

The Knowledge Changes the Behaviour Under the Focus of Cognitive Ergonomics

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ABSTRACT

The increase in the number of accidents at work and removal of the workers from their jobs , contribute to the increase in cost of production meant that entrepreneurs start thinking about managing and empowering workers so more focused on the causes involved. Due to the necessity of seeking the reduction and / or elimination of workplace accidents companies, they and safety at work. Considering the objective ergonomics modify the systems work to tailor the activity to existing features, abilities increasingly seek to train staff, identify ways to better and systematic safety management of health and limitations of people with a view to its efficient , comfortable and safe performance in it, according, entrepreneurs consider the application of ergonomics , even though still incipient mode

Keywords: *Ergonomics, Behavior, Constructivism*

INTRODUCTION

As an applied discipline, ergonomics brings the results of scientific modeling of reality treatments and the lifting of the state of the art of problem for the development of interfaces technology for the design, analysis, testing, standardization and control of work systems. From the existing need in organizations, ergonomics has been developing in their studies and applications, losing its character focused on physical aspects of the work , going to look the same more fully considering the cognitive aspects involved in the activities performed by employees .However, the theme of human cognition and behavior are relatively new to the area of work safety and more specifically in ergonomics.

According to Abrahão et al (2009) , cognition is a set of mental processes that allows people to search, store and treat utilize different types of information from the environment . It is from the cognitive processes that the individual acquires and produces knowledge . It is important to differentiate two processes at work act pivotally : how people capture information - perceptual processes - and how they understand them and organize - cognitive processes.

Ergonomists work, increasingly contributing to the design of work systems that foster the development of skills and to ensure workers' health and operational safety , according ABRAHÃO et al . 2009. With the identification of cognitive factors that contribute most strongly in human behavior when executing work activities , can establish more specific and targeted actions to prevent accidents .

CONTEXTUALIZATION

The internationally accepted definition today draws attention to three aspects : the type of knowledge and their interrelationships , the focus on change and criteria for ergonomic action. The consideration of these aspects simultaneously configures Ergonomics as a discipline of synthesis between various aspects of knowledge about people , technology and organization. For ordering this field employ a classification of such content , as suggested by the International Ergonomics Association (IEA): physical , cognitive and organizational ergonomics. The figure 1 outlines the cognitive process. In cognitive terms the human being transforms the information of physical nature in nature and symbolic information from this in action on the interfaces. Its design is brought to us by the field of cognitive science that aims to the study of virtual knowledge, the set focuses on the minimum structural and functional conditions of sensing , to represent , retrieve and use information (VIDAL , 2000).

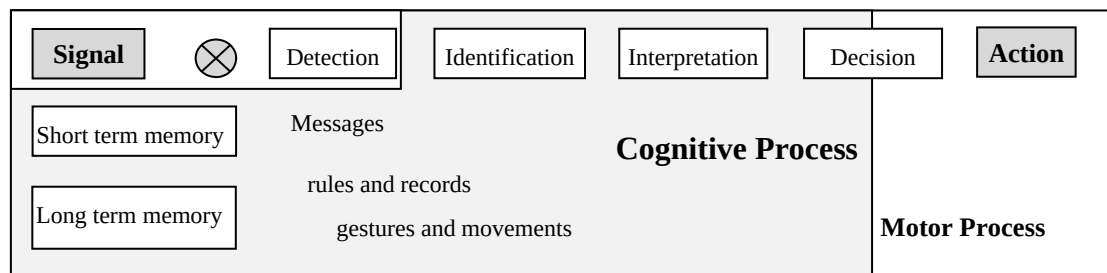


Figure 1 - Process perceptual, cognitive and motor

Within the complexity and innovation of the theme of cognitive ergonomics , this article discusses the main findings observed in the analyzed companies was that the need for companies in reducing accidents at work under the influence of the worker (human factors) in carrying out its activities based on development and participation in the training program in order to contribute to the transformation of knowledge into safe behavior .

