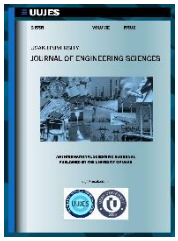

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Research article

LABOR EFFICIENCY: A STUDY IN THE PAPER MILL

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Abstract

Organizations achieve their goals thanks to their employees. Therefore, those who have the strongest effect on the efficiency of the organization are those who work. It is a desired situation for businesses to use their production resources rationally without wasting production resources and to obtain the most output with the least input. By conducting a survey on labor productivity valuation in a paper manufacturing enterprise, 21 questions were answered. The first 4 of these questions aimed to measure the demographic characteristics of the personnel, and the other 17 questions were applied to 126 people to measure the effect of the change in the factory and working conditions on the personnel productivity. The excel program was used in the analysis of the survey, and frequency distribution graphics were used. In addition to the frequency and percentage values of the obtained data, 13 hypotheses were established, and the results of the t-test and one-way analysis of variance (One Way ANOVA) and Pearson chi-square test were also given. As a result, it has been seen that the work of the personnel is not appreciated most of the time, but they are warned in case the work is interrupted or not completed. According to the personnel, success is determined as meeting the production targets. It has been revealed that age does not affect labor productivity, but gender affects labor productivity. The most important factor affecting the productivity of employees has been wages.

Keywords: *Business; efficiency; input-output; labor; paper industry.*

1. Introduction

In today's intense competition, productivity has gained a lot of importance. Because today, concepts such as cost, profit, efficiency and quality are among the most important criteria for businesses to survive.

Efficiency is an important measure that helps to understand the situation of the economy, firm, industry, sectoral and macroeconomic levels [1].

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Businesses are the organizations with the strongest economic aspects. Therefore, they should use these aspects to create benefits for people. If this use is not rational and the business cannot adapt to the ever-changing environment, even highly effective and dedicated managers cannot survive. Understanding and managing change play a vital role in increasing productivity [2].

Businesses are organizations whose economic aspects are at the forefront. Therefore, it must rationally use processes to reflect these aspects to corporate and employees with a profit-oriented approach. The enterprise, which has a certain technical power, aims to produce with the least expenditure. In a material sense, this power is the power of productivity or efficiency. Efficiency basically emerges because of internal order and harmony. If there is harmony between the production elements in an enterprise at every stage, the efficiency of each production element will reach the highest level [3].

The reliability of the enterprise will increase, as the people in the organizational structure try to achieve the objectives of the enterprise; at the end of this, the staff will get the results they expect. There is a correct relationship between the productivity of the personnel and the value they receive from the enterprise or organization [4].

In short, the concept of efficiency is a criterion that expresses the system's effective functioning in a way that will provide an increase in the amount of output without any increase in inputs. Thus, productivity increases the welfare level of an enterprise or nation by creating additional income [5].

The prerequisite for the continuity of productivity increase in enterprises is that there is no difference between the interests of the enterprises and the interests of the employees [6]. In this respect, while focusing on productivity increase in a business, the compliance of the employees with these decisions is important as well as the decisions to be taken by the business management. In a situation where the employees of the enterprise cannot be motivated about the benefits of increased productivity, problems will be encountered in practice. The main purpose of motivation is to ensure that employees work willingly, efficiently and effectively [7].

In order to provide a competitive advantage in enterprises, production of quality goods and services, technological superiority and being superior in the sector, maintaining profitability, reducing waste of resources and increasing the morale and motivation level of employees will increase the prestige of the enterprises. The realization of all these goals is possible with the efficiency and productivity of the employees [8].

Working life represents an important process of life for a person. An important part of life is spent working. Employees, like businesses trying to survive within the framework of the economic requirements of our age, are trying to keep up with the ever-changing processes and conditions.

Labor productivity is an important indicator that reflects the improvement and development in the production performance of enterprises, and therefore the competitiveness of the sectors. In a country that bases its growth on an increase in exports, it should be investigated whether progress has been made in this regard. Labor productivity is a very important concept, as increases in labor productivity will lead to growth in Gross National Product. There is a relationship between wages, which is one of the main elements of cost and therefore competition, and labor productivity. In addition, labor productivity is an important concept in terms of accessing data on the economy's capacity to produce goods and services, which is called the trend-growth rate.

"Human", which is the most important production factor in the production of economic goods and services in enterprises, is the most asset of the enterprise. The main objectives shared by the enterprises are to produce superior quality goods and services than other enterprises in the market, to become the leader of the sector in terms of technology, to continuously increase the sales volume and profitability, to prevent waste by reducing costs, to increase the motivation of the employees, and to strengthen the image of the enterprise. These stated goals can be realized with a single goal to be achieved, "making the workforce productive". Organizational goals can be achieved with the efforts of people, and how productive and effective an organization will be depending on the productivity of its employees.

Employee productivity has an extremely important place in achieving the goals of enterprises. However, in some cases, low employee productivity is inevitable. In particular, the reasons such as failure to provide organizational justice, low labor motivation, intense intra-organizational conflicts, and low promotion opportunities reduce productivity [9-10].

The most important input of labor-intensive industries is the labor force. In this sense, high labor productivity is the main factor that directly affects the competitive advantage of businesses by enabling them to work cost-effectively [11].

Today, companies that attach importance to and train their workforce, show incredible performance and provide competitive advantage. Because it is very difficult to imitate the success of companies that derive their strength from the loyalty and intelligence of their employees, thus creating a unique culture. Globalization and intense competition in the world threaten businesses and force them to change and renew rapidly to sustain their success and life. The realization of this change basically depends on advanced technology, innovation and creativity, and the production of efficient and quality goods and services. The source of knowledge, technology and innovation depends on the ability to produce and use knowledge [12].

Organizations achieve their goals thanks to their employees. Therefore, those who have the strongest effect on the efficiency of the organization are those who work. Employees' abilities and motivations are as important as their education level.
The chronological evaluation of these studies is given in Table 1 below.

