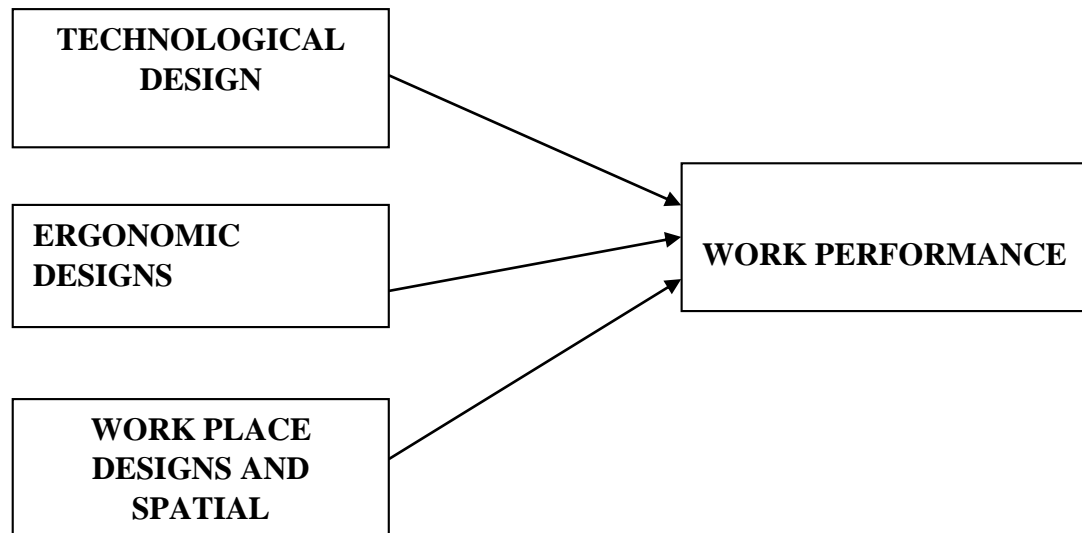


Figure: 2.1: Conceptual framework: Relationship between Ergonomics design and performance

Source: Researcher 2015

2.5 Summary

Ergonomics design of equipment, workplaces and systems of work require designs that have specific ergonomic stipulations as well as a consideration of desired output. As a result this chapter discussed in details the relationship between ergonomic designs and showed how they are linked to performance, thus being a guide to the researcher on the kind of data required to for the purposes of finding the best information that was assist the study to investigate ergonomic design variables that affect performance the most.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Overview

This chapter will cover the research design, target population, sampling design and procedure, data types, instruments and collection procedure, measurement of variables, pilot testing, data processing, data analysis, regression assumptions and ethical consideration

3.1 Research Design

Explanatory research design was adopted for this study; the design constitutes a blue print for collection measurement and analysis of data. It combined the data collection techniques such as interviews, observation, questionnaires, and document analysis, which a major strength was as opened the opportunities to use several different sources of evidence, this makes the findings more convincing and accurate (Yin, 1984).

This study will use an explanatory research design. This approach was chosen because it enables the detection of causal relationships between variables that were conceptualized to address the research issue without involving their manipulation (Saldana, 2011). Explanatory research is frequently quantitative, which makes it easier to evaluate hypotheses about the correlations between different variables (Zohrabi, 2013). Due to the quantitative structure of the study and it's potential to influence to investigations the real situations on how ergonomics affects work performance.

3.2 Study Area

3.2.1 Types and sources of data

Various methods were considered to retrieve and collect information from a variety of sources such as sampling, research, observation, questionnaires, surveys, interviews,

prototyping and joint requirement planning (Whitten *et al.*, 2001). A couple of research methodologies were used to complete this research. The techniques used for this study are: questionnaires, interviews, and document evaluation, to understand how work arrangements brought about by ergonomics design could affect employee performance. The main purpose of the research methodology was to comprehend the relationship. Data can be defined as information given or admitted as a fact on which research inference is based (Bell 1993).

Primary data will be the only type of data to be employed in sourcing for data directly from the Fairmont the Norfolk in Nairobi. Primary data enables the researcher to collect firsthand information (Douglas, 2015). Primary sources for the study will be obtained through the administration of questionnaires.

3.2.2 Data collection instruments

Questionnaires with focus on a narrow aspects of the workplace acoustical distractions (Juneja 2010), or on a specific characteristic association with productivity such as reduced absenteeism or fewer sick days (Seppanen 2005 Collection of data for this research was done using formal structured questionnaires. The questionnaires were of a 5 point Likert Scale type of with open ended questions to ensure maximum response from the respondents, so as to collect views, opinions, perceptions, feelings and attitudes. The researcher also collected data through document analysis of organizational records like level of absenteeism as a result of occupational effects, injuries occasioned at work, accidents caused by machines or human error, and product/service quality when using certain machines or artefacts.

3.2.3 Data collection procedures

The questionnaires were administered and the respondents given one day to submit their responses, as the Hotel has 3, 8 hour work -shifts, of morning, afternoon and night. The data was be collected at respective workplace department within Fairmont The Norfolk. There is none of the respondents who is expected to be physically challenged to be unable to fill the questionnaire, thus they were all able to fill the questionnaires themselves. It was expected that some respondents may have some fears on why the researcher is collecting the data, thus they may need explanation before filling the questionnaire, the researcher explained further to them, every time a questionnaire was issued that the information was not going to be used against them whatsoever, so as to assure them that there will be no victimization on a later date, and also the questionnaires will not contain names thus this gave them more confidence. The structured interview allows the researcher to collect the same information across a number of different implementations while also allowing follow up questions to put the answers in context. Structured interviews with assessment tools are utilized frequently by companies in the hiring process so that interviewers are able to assess one candidate against the others and develop a more complete and objective view of the candidate's capabilities than by random questioning or by performing a narrow test of a specific skill that does not represent the entire dimension of the job to be performed..

Table: 3.1 Summaries of Data Collected

| Technique | Primary method | Information Obtained | Forms of data |
|--|-------------------------------|---|----------------------|
| Interviewing (Current employees) | Qualitative | i. Overall quality of work with the intervention of Ergonomics ii. Organizational aspects that affect quality of work and performance iii. Ergonomic designs on employee's health and safety | Narrative Text |
| Survey (Employer) | Quantitative | Employer: i. Demographic information ii. General understanding performance levels iii. Importance Ergonomics, current practices and processes. iv. Causes of poor performance, employee's health, safety, and related workforce morale, commitment and retention efforts v. Skills required in the workplace vi. How to improve employability. | Numeric data |
| Interviews (Employer) | Qualitative | i. How to reduce skills gap and increase employee development, as well as training ii. Features of Ergonomics presently being used | Narrative Text |
| Document Analysis (Academic / Non-academic) | Quantitative and Quantitative | i. Examine work module techniques and work design processes and how they affect productivity ii. Policies and strategies as well as analyze the impact of ergonomics related organizational practices, and their effects on improved quality of work iii. Theories, previous tests on similar research iv. Assessed the impact of ergonomic designs on employee's health and safety. | Numeric and Text |

Source: Researcher 2014

3.2.4 Testing reliability and validity of instruments

Thus choice of a case study design enabled validation and reliability of data. Moreover the researcher subjected the questionnaires to a couple of ergonomics and human resources experts who evaluated the relevance of the each item in the questionnaire towards objectives of the study, by rating the questionnaire in the scale of 1 (relevant); 2 (somehow relevant); 3 (quite relevant); 4 (quite relevant). Therefore, validity and reliability was determined by the content of validity index rated at 3 and 4 respectively by both experts. Validity was aimed at ascertaining extent to which the research

instruments collected the intended data. Reliability was aimed at ascertaining consistency of responses by data collection instruments.

The assessment tool was developed after in-depth review of the literature review, from the tool it details how various organizational factors influences or, how it can impact performance and was derived after reviewing the research by Brill, Olson, Clements-Croome, Harrison, Jolton (2015), and the researcher's prior management experience. This model then became the basis for the structured interview assessment tool. The assessment tool was reviewed by the supervisors of the study, HR Director and others as needed. HR was critical to the data collection of this study as they have insight into how the organization functions and had a background of complaints from the employee which may not be solicited by the researcher during the study. Human Resources also the owner of the employee engagement/satisfaction survey process and provided the results of those efforts. IT was needed to provide basic information of the technology of the workplace is dependent on technology enablement, particularly with a mobile workforce. This model then became the basis for the structured interview assessment tool useful in making comparisons across the different departments of the Hotel.

3.3 Target Population

The population of the study comprised of employees and staff of Norfolk Hotel Nairobi. The targeted population for the study was 405 employees. The study focused on employees who are educated and who can read and write in English, and all those with access to ergonomic artefacts. Population is defined as "an entire group of individuals, events or objects having a common observable characteristic" it's further observed that population is the aggregate of all that conforms to a given specification (Mugenda and Mugenda, 2003). Fairmont The Norfolk is located 5 km from Nairobi city center located

at Harry Thuku road. The Hotel is characterized as having one of the finest teams of professional employees in the hospitality industry in Kenya, thus as an organization it is committed to becoming the luxury hotel brand of choice. The population is summarized as in table below.

Table 3.2: Total Number of Employees at Fairmont The Norfolk as per

| Department | |
|------------------------------|-------------------|
| Departments/ Sections | Population |
| Finance & Human Resources | 40 |
| Food production/ Kitchen | 105 |
| Health club | 20 |
| Housekeeping and Laundry | 80 |
| Food and Beverage | 100 |
| Stores and Purchasing | 25 |
| Engineering/ Maintenance | 20 |
| Security | 10 |
| Total | 400 |

Source HR as of Dec: 2014.

3.4 Sampling Design

3.4.1 Sampling Technique

The study used stratified random sampling which was aimed to give all departments an equal chance to be objectively selected, these was be done using random number tables. It was considered because it is less costly and it was beneficial in considering the limited time which is available to do the analysis, which was favorable for this study. Stratified sampling method was used because the population under study was not homogeneous and was be sub-divided into departments to obtain a representative sample. Therefore the sample was efficient by dividing sampled population to appropriate strata and make it mutually exclusive. Stratified strata were used to give better statistical efficiency on the sample and therefore provide an adequate data for analyzing various departments this enabled all the eight departments to be represented adequately.

The study also made use of the snowballing sampling methods in order to enable participants to identify others who were willing to participate in the study. This entirely depended on referrals from initial participants to acquire new participants. Snowball method was used where existing participants were free recruit prospective participants amongst their colleagues. The decision to include this sampling method was to ensure a robust participation from each subgroup (Heckathorn, 1997).

3.4.2 The sample size

This study utilized probabilistic sampling which gave all the departments population an equal chance of being selected. Therefore from a targeted population of 406 employees, a sample size was selected through stratified random sampling which stratified the population according to sections/ departments. The detailed are as below.

The sample population was derived using Krejcie & Morgan (1970) method that came up with the table showing the relationship between sample size and the population, as described using the following formulae and table. This assisted the researcher find an adequate and efficient sample. Based on the table below, the sample was established based on our target population of 406 employees, thus in this case the adequate sample size for this study was 196 employees.

The formula below was used to determine the sample according to Krejcie and Morgan (1970).

$$S = \frac{X^2 \times NP(1 - P)}{d^2 (N - 1) + X^2 \times P(1 - P)}$$

S- Required sample.

X²- The table value of Chi- square for 1 degree of freedom at the desired confidence level (3.841)

N- Population size.

P- The population proportion (Assumed to be .50 since this would provide the maximum sample size).

d- This is the degree of accuracy expressed as a proportion (.05).

No calculations were required since there is a table provided as below that shows adequate sample sizes for different populations.

Table 3.3: Table for determining sample size from a given population by Krejcie and Morgan (1970).

| N- Target Population | S- Adequate Sample | N- Target Population | S-Adequate Sample |
|-----------------------------|---------------------------|-----------------------------|--------------------------|
| 220 | 140 | 320 | 175 |
| 230 | 144 | 340 | 185 |
| 240 | 148 | 360 | 186 |
| 252 | 152 | 380 | 191 |
| 260 | 155 | 400 | 196 |
| 270 | 159 | 420 | 201 |
| 280 | 162 | 440 | 205 |
| 290 | 165 | 460 | 210 |
| 300 | 169 | 480 | 214 |

Source: Krejcie and Morgan 1970

Thus, based on the sampled number of 196 employees, the researcher selected the number of employees per department based on proportion to the size in number per department. Thus they were be distributed as below:

Table 3.4: Distribution of the sampled population according to size.

| Departments/ Sections | Sample Population |
|------------------------------|--------------------------|
| Finance & Human Resources | 17 |
| Food production/ Kitchen | 55 |
| Health club | 10 |
| Housekeeping and Laundry | 40 |
| Food and Beverage | 50 |
| Stores and Purchasing | 12 |
| Engineering/ Maintenance | 10 |
| Security | 7 |
| Total | 196 |

Source: The researcher 2014

3.5 Data Analysis

After the structured interviews were completed, the data was tabulated and compared for trends and observations. The model was revised to better reflect what was learned in the course of the case study. It indicated that all performance elements selected had a direct impact to employee productivity. This research effort discovered that some elements: Technology, Generational Differences, Profitability and Growth, and the Type of Work Performed all influence the design and delivery of Workplace and therefore have an indirect inter-relationship to the employee. The revised model fulfilled the research objective to provide a conceptual framework for the influences that was considered regarding workplace decisions and the impact to employee's performance.

