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## Ergonomic analysis of work in an eyeglasses store

Aarão Pereira de Araújo Júnior<sup>a</sup>, Maria do Carmo Medeiros Maia<sup>b</sup>,  
Mayara de Miranda Lima<sup>c</sup>, Paulo Romero Procópio Ferreira Lopes<sup>d,\*</sup>,  
Samara Coeli Paiva Téjo<sup>e</sup>

<sup>a</sup>Institute Federal of Paraíba, Street Floriano Peixoto, 793, APT. 305, Jaguaribe, João Pessoa-PB, 58015-280, Brazil

<sup>b</sup>Institute Federal of Paraíba, Avenue Capitão José Pessoa, 325, Jaguaribe, João Pessoa-PB, 58015-170, Brazil

<sup>c</sup>Institute Federal of Paraíba, Street of Imburana, 42, APT. 202, Anatólia, João Pessoa-PB, 58052-040, Brazil

<sup>d</sup>Institute Federal of Paraíba, Street Euzely Fabrício de Souza, 220, Manaira, João Pessoa-PB, 58038-410, Brazil

<sup>e</sup>Institute Federal of Paraíba, Avenue Treze de Maio, 669, Jaguaribe, João Pessoa-PB, 58015-430, Brazil

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### Abstract

Ergonomics is a science of work that directly endorses the creation of machinery and gadgets to be used safely and efficiently, as well as the conception and assessment of workplaces. This research aims to point the activities that take place in an eyeglass store located in the city of João Pessoa - PB - Brazil, as well as to analyze the ergonomic problems that happen in that environment. The adopted methodology was a field research with direct observation, where were applied surveys with the clients, as well as physical and photographic data collection. This work used the parameters of the Workplace Ergonomic Assessment (WEA), which helped the diagnosis and the suggestions for achieving the necessary adjustments for the ergonomic comfort. For the theoretical basis, there were used works from Pronk [10], Iida [4], Moraes & Pequini [9], Tilley [8], Dul & Weerdmeester [1] and Motta [5], as well as the NR-17 [3], NBR-9050 [6] and virtual sources of research. The results showed deficiencies in the physical and functional aspects of the environment, where the difficulties in the customers' adaption to the place do not favor a good performance to the realization of the developed activities, evidencing the relevance of having more researches like this. That being said, designers address the wide theme of Ergonomics in their investigations and absorb it in their projects.

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\* Corresponding author. Tel.: +55 83 96583772.  
E-mail address: [pauloprocopio85@gmail.com](mailto:pauloprocopio85@gmail.com)

## 1. Introduction

According to Dul & Weerdmeester [1], it can be said that Ergonomics is a science that is applied to the design of machines, equipment, systems and jobs, with the aim of improve the safety, health, comfort and efficiency during the work. “Ergonomics (or human factors) is a scientific subject that studies the interactions of mankind with other elements of the system, making applications of the theory, principles and Project methods, with the aim of improve the human well-being and the global performance of the system” [1]. In the projects of work and daily situations, Ergonomics focus the men. The unsafe conditions, insalubrity, discomfort and inefficiency are eliminated by their adaptation to the physical and psychological capacities of men.

The proposed work was developed in an eyeglass store in the city of João Pessoa - Brazil, which is an environment with flow and limited space problems. The research occurred, a priori, by studies related to the meaning and application of the word “ótica” (Portuguese for “eyeglass store” and its synonyms), with researches, surveys and assessment of the selected environment.

According to the page OPTO [2], the term “opto” comes from “óptico” (Portuguese for “optics”), from optometry. However, it is common, in Portuguese, to mistake *óptica* by *ótica*, which are words with complete different meanings. *Óptica* comes from the Greek *optkós* (or *optiké*) and from the Latin *optica*, which refers to vision and its phenomena, study of light and perspective, etc. *Ótica*, without the “p”, refers to the ear or to the hearing system. Its origin is also Greek, but from the word *otikós* (or *ótos*).

The studied built environment is a company that sells and mounts eyeglasses with the using of specific machinery to the storage of parts. The equipment needed for the realization of the company’s basic tasks was designed aiming the ergonomic comfort of the users that handle it, but the research showed that the ergonomics of this machinery stills not enough, since the work stations of the place are not following the NR-17 [3], which governs the work place ergonomics, nor are they following other regulations. The ergonomic problems found in the environment were exposed and discussed, based on local visitation, direct observation of the realized tasks, surveys and photographic data, with a sketch of the establishment.

This research also has the aim of evaluate the difficulties of both customers and employees, making possible the making of proposals and solutions to achieve the ergonomic comfort.

## 2. Work assessment

According to Iida [4], in order to reach its objective, Ergonomics studies various aspects of the human behavior in the workplace, as well as other important project factors, such as:

- The men – physical, physiological and social characteristics of the employee; influence of gender, age, training and motivation;
- Machinery – all the help with material received and used by the men in the work, covering all the equipment, tools, furniture and facilities;
- Environment – the study of the characteristics of the physical environment that surrounds the worker during the work, such as temperature, noise, vibration, light, colors, gases etc.;
- Information – refers to the existent communications between the elements of a system, the sharing of information, the processing and the decision-making;
- Organization – is the conjugation of the elements cited above in the productive system, studying aspects such as timetable, work shifts and team formation;
- Work consequences – here enters the control of information such as inspection tasks, studies of errors and accidents, of the money spent with energy, fatigue and stress.

According to the survey applied to the owner of the place and his employee, there is no work shift, but they share the tasks, which are the customer services, store organization and money accountancy.

The actions that are not predicted or not programmed do not happen in the company. The main functions realized by the workers are selling and mounting the glasses. The movement of the workers within the store is basically from

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