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**APPLICATION OF
QUANTITATIVE
METHODS TO ANALYZE
WHETHER THE AGE, SEX
AND EXPERIENCE OF
WORKERS INFLUENCE
THE VOLUME OF
PRODUCTION OF
CEMENT BLOCKS BY
COMPANY Y IN THE CITY
OF NAMPULA IN 2022**

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Abstract: Housing construction, with the use of cement blocks, is a branch of Civil Construction that involves the most intense participation of society in order to obtain their own home. This scientific article aims to use quantitative methods tools to analyze whether the profile of workers (age, sex and experience) influence the volume of production of cement blocks in company Y, located in the city of Nampula, in the year of 2022. For this purpose, documental research was used to collect data on gender, age, workers' experience and the volume of production for the year 2022, and they were processed and organized using Microsoft Office software and presented in the form of tables and graphics. Finally, it is concluded that the age, sex and experience of the model do not present significant differences in relation to the volume of production, since the $\text{Prob} > F = 43.54\% > 5\%$.

Keywords: Concrete blocks; Quantitative methods; Production volume.

INTRODUCTION

In the current economic scenario, it is observed that organizations are increasingly competitive, and it is necessary that they seek alternatives to remain active, as many have gone into decline, failing in the face of adversity, observed mainly in times of economic crisis. It is common knowledge that for an organization to make a profit and achieve the desired growth it takes more than just a large investment. It is also necessary to have a set of information and strategies so that this investment has the expected return. This leads to the understanding that the tools of quantitative methods provide managers with essential information for organizational development and growth.

Based on this, the problem of the present work focuses on the resistance of using the tools of quantitative methods by the managers

of company Y in the city of Nampula, who know its benefits but are not convinced of its importance, let alone in the company's decision-making process. The consequence of the lack of use of this science negatively affects the administrative function of the organization, making known all the mistakes made by managers when they do not have a set of information that can serve as a future guide.

Since the tools of quantitative methods is not something new for many managers, there is a need to develop this work to solve and resolve the problem that has been experienced in this and many companies.

The main objective of this article is to use quantitative methods to analyze whether the profile (gender, age and experience) of workers affects the volume of production of cement blocks, in company Y in Nampula City, in the year 2022. The analysis production volume of cement blocks is an indispensable tool in decision making in business administration and management.

Cement blocks are prefabricated elements, developed from a mixture of water, cement and sand, and are mainly used in the construction of masonry, also called walls. In general, the cement blocks are joined together by the application of mortars, which, once dry, give the whole set rigidity and stability. Mortars in general are mixtures of cement and sand.

LITERATURE REVISION

For Guimarães (2012), Statistical science is applicable to any branch of knowledge in which experimental data are manipulated. Thus, Engineering, Economics, Administration, Medicine, Biology, Agronomic Sciences, etc., tend more and more to use statistical methods as a working tool, hence their great and growing importance.

According to Santos (2014), The production area of any organization deals with

quantitative methods to verify data related to operation, execution and the processes of elaboration and control of production and/or quality of products.

For Flick (2005), Qualitative research is a process that advances through the multiplication of new approaches and new methods, and that is assumed by more and more disciplines, as an essential part of their curriculum. In Sociology, Psychology, Nursing, Engineering, Cultural Studies, etc., along with the older ones, new approaches to qualitative research are found. One result of this evolution is the continued growth of the literature on qualitative research.

For Santos (2014), When analyzing a company, organization or business in its main areas, namely, finance, production, marketing and human resources, the application and influence of quantitative methods is evident, either directly or indirectly in each of these elements.

For Gonçalves (2012), All the technical advantages of cement blocks provide opportunities and enable their production, which generates the use of business opportunities, enabling their commercialization in a competitive market, which requires professionalization and mastery of techniques. In order to be successful in the cement block production process, some factors must be taken into account, such as: capacity for investment, expansion, hiring personnel and competition, in terms of distribution, adaptation, production, updating of products and sales.

In the Mozambican context, the cement block production sector contributes to the improvement of the trade balance and, this way, to its economic development and financial balance, also allowing an index of greater social well-being.

Alves (2003) concludes that for a business to maintain or improve quality and

productivity, the development and proper use of quantitative methods and statistical techniques are essential.

METHODOLOGY

According to Azevedo (2011), In the methodology, the author must clearly justify the advantages of the qualitative processes for which he has chosen. The choice of certain participants or informants or the option for certain objects of analysis must also be justified.

In order to achieve the proposed objective, the present work is defined as a qualitative, explanatory approach, based on the procedures of a case study.

This research focused on document analysis for data collection, that is, information on sex, age, experience and production volume of 20 workers provided by the human resources of company Y in the city of Nampula was used.

Then, MS Excel was used to organize the data collected from the profile of each worker and, finally, analysis of variance was used to verify if, gender, age and experience, in an isolated way influenced the volume of production of cement blocks.

RESULTS PRESENTATION

According to Azevedo (2011), The results section of research of a more qualitative nature may appear under more varied titles than the results section of articles of a quantitative nature.

The univariate statistical analysis of the present work consisted of examining one variable at a time, organizing the results found in 2 tables, one of which belongs to the quantitative variables (Table 1) and the other to the qualitative variables (Table 2).

