



## IMPORTANCE OF WORK SAFETY IN PROFESSIONAL QUALIFICATION COURSES: REDUCTION IN LABOR ACCIDENT RATE

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### ABSTRACT

The use of Personal Protective Equipment (PPE) is a method of preventive action against accidents at work, with a purpose to preserve the individual from the threats to his individual health and safety. The objective of this work is to elucidate the success of the methodology applied in the student body of the SENAI Demóstenes Travessa School, regarding the use of PPE in professional qualification courses, preventing and raising awareness among students seeking knowledge to apply in the labor market or in their personal lives, I try in view that, the school is focused on the follow-up of construction, one of the sectors that most accidents occur.

**Keywords:** PPE; Workplace safety; Construction; Teaching, Professional Qualification.

### I. INTRODUCTION

Occurrences of occupational accidents are ancient facts, however, their teaching by Occupational Hygiene and Safety only gained prominence in society after the Industrial Revolution, due to the imposition of regulating the premises of labor such as labor laws and Regulatory Standards, and with therefore, to prevent the eventualities of accidents and occupational diseases. In addition to the physical injury to the employee and the suffering for their family members, the occurrence of occupational accidents has economic, socio-environmental and political consequences for the whole society [1].

Civil construction is one of the oldest sectors and always undergoing modifications, especially the Personal Protective Equipment [2] that is included in the construction process.

In Brazil, over the course of several decades, there was a high computation of accidents at work, especially in construction, as it is one of the sectors that most captures employees of various levels of knowledge because it covers various sectors. Consequently, it has inevitably contributed to the ranking of occupational accidents. This ranking has been reduced due to the numerous and expressive efforts of companies, employees and especially the government, in which it discusses and elaborates rules to make the lives of employees safer, healthier and healthier.

The Statistical Yearbook of Accidents at Work - SYAW highlights: According to Article 19 of Law No. 8,213, of July 24, 1991, “an occupational accident is what occurs when working at the service of the company or a domestic employer, or the work of the special insured, causing personal injury or temporary or permanent functional disturbance”. It can cause from a simple removal, loss or reduction of work ability, even the death of the insured [3].

Our educational institution supports all its employees in accordance with the requirements of the Ministry of Labor and Employment - MLE, however, because it is a vocational education institution, it also contributes to the fall of this statistic of occupational accidents, which prepares its students to act splendidly in the formal or informal job market.

The use of Personal Protective Equipment is a substantial preventive action method and is vital for the protection of the student body in the practice of vocational courses. PPE can eliminate or reduce the risks that exist in the learning environment, where the execution process sometimes follows the same characteristics found in the job market, as well as preventing accidents from becoming more severe and harmful.

Not only the supervision and awareness of use practiced in the company by the Internal Accident Prevention Commission - IAPC and the faculty, but also the training of students on how to

use and maintain PPE correctly in which it is passed on in theoretical and practical classes.

This work was developed with the objective of showing the magnitude of the methodology of teaching of professional qualification of SENAI Demóstenes Travessa School, which is focused on the follow-up of civil construction, and that follows the standards of the National Service of Industrial Learning - SENAI of all Brazil, instructing its student body objectively and clearly, in which it is inserted or will enter the active labor market, showing them and making them aware of the importance of the use of PPE as well as the norms, thus contributing to the drop in rates accidents at work across the country.

## II. DEVELOPMENT

This article highlights some principles of renowned authors in the area of occupational safety, developing issues related to the importance of awareness and the use of personal protective equipment, linked to the teaching of professional qualification, having contributed to the reduction of the rate of occupational accidents job.

Safety at work is indispensable for companies when it indicates conditions of risk to the health of employees, so the resulting item brings convictions and reports about safety. Chiavenato clarifies that occupational safety is the way to prevent accidents, eliminating unsafe circumstances and instructing employees to use PPE [4].