This research's effort discovered that some element like: Technology, Generational Differences, Profitability and Growth, and the Type of Work Performed all influence the design and delivery of Workplace and therefore have an indirect/ direct relationship to the employee's performance. Thus it led us to a model that fulfilled the research objective based on a conceptual and theoretical framework for the influences that

should be considered regarding workplace decisions and the impact to employee performance, which shall be discussed in detailed in chapter four.

3.6 Model Specification

A hierarchical regression analysis will be employed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Whereby:

Y= Work performance

B₀= Constant

X₁= Technological designs of machines, tools and ergonomics artifacts

X₂= Ergonomics designs and working posture range

X₃= Work place design and spatial requirement

ε= Error term

β₁, β₂, β₃, β₄ = Regression Coefficients

3.7 Regression Assumption

The study will conduct diagnostic tests as follows:

3.7.1 Linearity test

When the dependent variable has a linear relationship with the independent variables, linearity is present. This indicates that a change in either the independent or dependent variable causes the other to change, or that a change in either the independent or dependent variable causes a change in the other, and vice versa. The Pearson Correlation coefficient will be used in the study to determine whether or not there is a linear relationship between the dependent and independent variables. As advised by the authors, the threshold of linearity will be a significant deviation bigger than 0.05. (Zouet

al., 2003). A deviation value of less than 0.05 will show that the dependent variable and independent variable do not have a linear relationship.

3.7.2 Normality test

According to the normalcy assumption, prediction errors should be evenly spaced out. To test the null hypothesis that the sample is taken from a population with a normally distributed sample, the Skewness-Kurtosis, Shapiro Wilk, Shapiro-Francia tests, QQ plot of residuals, and Jarque-Bera (JB) statistics are frequently employed (Park, 2002). According to Park (2008), skewness is the degree of asymmetries in a distribution. A data set with values larger than zero is therefore skewed to the right, indicating that more observations fall on the left and vice versa.

3.7.3 Multi-collinearity test

Multi-collinearity, which is defined as a high correlation between two or more independent variables, is known to have a detrimental effect on the estimate of the regression parameter. The Variance Inflation Factor (VIF) and the tolerance level will be used in the study to test for the presence of multi-collinearity. A threshold of between 1 and 10 will be used for VIF. Hence, the presence of multi-collinearity will be indicated by a VIF value of less than 1 or larger than 10. On the other hand, it will be advised to use a tolerance level bigger than 0.10. (Fidell, 2001).

3.7.4 Homoscedasticity test

Using the Durbin Watson test, heteroscedasticity was evaluated using the Spss statistical package. The null hypothesis is rejected and heteroscedasticity is present if the test's p-value is less than 0.05, which is considered to be a level of significance.

3.8 Ethical Issues

The researcher was keen to observe the Laws of the country, research code of ethics and regulations of Fairmont Hotels & Resorts. Permission was being sought from the Group Human Resources Manager, and Operations Manager. Care was being taken to ensure confidentiality of respondents and the information sources. Acknowledgement of extracts from written and sourced documents was made accordingly if the source so wishes to be recognized. The researcher also organized, presented and analyzed data and then wrote a report on the study and shared part of the findings with the Hotel.

The respondents will receive sufficient information about the research and that participation is entirely optional when this study is conducted. The information will also be provided by individuals who are qualified to do so. Although the information from responders will only be used for research purposes and will be handled with the utmost confidentiality, privacy and confidentiality concerns will be taken into consideration (Orodho & Kombo, 2002). Moreover, permission will be requested through a research permit received from the University and the National Commission for Science, Technology, and Innovation (NACOSTI).

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.0 Overview

This chapter presents the data analysis as well as the findings of the study based on the study objectives. The data was summarized and presented using tables. The collected data was analysed and interpreted in line with the study objective. The study employed different statistical techniques aided by SPSS version 22 to analyze the data. This chapter also describes the data analysis, presentation and interpretation of the findings. The findings relate to the objectives that guided the study.

Table 4.1: Response Rates per Department

| Departments/ Sections | People Sent the Survey | Response Rates |
|---------------------------|------------------------|----------------|
| Finance & Human Resources | 17 | 10 |
| Food production/ Kitchen | 55 | 50 |
| Health club | 10 | 7 |
| Housekeeping and Laundry | 40 | 35 |
| Food and Beverage | 45 | 43 |
| Stores and Purchasing | 12 | 9 |
| Engineering/ Maintenance | 10 | 10 |
| Security | 7 | 6 |
| Total | 196 | 170 |

Response rate:

(Responses/ People sent the survey*100)

86.734%

Source: Researcher 2015

4.1 Respondents General Information

The types of employees are primarily professional with 70% designated professional, 2% executive, and 28% clerical. The Hotel is over 20 years old, however it is well maintained. A visual inspection of the property revealed dark interiors, high walled cubicles and maze-like corridors opening up into different areas of workspace and offices. Within the specific workspace pods, the space layout reflected the type of work

being performed such as no-walled workstations for customer contact or other activities and high-walled workstations for transactional activities such as the accounting and administration.

All respondents were first asked to provide information on: Gender, age bracket, duration or years of experience in the Job, marital status, and their level of education. The findings are presented as below.

4.1.1 Gender description

Respondents were asked to indicate their gender. According to the findings presented below, 38.5% of respondents were female and 61.5% were male.

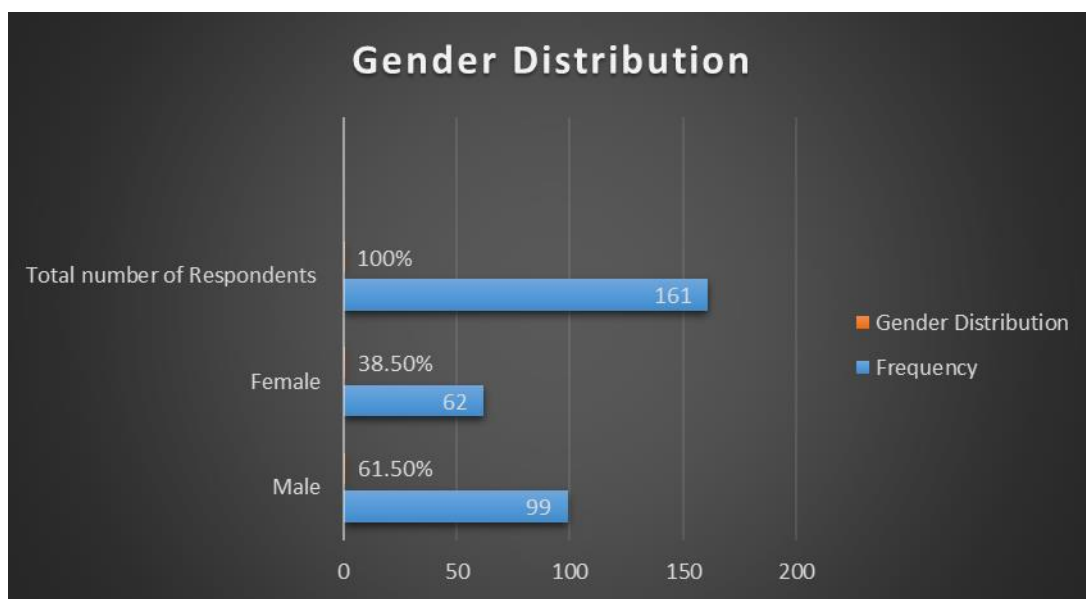


Figure 4.1: Distributions by Gender

Source: Researcher 2015

4.1.2 Age

The study sought to establish the age distribution among respondents, the findings revealed that 26.7% of respondents were between the ages of 20-25 years of age, and 15.5% of the respondents were between the ages of 25-30, therefore, this means the most hardworking employees are mainly youthful. Thus, demographically a significant percentage of employees belong to Baby Boomer generation and Generation X. The

Legacy generation represents approximately 40% of the workforce and the Generation Y is 60%. According to the Director of HR, the impacts of multiple generations in the workplace are significant, and she feels the Hotel has not yet effectively managed these differences. Her assessment is that they “have taken Millennials, which is what we call them, and force fit them into a traditional baby boomer atmosphere”. The researcher realized there were initiatives underway to better understand this and implement practices and policies which offer more flexibility, but nothing has been implemented to this point. In her role in HR, she sees a workforce that is relatively stagnant and risk-averse with everyone working with their best friends. She is finding the ability to attract and retain younger talent as a challenge.

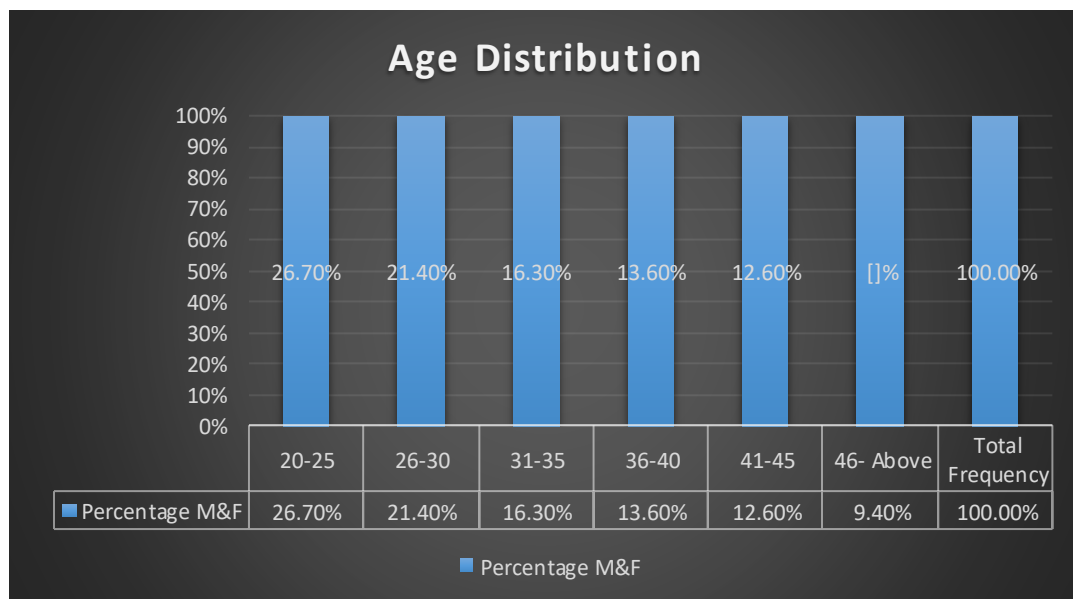


Figure 4.2: Age Distribution

Source: Researcher 2015

4.1.3 Professional Experience

Respondents were asked to indicate how long they had worked for the organization. According to these findings in Figure 4.2, 70% of respondents had worked with the organization for a period of between 2-5 Years at the period of our research. This an

indication that the organization doesn't have long serving employees in the same position.

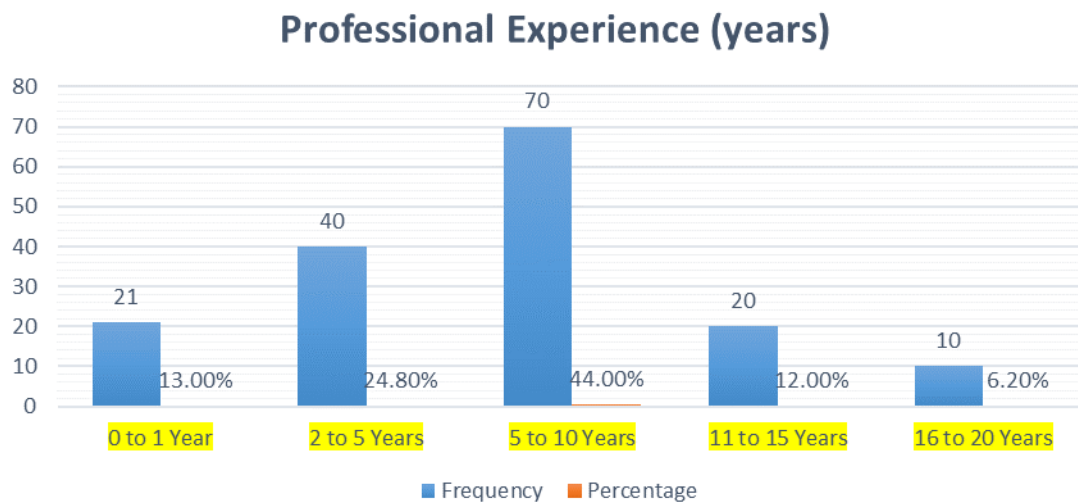


Figure: 4.3: Professional Experiences

Source: Researcher 2015

4.1.4 Level of Education

The respondents were asked to state their level of education, the study results indicated that 43% of the respondents had university or college education, 32 % had secondary level education while 19% of respondent had primary school education, which is an indication that the organization has knowledgeable staff. This was vital for the study, since the researcher required that the respondents are knowledgeable enough to understand the questions and as well as give us a feedback.