Table 1 Labor Efficiency Literature

The authors	Subject	Method	Results
[11]	A Computer-Aided Premium System Model Based on Efficiency and Quality in Apparel Businesses	Model Analysis	The model can work as a decision support system for the employer.
[13]	A Field Study to Examine the Factors Affecting Employee Productivity	Frequency Analysis and Correlation Analysis	The most important factor affecting employee productivity is wages.
[14]	The Effect of Nomophobia on Employee Productivity in Food and Beverage Businesses	Regression analysis	As a result of the research, it was revealed that the sub-dimensions of nomophobia affect employee productivity significantly and negatively.
[15]	The Effects of Ergonomics on Employee Efficiency in Hospitality Businesses	Compilation	It is known that ergonomic conditions have effects on the

			productivity of the employees.
[16]	Loss of Productivity Based on Shifts of Groupings in Business the Effect of Data Mining Method	Data mining	The loss in efficiency is due to losses at the beginning and end of shifts.
[17]	A Factor to be Considered in the Labor Efficiency Account: The Financial Health Status of the Employees,	Compilation	Financial health is important to business productivity.
[18]	The concept of efficiency and the importance of efficiency in businesses: The Example of AKFA Tea Factory	Class status	The importance of the concept of efficiency in terms of enterprises and the country's economy is stated.
[19]	The Relationship Between Ergonomic Workplace and Productivity: A Research on Academic Staff of Karadeniz Technical University	Frequency Analysis and Correlation Analysis	An ergonomic working environment is an effective factor in increasing employee productivity.
[20]	The Impact of Office Environments on Employee Performance: The Design of the Workplace as a Strategy for Productivity Enhancement	Regression analysis	Indoor and It has been determined that ventilation has an effect on job stress and satisfaction.
[21]	A Study on The Assignment of the Bureaus of Vocational High School Students in Terms of Ergonomics-Performance	Frequency Analysis and Correlation Analysis	In social programs students, technical had better ergonomic conditions than those in the program.
[22]	A Study Relating to Office Environments on Workers: Kocaeli Metropolitan Municipality Sample	Frequency Analysis	Participants noise, an ergonomic factor were found to be disturbed by the level of.
[23]	The Effect of The Working Environment Conditions on Management Fertility	Compilation	The desired efficiency will be achieved by increasing the quality and quantity of production.
[24]	Effects of Ergonomic Improvements on Work Psychology and Productivity: A Study in an Electrical Home Appliances Manufacturer	Compilation	our physical conditions improvement and It has been determined that the development of.

Based on the literature research mentioned above with this research, the evaluation of employee productivity in a paper production company is the subject of this study.

2. Material and Method

2.1. Purpose of The Research

Organizations achieve their goals thanks to their employees. Therefore, those who have the strongest influence on the efficiency of the organization are those who work. The humaneness of the environment in which employees work is as important as their abilities, motivations and education levels. To what extent do changes in wages, age, gender, length of service, and education level have an impact on staff productivity, and in which situations does the staff feel productive, what is the return of this productivity to the business? What are the ways to motivate the staff to work and to benefit from their physical and mental strength? Research has been conducted on issues such as revealing all these and the ideas and opinions of the staff.

2.2. Scope and Limits of The Research

The research was conducted in a company operating in the paper industry. The survey represents workers working in the paper business.

2.3. Mass and Sample

Since the research is based on the ratio in the stack, the most frequently used values for the sample diameter are entered into the tool as the default value. Although the margin of error value is often used as 5%, it may vary in specific studies. The stack diameter is 175 people. Minimum sufficient sample diameter calculated according to these explanations; n=121. The results were applied to n= 126 people in proportion to these ratios. Considering the number of people taken as a basis, the number of surveys is statistically within the confidence interval of 0.05 [25].
The face-to-face survey method was applied to 126 people randomly selected among 175 employees working in Paper- Cardboard Industry Inc, by the interviewers in 2018. It was applied to 126 people that we believe represent the main mass in an enterprise with the highest number of workers.

2.4. Data Collection Analysis and Techniques

"Survey Method", one of the data collection methods, was used in the research. The survey was conducted on 126 personnel through face-to-face interviews with the personnel. Our survey consisted of 21 questions in total. The first 4 of these questions are aimed at measuring the demographic characteristics of the personnel, and the other 17 questions are about the relationship in the factory and the effect of the change in working conditions on the productivity of the personnel and are presented in the appendix. Excel program was used in survey analysis and frequency distributions and graphics were used. The questionnaire was filled out through face-to-face interviews. More accurate information was obtained by filling it face to face.

3. Results and Discussions

3.1. Personal Characteristics of the Personnel

The evaluation was made regarding the age, gender, education level and length of service of the personnel.

3.1.1. Gender of the Personnel

The distribution of the personnel participating in the survey by gender is shown in the graph.

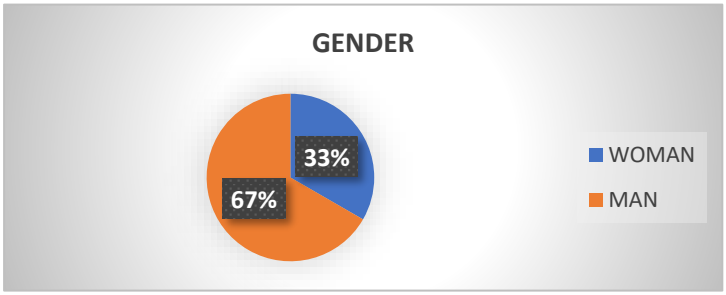

Fig. 1 Gender of the Personnel

As shown in Fig. 1, the majority of the personnel participating in the survey are men.

3.1.2. Age Range of Personnel

The age range distribution of the personnel participating in the survey is shown in the graph.

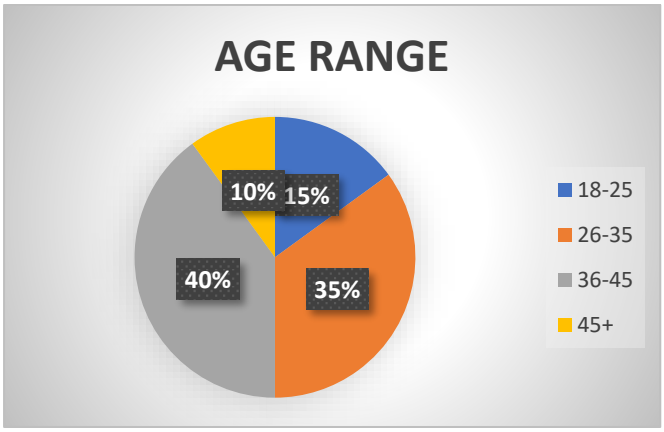

Fig. 2 The age range of personnel

As shown in Fig. 2, the age range of most of the personnel participating in the survey is 36-45.

