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ERGOWORK AND SUSTAINABLE WORKPLACES

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Abstract: *Ergonomics is very important in the workplace. There are many studies on this field, and it has been demonstrated that for maximum productivity humans need a well-defined ergonomic workspace. Things should be set up properly so that staff can use the equipment to the maximum for higher efficiency. In this paper we present the advantages of a modern ergonomic space and the improvements that can be made at workplaces, to increase the productivity, and the health of the employees.*
Key words: *ergonomics; health; productivity; workspace, efficiency*

1. INTRODUCTION

Workplace ergonomics (Ergo-work) [1] is the science whom can design the workplace, while the limitations of the employees are taken into account. However, the poor workplace design and ergonomics might cause frustration and, more important, can affect the health of the personnel by professional diseases or work accidents, thus having direct impact over the labor productivity and, the production quality.

Improving the work conditions, due the anthropometric appropriations and limits, can increase the productivity, as indirect consequence, by reducing the risk of illness and work accidents.

In the following, will be described how that ergonomics improvements are contributing in a positive way to the company's low-level line, having as a goal increasing the labor productivity, and the operations profit, in the end.

An ergonomics improvement if is doing in a good way, may conduct to a competitiveness increase over the competitors, the human resource becoming the critical manufacturing factor in the near feature. Also, the company is in a better place to aim for the same result for the more and more scares: human resource.

Ergonomics is having a deep positive impact on the following five areas where benefits typically rely:

- Reducing costs;
- Improving productivity;
- Improving quality;
- Improving employee engagement;
- Better safety for the culture.

1.1. Ergonomics can reduce costs

To reduce *ergonomic risk factors*, a company can prevent the costly MSDs (or Musculoskeletal Disorders, how are called are injuries and disorders that affect the human body's movement or musculoskeletal system) [2].

At each 3$ won from each worker, if we take 1$ from each of them, cost compensation can lead to MSD, so can be a significant opportunity for cost saving.

1.2. Ergonomics improves productivity

For the best productivity we need to bring the most useful solutions for ergonomics. The appropriate posture of the worker at the workplace, influences positively the number of movements, increasing the work field, thus conducting to an increase labor productivity. As it can be seen in Figure 1

Fig. 1. Chair cover with massage feature, the ultimate revolution about an ergonomic cover

for a chair, which can bring you the most specific massage, directly at work. This can be applied on the work chair and is simple to use, reducing the stress during the work time.

Fig. 1. Chair cover with massage feature (https://www.amazon.com/Snailax-Shiatsu-Kneading-Massager-SL-256/dp/B076HWNCP5)

1.3. Ergonomics improves quality

Ergonomic at a decreased level, this can bring tired and disappointed workers because they do not do their best for the workplace.

Having a job task who produce too much stress on workers, they may not realize their job like they had been learned. For example, an employee might not fasten a part tightly enough because to a high push condition which could create a product quality problem.

1.4. Ergonomics improves employee engagement

If the point of view of an employee, is taken into consideration, they can notice what the company is doing to improve the work condition. Nevertheless, the lack of fatigue or discomfort experience at the workplace, conducts to an enhanced engagement attitude of the employees, in contrast with the apathy observed at employees, whom workplaces are not ergonomic organized and operated. The lack of involvement directly causes the labor productivity reduction, and finally to the business turn over.

1.5. Ergonomics improve the safety feeling

The assuring a safe and healthy work environment is the goal of the continuous effort of the company, as internal culture, enhancing the employees feeling of safety and health.

Fig. 2. Health and safety first at work

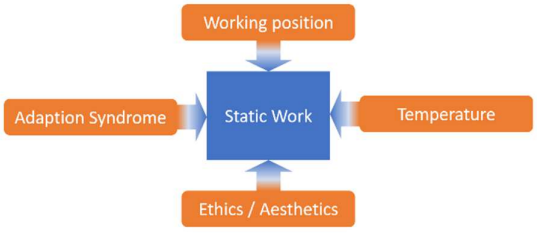
The less accidents and professional diseases encountered at the work places, conducts to an increase safety and health feeling of the employees, they considering those improvements, as a part of the care that the company takes over them, being an extrinsic rewarding factor for the labor deposed (Fig. 2).

2. SPECIFIC CRITERIA REGARDING ERGOWORK

Several aspects should be taken into consideration regarding the work space ergonomics. There are several factors that influence static work, conditions under which stress is triggered, but also the optimum level of comfort in the workplace [3].

In this paper, our emphasis lies on specific aspects, such as the working position, the general adaption syndrome, the temperature, and the ethics/aesthetics, all of which have a significant influence on the static work, presented in Figure 3.

Fig. 1. Influencing factors on static work



2.1. Working height in sitting position

When the work is done in a seating position, there are some indications regarding the specific height of each work performed, illustrated in

Table 1. The more precision and vision are required to perform the work, the higher the seating position is recommended, while the manual and regular work, should have a lower position.