Table 4.2: Level of Education

| Education | Male | Female | Total Frequency | Percentage |
|---------------------|-----------|-----------|-----------------|-------------|
| K.C.P.E | 18 | 11 | 29 | 19% |
| K.C.S.E | 20 | 32 | 52 | 32% |
| University/ college | 33 | 37 | 70 | 43% |
| Higher education | 2 | 8 | 10 | 6% |
| Total | 73 | 88 | 161 | 100% |

Source: Researcher 2015

4.1.5 Summary of bio data Findings

Out of 161 respondents, there were 98 men and 63 women who took part in the survey study. Their percentage was 60.9% and 39.1% respectively. As far as their level of education is concerned, there were 29 respondents who were K.C.P.E certificate holder, 52 respondents were K.C.S.E certificate holders, 70 were university/college graduates and 10 had master and above education level. Their percentage was 19%, 32%, 43% and 6% respectively. The respondents belong to different age groups. Like 26.7% belong to age group 20- 25 years, 21.4% were between 26-30 years, 16.3% were between 31-35 years, 12.6% were between 41-45 years and 9.4% of respondents belonged to age group level of 46 and above. Among the respondents, 21 had professional experience from 0 -1 (year), 40 had were level of experience from 2 to 5(years), 70 had 5-10(years), 20 had 11-15, 10 were from 16-20(years). The above summary means that the targeted population was: Well Educated since more than 60 % had colleague education and above, had mixed age variances as at least 35% of the respondents were baby boomers, and approximately 40% were millennials this means that the workers have different ideas on how the workplace operates, the technological incorporation, speed of task execution, performance and many other factors which affect performance, the study also shows that the targeted population is well experienced in their Jobs about 70% of the employees have experience of between 2 and 20 years, which means the more experience you have the more you have mastered the work and the rate of errors is dramatically reduced.

4.2 Diagnostic Test Results

When determining normalcy using the Jarque-Bera test, the null hypothesis cannot be ruled out if the p-value is less than the Chi (2) value. The residuals were determined to be normally distributed based on skewness and kurtosis. The null hypothesis cannot be

ruled out, as shown by Table 4.3, where the p value of chi (2) is 0.357, which is greater than 0.05. The assumption of normal distribution is not broken, according to the implication.

Table 4.3: Level of Education

| Skewness/Kurtosis tests for Normality | | | | ----- joint ----- | | |
|---|-----|--------------|--------------|-------------------|---------|-----------|
| Variable | Obs | Pr(Skewness) | Pr(Kurtosis) | Adj | chi2(2) | Prob>chi2 |
| Myresiduals | 196 | 0.361 | 0.272 | | 2.060 | 0.357 |
| Jarque-Bera normality test: 1.926 Chi (2) .3818 | | | | | | |
| Jarque-Bera test for Ho: normality: | | | | | | |

Source: Researcher 2015

Null hypothesis (Ho) of Jarque-Bera test is “residuals of variables are normally distributed” While alternative hypothesis (H0) states that “residuals are not normally distributes”. P-value of Jarque-Bera test shows the value of .3818 which is larger than 0.05. It means that it is not significant and null hypothesis cannot be rejected and the null hypothesis states that the residuals are normally distributed.

4.2.1 Autocorrelation Test

Autocorrelation test of the residuals was tested using the Durbin Watson test.

Table 4.4: Breusch Godfrey LM test for serial correlation

| Source | chi2 | Df | Prob>chi2 |
|--------------------------------|------|----|-----------|
| Durbin Watsin Test d statistic | | | 2.299125 |

Source: Researcher 2015

Table 4.4 above shows the results of the DW test for correlation. The null hypothesis of no correlation is supported by the Durbin Watson test statistic of 2.299125. The general rule of thumb is that when the test statistic values range between 1.5 and 2.5 there is no serial correlation.

4.2.2 Heteroscedasticity Test

Heteroscedasticity test for residuals was tested using Breusch Pagan test. The null hypothesis of homoscedasticity was tested against the alternative hypothesis of heteroscedasticity. According to Breusch & Pagan, (1979), the null hypothesis of homoscedasticity is accepted if the p values that corresponds to the chi-square test statistics is greater than the 5 percent level of significance and rejected if the p values corresponding to the chi-square test statistics is less than 5 percent level of significance.

Table 4.5: LM Test for Heteroscedasticity

| Source | chi2 | Df | Prob>chi2 |
|--------------------|------|----|-----------|
| Heteroscedasticity | 8.19 | 13 | 0.8312 |

Source: Researcher 2015

The results for this test shown in the Table 4.5 above indicate that the residuals of the model are homoscedastic. This supported by the p values corresponding to chi-square test statistics of 0.8312 than is greater than 5 percent level of significance (0.05). This therefore means that the residuals of the model have a constant variance.

4.2.3 Multi-collinearity Test

Multi-collinearity in the model was tested using the variance inflation factor (VIF). The VIF measures the interrelationship among the independent variables in a model. A general rule of thumb for multi-collinearity is that values greater than 10 indicates the presence of multi-collinearity in the model and values less than 10 indicates the absence of multi-collinearity in the model.

Table 4.6: VIF multi-collinearity test

| Variable | VIF | 1/VIF |
|------------------------------------|------|----------|
| Technological designs | 1.14 | 0.875756 |
| Ergonomics designs | 1.19 | 0.843225 |
| Work place and spatial requirement | 1.50 | 0.667955 |
| Mean VIF | 1.31 | |

Source: Researcher 2015

Table 4.6 above shows the results of multicollinearity. The VIF is the table above is 1.31 which is less than generally accepted rule of thumb of 10 indicating that there is no multicollinearity among the independent variables.

4.3 Research Findings

4.3.1 Technological design of machines, tools and ergonomic artifacts at work, and their effect the work performance?

Table 4.7: Technological ergonomic designs of machines and tools and their impact on speed execution

| Responses | Frequency | Percentage |
|---------------------------|-------------------------------------|--|
| Strongly Disagree | 3 | 1.9% |
| Disagree | 17 | 10.5% |
| Neutral | 19 | 11.8% |
| Agree | 46 | 28.6% |
| Strongly Agree | 76 | 47.2% |
| Total | 161 | 100% |
| Standard Deviation | 29.012 (841.7 Variance) | p- value =0.00 |
| Median | 19 | r -value =1 (P-Value is < |
| Skewness | 0.57277 | 0.00001. The result is |
| Kurtosis | 1.5976 | significant at p < 0.01) |
| | X Values | R |
| | $\Sigma = 100$ | $r = \frac{\Sigma((X - M_x)(Y - M_y))}{\sqrt{(\Sigma SS_x)(\Sigma SS_y)}}$ |
| | Mean = 20 | |
| | $\Sigma(X - M_x)^2 = SS_x = 1298.9$ | $r = \frac{2091.2}{\sqrt{((1298.9)(3366.8))}} = 1$ |
| | Y Values | |
| | $\Sigma = 161$ | |
| | Mean = 32.2 | |
| | $\Sigma(Y - M_y)^2 = SS_y = 3366.8$ | |
| | X and Y Combined | |
| | $N = 5$ | |
| | $\Sigma(X - M_x)(Y - M_y) = 2091.2$ | |

Source: Researcher 2015

From the above table, it was observed that 28.6 percent of respondents agree that technological design tools, machines and artefacts used at work affect performance, and 47.2 percent employees strongly agree that the design of machines, tools and ergonomic artefacts at work, affect the speed of task execution. However, 11.8 percent of respondents remained neutral about the question. Therefore, ergonomics is seen vital in developing and maintaining a working environment where maximum level of performance is obtained at particular time. Therefore the r value 1 indicates a strong positive correlation technological design of Machines, tools and ergonomically design on performance, which means high variable scores on responses go with high variable scores in the frequency of the sample (*The value of R is 1. This is a strong positive correlation, which means that high X variable scores go with high Y variable scores (and vice versa)*). While the ergonomically developed technologies are in place to support alternative work strategies, the implementation is categorized as “at department discretion”. This is due to the perception of senior management that work can only be performed while a person is at the office and seated on his/her desk, and using certain type of machines, ergonomics. According to Human Resources Department performance review conducted in first three months of a new workplace after the start of Ergonomic compliant workplace, performance levels increased dramatically since the implementation of ergonomically designed machines and tools at work. There has been some innovative use of technology to support a mobile workforce has been the pilot introduction of tablet devices within the company, this has led to improved performance and productivity, by about 15% (Human resources Department August 2013)

4.3.2 Does Ergonomic Designs of the work environment in form of posture and working range affect the rate of human errors?

Table 4.8: Ergonomic Designs of work environment on error rates

| Responses | Frequency | Percentage |
|---------------------------|-------------------------------------|---|
| Strongly Disagree | 6 | 3.7% |
| Disagree | 10 | 6.2% |
| Neutral | 10 | 6.2% |
| Agree | 50 | 31.1% |
| Strongly Agree | 85 | 52.8% |
| Total | 161 | 100% |
| Standard Deviation | 34.6 (1194.2 Variance) | p- Value = 0.00 (The P- Value is < 0.00001. The result is significant at p < 0.01) |
| Median | 10 | |
| Skewness | 0.68437 | |
| Kurtosis | 1.5478 | r -value=1 |
| | Y Values | R |
| | $\Sigma = 161$ | $r = \frac{\sum((X - M_x)(Y - M_y))}{\sqrt{((SS_x)(SS_y))}}$ |
| | Mean = 32.2 | $r = \frac{2969.2}{\sqrt{((1845.62)(4776.8))}} = 1$ |
| | $\Sigma(Y - M_y)^2 = SS_y = 4776.8$ | |
| | X and Y Combined | |
| | N = 5 | |
| | $\Sigma(X - M_x)(Y - M_y) = 2969.2$ | |

Source: Researcher 2015

In responding to the question on if performance level can be improved if the working posture, working range and distance were ergonomic compliant, we observed that majority of respondents were in agreement or strongly agree with the statement, in that 31.1 percent of respondents were in agreement and 52.8 percent employees were in strong agreement performance levels in terms of error rates was altered if the working posture, working range and distance were ergonomic compliant. The results of the r value were 1 which indicates a strong positive correlation, which means high variable scores on responses went with high variable scores in the frequency of the sample (*This is a strong positive correlation, which means that high X variable scores go with high Y variable scores (and vice versa)*). As observed in the above attribute, ergonomic

technology plays a big role in determining working range and distance, therefore, there were significant influences to the quality of outputs delivered in terms of reduced error rates, which in turn the impact can be measured. Therefore, the study recommends any company to implement the technology that suites them to achieve this fit, which is derived from a work based analysis. In a performance report from Kitchen, Engineering and Food & Beverage department, the departments saw a 75% reduction of human errors, when they introduced ergonomic compliant designs to work place, to interactively assist employees during the performance of their work, by adapting to employees requirements of posture, distance and working range.