3.1.3. The Education Level of The Personnel

The education level of the personnel participating in the survey is shown in the graph.

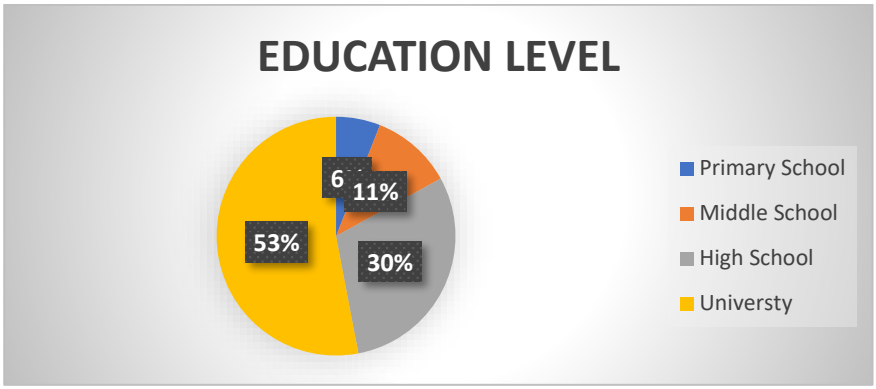

Fig. 3 The education level of the personnel

As shown in Fig. 3, it is seen that the education level of the majority of the personnel participating in the survey is high university.

3.1.4. Service Period of The Personnel

The service period of the personnel participating in the survey is shown in the graphic.

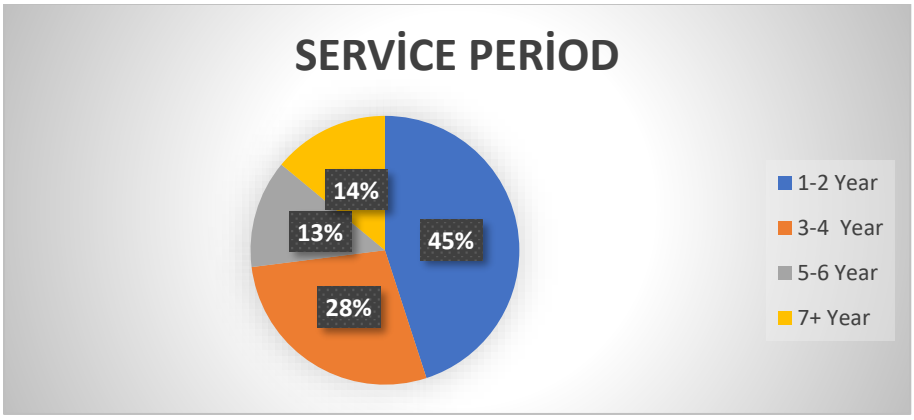

Fig. 4 Service period of the personnel

As shown in Fig. 4, it is seen that the majority of the personnel participating in the survey serve for 1-2 years.

3.2. Factors Affecting the Productivity of Staff

Evaluations are given to measure the effects of the changes in factory relations and working conditions on personnel productivity.

3.2.1. The Training Received by The Employees Regarding Their Job

The training received by the personnel participating in the survey is shown in the graph.

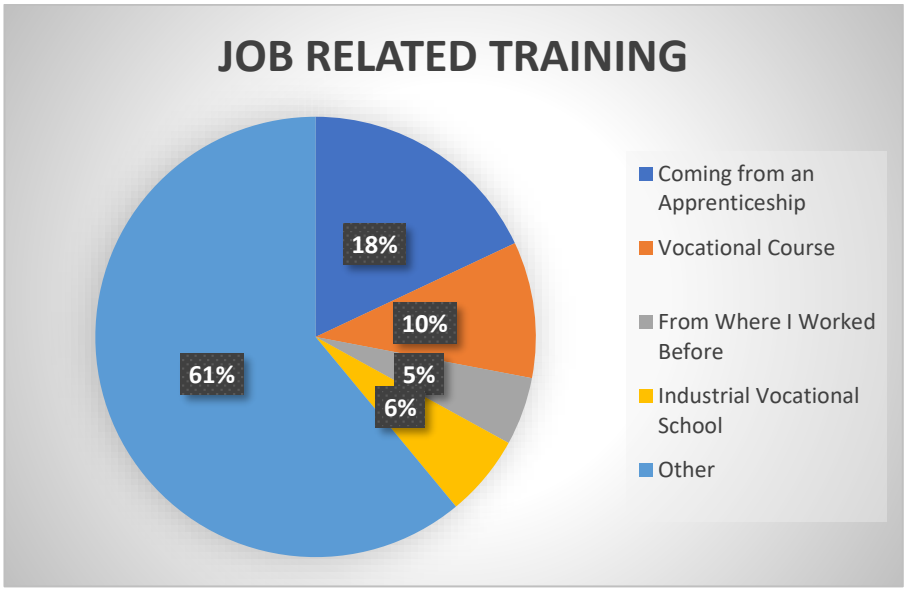

Fig. 5 Work-related training of employees

As shown in Fig. 5, it has been determined that the majority of the personnel participating in the survey did not receive any job-related training.

3.2.2. The Reason Employees Prefer to Work in Such a Job

The reason the personnel participating in the survey prefer to work in such a job is shown in the graph.