2.2. Working height in sitting position

If the emphasis is placed on the state of the body, on its reactions to stress agents, excessive emotional responses are considered [4]. H. Selye discovers the mechanisms of adaptation of the organism to the action of stressors (Fig. *2.* General adaption syndrome) [5]:

Table 1

Heights for Specific Work

SPECIFIC WORK	HEIGH [mm]
Works with special demand for vision	980-1020
Precision work	880-920
Office work	700-780
Regular manual work	670-700
Manual work with intellectual effort (on the computer)	650-680

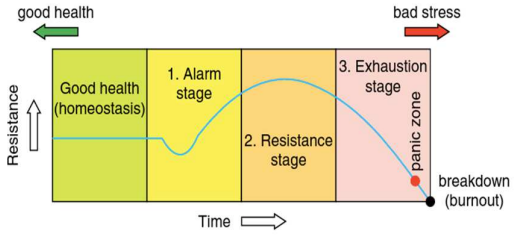


Fig. 2. General adaption syndrome (http://stresshealthandlife.blogspot.com/p/stress-response.html)

Alert Stage - If the body labels a stressor as a hazard. This would be an immediate response of the brain confronting the immediate danger perceived.

Support Stage - The part where your adrenaline is weak in defense and needs energy to repair any damage that stress would have caused you. Think of yourself as fighting a sharp edge. Now your body is on guard to be cut and would always fight when required.

Fatigue Stage - The last stage, this is the part where your body can no longer fight stress because you no longer have strength, so your body is simply on the verge of overwork.

2.3. Thermal comfort and good physiological condition at work

The subjective temperature is what the human body feels and can be defined as the average result between the temperature from the air and the temperature from the surfaces in the room in which the subject is (see Equation 1):

$$T_{s=}[T_a + T_m]/2 \quad (1)$$

Where Ts is the subjective temperature;

T_a - average air temperature;

T_m - the average temperature of the surfaces of the room where the subject is.

2.4. Ergonomics and the ethic dimension

An often-forgotten factor that significantly influences the ergonomic space is its ethical dimension, who is concerned by values, as like aesthetics. Both, ethics, and aesthetics compromise the branch of philosophy that is called axiology. Humans perceive ethical values differently with a complex dependency on factors such as: age, culture, education and many more. Therefore, the ethical dimension shall be part of the design process. Solcal et al. [5] describes the non-linear design thinking process for a car seat for electrical cars. All five phases of empathize, define, ideate, prototype and test shall aim for an ethical dimension. Human acceptance of products designs, and the like are consciously or unconsciously highly influenced by ethics. A typical example is that designs which reuse recycled plastic material are easier accepted (at least in western civilization), since humans' value that are useful to help reducing waste. In the article [6], the author describes a total five dimensions of human factors and ergonomics, which are neither unidimensional nor as the independent. Specifically, we would like to obtain the two-dimensional space between aesthetic dimension and the ethic dimension:

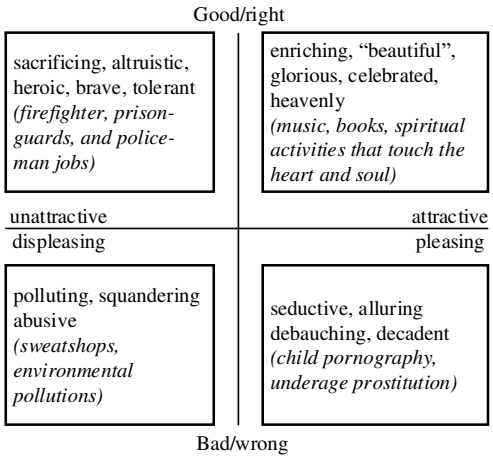


Fig. 3 The two-dimensional space, aesthetic versus ethics dimension

One can easily conclude that the vertical axis of ethics has a stronger impact on individuals, compared to the horizontal axis of aesthetic/affective dimension. In other words, doing something good or right is more important than doing something pleasing versus something displeasing [7].

3. CONCLUSION

We noticed that several workplace improvements can have immediate positive impact over the labor productivity. The ergonomic chair can be adapted with a massage cover for the efficiency of the staff. For an efficient ergonomic space, it must keep in mind that all the tools / machines should be in adapted to the operator anthropometry. Also, the safety and health feeling are the most important aspect for a worker. Nevertheless, the ethics has a special place in employees' perception on the job reward. A clean and healthy environment will bring to any company higher productivity, efficiency and finally, economic growth.

The present study is limited by emphasizing just several aspects of direct relation between ergonomics, labor productivity and efficiency. However, in the future work, we plan to develop new studies regarding the profound implications that the ergonomics have in the work relationship and, in the private life.

4. REFERENCES

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Locurile de muncă ergonomice și durabile

Rezumat: Ergonomia locurilor de muncă este foarte importantă. Numeroase studii în acest domeniu indică necesitatea unui spațiu de lucru ergonomic bine definit în vederea creșterii productivității. Optimizarea organizării locurilor de muncă trebuie să urmărească utilizarea eficientă a echipamentelor. În această lucrare sunt prezentate avantajele unui spațiu ergonomic modern și îmbunătățirile care pot fi realizate la locurile de muncă, pentru creșterea productivității muncii și menținerea stării de sănătate a angajaților.

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