4.3.3 Does work place design and spatial requirements and effect levels of work attendance and reduce absenteeism?

Table 4.9: Furniture design and spatial requirements and its effect on accidents and absenteeism levels

| Responses | Frequency | Percentage |
|---------------------------|-----------------------------------|---|
| Strongly Disagree | 12 | 7.5% |
| Disagree | 15 | 9.3% |
| Neutral | 16 | 9.9% |
| Agree | 80 | 49.7% |
| Strongly Agree | 38 | 23.6% |
| Total | 161 | 100% |
| Standard Deviation | 28.657 (821.2 Variance) | p- Value= 0.00 (P-Value is < 0.00001. The result is significant at p < 0.01) |
| Median | 16 | r -value=1 |
| Skewness | 0.97553 | |
| Kurtosis | 2.0554 | |
| | | R |
| | | $r = \frac{\sum((X - M_y)(Y - M_x))}{\sqrt{((SS_x)(SS_y))}}$ |
| | X Values | |
| | $\sum = 100$ | |
| | Mean = 20 | r = 2040.7 / |
| | $\sum(X - M_x)^2 = SS_x = 1267.8$ | $\sqrt{((1267.8)(3284.8))} = 1$ |
| | Y Values | |
| | $\sum = 161$ | |
| | Mean = 32.2 | |
| | $\sum(Y - M_y)^2 = SS_y = 3284.8$ | |

Source: Researcher 2015

From the above table we observed that ergonomic efforts made in terms of furniture design, spatial requirements towards organizational work models, and lead to improved work performance, this was significant in developing an ergonomic compliant working environment, which leads to improved performance. The results showed that 49.7 percent employees were agreed and 23.6 percent employees strongly agreed with the statement that a good relationship among coworkers will help in enhancing ergonomics efforts aimed at improved performance, made by the organization. From the above table we saw that employees strongly agreed with the opinion. Therefore the r value 1 indicates a moderate positive correlation, which means there is tendency for high variable scores on responses with high variable scores in the frequency of the sample (*This is a strong positive correlation, which means that high X variable scores go with high Y variable scores (and vice versa)*). The Hotel performs an annual employee engagement survey administered by human resources. Engagement surveys also known as employee satisfaction surveys, indicated how well a company is engaged with its workforce and identifies areas that may be of potential concern in relation to performance. These surveys were not meant to be a report card, but a tool to help senior management have insight into the alignment of employee goals and expectations with company mission and goals, and the study established that the gaps can be bridged by use of ergonomics by altering work models and norms. Many employees in the Hotels had scored higher than the high performing norm included questions regarding: senior management, direct supervisors, coworkers, advancement opportunities, accountability and performance management, and the physical work environment. Areas which scored below the norm included questions surrounding communications, customer service, and teamwork. These results were discussed with the HR Director who reinforced the research observations and further emphasized the company had some opportunities to

improve the company position on work/life balance and compensation. Thus the HR Director considered this findings in implementing and factoring in of ergonomic designs with considerations of spatial requirements of employees, in efforts to reduce work related injuries and related to absenteeism. The findings after three months of implementation found that, there was 35% increased levels of attendance in comparison to previous period last quarter. Therefore, it was discovered that reduced accidents and injury at work place increased the levels of attendance and significantly reduced absenteeism.

4.3.4 Do you think that any ergonomic efforts and practices done by your organization have helped you to increase your level of performance on the job?

Table 4.10: Management Requirements and organizational procedures and their effect on revenue growth

| Responses | Frequency | Percentage |
|--------------------|--|--|
| Strongly Disagree | 22 | 13.7% |
| Disagree | 25 | 15.5% |
| Neutral | 7 | 4.3% |
| Agree | 25 | 15.5% |
| Strongly Agree | 82 | 51% |
| Total | 161 | 100% |
| Standard Deviation | 28.82 (830.7 Variance) | p- value=0.00 |
| Median | 25 | r -value=1 |
| Skewness | 1.1036 | |
| Kurtosis | 2.3802 | |
| | | <i>X and Y Combined</i> |
| | | <i>N = 5</i> |
| | <i>X Values</i> | $\sum(X - M_x)(Y - M_y) = 2068.5$ |
| | $\sum = 100$ | |
| | Mean = 20 | <i>R</i> |
| | $\sum(X - M_x)^2 = SS_x = 1287.68$ | $r = \frac{\sum((X - M_x)(Y - M_y))}{\sqrt{(SS_x)(SS_y)}}$ |
| | <i>Y Values</i> | |
| | $\sum = 161$ | $r = 2068.5 /$ |
| | Mean = 32.2 | $\sqrt{((1287.68)(3322.8))} = 1$ |
| | $\sum(Y - M_y)^2 = SS_y = 3322.8$ | |

Source: Researcher 2015

From the above table, the research found out that that 15.5 percent of employees agree, while 51 percent strongly agree that ergonomic efforts and practices done by your organization has aided efforts to increase the level of performance on the job, which has intern improved revenue growth, 4.3 percent of the respondents were neutral with the view about role of relationships among coworkers in the presence of ergonomics and their effect on performance. The Hotels aided aspects include things like productivity and performance metrics however, the hotel does not have any formal performance metrics in place across the company, and it was only centered in specific departments. This means that having performance metrics tailored completions at workplaces might lead to performance soaring. As compared to industry norms, the HR Director said these departments perform at or above industry norm. The turnover metrics compared favorably which the HR Director admitting could be a factor of the current economy. Therefore the r value 1 indicates a positive correlation, which means there is a tendency for high variable scores on responses which went high variable scores in the frequency of the sample (*This is a strong positive correlation, which means that management/ organizational requirements supported by ergonomic designs of workplaces have a na impact on overall organizational performance in terms of profitability and variable scores go with high Y variable scores (and vice versa)*). Organizational/ management requirements, in terms of procedures assisted by use of Ergonomics design of the workplace is seen to lead to high-performing and innovative employees, which are the foundation of increased organizational performance, revenue growth and Hotels profitability, by far the most impactful factor in workforce and team performance is hiring and retaining employees with exceptional capabilities and self-motivation. Working together, managers and HR can attract, hire, develop, and retain individual employees who are agile, high-performing continuous learners and

innovators, and for HR to achieve this goal, organizations should have workplaces that attract those kind of employees. Unfortunately, even the best employees cannot perform without great managers, best ergonomic supported tools and resources as well as proper direction. Therefore, it is noted that organizational procedures supported by ergonomics design efforts have an impact on overall organizational performance. In a performance review of the Hotel conducted on August 2013, it was discovered that within three months of enactment of the use of Ergonomic designs at workplaces the Hotel attracted new caliber of employees, it was also noted the Hotels' financial performance also increased by 25% based on same period in 2012. (Human Resources Department, 2013 and financial statement 2012-2013).

4.4 Summary of Findings

The analysis of the results indicate a positive correlation between ergonomic technological design of machines, tools and performance in terms of speed of task execution ($r=1$) and is significant at 0.05. This shows that when the design of tools and machines used by the employees is not comfortable and according to the needs of the employees their performance is affected.

There is a positive relationship between Ergonomic designs, working posture and range against error free performance. The correlation coefficient ($r=1$) is significant at 0.05. The positive relationship between working postures and range vs performance shows that employees' performance highly correlates to the working range and postures determined by ergonomic designs which in turn affect error rates committed during task execution.

The results of Furniture design and spatial requirement reveal a significant correlation with performance. ($r=1$) at $p=0.05$. Spatial Arrangement which is determined by

furniture design controls the space factor of the work place design has a pounding effect on employees injury cases which impact on attendance/ absenteeism rates; when the correlation was calculated in SPSS it gave a positive relation with performance ($r=1$) where $p=0.05$. It means that the spatial arrangement has a considerable effect on the employees' performance.

The coefficient of determination R. square =1. This gives us the ratio of explained variation to total variation. On converting the R. square value to percentage it comes to be approximately 58 Percent. From this percentage it is concluded that 58 percent of the variability of employees' performance is accounted for by the variables in this model.

The regression co-efficient for the predictor variables; technological design of machines, Ergonomic design of work environment, Furniture design & spatial arrangements, and finally organizational procedures and management requirements and are 1, 1, 1, and 1, respectively. The coefficient values show, the change in performance with a unit change in a variable value, when all the other variables are held constant.

When we analyze the coefficient value for the variables, First 'technological design' we can say that there is an increase of 1 in the speed of task execution of an employee for every unit increase (betterment) in the technological ergonomic design conditions of the machines and tools, keeping all the other variables constant. Second, 'ergonomic designs that affect working range and postures increase of 1, in the error rates of the employee, such that the poor the design or the longer the working range the higher the rates of error in output. Thirdly, 'furniture design and spacial requirements, we can say there was an increase of 1, towards the levels of absenteeism and accidents, in that, the poor the design used per employee, lead to probability of proneness to injury and

likelihood to be absent as a result. Finally, Organizational procedures and management requirements of performance assisted with ergonomics design affects revenue growth and profitability. Thus there was an increase if 1, if organizations took steps to improve the workplaces by installing ergonomic compliant workplaces on companies revenue growth.

The Hotel is strong and stable, it recognizes that it needs to update some of its policies and practices in relation to ergonomics and ergonomic compliance in design, by integrating more ergonomics artifacts. Some of the workspace and the organizational policies need to be updated and the study is championing these efforts. There is significant investment in technology surrounding video conference tools and the one-phone deployment, and it will be interesting to see how these tools have been utilized and what benefits they will provide in the next 12-18 months.

4.5 Comparison and Analysis

After conducting the structured interviews in the case Study companies, results were tabulated and analyzed to see if there were any trends or conclusions as per below:

Organization Effectiveness Indicators

Employee's positivity about Senior Management, Employees positivity about direct supervisor, Employees proud to work for the Hotel, working in Company that promotes work/life balance, Employees clear about expectations, Employees find workplaces suitable, Employees feel fairly compensated, are the attributes that makes the 22nd century work place, that is able to foster great performance, improved productivity and increased motivation .

Comparison of Organizational Effectiveness Indicators

Based on organizational records (Secondary data analysis), the Hotel had conducted an annual employee engagement surveys. At first management felt they were doing well as they had changed their methods to a higher performing company index than in the past. In reviewing their summary scores, they ranked very low on communications issues as compared to the high performing companies which may be influenced by the way the working space is organized. As far as the second survey was concerned it reflected a complacent workforce rather than a company who was remaining current with the competition. Management chose not share any specific results from their survey but did not feel it was an accurate reflection of their current organizational status. Thus they felt certain that the constant industry pressures, reorganizations, and mergers/divestitures would show low scores, and have chosen to focus their efforts toward annual corporate-wide goals instead. Attitudes regarding senior management were highest in the recent past and there were some degree of skepticism at this point. These trends also influenced the responses regarding question 26, which is the overall attitude toward the company. Responses regarding direct supervision were highest at the time of second survey, although Company felt it reflected an unhealthy level of comfort rather than excellent management. Work/Life balance ranked the same with a slightly lower. General flexibility in work styles were noted as barriers here.

4.6 Inferential Analysis

4.6.1 Correlation between Ergonomic variables and their effect on performance

Table 4.11: Correlation Analyses

| Variable Name | r value | p value | Correlation Relation |
|---|---------|---------|----------------------|
| Technological design of machines, tools and ergonomic artefacts at work, and their effect the speed of task execution. (Ergonomic designs of work environment in terms of working posture, working range and distance and the effect on error rates, thus, work module techniques and work design processes on productivity). | 1 | 0.00 | Strong + |
| Furniture design and Spatial requirements and its effect on levels of absenteeism and accidents (organizational practices and improved quality of work and performance) | 1 | 0.00 | Strong + |
| Organizational and management requirements (ergonomic designs on employee's health and safety) | 1 | 0.00 | Strong - |

Source: Researcher 2015

From the above table we observed that the value of Pearson r is greater than 0.00 which indicated that there is a strong positive correlation that existed between the variables and performance, however a null on ergonomic designs on employee's health and safety. It was also clear that as the p value or sig (2-Tailed) values were less than 0.05 that indicated a significant correlation between ergonomics design and performance.

According to the results above, it can be concluded that, the differences are found amongst the responses to different factors in the workplace. There is a direct relationship between ergonomic workplace Design and performance. This relationship between ergonomic design and performance was determined by using the Pearson's Correlation in standard statistical software "Statistical Package for Social Sciences" (SPSS). Pearson's Correlation is a measurement of the strength of a linear or straight line relationship between two variables. The Correlation Coefficients indicate both the direction of the relationship and its magnitude.

4.7 Summary of Descriptive Data

According to the data collected, 39.1 percent respondents were female employees and 60.1percent were Male employees. The overall response according to the gender and the mean and productivity for male and female employees is detailed in Table Below.