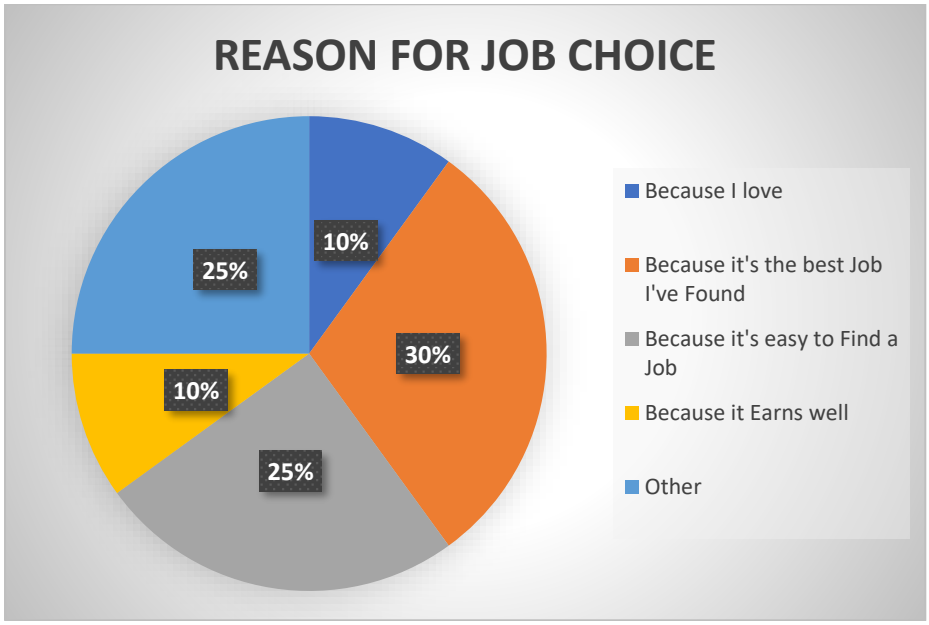

Fig. 6 The reasons why employees prefer the job

As shown in Fig. 6, the majority of the surveyed personnel chose this job because it was the best job they found.

3.2.3. The Work Done by The Employees Creates Boredom and Monotony

The graph shows whether the work of the personnel participating in the survey creates boredom and monotony.

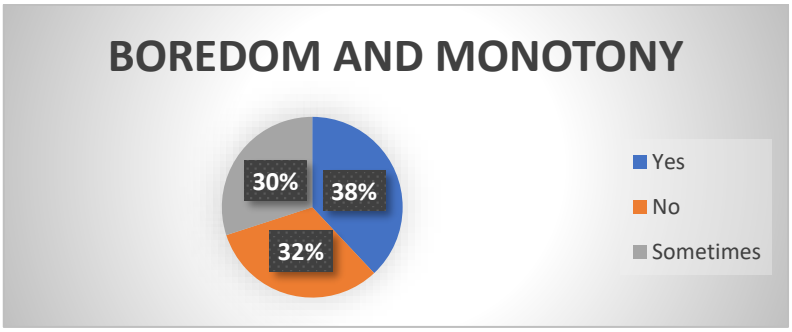

Fig. 7 The work done by the employees creates boredom and monotony

As shown in Fig. 7, the work of the personnel participating in the survey causes boredom and monotony.

3.2.4. Are The Employees Satisfied with Their Work?

It is shown in the graph how much of the personnel participating in the survey do they prefer the job they do and whether they prefer this job again.

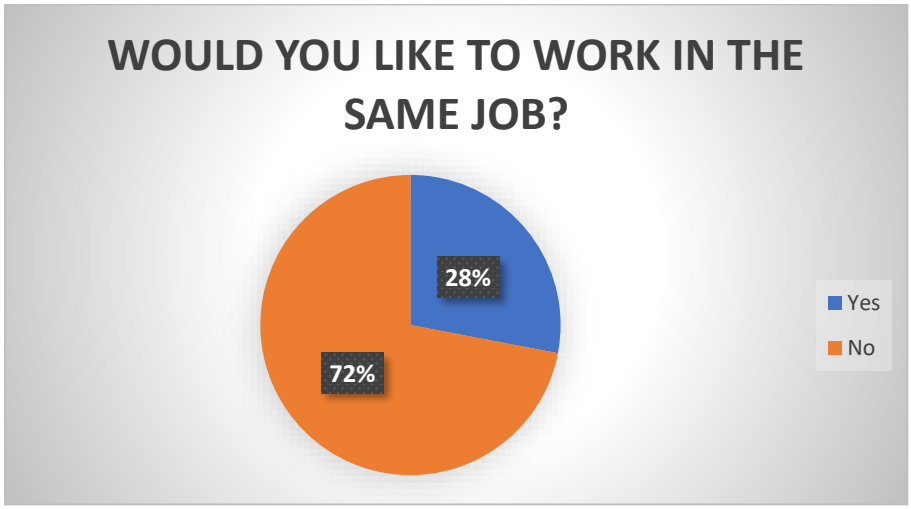

Fig. 8 The work done by the employees creates boredom and monotony

As shown in Fig. 8, it is seen that 72% of the personnel participating in the survey do not enjoy their job.

3.2.5. Wage Satisfaction

The salary satisfaction of the personnel participating in the survey is shown in the graph.

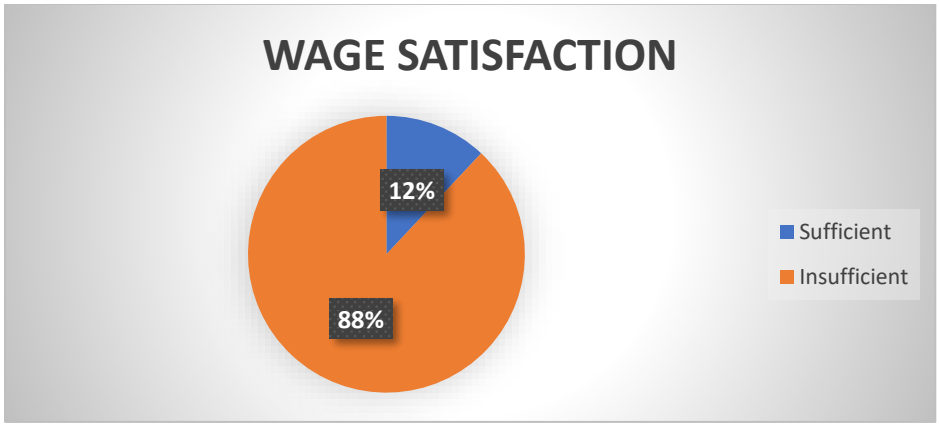

Fig. 9 The work done by the employees creates boredom and monotony

As shown in Fig. 9, it is seen that 88% of the personnel participating in the survey are not satisfied with the wages they receive and are inadequate.

3.2.6. Overtime

The overtime of the personnel participating in the survey is shown in the graph.

