

Productivity Increase through Ergonomically Design Workplace

Adaramola S.S & Ugbebor J.N

University of PortHarcourt, PortHarcourt, Nigeria.

1. INTRODUCTION :

The study is geared to determine how much of an impact ergonomically design workplace has on bottom-line (Profit). Also, it ascertains whether or not an ergonomically designed workplace will reduce the number of work-related injury time off and thereby increase productivity in such workplaces. This paper present result of a business case study in a firm located in Nigeria that shows how it is important to design workstation ergonomically for most positive impact on the work as well as bottom line. It is the believe of the Authors that the study can be used for future decision-making needs in several organization. The need for ergonomically designed workstation has produced opportunities for profits in the way of office design and furniture compliant by the process of adjusting the workplace to the user and teaching individuals how to correctly use the computer in the office setting, can quantify measurable increases in performance. These actions also reduce risk factors associated with office-related cumulative trauma disorders such as carpal tunnel syndrome and tendonitis causing absenteeism. Ergonomics undoubtedly contributes to productivity as the studies in this paper prove (Rao H, Sutton R.,2008).

1.1 ERGONOMICS AND PRODUCTIVITY

Ergonomics is the science of adjusting the workplace to the worker. But the effects of ergonomics extend well beyond employee comfort. They impact productivity, morale, and even product and service quality.

Ergonomics, also known as "human factors," is the science of adjusting the workplace to the worker. While it has been touted as improving productivity, cutting absenteeism, reducing on-the-job injuries, improving morale and minimizing turnover that can be measured through standard management systems. Ergonomics applications allow workers to perform better, improve productivity, maximize quality and maintain customer service, all real world business principles and thus measurable by real dollars, (Harter, J., et al, 2003).

Investing in ergonomics is critical. Consider that, currently, billions of dollars are spent by employers on workers' compensation claims associated with musculoskeletal disorders. Hundreds of thousands of workers each year suffer from these disorders.

In 1997, the National Institute for Occupational Safety and Health (NIOSH) estimated U.S. business spent approximately \$13 billion annually on musculoskeletal disorders and \$100 billion per year

on related losses according to the U.S. Department of Labor. Repeated trauma accounts for 62 percent of all work-related illnesses according to the Bureau of Labor Statistics. (United States Department of Labor Bureau of Statistics.2010)

Since labor costs are a major component of most organization expenses, improving productivity has become a battle cry of management. Improving productivity can be accomplished by changing business processes, improving user "tools" and increasing employee job satisfaction. Few people would disagree with the statement that happy employees who have the right tools to perform their job have the highest productivity. Improving employee performance is central to the improvement of overall business performance. (Springer Associates, Inc., 1986)

2. STUDY ON NIGERIA ENTERPRISE LIMITED

A study of the relationship between ergonomic office environments and productivity was carried out in Nigeria Enterprise Limited. This study was an end-user study for a period of three months. In a survey taken by participants prior to the study, workers using computer displays more than one hour per day reported twice as many complaints of neck and shoulder discomfort as co-workers who did not use computer displays. Computer workers also reported eyestrain three times as often, had higher rates of absenteeism, reported less job satisfaction and, at entry-level positions, had a higher turnover rate than their non-computing co-workers had. Three months of various improvements to their workstations proved to have dramatic results: absenteeism fell from 4 percent to less than 1 percent; error rates in document preparation fell from 25 percent to 11 percent; the percent of the day the computer was in use increased from 60 to 86 (an increase in active work time of more than 40 percent); and reports of postural discomfort dropped in frequency, severity, and duration. Ninety percent of their managers rated the productivity of their employees as "much improved". Two-fold approaches was adopted as follows;

2.1 Office Attitude Study

Office workers were asked to list elements in their work place that they thought might lead to a better job satisfaction and performance. An overwhelming 92 percent of the office workers perceived a connection between their personal satisfaction with their office surrounding and their job performance.

Eighty-five percent of the respondents mentioned good lighting as a factor, and almost that many said a more comfortable chair was important. Heating and air conditioning changes were cited by 70 percent. About 90 percent said they would feel better about their work place if they had been consulted about design elements.

By contrast with the environmental factors, only 67 percent mentioned pay raises as a contributing factor, and 25 percent even

went so far as to say that they would be willing to accept a lower pay raise in exchange for a better environment.

2.2 Video Display Units Use Study

Today, computer displays are standard office equipment for most agents. In fact, few departments within a corporation can survive without the benefits of computer technology and electronic communications. And, users are doing more at their computer than ever before. They are running multiple applications, viewing a variety of data types and viewing the screen for long periods of time.