Table 4.12: Descriptive Data Analysis

| Attribute | Technology | Working Environment | Ergonomic Models | Organizational Requirements and Ergonomic Performance |
|--|------------|---------------------|------------------|---|
| Median | 19 | 10 | 16 | 25 |
| S.D | 29.012 | 34.6 | 28.657 | 28.82 |
| Mean | 20 | 32.2 | 20 | 20 |
| Cumulative percentage of employees who Agree and Strongly agree | 75.8% | 83.9% | 72.3% | 65.5% |

Source: Researcher 2015

4.7.1 Work place Analysis

The Hotel has different departments namely: Sales & Marketing, Finance, Front Office, Engineering, Housekeeping, and some additional staff functions. The floor plans are open with approximately 50% of the space having interior offices and no-wall workstations. The remaining 50 % is a mix of high-wall and low-wall workstations and interior offices. The buildings are highly automated with lighting and energy control systems and indoor air quality management systems. Thus is considered generally conducive to work. However, the space allocation to workstations with 40% of the space in low to no wall configurations, 40% in high walled workstations, and 10% dedicated to enclosed offices. Conference room space covers approximately 10% of the area footprint. The use of workplace standards is generally in place although due to the timing of acquisitions and associated build-outs along with the philosophy of taking space “as is”; the feel of the furniture and finishes is very different from one department to the next. The space is also organized in separate pods or pockets as the availability

of contiguous space was limited by the as-needed approach to acquiring space. According to Engineering Manager, he has handled requests in a timely manner, but finds it difficult to respond effectively to space requests due to their current space constraints.

a. Types of Work Performed at this Location

The Hotel is composed of primarily Hotel operations at 70% and a housekeeping, front office, food & Beverage and kitchen which represent approximately 80% of the workforce. Remaining business functions include Sales & Marketing (5%), Finance (10%), Engineering (13%), General Management (1%), and HR (1%). The work is evenly divided between operations work, transactional work, confidential projects, and training or marketing presentations. The advantage part is that the Hotel can change the setting has flexibility to reallocate space depending on these needs.

b. Technology

At the time of the study, the Hotel was in the process of doing a number of technology upgrades to foster collaboration. While they have one tele-presence video conference unit in place, they are installing 18 additional units to connect 12 locations. The older video conference equipment was relatively complex and seldom used, so they have focused this implementation on being easy to use in addition to providing the inherent benefits of the high definition images. Other collaboration tools provided include online reservation systems for conferencing, A/V equipped conference rooms and offices for 70% of the available rooms, and the use of Connect Pro virtual meeting software. They have one electronic whiteboard, but noted that it was not used.

Mobility tools include laptops and smart phones, but they are also upgrading the business phone system to the “one phone” technology. This technology allows an

individual to have their office phone ring at all locations: office, or when they are mobile, and can be adjusted through employee controlled settings so that work related calls can be diverted after hours as necessary. Other mobility technologies in place include 100% wireless coverage, secure remote access, and cloud computing for some applications. The HR Director noted a deficiency in the overall mobility strategy due to lack of management support for alternative work strategies. While the company does have specific policy backing, the top management is skeptical. According to the HR Director, this is due to an entrenched baby boomer management style where some find it difficult to believe employees can be productive outside of the office.

c. Organizational Effectiveness and use of Flexi work

A number of performance metrics associated with organizational effectiveness were captured by the study. The HR Director warned that while the metrics are captured and compare favorably to industry trends, they can also be misleading if a company has not gone through the process of defining who they are. The company does an annual employee satisfaction survey with consistently high scores, but the HR director is concerned that this may reflect a complacent workforce as opposed to an effective workforce. As an example, the attrition rate is 8% which is favorable for a software development company, but does not measure whether you are hiring and keeping the right people. They have implemented a new metric tracking retention within the first year of employment and learned it was trending downward in the first year but it is now at a more favorable level. Another concern was the perception of senior management by the employee population. This is due to a high turnover rate. Most employees are taking a “wait and see” approach which may impede overall productivity. Other management concerns noted was a culture of the immediate supervisor being the “best

friend” so that while everyone got along, performance expectations may not be at the right level.

The HR Director summarized overall organization effectiveness as good, but needing improvement. The workforce itself has an eight-to-five and/ or 8 hours per day mentality, while the managers and middle management work very hard and long hours to promote new concepts and programs. The company provides good benefits and has a wellness strategy to promote work/life balance, but lacks some of the workplace environmental factors attractive to new employees. The HR Director hears the daily issues of the younger workforce who want meaningful work and the ability to work outside the Hotel and in a more casual setting which she does not feel is offered. The HR manager is championing some changes in this area, that include changes in ergonomic designs of the workplaces, but she is faced the challenges of educating senior management about the impacts of ignoring more flexible work environments.

d. Productivity and Metrics

A number of metrics are tracked with revenue per product line and dates around software releases being the most observed metric. HR tracks turnover rates and on-boarding costs for new employees and trends favorably as compared to industry norms. Absenteeism is captured through the wellness programs to see if they are effective, but not enough data has been captured to observe a trend. Metrics around the workplace focus on expense reduction and control with a cost focus rather than an end-user satisfaction focus.

4.7.2 Organizational Productivity/Performance Metrics

Table 4.13: Comparisons of Organizational Productivity/Performance Metrics

| Productivity/Performance Metrics | Percentage |
|---|------------|
| Corporate Workplace significant to productivity | 85% |
| Workplace impacts to organization | |
| Expense reduction and control | 21% |
| Increase employee satisfaction | 32% |
| Improve flexibility | 25% |
| Improve service delivery | 33% |
| Operation metrics captured | 33% |
| Cost per employee | 65% |
| Revenue/Employee | 20% |
| Customer service – internal | 60% |
| Customer service – external | 55% |
| HR Cost/person | 45% |
| Technology cost/person | 60% |
| Employee productivity measures | |
| Individual level | 20% |
| Department level | 65% |
| Corporate level | 10% |
| Not captured | 5% |
| HR metrics captured at this location | |
| Training costs | 85% |
| Recruiting Costs | 60% |
| Turnover rates | 85% |
| Absenteeism | 15% |

Source: Researcher 2015

The Hotel felt the corporate workplace was significant to productivity and that some changes were needed, that the Hotel had a new relocation project scheduled, as well as plans to create some new collaboration space and not yet happy with the new space they occupy. The report generally acknowledged that the workspace was an expense to manage. Flexibility was important; however they had a lease expiring in 2 years, so that they may explain why flexibility was not an important characteristic at this time. It also felt that service delivery was important for their workplace. Almost all the operational metrics related to workplace and staff functions were captured, although they were

more indicators of cost control than quality. The findings also capture HR and Technology costs per person and used it to defend overhead costs. At the time of the study the Hotel had not implemented any metrics except for the power generating facilities which drive overall corporate goals.

Employee productivity goals were captured at the individual level and department level and used in performance management. This was not done in all functions, but only those in sales, front office, and housekeeping were involved. The Hotel as well had some metrics in the call center and looked at company level sales metrics for different product lines. Other departments did not track any sort of productivity metrics. No knowledge worker metrics were in place for any of the sections. The only metric associated with employees in other departments like kitchen was that, the Hotel tracked safety metrics.

HR tracked performance metrics at all the departments. On boarding costs are easy to capture out of the new web-based recruiting tool which the Hotel uses. Recruiting costs were tracked which was again a natural result of the web-based tool, which they utilized. Turnover rates were tracked at all levels. Absenteeism was not systematically tracked by all departments. Some departments did track absenteeism through participants in their different attendance programs.

4.7.3 Reliability Testing

Below is the summarized Cronbach Alpha's Coefficient, using George and Mallery (2003) rule of thumb any items with a value of less than 0.5 would be unacceptable, where physical environment scale has demonstrated acceptable internal consistency reliability that with obtaining 0.8 "good" or 0.7 rather sufficiently reliable and 0.6 questionable. Moreover annually (1978) reasoned that variable value approaching to 1.00 is reliable. Based on the summarized Cronbach alpha coefficient in Table 2, it

shows most of the variable have exceeded the acceptable level respectively suggesting a good interim reliability.

Table 4.14: Cronbach Alpha Coefficients summary

| Variable | Number of Items | Cronbach's Alpha |
|---------------------------------------|-----------------|------------------|
| Designs on Health and Safety | 3 | -0.981 |
| Company procedures and Processes | 3 | 0.623 |
| Employee Performance and Productivity | 3 | 0.803 |

Source Researcher 2015

4.7.4 Inferential Analysis

Pearson Correlation Pearson Correlation used to determine the relationship between the independent and dependent variable. Desired level significant is 0.05. Based on Table 4, the result indicates positive correlation between building aesthetic and employee performance ($r=0.793$) significant at 0.05. Where else furniture arrangement ($r=0.623$) significant at 0.05. There is a negative correlation between facilities ($r=-0.981$) significant at 0.05. Similarly, ventilation ($r=-0.713$) significant at 0.05. Lightings ($r=0.272$) with significant at 0.05, and noise ($r=0.306$) significant at 0.05.

Table 4.15: Correlation between physical environment and employee performance

| Items | Pearson Correlation (r) | Significance (2-tailed) |
|-----------------------|-------------------------|-------------------------|
| Building Aesthetics | .793 | .023 |
| Furniture arrangement | .623 | .000 |
| Facilities | -.981 | .000 |
| Ventilation | -.713 | .000 |
| Lighting | .272 | .021 |
| Noise | .306 | .029 |

***Correlation is significant at the 0.05 level (2-tailed)*

Source: Researcher 2015

4.7.5 Multi regression result model

The R value measures the strength associated between independent variable and dependent variable. Referring to Table 5, the R square value is 0.565 which suggest

56% of the variation in job performance that explained by the independent variable and the remaining 44 percent may be influenced by other variables that is not included in this study. $p < 0.05$. This means that at least one of the 3 variables can be used to explain employee performance.

Table 4.16: ANOVA of Physical environment and employee performance

| Regression | Sum of Squares | Df | Mean Square | F | Sig |
|-----------------|----------------|-----|-------------|--------|---------|
| Residual | 34.712 | 6 | 7.103 | 25.807 | .000(a) |
| Total | 26.273 | 177 | .275 | | |
| | 62.000 | 183 | | | |

Source: Researcher 2015

Predictors: (Constant), building aesthetics, furniture arrangement, facilities, ventilation, lighting and noise b. Dependent variable: Employee Performance

The below Table below, depicts the correlation between the physical environment variables and employee performance. There is a significant relationship between facilities and employee performance ($B=0.138$, $p < 0.05$) and noise and employee performance ($B=0.133$, $p > 0.05$).

Table 4.17: Coefficients relationship physical environment variable and employee performance

| Noise | B | Std. Error | Beta | t | sig |
|-----------------------|--------|------------|------|-------|-------|
| (constant) | 0.671 | 0.317 | | 2.130 | 0.032 |
| Building Aesthetics | 0.007 | 0.017 | .013 | 0.141 | 0.009 |
| Furniture arrangement | 0.0052 | 0.026 | .235 | 1.997 | 0.006 |
| Facilities | 0.138 | 0.027 | .334 | 2.961 | 0.000 |
| Ventilation | 0.076 | 0.018 | .067 | 0.667 | 0.009 |
| Lighting | 0.006 | 0.025 | .023 | 0.253 | 0.561 |
| Noise | 0.133 | 0.032 | .506 | 4.510 | 0.616 |

Source: Researcher 2015

4.8 Discussion of the study findings

Thus, result of the multiple regression analysis between physical environment factors and employee performance using stepwise model. It indicates that the facilities are the

most significant predictor towards employee performance which contributes 41%. This is followed by the other factors such as furniture arrangement, building aesthetics and ventilation contributing 46% to employee performance. Hence, it can be concluded that the four physical environment factors such as facilities, furniture arrangement, building aesthetics and ventilation are the significant predictors of employee performance

It clearly demonstrates that ergonomics problems lead to the deterioration of staff performance, which ultimately leads deficiencies job quality and commitment. The study reveals that the physical environment has a significant impact on employee performance. Moreover the female is relatively higher with 60.2% as compared to the male with 39.8, hence female employees tend to be more concern about workplace surrounding than the male employees. The mean score is 3.51 where the physical environment concern is at a moderate level and confirms that physical environment deficiencies impacts negatively staff performance. Conducive work atmosphere can be attained through a clear understanding on how the employee perceives about their own working environment (Rasila, 2012). The mean and standard deviation score indicate facilities scored the highest 3.86, for instance sharing multi-functional printer and if the printer is embedded with photocopier and shared by more than 5 employees, it will cause chaotic at work. Cafeteria serving unhealthy food without much variety may cause employees to feel undernourished and exhaustion. The unavailability of projector or personal computer in classrooms, requiring academician to bring or carry the equipment's to the classrooms which may cause exhaustion and affects their performance. Using Pearson Correlation used to determine the relationship between the independent and dependent variable. Desired level significant is 0.05. Based on table 4, the result indicates positive correlation between building aesthetic and employee performance ($r=0.793$) significantly at 0.05, which means when the aesthetic setting is

uncomfortable and not pleasing it will affect the employee performance. Where else furniture arrangement ($r=0.623$) is significant at 0.05, if the arrangement of furniture is it too congested and cramped may lead to poor performance. The negative correlation between facilities ($r=-0.981$), means poor facilitation decreases the employee performance. Similarly, ventilation ($r=-0.713$), means poor ventilation plan possibly will lead to escalation in uneasiness and restless among employee and which will lead to poor performances. The lighting ($r=0.272$), and noise ($r=0.306$), both factors are not strongly correlated with employee performance, but increase or decrease in the both factors may relate to employee performance. Basically, lighting is always a concern for the organization and it will be immediately resolved as it comes within the maintenance cost. The Multi regression used to analysis the data collected and the physical environment factor such as building aesthetic, furniture arrangement, facilities, ventilation, lighting and noise was found to contribute a total of 56% of employee performance, where it suggests that variables other than physical environment factors could also contribute towards employee performance. Based on the Model Summary, the four physical environment factors were found to be significant predictors towards employee performance contributing 46.1%. The paramount predictor towards the employee performance is facilities which contribute 41%. Overall, the physical environment factors should be considered carefully, as this creates an impact upon employee commitment (Gyekye, 2006).