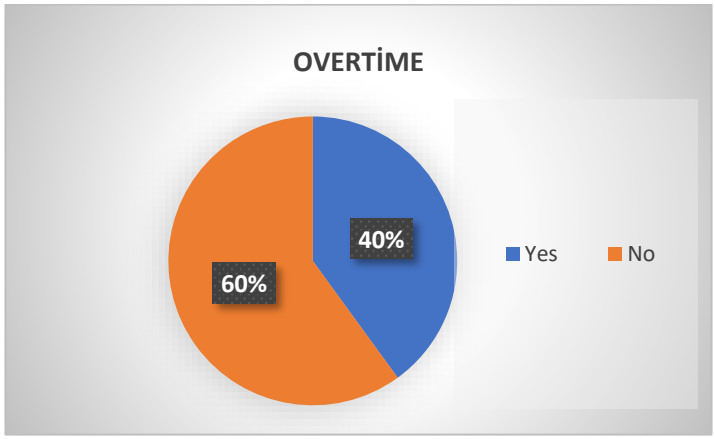

Fig. 10 Overtime graph

As shown in Fig. 10, it is seen that 60% of the personnel participating in the survey do not work overtime frequently.

3.2.7. Social Opportunities

The social opportunities of the personnel participating in the survey are shown in the graphic.

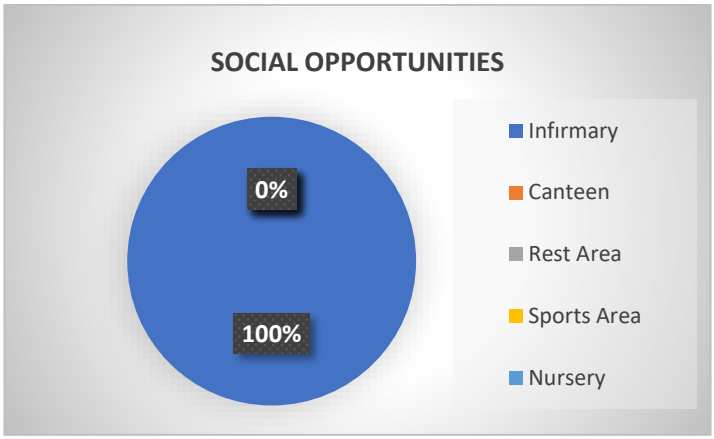

Fig. 11 Social opportunities

As shown in Fig. 11, it is seen that the person participating in the survey only has the infirmary as a social opportunity.

3.2.8. Cleanliness of The Working Environment

The cleanliness of the working environment of the personnel participating in the survey is shown in the graphic.

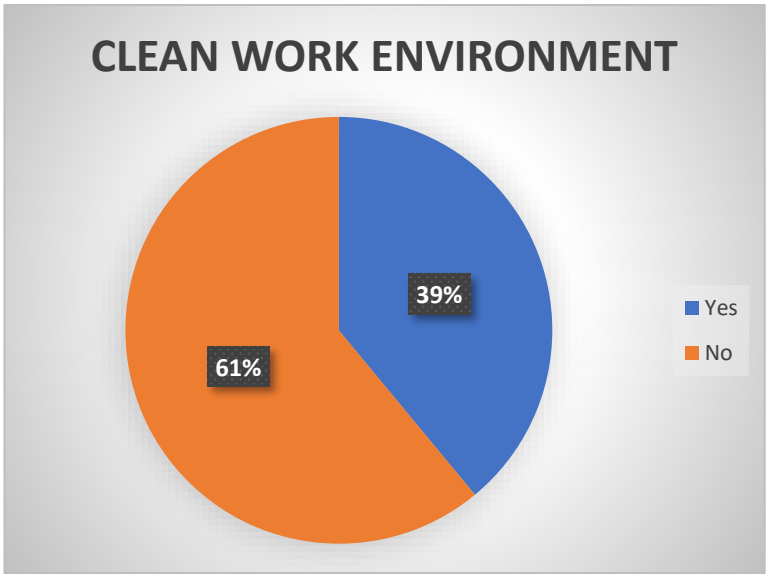

Fig. 12 Cleaning of the working environment

As shown in Fig. 12, it is seen that the working environment of most of the personnel participating in the survey is not clean.

3.2.9. Things That The Workplace Pays Attention To in The Working Environment

What the surveyed personnel pay attention to in the workplace is shown in the graphic.

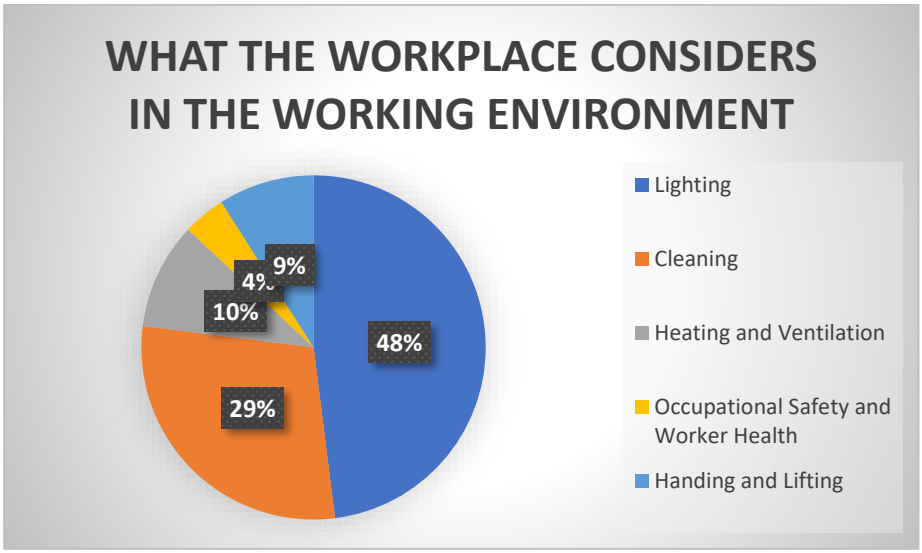

Fig. 13 What the workplace attaches importance to in the working environment

As shown in Fig. 13, 48% of the personnel participating in the survey attach importance to lighting and 29% to cleanliness in their working environment.

3.2.10. Business Relations

The relationships of the personnel participating in the survey with their colleagues and supervisors at the workplace are shown in the graphic.