Training is the educational process applied in a systematic and organized way by which people perceive knowledge , skills and attitudes according to defined objectives. Professional development is a broader aspect that the training aims to provide education as a way to develop and enhance people in certain careers , organizations , or to become more efficient and productive in their jobs (PALMEIRA, 2004 apud BORGHI, 2008) . Hamblim (1974) defines a sequence of training experiences and opportunities designed to modify behavior or any activity that aims to enhance personal skills to the performance of a task apud (BORGHI , 2008) .

According to Kirkpatrick (2010), this is the most basic of requirements. If the program does not meet the needs of the participants, the evaluation results can be disastrous. The survey was conducted in three business segments roasting and grinding coffee (Company A) , Plastic Industry and Trade (company B) and horizontal and vertical lifting and handling of loads (Company C) , located in the state of Pernambuco .

This article presents the results of analyzes for the completion of training after injury and reducing them , contributing to the transformation of the behavior of workers in three companies from different segments as mentioned earlier. The choice is due to the fact that companies having submitted work safety sectors structured with clearly defined tasks.

METHODOLOGY

The research was conducted as a case study (multi - event) in 03 companies involving industrial sector and services. The research was exploratory to observe performance results in job safety after application training. The survey was conducted in two phases : the first concerning the literature with regard to the theoretical background on the subject for the development of practical research . The second phase related to field research with analysis of reports of accidents and trainings conducted with focus on safety. Regarding technical research survey was based on

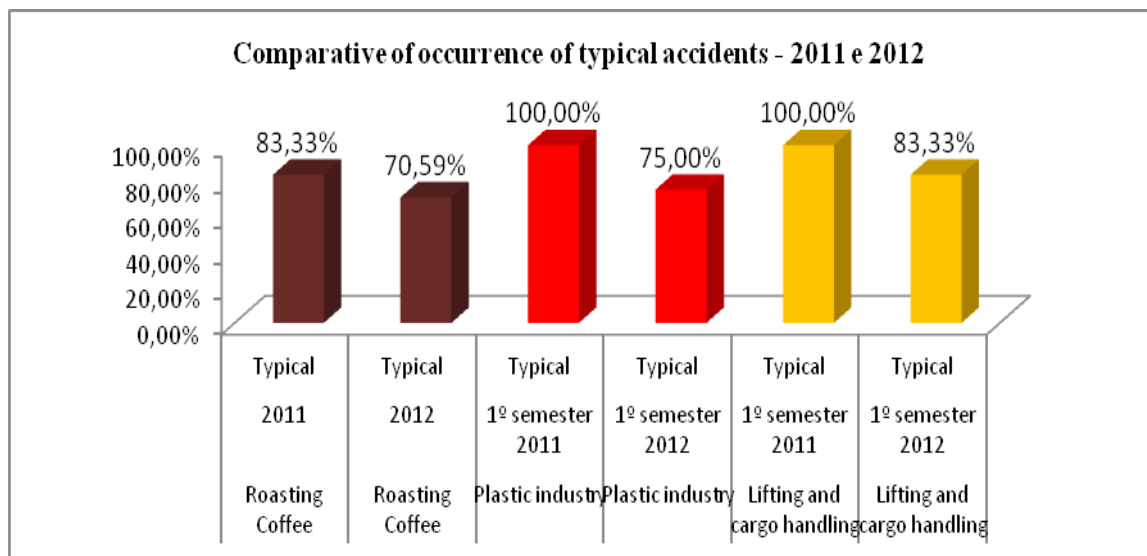
reports and analyzes carried out by companies to know the types of behavior occurred due to worker accidents .

As instruments to collect data on documentary research were considered primary sources such as documents , company reports study object and secondary sources, for example, records of accidents in the Ministry of Labour , available information on the internet , books , articles and newspapers. For the analysis and interpretation of data were studied and developed phases of collection on the occurrences of accidents at work in the years 2011 and 2012 , analysis by the consolidated company information , preparation of graphical illustration for better understanding. Were also collected data made interpretation of the data with the goal of having consolidated and comparative information about the problem which seeks to get answer.