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMENDATIONS

5.0 Overview

This chapter presents the summary of the previous chapter's findings and presents the conclusion, recommendations, and areas for further research.

5.1 Summary of the Findings

The study conducted and categorized the existing research literature on the relation between ergonomic workplace design and business performance. The research looked into an extensive but highly skewed literature that has largely been written by and for academics and to a much lesser extent design practitioners rather than for the “real” audience of business users. The literature is uneven. The largest area of existing research has been on environmental and ergonomic issues related to the comfort of individual workers. Research on the efficiency with which work space is used comes second. Adaptability and flexibility, which is also important which was the study’s’ attractions, as well as relating to supporting work processes.

The extent to which each of the major themes related back to empirical data varies greatly. There is also significant variation in the dependence of the factors on the strategy and management of the Hotel.

Efficiency: Achieving basic health and comfort at workplaces is the first essential building block of improved business performance. Not achieving these will limit the potential impact of other interventions.

Effectiveness: Current management theory points directly to the value of how people operate in space, and how provision for this contributes positively to business performance.

Expression: Though little empirical evidence exists, there is a professional belief that this is an area worth focusing on. Post occupancy evaluations suggest that messages mediated through physical space have a powerful effect on staff motivation, satisfaction and retention levels and that is likely to lead to improved business performance.

More significant than what has been included are matters that have hardly been touched. Topics that are vitally important in contemporary management literature such as knowledge management, branding, and corporate culture have so far been addressed only rarely by ergonomics researchers. Much of the work has been focused on individual performance rather than how people work together in groups and teams to achieve a goal. A disproportionate amount of research energy has been devoted to the performance of building services rather than, for example, the accommodation of information technological design of workplaces, and the general performance. Implicit assumptions about what work stations are for can be derived from the literature. There is little overt interest in business matters and little contextual information about the employee. A stable business environment seems to be taken for granted the very opposite of contemporary corporate reality. Business constraints of time and cost are largely ignored. And issues of the personal choices open to employees have been given very little attention an oddity when distributed working is becoming so important. Measurement has concentrated on individual satisfaction, and comfort, and rarely on performance rather than on what office organizations do, why they exist, how well they perform. Methodological limitations mean that complex contextual matters have been given little attention. In many ways the research literature reflects the introverted, supply side thinking about workplace buildings that is unfortunately characteristic of many ergonomic designers and is endemic in the specific industries. To fill the obvious gaps in the literature, is what the study aimed at and in part tried to assist in developing

a greater understanding of interconnections between decision making, building design variables and business performance, a case study was developed. Several cases were researched. For a case study to reveal a greater degree of information about the relationship between business and ergonomics design, the two components were discussed with equal specificity within the study. This was a challenge, since the knowledge of various components came from diverse individuals.

5.2 Conclusion

Based on the interviews conducted in the study, the Workplace and Organization Effectiveness influences have an interactive relationship. This conceptual framework contributed to advance the understanding of influences ergonomics design on performance. As Technology is expected evolve and it should become more integrated into the Workplace, the lines between Technology and Workplace are blurring, that what this study was set to discover and communicate. However, additional research is needed to better understand the relationship between Technology and Workplace, or if boundaries continue to exist as Alternative Work Strategies mature. How well companies integrate technology and workplace decisions may have significance to performance that distinguishes them from their competitors. Additional research to better understand the dynamism between organizational effectiveness and Workplace may also be helpful in increasing performance of workers. Of particular interest would be the relationship between the Organizational Effectiveness element of corporate social responsibility and the occupant's performance.

The following conclusions were made on the base of above research study: First, organization must observe continuously the dynamic nature of the working environment. Organizations must implement latest concepts of HR in the organization to create jobs that fit the employees.

Secondly, the management must develop a win- win approach in the organization and try to develop the concepts of synergy and team work in relation to ergonomics among the employees to have a huge impact on performance. The organizations might initiate continuous training programs for all employees who use ergonomic artefacts within the organization, so as to take full advantage. The target organizations must discourage to develop the culture of late sittings that is also a reason of creating non conducive working environment in the organizations.

Third, the organizations should encourage their employees and/or arrange daily physical exercise facilities for employees to keep them physically fit on the job i.e introduction of Gym classes.

Fourth, the organizations must open ways of communications between management and employees. This was help organizations to generate suggestions that will help in improving ergonomic related working conditions in the organizations.

Fifth, the organizations should offer counseling to resolve in house and job related issues that involve ergonomics. The organizations must encourage employees to develop new methods and they experimented with new ideas that lead to increased employees' performance, and such efforts should be rewarded, and continuous to achieve best results.

Lastly, the organization top management support is crucial, these must set clearly in policies and procedures to make them mandatory and not optional.

This study examined the relationship between the physical ergonomic environment factors and its impact on academic staff performance. The study reports that factors such as building aesthetics, furniture arrangement, ventilation, lighting and noise do

have some form significance. But the survey reveals that deprived facilities are relatively associated with academic staff performance. Facilities provided should be physically apt and contented and it is categorized as cafeteria serving healthy food, feature healthy foods with high protein and fiber, low in salt and calories impulses good health and renewed performance, clean water dispenser, appropriate placement of the projector and PC's for teaching, sharing multi-functional printers, poor network connection and sick bay and staff lounge, and finally sanitary fixtures in toilets since majority are female respondent. It creates an impact such as psychological stress, physical discomfort and poor work quality. Moreover, prolonged stress can lead to decrease the thinking function and their performance. In this situation the discomfort would be escalated to in lesson preparation and delivery. Every worker is involved in additional work which requires extra working hours to discharge other duties. Apparently, all employees are exposed to much occupational health, safety and environmental hazards due to their various roles, hence their performance should be assessed and maintained periodically through various measures. The outcome of this study believed to be beneficial through the intervention of appropriate measure. Practically, ergonomic concern should be attended immediately, and organization should not hold onto or like the cowboy culture (Wilson, 2012), where anything will do and be. The limitation of this study is, the respondent is merely 183 and carried out in the area of Nairobi covering only the Hotel's, where future studies could consider and conduct with large sample size and with more choices of private and public institutions. The ergonomic factors actually covers three major area which is physical ergonomics, cognitive ergonomics and organizational ergonomics, due to time constraint, the research concentrates only on physical ergonomic factor. Finally, further research in

this area is necessary to investigate the cognitive ergonomics and organizational ergonomics to achieve desirable fact pertaining to employee performance.

5.3 Recommendations

5.3.1 Managerial Recommendations

A proactive ergonomics process should be a priority to an organization should it identify ergonomic related factors it faces, and desires to change them, which can be tackled by being ergonomic compliant, and then reducing risks associated by use of engineering, technological and administrative controls. Remember that, above all else a world class ergonomics program is proactive and is viewed as a strategic continuous improvement process that makes a positive impact on the entire business, the impacts will be impractical. Therefore it should be considered as a tool of human capital growth.

Analysis of the collected data revealed that ergonomics design has a substantial impact on the employees' performance. The overall impact of different elements showed that work place design to work affects the employees' performance the most. The overall mean of all the factors show that female employees are more concerned about their workplace surroundings, whereas, their male counterparts are less concerned with it. The overall response, according to gender, showed differences amongst the responses for different elements in the workplace. Male respondents' results show that they are more concerned about the design of the tools, machinery and general immediate technological interphases at their offices, followed by the spatial arrangement.

5.3.2 Policy Recommendations

There is a direct relationship between work place design and performance. The Relationship between ergonomic design of the workplace and performance was

determined by using the Pearson's Correlation in SPSS. Thus based on the findings, following are the implications of the study.

First, ergonomics design was found to be the major factor, which is affecting the daily and overall performance of employees at workplaces. Therefore, it is recommended to have proper and adequate designs that fit the worker to better their performance.

Secondly, most of the organizations do not give importance to ergonomics design; this study should give them ample reasons to consider ergonomics design as an important factor in increasing their employees' performance.

Recommendations Even at this stage, though, having completed the study, and despite the huge gaps that exist today between the research literature and the requirements of employees, some preliminary recommendations can be made for three of the major parties whose success depends upon linking ergonomics design and business performance.

5.3.3 Theoretical Recommendations

According to Gilbraith and Taylor theory, what remains to be done more significant than what has been included in the literature are matters that have hardly been touched by current research topics that are vitally important in contemporary management such as knowledge management, branding, and corporate culture have rarely been addressed. Much of the work has also been focused on individual performance rather than how people work together in groups and teams. This is a critical oversight which should be addressed through a comprehensive research program exploring aspects of business performance in "real world" conditions and in organizations that are having to work within a dynamic and often unpredictable global marketplace. The study included practitioners from a wide range of disciplines including design, business, information

technology, corporate real estate and human resources; and was truly international so as to capture cultural and regional differences in priorities and approaches to measurement. So that this additional work builds to a usable body of knowledge that has relevance to a broad audience, including: an over-arching framework; a framework for the organizations of research, and the analysis of options; a set of HR metrics for measuring staff performance in general and productivity in particular; a consistent approach towards the calculation of total workplace costs.

To conclude in the introduction to this study, and in Chapter 2, we addressed some of the systemic problems which cloud the successful relationship between business operations and the environments in which they take place. We discussed such issues as the large-scale, many layered nature of physical working environments; the fragmented links between supply and demand, from initial investment decisions through to end users' ability to make short term changes in their immediate working environment; and the lag between the rapid rate of change in organizations and the slow pace of development. We hope we have dealt with these issues and provided some suggestions for ways forward in this conclusion. As the majority of work carried out at Fairmont moves towards knowledge transaction, we are witnessing a shift of focus from tangible assets to human capital and intangible assets such as R&D, marketing, HR, innovation management and branding. This has implications for the workplace. Work environments designed for linear transaction processes are less appropriate than those that support knowledge transfer and connect communities of people and autonomous workers. As work becomes more distributed, ergonomics technology will play an even greater role, supporting mobility and virtual working, while the individual work stations becomes just one part of an organization's workspace.

5.4 Suggested Areas for Further Research

The repercussions of this on the subject of ‘workplace performance’ are potentially profound. If what is currently perceived as the ‘workplace’ only provides accommodation for half of a person’s working week, does this undermine research predicated on the idea of a 9 to 5 day sat at a fixed, owned workstation? Such new directions emphasize the need for further investigation. In addition to more Post Occupancy Evaluations, it will become essential to engage with issues such as workplace connectivity and social network analysis. More understanding is also required of workplace culture indicators to compare different organizations’ cultures through analysis of their unwritten rules, stories and metaphors. In particular, there is a need for future studies that analyze the complex decision-making and systemically linked data that go into the design and procurement of the modern work environment. In other words, in the rapidly changing world of work, the implications of linking office design with business performance are so profound that innovation is as important in the conduct of research as in the ways that offices are developed, designed and managed.

5.5 Limitations of the Study

This Research was limited by subjective responses to a narrow group of structured interviews. Future Research would enhance the framework through additional case studies and data gathering. It may be useful for future researchers to define occupant data that could relate building characteristics to performance attributes so conclusions could be drawn from a larger data population not limited to Hotel Industry. Occupant attributes such as absences, sick days, and subjective performance assessments are examples of data which could be gathered to and analyzed. Some workplace experts suggest the use of a standard post-occupancy evaluation to gather performance feedback and facilitate continuous learning on ergonomic design issues, and this study

would suggest it could be the best way to facilitate knowledge worker performance measurements.

Following are a few limitations of the study; first, the sample size was not diverse enough to give the image of all organizations functioning in Kenya. The data collected was based on subjective performance measurement; some other objective method of collecting data can also be used. Data was collected by employing the simple method of structured questionnaires; other methods could have been used for collecting data.