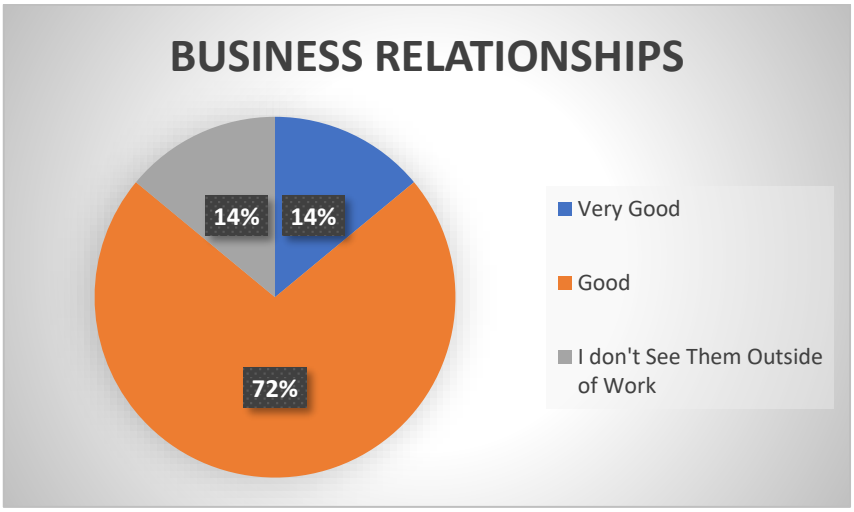

Fig. 14 Business relations

As shown in Fig. 14, it is seen that 72% of the personnel participating in the survey have good relations with their colleagues and supervisors.

3.2.11. Efficiency Graph

The thoughts of the personnel participating in the survey to increase efficiency in the workplace are shown in the graph.

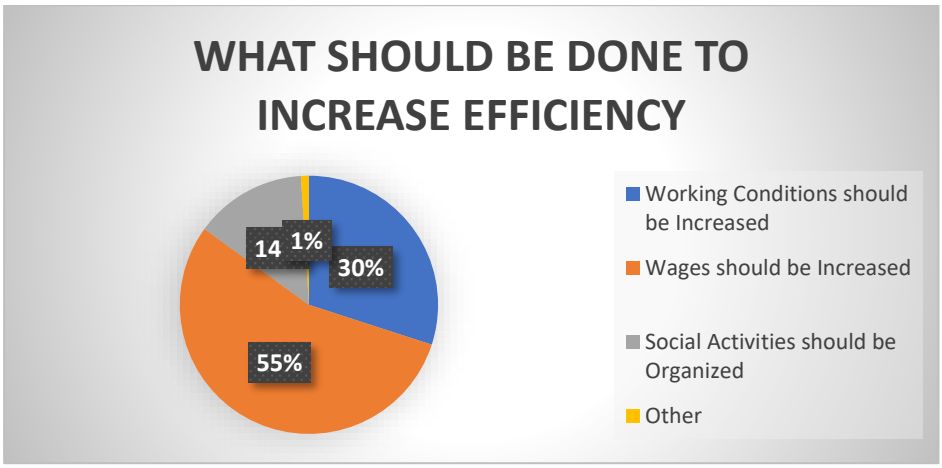

Fig. 15 Efficiency Graph

As shown in Fig. 15, it is seen that more than half of the personnel participating in the survey want to improve their working conditions.

3.2.12. Break Times

The sufficiency of the break times at the workplace of the personnel participating in the survey is shown in the graphic.

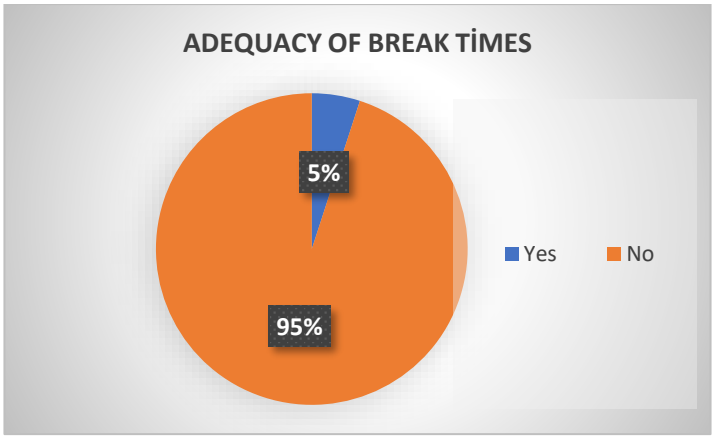

Fig. 16 Break times

As shown in Fig. 16, it is seen that 95% of the personnel participating in the survey work without taking breaks.

3.2.13. Permission Status

The annual leave periods used by the surveyed personnel at the workplace are shown in the chart.

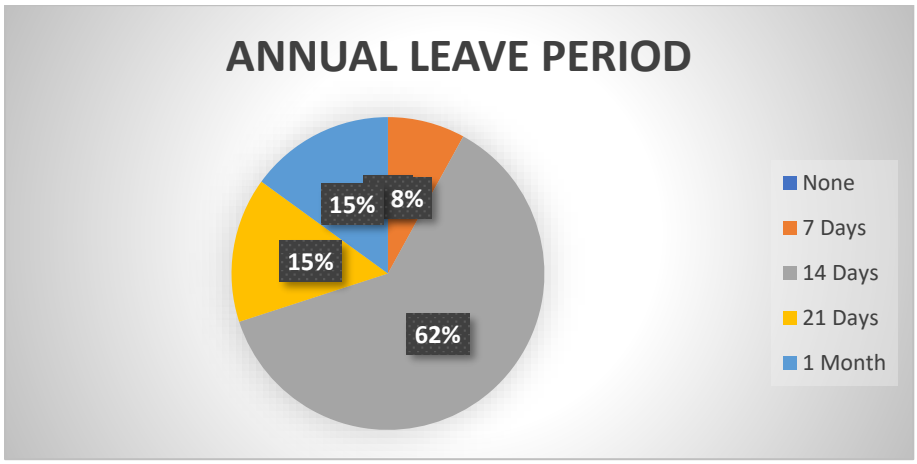

Fig. 17 Permission status

As shown in Fig. 17, it is seen that 62% of the personnel participating in the survey take 14 days off since the starting interval is 1-3 years.

3.2.14. Promotion at Work

The opportunities for promotion in the workplace of the personnel participating in the survey are shown in the graphic.

Fig. 18 Promotion status at work

As shown in Fig. 18, it is seen that 67% of the personnel who participated in the survey did not have a job promotion.

3.2.15. Appreciation

Appreciation of the surveyed personnel at the workplace is shown in the chart.