From the reports provided by the companies assess the relationship between the training carried out in the safety aspects of work and work-related injuries that occurred after the implementation of training for demonstration of results achieved in the effectiveness of the training was conducted. Accidents at work are analyzed and ranked by typical path . And the causes of these accidents identified in the analyzes will be stratified in human factors and working conditions

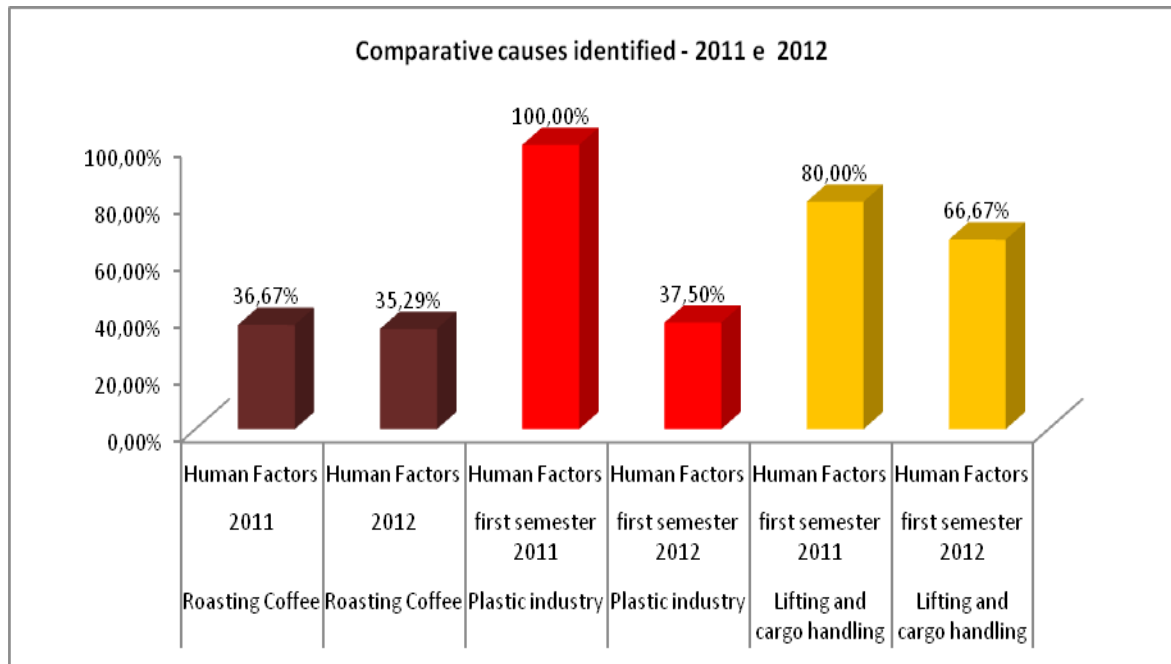
CONCLUSIONS

All three companies object of study of this article was no reduction in the occurrence of typical accidents occurring in the workplace, in relation to the period following achievement of the training of workers involved in accidents as shown in Graph 1.