Conservation and awareness of the use of Personal Protective Equipment can reduce workplace accidents or cause minor harm to the health and well-being of the employee in the event of an accident, as noted above, always emphasizing occupational safety. Marras ensures that the awareness program serves to signal risks and ensure the life and integrity of employees, however, this awareness is not only given through the government, companies or between employees. Raising awareness of the use and conservation of PPE among other safety mechanisms can also be sought in SENAI's professional qualification courses, which contributes to the reduction of the national occupational accident ranking, with the objective of enabling, raising awareness and training splendid form its student body that acts or will act in the

formal or informal labor market. These actions of preservation of the life of the collaborator together, bring economic advantages, because the expense that the company has for the removal due to work accidents minimizes. However, taking advantage of Marras' main idea: "accident prevention is the best the company has to do [5]".

The methodology used was a field research, where I applied a questionnaire to the student body of the school before starting the professional qualification course, was also taken into account the experiences and observations lived in the daily teaching of SENAI Demóstenes Travessa School, which has the following in the area of construction, one of the sectors with the highest causes of occupational accidents. The school receives numerous students from different social levels, ages and educational levels, seeking vocational training courses to add skills to their curriculum or personal life, applying the knowledge acquired in the formal, informal or even personal labor market.

The teaching staff of SENAI Demóstenes Travessa School is highly trained and qualified, strictly following the national standardization of SENAI - National Service of Industrial Learning and also the guidelines of the Ministry of Labor and Employment, of SESMET - Specialized Services in Engineering of Occupational Safety and Medicine, NR 04 and IAPC - Internal Accident Prevention Commission [6], obtaining the mastery and the ability to transmit and promote the professional and technological education with innovation, contributing to increase the competitiveness of the Brazilian and helping to reduce the ranking of occupational and regional accidents in the country, emphasizing and making their students in the classroom or laboratory aware of the correct use and handling of PPE - Personal Protective Equipment, according to NR 06 or following the correct procedures of safety.

Every effort to reduce the ranking of occupational accidents revolves around three aspects: the government, the employer and the employee, in which they work collectively to avoid damage and harm. For years these numbers of occupational accidents have been falling, according to the table of the Statistical Yearbook of Accidents at Work [3].

Chapter 1 - Brazil and Major Regions																		
1.1 - Number of occupational accidents, by registration situation and reason according to the National Classification of Economic Activities (NCEA), in Brazil 2015/2017																		
NCEA	AMOUNT OF WORK ACCIDENTS																	
	Total			With Registered WAC												No Registered WAC		
				Total			Reason											
				Typical			Path			Work Disease								
2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	
<b>Total</b>	622.379	585.626	549.405	507.753	478.039	450.614	385.646	355.560	340.229	106.721	108.552	100.685	15.386	13.927	9.700	114.626	107.587	98.791

Figure 1: Work accident report in Brazil and Major Regions. Source: Adapted from [3].

Chapter 4 - Amazonas																		
4.1 - Number of occupational accidents, by registration status and reason, according to the National Classification of Economic Activities (NCEA), in the state of Amazonas - 2015/2017																		
NCEA	AMOUNT OF WORK ACCIDENTS																	
	Total			With Registered WAC												No Registered WAC		
				Total			Reason											
				Typical			Path			Work Disease								
2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	
<b>Total</b>	8.495	7.293	6.670	6.070	4.982	4.567	4.413	3.620	3.464	1.025	1.009	882	632	353	221	2.425	2.311	2.103

Figure 2: Work accident report in the Amazon. Source: Adapted from [3].

The purpose of the research is to show that it is not only through these factors that work accidents can be reduced, and can be optimized within a vocational education institution, helping to reduce the work accident rate, which is not highlighted in the scientific literature, considering that many students have already gone through professional qualification obtaining greater awareness. According to the School Management System - SMS in 2018 there were 647 enrollments in vocational training courses only at SENAI Demóstenes Travessa school and in 2019 until June were 335.