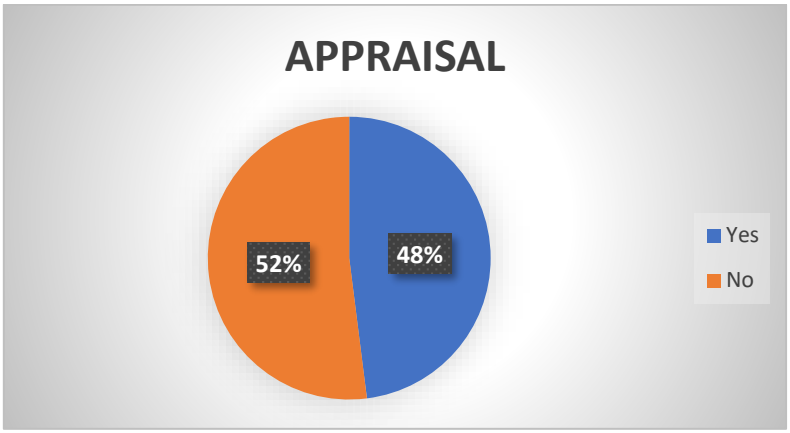

Fig. 19 Appreciation

As shown in Fig. 19, 52% of the personnel who participated in the survey are appreciated for their work.

3.2.16. Warning

The status of being warned at the workplace of the personnel participating in the survey is shown in the graph.

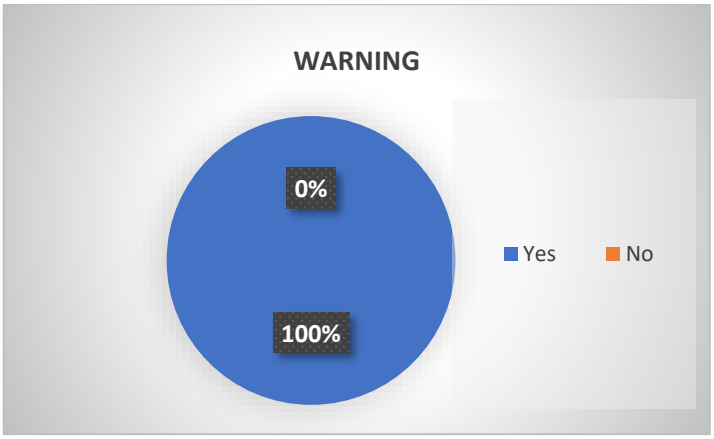

Fig. 20 Warning

As shown in Fig. 20, it is seen that all the personnel participating in the survey are dismissed when they do less work.

3.2.17. What Is Success?

What is the success in the workplace of the surveyed personnel? The graph of the question is shown.

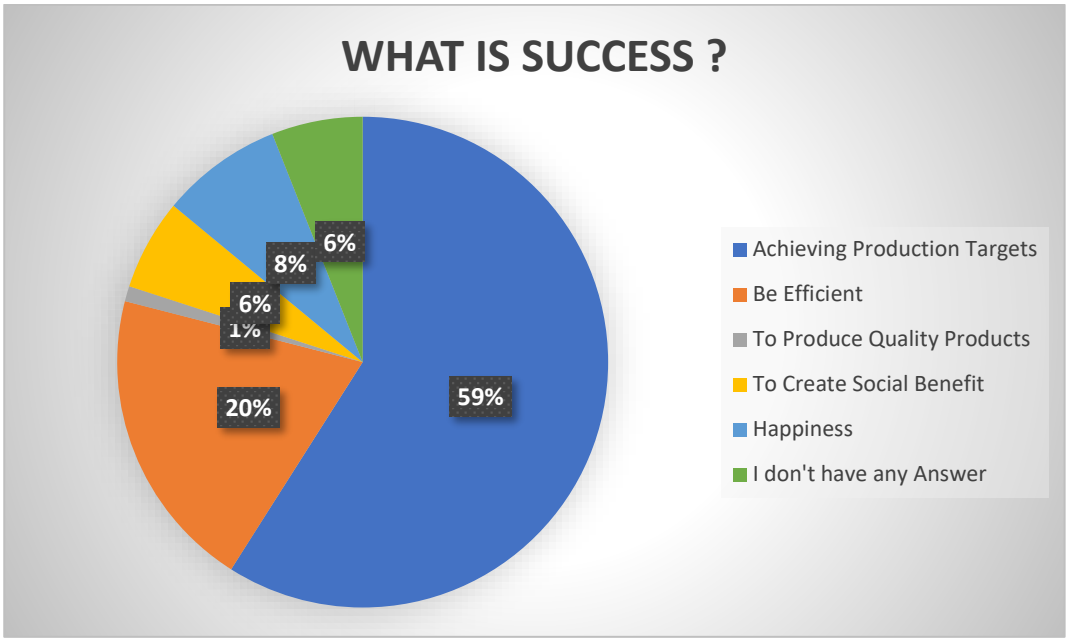

Fig. 21 What is success?

As shown in Fig. 21, it is seen that 59% of the personnel who participated in the survey said to reach the production target.

3.3. Analysis of Research Hypotheses

A total of 13 hypotheses were tested using the IBM SPSS 22 statistical package program based on the information obtained from the literature. In analyzes requiring normal distribution, skewness-kurtosis coefficients were examined [26-27]. If both coefficients did not exceed ± 2, the data distribution was considered normal. However, the closeness of mean and median, histogram, coefficient of variance, detrended Q-Q plot and Kolmogorov-Smirnov test were used to decide on a normal distribution.

In all analyses to examine the differences, primarily parametric ones were preferred. Independent sample t-test and one-way analysis of variance (One Way Anova) were performed. However, when the necessary prerequisites were not met, non-parametric equivalents of the related tests were preferred. In parametric tests, the significance of the variances was checked first and the process was terminated when the H0 hypothesis was accepted ($p>0.001$). When the H0 hypothesis was rejected ($p<0.001$), the precondition of homogeneity of variances was sought. The homogeneity of the variances is effective in choosing the Levene tests (Post Hoc) to be selected. If the result of the homogeneity of variances test is $p<0.001$, Tamhane's T2 test was used, and if $p>0.001$ the Scheffe test was used.

The "Two-Independent Samples Test" (Mann Whitney U), the non-parametric equivalent of the independent sample t-test, was used in the absence of at least one of the prerequisites. One Way Anova test was used for at least three variable expressions. In the absence of at least one of the prerequisites that would prevent the use of the test, the non-parametric equivalent "K Independent Samples Test" (Kruskal Wallis –H) was used

instead. In these tests, Mann Whitney U pairwise comparisons were used to find the source of the difference. A significance level of p=0.05 was used in all analyses.