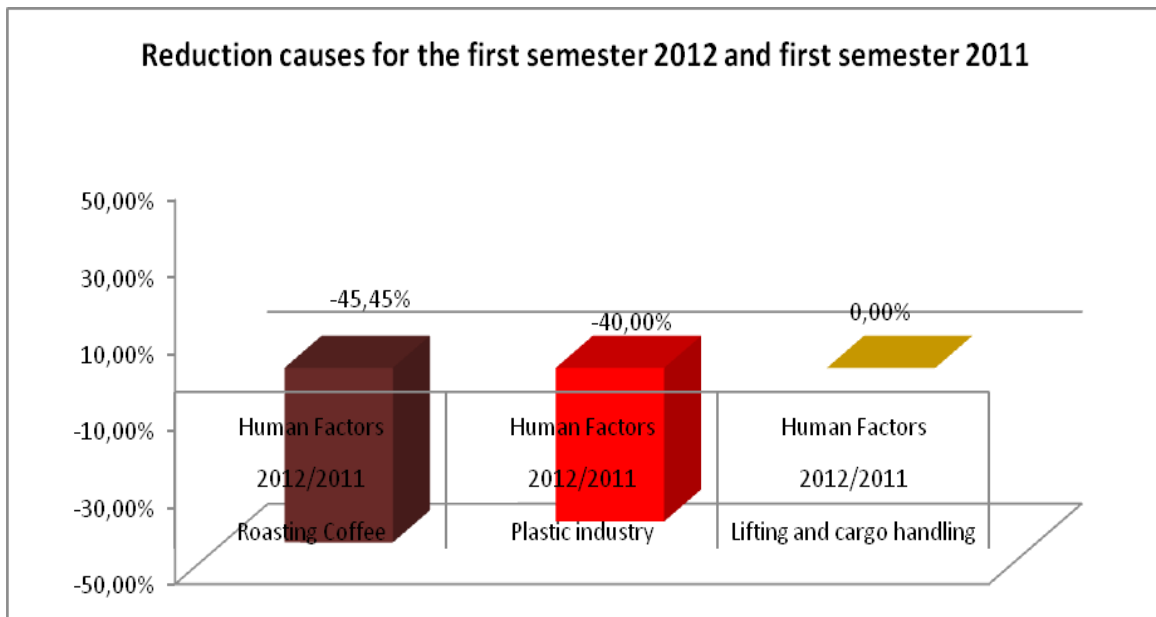
Graph 1 - Occurrence of typical accidents in the studied companies (Source: author's own production)

The three companies studied had a reduction of accident causes by human factors in training after the completion of addressing workers' behavior as graph 2 periods.



Graph 2 - Typical Causes of accidents identified in the companies studied (Source: author's own production)

The actions taken after the occurrence of typical accidents with identified causes associated with human factors, were related to training sessions and meetings addressing human factors and the body parts of workers involved in workplace accidents. The three companies analyzed had reduced human factors causes of accidents involving comparing the typical number of human factors accidents between 2012 and 2011. The Company achieved a reduction of 45.45% of causes of human factors, Company B was reduced by 40.00% and the company C causes no increase due to human factors as Graph 3.



Graph 3 - Typical Causes of accidents identified in the companies Studied (Source: author's own production)

The reduction of human factors is presented as a result of the attention of workers from the training provided , and

employees improved their performance and safety at work using safer practices demonstrating that managed to transform the knowledge gained in behavior. However, it was noted that workers still restricted the care and attention needed for the body parts directly involved with the training carried out, therefore having new body parts involved in accidents in 2012. The importance of training was evident in the transformation of the acquired knowledge worker behavior in relation to safety.

With my experience I observed that this study is relatively new in Brazil there is plenty of opportunity to develop both as research tools that help professionals working in occupational safety regarding cognitive elements, training and worker safety behavior justifying deeper investigations on the theme.

As a suggestion for future research have:

- The expansion of the universe of application of this study, since this study only allows conclusions about the companies observed, not on the universe of Brazilian companies.
- The development of a questionnaire to identify factors that influence the behavior of the worker on the aspects of safety at work, as well as its implementation.
- The identification of cognitive factors that facilitate the transformation of knowledge into safe behavior in relation to safety.

REFERENCES

- Abrahão, Júlia. *Introdução à Ergonomia - da Prática à Teoria*. São Paulo: Blucher, 2009.
- Borghì, Layla D'lla Kássia. *Avaliação de resultados do Treinamento: Uma análise das Metodologias disponíveis e sua aplicação em empresas brasileiras*. Dissertação (Mestrado profissionalizante em administração) – Faculdade de Economia e Finança/IBMEC, Rio de Janeiro, 2008.
- Kirkpatrick, Donald L. ; Kirkpatrick, James.D. *Como implementar os quatro níveis de avaliação de treinamento de equipes: um guia prático*. Tradução de Alessandra Mussi. Rio de Janeiro: Senac Rio, 2010. Tradução de: Implementing the four levels: a practical guide for effective evaluation of training programs.
- Vidal, Mario Cesar. *A certificação do ergonômista brasileiro*, Editorial do Boletim 1/2000, Rio de Janeiro.