A questionnaire was applied to 44 students at the beginning of the professional qualification course and their answers were analyzed, whether or not they are active in the labor market, after which the questionnaire was reapplied at the end of the course. The questions of the questionnaire are fundamental and paramount to ensure better work safety within a corporation, when there is mastery and awareness of them, thus contributing to the reduction of occupational accidents. Much was unaware of a simple verification of the Certificate of Approval - CA of an PPE for example.

Even if the government is implementing regulations, laws or enforcement sometimes unsuccessfully due to the high demand for labor market activities, even if companies train their employees in their corporations, there may still be a gap in awareness and the importance of using them of the PPE. Employees who are at the front of the service end up crashing out of neglect or the obscure way that their safety and health at work training was transmitted and absorbed, if any. Incorrect information, manipulation and conservation of PPE's, for example, can lead to an accident at work, causing the employee to leave or even die.

In addition to the fact that our staff is well qualified and trained, always undergoing retraining, the lesson plan of any professional qualification course includes Occupational Safety, objectively and clearly raising awareness of our students, as shown in the image below.

8 Basic Contents:	9 Partial Hours:
<b>1 Safety, Quality and Environment in Construction:</b>  <b>1.1 Safety at Work:</b>  1.1.1 Basic Concepts (Understanding NR - 18); 1.1.2 Hygiene and Safety at Work; 1.1.3 Causes of Accidents; 1.1.4 Accident Prevention; 1.1.5 Preliminary Risk Analysis; 1.1.6 Ergonomics and Accessibility ABNT NBR 9050; 1.1.7 Personal and Collective Protection Equipment (Notions NR-06).	25h

Figure 3: Course outline, Safety, Quality and Environment. Source: Adapted from [8].

The courses are divided into two moments, the theory made in the classroom where is passed on all information according to laws, rules and procedures, the duties and rights of the employer as the employee.

In the practical classes of the courses is the moment where the student will apply and simulate in the laboratory situations that will find in their work environment, having the assisted support of the teacher where reinforces and continues the awareness about the procedures and the importance of following the rules and the use of PPE, studied in theoretical classes.

The results of the field research carried out with the students who were training at SENAI Demóstenes Travessa School were descriptive and gathered data that will be presented below.

The questionnaire was applied on the second day of the professional qualification course and later at the end, in order to seek an understanding of occupational safety, emphasizing

personal protective equipment and capturing information about the importance of the study of occupational safety within professional training.

In the first application of the questionnaire 44 students performed. Of these, 42 are male and 2 females, with 2 having completed elementary school, 37 having completed high school, 4 having completed higher education and 1 student did not report their level of education. Student ages range from 18 to 56 years.

The students who were willing to answer the questionnaire trained in vocational courses focused on civil construction. Of these, twenty-seven have reported employment and seventeen are unemployed.

The analysis below shows the degree of knowledge of the students before starting the professional qualification course.

Table 1: Questionnaire with 8 questions, 44 students answered, first application.

QUESTION	QUESTIONNAIRE	YES	NO
1	Do you know what Personal Protective Equipment - PPE is?	40	4
2	Do you know the importance of using PPE?	38	6
3	Do you know the employer's obligations regarding the use of PPE?	29	15
4	Do you know the employee's obligations regarding the use and handling of PPE?	30	14
5	Can you tell if the PPE used in your work activity is appropriate?	33	11
6	Do you know what an EPI Certificate of Approval - CA is?	19	25
7	Have you been trained in the use and conservation of PPE?	27	17
8	Are you aware of the damage that can occur in a work accident when you do not wear PPE?	39	5

Source: Authors, (2019).

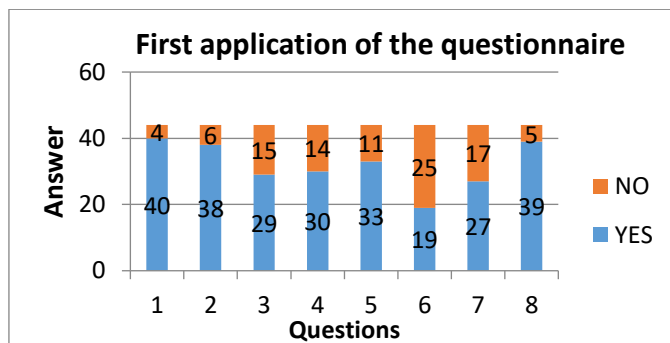


Figure 4: Graph, result of the first questionnaire application. Source: Authors, (2019).