REFERENCES

- Al-Anzi, N. M. (2009). Workplace environment and its impact on employee performance. *Project Management Department (PMD)*. Retrieved August, 8, 2011.
- Armstrong, M. (2020). *Strategic human resource management: A guide to action*. Kogan-Page.
- Arokiasamy, A. R. A. (2015). "A study on employee satisfaction perspectives in the hotel industry in Malaysia". *International Journal of Management and Strategy*.
- Aswathappa, K. (2000). *Organisational Behaviour–Text and Cases*.
- Aust et. al., (2013). *Human Factors Methods; A Practical Guide for Engineering and Design*. Ashgate Publishing Limited.
- Babapour Chafi, M., Hultberg, A., & Bozic Yams, N. (2022). Post-pandemic office work: Perceived challenges and opportunities for a sustainable work environment. *Sustainability*, 14(1), 294.
- Barber, C., Garner-Wortzel, Andrew, Morris, Trex (2012). "Workplace Mobility: Comparing business models of early adopters in traditional businesses with consulting firms." *Corporate Real Estate Journal* 1(2): 168-180.
- Battini, D., Faccio, A, M., Persona, B, A. & Sgarbossa, F. (2011). "New methodological framework to improve productivity and ergonomics in assembly system design", *International Journal of Industrial Ergonomics* 41, 30-42.
- Bell, D. (1993). *Communitarianism and its Critics*.
- Braganza, A., Chen, W., Canhoto, A., & Sap, S. (2021). Productive employment and decent work: The impact of AI adoption on psychological contracts, job engagement and employee trust. *Journal of business research*, 131, 485-494.
- Brill, E., Lin, J., Banko, M., Dumais, S. T., & Ng, A. Y. (2001, November). Data-Intensive Question Answering. In *TREC* (Vol. 56, p. 90).
- Broberg (2012). *Evaluation of Human Work a practical ergonomics methodology. Human Factors in Design A human factors design manual*.
- Brookhuis, K., Hedge, A., Hendrick, H., Salas, E., and Stanton, N. (2005). *Handbook of Human Factors and Ergonomics Models*. Florida: CRC Press.
- Borman, W. C., & Motowidlo, S. J. (1997). Task performance and contextual performance: The meaning for personnel selection research. *Human performance*, 10(2), 99-109.
- Cable, D. M., & Judge, T. A. (1996). Person–organization fit, job choice decisions, and organizational entry. *Organizational behavior and human decision processes*, 67(3), 294-311.
- Chandrasekar, D. K. (2011). "Workplace environment and its impact on organizational performance in public sector organizations." *International Journal of Enterprise Computing and Business Systems* 1(1).

- Chow, C. W., Harrison, G. L., McKinnon, J. L., & Wu, A. (2001). Organizational culture: Association with affective commitment, job satisfaction, propensity to remain and information sharing in a Chinese cultural context. *San Diego University CIBER Working Paper Series, Publication, 1(11)*, 1-28.
- Christian, M. S., Garza, A. S., & Slaughter, J. E. (2014). Work engagement: A quantitative review and test of its relations with task and contextual performance: Erratum.
- Clements-Croome, D. (Ed.). (2006). *Creating the productive workplace*. Taylor & Francis.
- Collins, G. (2010). "The Death of the Office (as we know it)." *Contracts*.
- Das, B. L., & Baruah, M. (2013). Employee retention: A review of literature. *Journal of business and management, 14(2)*, 8-16.
- Davenport, T. H. (2006). Competing on analytics. *Harvard business review, 84(1)*, 98.
- Dean, A. M. (2007). The impact of the customer orientation of call center employees on customers' affective commitment and loyalty. *Journal of Service Research, 10(2)*, 161-173.
- Douglas, J. D. (2015). *Social meanings of suicide* (Vol. 1242). Princeton University Press.
- Drew, B. (2007). *Improved Workplace Performance and Productivity Through Movement: The Emerging Role of Adjustability*
- Drury, S. (2004). *Employee perceptions of servant leadership: Comparisons by level and with job satisfaction and organizational commitment*. Regent University.
- Dumas, J. S. & Salzman, M.C. (2016). *Reviews of Human Factors and Ergonomics. Human Factors and Ergonomics Society*.
- Edwards, B. D., Bell, S. T., Arthur, Jr, W., & Decuir, A. D. (2008). Relationships between facets of job satisfaction and task and contextual performance. *Applied psychology, 57(3)*, 441-465.
- Edwards, J. R. (1991). *Person-job fit: A conceptual integration, literature review, and methodological critique*. John Wiley & Sons.
- Ergonomics. Volume 31, Issue 6, Pages 555-690 Wright, T.A. (2006). "The emergence of job satisfaction in organizational behavior: A historical overview of the dawn of job attitude research". *Journal of Management History*. Vol. 12. Issue: 3, pp.262 - 277
- Eklund, J. A. (1995). Relationships between ergonomics and quality in assembly work. *Applied ergonomics, 26(1)*, 15-20.
- Foss, N. J., Minbaeva, D. B., Pedersen, T., & Reinholt, M. (2009). Encouraging knowledge sharing among employees: How job design matters. *Human resource management, 48(6)*, 871-893.
- Furtwängler, W., & Albrecht, G. A. (2000). *Symphony No. 3 in C sharp minor*. ARTE NOVA Musikproduktion.

- Garg, P., & Rastogi, R. (2006). New model of job design: motivating employees' performance. *Journal of management Development*, 25(6), 572-587.
- Getty, R. L. (1999, September). Ergonomics and the customer satisfaction model: ergonomics in the language of business. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 43, No. 14, pp. 815-819). Sage CA: Los Angeles, CA: SAGE Publications.
- Grandjean, E. (1986). *Ergonomics in computerized offices*. CRC Press.
- Grant, A. M., Fried, Y., Parker, S. K., & Frese, M. (2010). Putting job design in context: Introduction to the special issue. *Journal of Organizational Behavior*, 31(2-3), 145-157.
- Griffin, M., Neal, A., & Neale, M. (2000). The contribution of task performance and contextual performance to effectiveness: Investigating the role of situational constraints. *Applied Psychology*, 49(3), 517-533.
- Gyekye, S. A. (2006). Workers' perceptions of workplace safety: An African perspective. *International journal of occupational safety and ergonomics*, 12(1), 31-42.
- Hackman, J. R. (1980). Work redesign and motivation. *Professional psychology*, 11(3), 445.
- Hameed, A. and S. Amjad (2011). "Impact of Office Design on Employees' Productivity: A Case study of Banking Organizations of Abbottabad, Pakistan." *Journal of Public Affairs, Administration and Management* 3(1): 1-13.
- Harrison, D. A., Newman, D. A., & Roth, P. L. (2006). How important are job attitudes? Meta-analytic comparisons of integrative behavioral outcomes and time sequences. *Academy of Management journal*, 49(2), 305-325.
- Hattrup, K., O'Connell, M. S., & Wingate, P. H. (1998). Prediction of multidimensional criteria: Distinguishing task and contextual performance. *Human performance*, 11(4), 305-319.
- Heidarimoghadam, R., Mohammadfam, I., Babamiri, M., Soltanian, A. R., Khotanlou, H., & Sohrabi, M. S. (2022). What do the different ergonomic interventions accomplish in the workplace? A systematic review. *International Journal of Occupational Safety and Ergonomics*, 28(1), 600-624.
- Holman, D. (2003). Phoning in sick? An overview of employee stress in call centres. *Leadership & Organization Development Journal*.
- Jafari, M., Bourouni, A., & Amiri, R. H. (2009). A new framework for selection of the best performance appraisal method. *European Journal of Social Sciences*, 7(3), 92-100.
- Jafari, M., Bourouni, A., & Amiri, R. H. (2009). A new framework for selection of the best performance appraisal method. *European Journal of Social Sciences*, 7(3), 92-100.

- Jankingthong, K., & Rurkkhum, S. (2012). Factors affecting job performance: a review of literature. *Humanities, Arts and Social Sciences Studies (former name Silpakorn University Journal of Social Sciences, Humanities, and Arts)*, 115-128.
- Jeffrey, E. F. (1995). Ergonomics in the workplace. *Facilities*, 13(4), 20-27.
- Juneja, P. K. (2010). *Auditory Distractions for Open Office Settings: A Multi Attribute Utility Approach to Workspace Decision Making. Architecture*. Atlanta, The Georgia Institute of Technology. Doctorate 515.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational behavior and human performance*, 16(2), 250-279.
- Haslegrave, C., Wilson, J. R., Corlett, E. N., & Manenica, I. (1990). Work design in practice. In *Proceedings of the 3rd International Occupational Ergonomics Symposium Zadar*.
- Hartley, L. (2006). Fatigue and Driving in International Encyclopedia of Ergonomics and Human Factors.
- Heckathorn, D. D. (1997). Respondent-driven sampling: a new approach to the study of hidden populations. *Social problems*, 44(2), 174-199.
- Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *Journal of applied psychology*, 92(5), 1332.
- Kalowowsky (2001); Leblebici (2012); and Gazar (2013). Ergonomic Design of Workstation Using Rapid Prototyping and Response Surface. Methodology. *IIE Transactions on Design and Manufacturing*, 34(4), 375-391.
- Karwowski, W. (2005). Ergonomics and human factors: the paradigms for science, engineering, design, technology and management of human-compatible systems. *Ergonomics*, 48(5), 436-463.
- Kalyani, L. D. (2006). An Empirical investigation of the Impact of Organizational factors on the Perceived Job Performance of Shop Floor Employees of Large scale Garment Industries in Sri Lanka.
- Keeling, B. L., & Kallaus, N. F. (1996). *Administrative office management*. Cengage Learning.
- Kitchenham, B.A., & Pfleeger, S. L. (2002). Principles of Survey Research, Part 5: Populations and Samples, Software Engineering Notes, Vol. 27, No. 5, pp.17-20
- Knight, C., & Haslam, S. A. (2010). The relative merits of lean, enriched, and empowered offices: an experimental examination of the impact of workspace management strategies on wellbeing and productivity. *Journal of Experimental Psychology: Applied*, 16(2), 158.
- Kogi, K., & Kawakami T. (1997). "Current research-Ergonomics". *Environmental Management and Health*, Vol. 8 Iss: 5, pp.188 - 190

- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.
- Kreitner, R., Kinicki, A., & Buelens, M. (1989). *Organizational behavior*. Homewood, IL: Irwin.
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of Individuals' Fit at work: A meta-analysis OF person–job, person–organization, person–group, and person–supervisor fit. *Personnel psychology*, 58(2), 281-342.
- Lee, S. Y. and J. L. Brand (2005). "Effects of control over office workspace on perceptions of the work environment and work outcomes." *Journal of Environmental Psychology* (25): 323-333.
- Maryani, Y., Entang, M., & Tukiran, M. (2021). The relationship between work motivation, work discipline and employee performance at the Regional Secretariat of Bogor City. *International Journal of Social and Management Studies*, 2(2), 1-16.
- Molinsky, A., & Margolis, J. (2005). Necessary evils and interpersonal sensitivity in organizations. *Academy of Management Review*, 30(2), 245-268.
- Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of applied psychology*, 91(6), 1321.
- Morgeson, F. P., Garza, A. S., & Campion, M. A. (2013). Work design.
- Motowidlo, S. J., & Van Scotter, J. R. (1994). Evidence that task performance should be distinguished from contextual performance. *Journal of Applied psychology*, 79(4), 475.
- Mugenda, O. M., & Mugenda, A. G. (2003). Research methods: Quantitative and. *Qualitative. Approaches. Nairobi*.
- Ng, T. W., & Feldman, D. C. (2012). Evaluating six common stereotypes about older workers with meta-analytical data. *Personnel psychology*, 65(4), 821-858.
- Nguyen, P. T., Yandi, A., & Mahaputra, M. R. (2020). Factors that influence employee performance: motivation, leadership, environment, culture organization, work achievement, competence and compensation (A study of human resource management literature studies). *Dinasti International Journal of Digital Business Management*, 1(4), 645-662.
- Nicole, N., Ralph, B., & Begoña, T. (2012). *The charge of ergonomics – A model according to the influence of ergonomic workplace design for economical and efficient indicators of the automotive industry* 35, 47-60,
- Numonjonov, S. U. (2020). Innovative methods of professional training. *ISJ Theoretical & Applied Science*, 1(81), 747-750.
- Obinna, F. P., Sunday, A. A., & Babatunde, O. (2021). Ergonomic assessment and health implications of classroom furniture designs in secondary schools: a case study. *Theoretical Issues in Ergonomics Science*, 22(1), 1-14.