According to table 1, we can see that the average age of the company's workers is 27.3 years, where the maximum age is 43 years and the minimum age is 19 years, we can also

observe that the average annual production is 10712.5 blocks of cement, the maximum annual production is 11100 blocks and the minimum annual production is 10000 blocks.

It is important to mention that the maximum annual production is 1100 blocks more than the minimum production of blocks.

Looking at graphs 1 and 2, it can be seen that the company chose to hire more male workers in relation to female workers, and also that the company chose to hire more workers who have experience in the manufacture of cement blocks. than those who have no experience in producing them.

It is important to mention that the company has 6 more male workers than female workers, and has 4 more experienced workers compared to those with no experience.

The bivariate statistical analysis of the present work consisted of relating the dependent variable with the independent variables, one at a time, and analyzing their behavior in the presence of each other.

Looking at table 3 it is possible to verify that:

-Between the age of the company's workers and the volume of production, there is a negative correlation (-7.63%), that is, the older the worker, the lower the volume of production of cement blocks.

-Between the sex of the company's workers and the volume of production, there is a positive correlation (26.60%), that is, the more men the company hires, the greater the volume of production of cement blocks.

- Between the experience of the company's workers and the volume of production, there is a positive correlation in (16.91%), that is, the more experience the worker has, the greater the volume of production of cement blocks.

The multivariate statistical analysis of the work consisted of measuring, explaining and predicting the degree of relationship between variables and their impacts simultaneously.

FINAL CONSIDERATIONS

From this article it is possible to conclude that statistical research is present in simple decisions even in the most complex ones of our daily lives, and this information cannot or must not be passed on in any way. There are specific rules for data collection, for its analysis and even for the definition of the research reliability estimate, in short, all these rules arise based on tools developed in the study of statistics.

Looking at table 4, it is possible to see that the model contains 20 samples, the coefficient of determination is 15.26%, that is about 15.26% of the variation in life expectancy can be attributed to the model variables, and that age, sex and model experience do not present significant differences in relation to production volume, as the $\text{Prob} > F = 43.54\% > 5\%$.

Variable	Note	Average	median	Standard deviation	Minimum	Maximum
Age	20	27.3	25.5	7.476982	19	43
Production volume	20	10712.5	10875	435.8522	10000	11100

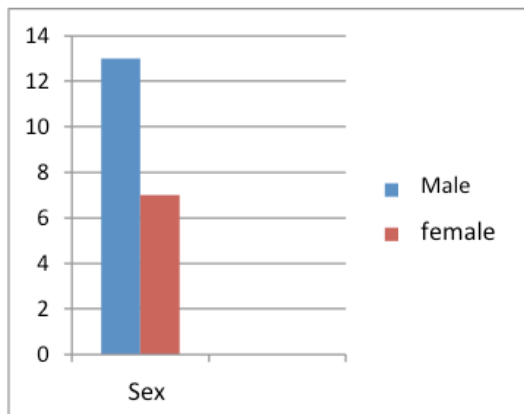
Table 1: Distribution of frequencies and interpretation of their values

Source: (Elaborated by the author, 2022)

Variable	Freq.	Percent	Cum.	Variable	Freq.	Percent	Cum.
Sex				Experiência			
female	7	35.00	35.00	Não	8	40.00	40.00
Male	13	65.00	100.00	Sim	12	60.00	100.00

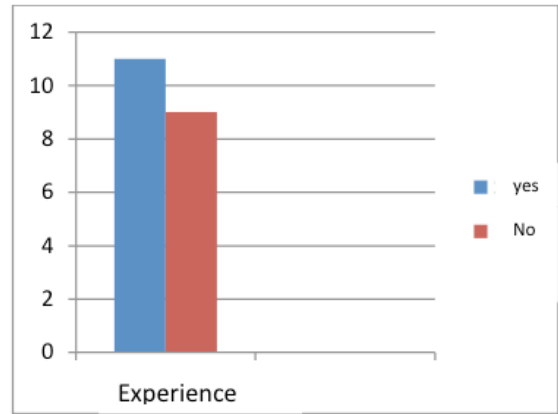
Table 2: Distribution of frequencies and interpretation of their values

Source: (Elaborated by the author, 2022)



Graph 1 : Number of workers by sex.

Source: (Elaborated by the author, 2022).



Graph 2: Number of workers by experience.

Source: (Elaborated by the author, 2022).

	Age	Sex	Experience
Production volume	-0.0763	0.2660	0.1691

Table 3: Bivariate statistical analysis

Source: (Elaborated by the author, 2022)

Number of obs	20
F(3, 16)	0.96
Prob > F	0.4354
R-squared	0.1526
Adj R-squared	-0.0063
Root MSE	437.22

Production volume	Coef.	Standard deviation	t	P > t	[95% confidence interval]
Age	8.918558	20.20791	0.44	0.665	-33.9203 51.75742
Sex	-293.3962	208.0439	-1.41	0.178	-734.4296 147.6372
experience	-314.785	302.6035	-1.04	0.314	-956.2758 326.7058
_cons	10848.6	471.12	23.03	0.000	9849.872 11847.33

Table 4: Multivariate statistical analysis

Source: (Elaborated by the author, 2022)

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