In the second application of the questionnaire 35 students performed. Of these, 33 are male and 2 females, 31 of which have completed high school and 4 have completed higher education. Student ages range from 18 to 50 years.

The students who were willing to answer the questionnaire were trained in vocational courses focused on civil construction. Of these, twenty-three have reported employment and twelve are unemployed.

The analysis below shows the degree of knowledge of the students at the end of the professional qualification course.

Table 2: Questionnaire with 8 questions, 35 students answered, second application.

QUESTION	QUESTIONNAIRE	YES	NO
1	Do you know what Personal Protective Equipment - PPE is?	35	0
2	Do you know the importance of using PPE?	35	0
3	Do you know the employer's obligations regarding the use of PPE?	34	1
4	Do you know the employee's obligations regarding the use and handling of PPE?	35	0
5	Can you tell if the PPE used in your work activity is appropriate?	35	0
6	Do you know what an EPI Certificate of Approval - CA is?	34	1
7	Have you been trained in the use and conservation of PPE?	35	0
8	Are you aware of the damage that can occur in a work accident when you do not wear PPE?	35	0

Source: Authors, (2019).

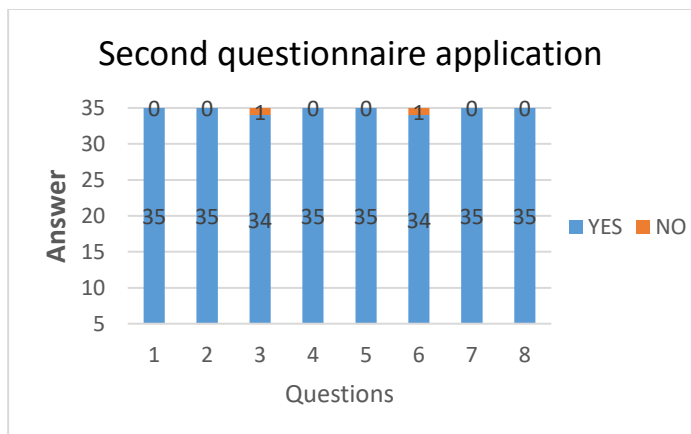


Figure 5: Graph, result of the second questionnaire application. Source: Authors, (2019).

Employees need to know exactly why and the importance of using personal protective equipment at work, the application of a method of awareness is necessary, and this is present in the vocational training courses of SENAI Demóstenes Travessa School. In order to implement the methodology of awareness in a work environment, the collaboration of all is first requested, making them follow the guidelines and information acquired in the course. The degree of safety in an organization is acceptable and satisfactory when it ensures and takes care of the occupational health of its employees [7].

### III. CONCLUSIONS

Based on the results of the applied questionnaire, it can be considered that this field research contributes to evaluate the importance of the employment of the Occupational Safety in the professionalizing courses in the professional qualification institutions, using as model the SENAI Demóstenes Travessa School that through the qualifications, helps in reducing the rate of occupational accidents, as the course plan includes the content mentioned above.

The school not only empowers the student for his or her specific role, but also raises awareness, displays and practices workplace safety guidelines by emphasizing the importance of laws, regulations and the proper use of PPE, thereby helping to reduce the rate of accidents.

In the comparison of the questionnaires we saw that shortly after the end of the vocational training course there was a

considerable increase in knowledge and awareness about work safety, reaching almost 100% in the YES answer. It also took into consideration that of the 44 students evaluated 27 reported that they are employed, about 61% and, even in the company, had a deficit in knowledge on Work Safety, which could be a potential index of work accident.

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