- Oldham, G. R., & Hackman, J. R. (2010). Not what it was and not what it will be: The future of job design research. *Journal of organizational behavior*, 31(2-3), 463-479.
- O'Neill, M. (2005). Employee care, a vital antecedent to customer care in the health care industry: An exploratory investigation of the employee satisfaction construct at North East Alabama Regional Medical Center. *International Journal of Health Care Quality Assurance*, 18(2), 131-151.
- Opatha, H. H. D. N. P. (2009). *Human resource management*. Department of HRM, University of Sri Jayewardenepura.
- Opsvik, P. (2009); Dierdorff & Morgeson (2013), "Re-Thinking Sitting" Interesting insights on the history of the chair and how we sit from an ergonomic pioneer.
- Orodho, A. J., & Kombo, D. K. (2002). Research methods. *Nairobi: Kenyatta University, institute of open learning*.
- Parker, S. K., Wall, T. D., & Cordery, J. L. (2001). Future work design research and practice: Towards an elaborated model of work design. *Journal of occupational and organizational psychology*, 74(4), 413-440.
- Pfeffer, J. (1994). Competitive advantage through people. *Boston/Mass.*
- Pheasant (2013). Isabel A P Walsh; Jorge Oishi; Helenice J C Gil Coury (February 2008). "Clinical and functional aspects of work-related musculoskeletal disorders among active workers".
- Quible, Z. K. (2008). The Strategies Approach: Effective for Reviewing Grammar and Punctuation Concepts. *Delta Pi Epsilon Journal*, 50(3).
- Rao, S., & Ramesh, N. (2015). Depression, anxiety and stress levels in industrial workers: A pilot study in Bangalore, India. *Industrial psychiatry journal*, 24(1), 23.
- Roelofsen, P. (2002). The impact of office environments on employee performance: The design of the workplace as a strategy for productivity enhancement. *Journal of facilities Management*, 1(3), 247-264.
- Ronald, N. (2012). The Design of Everyday Things, An entertaining user-centered critique of nearly every gadget out there Independence, Missouri (USA).
- Saldana, J. (2011). *Fundamentals of qualitative research*. Oxford university press.
- Salvendy, G. (Ed.). (2012). *Handbook of human factors and ergonomics*. John Wiley & Sons.
- Schmitt, N., Cortina, J. M., Ingerick, M. J., & Wiechmann, D. (2003). Personnel selection and employee performance.
- Singh, A., M. Syal, et al. (2010). "Effects of Green Buildings on Employee Health and Productivity." *American Journal of Public Health* 100(9): 1665-1668.
- Sinha, K. K., & Van de Ven, A. H. (2005). Designing work within and between organizations. *Organization science*, 16(4), 389-408.

- Sluchak, T. J. (1992). Ergonomics: origins, focus, and implementation considerations. *AAOHN Journal*, 40(3), 105-112.
- Sonnentag, S., & Frese, M. (2002). Performance concepts and performance theory. *Psychological management of individual performance*, 23(1), 3-25.
- Stamer, T. (2011). *The Shrinking Cubicle*. Human Resource Executive Online
- Stewart, G. L., & Brown, K. G. (2019). *Human resource management*. John Wiley & Sons.
- Taylor & Francis., & Leblebici, D. (2012). Impact of workplace quality on employee's productivity: Case Study of a Bank in Turkey, Turkey, *Journal of Business, Economics and Finance*, Vol. 1, Issue. 1 pp. 38-40.
- Armstrong, T. J. (2008). Gonzalez et. al., (2008) Chapter 10: Allowances, Localized Fatigue, Musculoskeletal Disorders, and Biomechanics (not yet published).
- Thomas J. Smith, (2012) - *Integrating community ergonomics with educational ergonomics – designing community systems to support classroom learning*.
- Tietjen, M.A., & Myers R.M. (1998). "Motivation and job satisfaction". *Management Decision*. Vol. 36 Issue: 4, pp.226 – 231. Wilson, J.R. (2000). *Fundamental Reviews in Applied Ergonomics*.
- Torraco, R. J. (2005). Work design theory: A review and critique with implications for human resource development. *Human resource development quarterly*, 16(1), 85-109.
- Van Scotter, J. R., & Motowidlo, S. J. (1996). Interpersonal facilitation and job dedication as separate facets of contextual performance. *Journal of applied psychology*, 81(5), 525.
- Valerie J Gawron (2000); Humphrey (2006); Jex 7 Brit (2008). *Human Performance Measures Handbook Lawrence Erlbaum Associates - A useful summary of human performance measures*.
- Wartenberg, T. (2014). Assessing an elementary school philosophy program. *Thinking: The Journal of Philosophy for Children*, 20(3/4), 90-94.
- Werdhiastutie, A., Suhariadi, F., & Partiwii, S. G. (2020). Achievement motivation as antecedents of quality improvement of organizational human resources. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume, 3*, 747-752.
- Weedmaster (1989); Salvendy (1997; Torraco (2005); Wickens & Holland (2012). *Ergonomics for Beginners - - A classic introduction on ergonomics - Original title: Vademecum Ergonomie (Dutch) -published and updated since 1960's*.
- Whitten, T., Holmes, D., & MacKinnon, K. (2001). Conservation biology: a displacement behavior for academia?. *Conservation biology*, 1-3.
- Wickens, C. D.; Sandy, D. L.; Vidulich, M. (1983); Gallanher (2007). Compatibility and resource competition between modalities of input, central processing, and output". *Human Factors (Santa Monica, CA, United States: Human Factors and Ergonomics Society 25 (2): 100–272*.

- Wright, T. A. (2006). To be or not to be [happy]: The role of employee well-being. *Academy of Management Perspectives*, 20(3), 118-120.
- Yin, M. T., & Cohen, M. L. (1984). Structural theory of graphite and graphitic silicon. *Physical Review B*, 29(12), 6996.
- Zikmund, W.G. (2003). *Business Research Methods*. 7th Edition. Thomson/South-Western.
- Zohrabi, M. (2013). Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and practice in language studies*, 3(2), 254.

APPENDICES

Appendix I: Introduction Letter

Gregory Maroko,
Student Moi University,

Dear Respondent,

RE: LETTER OF INTRODUCTION

My name is Gregory Maroko, I am student of Moi University pursuing a Master of Science degree program at Nairobi Campus. Pursuant to pre-requisite course I am carrying out the research, studying the effects of ergonomic design on employee's performance in Nairobi. The focus of my study was Fairmont the Norfolk where I intend to investigate the phenomena, using questionnaires and interview will be administered employees of the Hotel.

You have been identified as a respondent in this study. Therefore, there are no correct or wrong answers to these statements; they are only intended to obtain your honest opinions, to the effect of ergonomic designs on performance.

Would you kindly spare few minutes of your time and answer the following questions. Kindly note that information you provide was be treated with outmost confidentiality and was be strictly used for research purposes.

Thank you for your cooperation

Yours Faithfully

Gregory Maroko
M.Sc. Student Moi University.

Appendix II: Questionnaire**QUESTIONNAIRE****TOPIC: EFFECTS OF ERGONOMICS DESIGN ON YOUR PERFORMANCE****PART A: Bio- Data
questions**

Kindly answer all the questions by writing, or Tick in the spaces provided.

1. What is your gender?

Male []

Female []

2. What is your age bracket?

20-25 [] 26-30 [] 31-35 [] 36-40 [] 41-45 [] 46 and Above []

3. How long have you worked in the named designation?

0-1 Year [] 2-5 Years [] 5-10 Years [] 10 and above []

4. What is your marital status?

Single [] Married [] Other []

5. What is the level of your education?

K.C.P.E [] K.C.S.E [] University/ College [] Higher Education []

PART B: Research Questions

Section 1: Design of Machines and Tools

6. Do you experience pain, discomfort or sometimes excessive fatigue after or during performing some tasks, usage of certain tools, or artefacts or machines?

I Strongly Agree []

I Agree []

Neither do I agree nor disagree []

Disagree []

Strongly disagree []

7. I work more than 5 hours on one single task mentioned above without a break.

I Strongly Agree []

I Agree []

Neither do I agree nor disagree []

Disagree []

Strongly disagree []

8. Based on my opinion, the design of tools and machine I use are poor, therefore they don't enable me to perform to expectations.

I Strongly Agree []

I Agree []

Neither do I agree nor disagree []

Disagree []

Strongly disagree []

9. Does the design of work artefacts, which include machines, tools, working posture affect your performance?

I Strongly Agree []

I Agree []

Neither do I agree nor disagree []

Disagree []

Strongly disagree []

Section 2: Working Range and Distance

10. Do you think your performance level can be improved if your working environment was ergonomic compliant?

I Strongly Agree []

I Agree []

Neither do I agree nor disagree []

Disagree []

Strongly disagree []

11. When I work at longer lengths the quality of my work reduces than when I work at close proximity

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []
 Strongly disagree []

12. Quality of my service is affected by the working range/ distance.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

Section Three: Spatial requirements and working relationships

13. Does a good relationship with coworkers was help in enhancing ergonomics efforts made by the organization?

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

14. The work station design is poor and thus it's responsible for many accidents.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

15. A times my colleagues are absent due to injuries are caused by design of furniture and equipment.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

16. Space at the work place makes me more motivated to work.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

17. My work station design affects my attitude towards work.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

18. My company cares so much on the design of my work station

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

19. The design of my work station is important to my performance.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

Section Four: Organizational Procedures and Management Requirements

20. The work practices and requirements negatively affect my performance.

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

21. Do you think that your productivity level was increase with the help of your supervisor without any change in work ergonomic artefacts?

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

22. Does Ergonomics artefacts motivate you at work?

- I Strongly Agree []
 I Agree []
 Neither do I agree nor disagree []
 Disagree []
 Strongly disagree []

23. Does a good training and development plan on work methods and how to use machines and artifacts help you to increase level of productivity in the organization?
- I Strongly Agree []
I Agree []
Neither do I agree nor disagree []
Disagree []
Strongly disagree []
24. My company supports my performance by providing necessary procedures and managerial support
- I Strongly Agree []
I Agree []
Neither do I agree nor disagree []
Disagree []
Strongly disagree []
25. The procedures and processes at work affect my performance.
- I Strongly Agree []
I Agree []
Neither do I agree nor disagree []
Disagree []
Strongly disagree []
26. The design of machines and tools determine the quality of my good or services.
- I Strongly Agree []
I Agree []
Neither do I agree nor disagree []
Disagree []
Strongly disagree []

THANK YOU VERY MUCH FOR YOUR PARTICIPATION

Appendix III: Research Authorisation – NACOSTI



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
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When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:

24th July, 2014

NACOSTI/P/14/4898/2795

Gregory Maroko Mainye
Moi University
P.O.Box 3900-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“The effects of ergonomic designs on the workers’ performance in the Hotel Industry in Kenya: A case of Fairmont the Norfolk,”* I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for a period ending **31st December, 2015**.

You are advised to report to **the Manager, Fairmont the Norfolk, the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. S. K. LANGAT, OGW
FOR: SECRETARY/CEO

Copy to:

The Manager
Fairmont the Norfolk.

The County Commissioner
The County Director of Education
Nairobi County.

COUNTY COMMISSIONER
NAIROBI COUNTY
P. O. Box 30124-00100, NBI
TEL: 341666



Appendix IV: Anti-Plagiarism Similarity Index



Plagiarism Checker X Originality Report

Similarity Found: 10%

Date: Tuesday, August 23, 2022

Statistics: 2392 words Plagiarized / 23469 Total words

Remarks: Low Plagiarism Detected - Your Document needs Optional Improvement.

THE EFFECTS OF ERGONOMIC DESIGNS ON WORKERS' PERFORMANCE AT THE FAIRMONT THE NORFOLK IN NAIROBI BY MAROKO GREGORY SHRD/PDG/045/12 A RESEARCH THESIS SUBMITTED TO THE SCHOOL OF HUMAN RESOURCE DEVELOPMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN HUMAN RESOURCE DEVELOPMENT MOI UNIVERSITY AUGUST 2022 DECLARATION Declaration by Candidate This thesis is my original work and has not been submitted or published by any institution, for any purpose.

Sign: _____ Date: _____ Gregory Maroko
SHRD/PDG/045/12 Declaration by the Supervisors This thesis is being submitted for examination with our approval as the Moi University supervisors

Sign: _____ Date: _____ Prof. Richard O. Musebe
Department of Management Sciences and Entrepreneurship School of Business & Economics Moi University Sign: _____ Date: _____
Prof. Leonard S.

Mulongo Department of Geography and Environmental Studies School of Arts and Social Sciences Moi University DEDICATION This work would not have been possible without the Guidance of God who helped us fulfill this research work. I would like to express our sincere appreciation to my respectable supervisors: Prof. Richard O. Musebe and Prof. Leonard S. Mulongo for their indebted leadership, support, considerate and compassionate supervision, and whose contribution to this work considerably added to my study and experience.

I am also grateful to the other Professors and Lecturers within the Moi university fraternity, who supported me through their advice and collaboration. Special thanks go to Dr. Lydia Maket and Milly Shonget who have been a source of motivation to