The Study has shown that any user at their computer display for more than two hours per day is at risk for display-related problems. The study reveals that in keyboard intensive environments, the cost to mitigate health problems averages \$1,200 per employee per year. Also 70 percent of display users reported eyestrain or fatigue. Furthermore, complaints of eyestrain and muscle fatigue were two thirds lower when subjects read from a high-resolution display. If the design criteria unique to computer displays are not incorporated into the ergonomic solution, the adverse effect on employee health can outweigh the productivity advantages of using computers in the first place. Also, this study examines how the physical environment, furniture, equipment, facility management and changes in work procedures affect performance. The results are given as follows;

3. FINDINGS

Enclosures

The open office design best facilitates employee communication, but only so long as the individual work area is surrounded on at least three sides by partitions higher than standing eye-height. The idea that high enclosures hide people away from each other and hamper communication is not true. In fact, high enclosures are directly related to increased ease of communication.

Floor area

Job type determines floor area. A reduction of workspace floor area by more than 25 percent generally reduces job satisfaction – but does not impact other bottom-line indicators.

Layout

The suitability of workspace layout is important for all workers and affects both environmental satisfaction and job performance. The location of furniture, location of entryways, height and number of partitions and the ability to see other people affect layout.

Windows

Most office workers prefer to be near a window and in fact, in most office environments 60 percent can see one from their workspace. However, the proximity of a window has no impact on job performance and only slight influence on job satisfaction.

Lighting

The level and distribution of lighting definitely affects satisfaction with both the office environment and the job itself. Our Case Study environments require two separate but complementary lighting systems, including uniform ambient lighting for displays and task lighting for hard copy reading and writing.

Noise

The sources of the most bothersome noises for workers are ringing telephones, people talking and equipment. As noise increases, job satisfaction drops.

Privacy

Most workers would opt for more privacy than they have. They do not seek absolute privacy, but want to minimize interruptions by limiting the access that others have to them. Interestingly, increased privacy is directly associated with ease of communication.

Communication

Ease of communication affects both job and environmental satisfaction. An open office with a high degree of enclosure for each individual supports communication far better than offices with less enclosure and about as well as a fully private office.

Display and personalization

Most people feel it is important to personalize their workspaces. Displaying personal items affects environmental satisfaction for all job types. Most organizations permit personalization, though even when it is not permitted; people tend to do it anyway.

Appearance

With respect to the interior decoration of their offices, office workers' preferences tend toward pastels, warm or cool colors. And natural materials like wood or fabric.

Participation

Workers who are permitted to participate in the planning and design of their work spaces are the most satisfied with their work environment and their jobs. However, only 25 percent of the work force participates in the design of workspace and these are largely managers and supervisors.

4. CONCLUSION

Our studies show that investments in ergonomics can pay for themselves within one year. However, most studies measure only productivity of the workers and incidence of injury. Only a few measure longevity of employment, absenteeism and morale. When these are factored in, analysts believe the benefits of ergonomics are even more impressive.

5. RECOMMENDATIONS

- Develop a proactive attitude toward ergonomics: Put ergonomics in your vocabulary. Have ergonomics as a part of employees' performance appraisal. Don't think that there is a quick, total, one-time fix for ergonomic problems. People change (they lose weight, they gain weight), people are different (height, weight) and your budget is not unlimited.
- Develop a flexible approach to ergonomics by analyzing your environment: – there is no one right solution. And, in the case of ergonomics – one size does not fit all. Also, even when you think you have it ALL right...something will change and you will need to update and continually improve.
- Figure out what you can do in a fiscally responsible manner: You don't need to do everything at once but make sure you have the right priorities in your plan. Get people involved here...let the experience workers help you decide what to do as you help them learn the business parameters for making fiscally responsible decisions.
- Understand you are working in an interrelated system: When you change one thing, I guarantee it will affect something else. Taking a shotgun approach to ergonomics can be disastrous. For example, if you change the location or type of a video display unit you could impact glare or lighting requirements. Watch for these downstream effects of your decisions.
- Vary people's activities. But apart from these types of variations, allow your workers time to look away from the computer screen, to stretch, take a short break to recover – if you don't do this about every 45 minutes or so it has been proven that productivity diminishes.
- Educate your people: You can purchase all the best equipment and ergonomic tools available but if people don't know how to use them then, well...you know the outcome. Many companies require each employee to go through several hours of ergonomic training on a periodic basis.

6. REFERENCES

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