The chi-square test is a statistical test that is generally used to test two independent qualitative criteria. The null hypothesis (H0) states that the two criteria are independent, while the research hypothesis (HA) states that there is a relationship between the two criteria. As a result of the chi-square test, the question is asked whether there is an expected frequency of less than 5 in more than 20% of the cells. If the answer is no, the Pearson Chi-square statistic is used. If the answer is yes, the value of "the minimum expected count" (smallest expected value = EBD) is checked. If EBD < 5, Fisher's exact test statistic is used, if 5 <= EBD < 25, the "continuity correction" statistic is used. If EBD >= 25, Pearson Chi-square statistics are used [28].

The research hypotheses were formed as follows.

H1: Labor productivity differs by gender.

H2: Labor productivity differs according to age.

H3: Labor productivity differs according to graduation.

H4: Labor productivity differs according to the length of service.

H5: It differs according to what needs to be done to increase labor productivity.

H6: Labor productivity and the desire to work in the same place are interconnected.

H7: Labor productivity and wage adequacy are interconnected.

H8: Labor productivity wages are interdependent.

H9: Labor productivity and workplace cleanliness are interdependent.

H10: The level of labor productivity of co-workers and employer relations are interdependent.

H11: Labor productivity is interconnected when managers give the opportunity to rise.

H12: Labor productivity appreciation is interconnected.

H13: Labor productivity alert status is interdependent.

The results of the Mann-Whitney U Analysis of the H1 and H2 hypotheses are included.

The H1 hypothesis tests the effect of gender on labor productivity. As a result of examining the labor productivity differences between men and women with the Mann-Whitney U test, it was found that p=0.004 < 0.05. This means that gender affects labor productivity.

The H2 hypothesis tests the effect of age on labor productivity. As a result of examining the labor productivity differences between the workers aged 18-25 and workers aged 26-35 with the Mann-Whitney U test, it was found that p=0.808 > 0.05. This means that age does not affect labor productivity.

The results of the one-way analysis of variance (Kruskal Wallis -H) of the H3-H5 hypotheses are included.

According to the H3 hypothesis, the effect on the productivity of different groups of graduates was examined. A statistically significant difference was obtained and it was seen that the finance graduate group was lower than the other groups in terms of productivity.

In the H4 hypothesis, the effect of different service periods on labor productivity was examined. A statistically significant difference was also obtained for this hypothesis, and it was seen that those with more than 7 years of service had higher productivity than the other groups.

In the H5 hypothesis, the suggestions that should be made to increase work efficiency are examined. A statistically significant difference was obtained, and training from the apprenticeship to the training attended by the personnel came to the fore.

Considering the chi-square and Fisher's exact test results, H7, H9, and H13 do not support it. In other words, labor productivity does not depend on wage adequacy, cleanliness of the work environment, or being warned at work.

According to the chi-square test results, H6, H8, H10, H11, H12 hypotheses are supported. Labor productivity depends on the desire to work in the same place, the type of wages, the relations with colleagues and employers, the opportunity for promotion by the managers, and the state of being appreciated.

It has been observed that the work of the personnel is not appreciated most of the time, but they are warned in case the work is interrupted or not completed. Thus, it satisfies the H13 hypothesis.

4. Conclusion and Recommendations

One of the most important problems of businesses is to increase efficiency. Taking and implementing efficiency-enhancing measures is one of the main duties of enterprises. In addition to the factors of production that directly affect productivity, the place of the workforce is also very important. The motivation of the employee, the sufficient level of wages and the arrangement of the physical environment of the workplace in such a way that the employee can work are effective in his productivity. It has been observed that employees who are protected from work accidents and who work in healthy environments and who are satisfied in terms of wages are more productive.

67% of the personnel participating in the survey are male and 40% of the age range of the personnel is between the ages of 36-45. 53% of the personnel are university graduates. Since 45% of the personnel have been serving for 1-2 years, their annual leave status is 14 days. 61% of them are from other professions and 30% of them do this job because it is the best they have found, while 10% do this job because they love it. While 40% of them stay overtime frequently, 60% do not. Only the infirmary is used as a social facility. 14% do not meet with their colleagues outside the workplace. Working relationships are good with co-workers and supervisors. 75% of them complain that their work is tedious and monotonous. 72% do not intend to work in the same job again. 95% of them mentioned that the breaks were insufficient, and 67% of them mentioned that they had the opportunity to get promoted at work. 62% of them stated that reaching the production target was a success. 61% of the personnel do not find the work environment clean. Lighting and partial cleanliness are given importance in the workplace. 553% think that wages should be increased to increase productivity and that breaks at work are insufficient. It has been seen that there is no chance of advancement. It has been observed that the work of the personnel is not appreciated most of the time, but they are warned in

case the work is interrupted or not completed. According to the personnel, success in meeting the production targets.

Considering the results that were significant as a result of the analyzes in this study, it was observed that there were many factors affecting employee productivity. In particular, the most important factor affecting the productivity of employees has been wages. Employees who are satisfied with their wages embrace their work more, embrace their work, and as a result, the productivity of the employee increases. In this context, it is important in terms of efficiency that business owners pay their employees the wages they deserve. In this study, the most desired by the employees from their businesses is to earn income to the extent of their productivity. The practice business urgently needs to develop compensation systems that allow employees to be paid based on their efficiency and achievement.

Considering that the physical conditions of the workplace are another factor affecting productivity, the appropriate physical conditions of the employees working in the application business is another factor affecting work efficiency.

Performance-based wage systems may be preferred in order to increase labor productivity. In addition, the increase in productivity as a result of wage increases also increases the motivation and commitment of the workforce at the micro level. Ensuring the employment of a skilled workforce will bring out employees who love their job and therefore do not see their job as a burden or beyond their source of income. This will be a feature that directly reduces the cost in terms of input.

It has been proven to increase the productivity of the workforce when internal audits are carried out in a way that does not disturb the employees, or rather, does not cause the employees to feel that they are being punished. In this sense, a qualified and realistic audit employee in a correct and timely manner will positively affect the employee.

It is necessary to include factors such as providing adequate promotion opportunities for workers, establishing sufficient communication between management and employees, providing in-service training activities from time to time depending on technological developments and social activities where employees can relax and improve themselves outside of working hours, ensuring work discipline and employee safety. will increase efficiency.

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